

**Feeding the Brethren: Grain Provisioning of
Norwich Cathedral Priory, c. 1280-1370**

by

Philip Slavin

**A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
Centre for Medieval Studies
University of Toronto**

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Thesis Abstract

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The present dissertation attempts to follow and analyze each and every individual stage of food provisioning of a late medieval monastic community.

Chapter One is an introductory survey, describing the topic, its *status quaestionis*, problems and methodology.

Chapter Two establishes the geography of crops in the rural hinterland of Norwich, with each manor specializing in different crop. A close analysis of the crop geography partially supports the Von Thünen thesis.

Chapter Three looks at the agricultural trends of the demesnes. Roughly speaking, the period between c. 1290 and 1370 was a history of wheat's expansion at the expense of rye, on the one hand, and legume shrinkage at the expense of grazing land.

Chapter Four discusses annual grain acquisition, its components and disposal. It shows that about eighty per cent of the total supply derived from harvest, while the remainder came in form of tithes, grants and purchases.

Chapter Five deals with the human and equine interaction. The bovine population was certainly dominant, but the draught horses easily outnumbered the oxen. Each year, the Priory authorities saved a great deal of money, because of (virtually) free customary carting service.

Chapter Six explores the space for storing and processing of the annual grain supply. The five adjacent buildings, namely the Great Granary, brewery, bakery, mill and staples, allowed most effective cooperation between dozens of Priory labourers working in victual departments, on the one hand, and decreased transportation costs.

Chapter Seven attempts to establish the relation between the Priory population, its annual grain supply and demand. Conversion of the grain into approximate calorific and financial equivalent reveals that the supply must have exceeded the demand.

Chapter Eight is deals with the actual consumption of the grain supply. As far as Norwich monks are concerned, their annual bread and ale supply has certainly exceeded their normal requirements and there is no hint about selling the surplus. Joining the bread and ale accounts with those of the cellar, we arrive at astonishing calorific figures.

Chapter Nine discusses the charity activities of Norwich Priory, particularly connected to the distribution of bread and ale among the needy. There were three distinctive groups: hermits, prisoners and paupers. According to almoner's accounts, the Priory allocated generous sums of loaves and ale to the paupers.

להורי ולחמי וחמותי,

For

My Parents, Edward Slavin and Tamara Slavin (née Olijnik)

*And my Parents-in-Law, Alexander Mozias and Svetlana Mozias (née
Meiler)*

Acknowledgments

The present dissertation marks the culmination and, unfortunately, the end of what only yesterday seemed to be never-ending, challenging, yet exciting path towards the PhD degree. Five years of search and research, travel and study, writing and re-writing. Although the present work, to my best knowledge, is written by me only, it could not possibly be completed in its present form without the kind support of so many people, teachers, friends and relatives alike. Each and every of them deserves a separate and eloquent introduction here; the present format, however, compels me to keep succinct and brief.

First and foremost, my deepest and most sincere thanks go to my Thesis Committee members: Joseph Goering, John H.A. Munro, David Townsend and Lawrin Armstrong. I am deeply thankful to them for their pastoral care, keen observations, critical advices and time. I am equally grateful to John Langdon, my external examiner, for his most careful reading of the manuscript, which slew some rather embarrassing errors. The remaining errors are, of course, mine.

The Centre for Medieval Studies provided me generously with both financial support and stimulating teachers. In particular, I am thankful (in alphabetical order, not in order of preference) to Professors Virginia Brown, Nicholas Everett, Mark Meyerson, Andy Orchard, A.G. Rigg and William Robbins). Separate thanks go to Grace Desa the 'Patience'.

At the Pontifical Institute for Mediaeval Studies Library I have found, as many rightfully noticed over these years, my second (and according to some first) home. Writing my dissertation in its paleography room gave me the well-known feeling of 'working from Nine to Five' (although in most times it was rather 'from Nine to Seven'). Special thanks go there to Caroline Suma, who, unfortunately, left the library last year, after having worked there for twenty-seven years.

I am equally thankful to the University of Toronto School of Graduate Studies (SGS) and the Centre for Renaissance and Reformation Studies (CRRS) Victoria College, University of Toronto, for generously financing my research trips to England. In the *Albion* proper, an endless list of individuals can be created whom I owe a great deal. I should thank the most helpful staff members of the National Archives (formerly, the Public Record Office), Kew Gardens, Surrey; the British Library, London; Norfolk Record Office, Norwich; Bodleian Library, Oxford; Corpus Christi College, St. John's College and Cambridge University Library, Cambridge. As far as concrete individuals go, I should mention Professors Carole Rawcliffe, of University of East Anglia, Norwich, and Bruce M.S. Campbell, of Queen's University, Belfast. The infecting influence of the latter can easily be detected in the present thesis. Brian Ayers, the Chief Archaeologist of Norfolk should be thanked for introducing me to the landscapes of Norfolk the Beautiful.

Despite changing continents, languages and millennia, I remain grateful to my teachers at the Hebrew University, Jerusalem, over the years. Just to name a few: (the late and much missed) Emmanuel Vardi (my first teacher in matters medieval), Amnon Linder (my MA mentor, whose dedicated support, both professional and personal, past and present, continues to inspire me), Avy Abramovici (my violin performance teacher), Benjamin Z. Kedar, Michael Toch, Esther Cohen, Emmanuel Sivan, Gabriel Motzkin,

Michael Heyd, Guy G. Stroumsa, David Satran, Hannah Cotton, Debbie Gera, Dana Shalev, Naphtali Gutman, Don Harran, Jehoash Hirschberg, Julia Kreinin and Naphtali Wagner.

The dissertation could not have been completed without the inspiration of numerous composers and bands, too numerous and diverse to list. From incomparable beauty of Josquin Des Prez and Byrd, melodic perfection of Bach and Vivaldi, through extravertal expressions of Schuman and Brahms, philosophical reflections of Mahler and Debussy, mighty yet very personal chords of Shostakovich and Prokofiev, pastoral moods of Bartok, challenging structures of Schnittke and Artemiev, down to irresistible lines of the 'Beatles' and 'Queen', rebellious songs of the 'Doors', convention-breaking 'Sex Pistols', 'Pixies' and 'Nirvana', and earth-shaking voice of Ronnie James Dio. Alexander Laertsky, whose rarely sarcastic yet very real and intelligent sense of humour has been my constant source of support, should be thanked here separately. Same goes to Vladimir Vysotsky, the *vox populi clamantis*.

More generally, but no less personally, I would like to thank my numerous friends and colleagues: Ilya Avroutine and Maria Kozlov, Leonid Budnevich, Edwin and Anne DeWindt, John and Sarah Geck, Susanne Jenks, Alan Kiriev, Zeev and Marina Lieber, Michael Margolin, Ivan and Svetlana Neganov, Max Nelson, Tim Newfield, Micha Perry, Jaclyn Piudik, Zvi Razi, Shai Shir, Judith Schlanger, Moshe Sluhovsky and Nathan Sussman. Whether over a pint (or shot), or in a formal atmosphere, the abovementioned persons have always encouraged me to go on with my dissertation project, even when I seriously doubted its wisdom and significance. Thanks should be extended to my immediate family: my parents Edward and Tamara Slavin (née Olijnik), who have always provided me their support, both parental and financial, and my parents-in-law, Alexander and Svetlana Mozias (née Meiler) who warmly welcomed me into their family. My brother Sasha and his family should be thanked, too. Last, but not least, Tanya Slavin, my better (and much beloved) half, *sine qua non*, has always been a source of unimaginable support, love and...forbearance. It is through her that I finally came to know the difference between *house* and *home*. I promise to dedicate my first monograph to her.

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Chapter 1: Historiography, Problems and Methodology

Historiography

Provisioning of medieval towns by their surrounding hinterland has been relatively a new field in scholarship. While there is a good number of valuable studies on the provisioning of Mediterranean towns,¹ too little is known about the situation in England.

¹ For Spain, see Antonio José Mira Jódar, 'Ordenación del espacio agrario y conducción a corto plazo de la tierra en la Huerta de Valencia (1285-1350)', *Studi Medievali* ser.3. 45:1 (2004), 159-204; Maria Teresa Ferrer Mallol, 'Flix, un port fluvial blader per a Barcelona: la compra de la baronia de Flix i La Palma l'any 1400', *Acta Historica et Archaeologica Mediaevalia* 23-24 (2003), 465-507; Carmen Argente del Castillo Ocaña, 'La política frumentaria de los concejos andaluces (siglos XV-XVI)', *Anuario de Estudios Medievales* 31:2 (2001), 693-725; Josefina Mutgé i Vives, 'L'abastament de blat a la ciutat de Barcelona en temps d'Alfons el Benigne (1327-1336)', *Anuario de Estudios Medievales* 31:2 (2001), 649-691; Agustín Rubio Vela, 'El ganado de Valencia y los pastos del reino: el avituallamiento urbano bajomedieval como factor de conflictividad', *Boletín de la Sociedad Castellonense de Cultura* 75:3-4 (1999), 651-719; Jordi Comellas Solé, 'L'abastament d'una ciutat en temps de guerra: el setge de Barcelona de 1472', *Acta Historica et Archaeologica Mediaevalia* 18 (1997), 451-471; Antonio Cortijo Ocaña, 'Commercial Rivalry between Barcelona and Valencia in the Fourteenth Century: Privileges and Franchises', *La Corónica: A Journal of Medieval Spanish Language and Literature* 26:1 (1997), 45-52; Pilar Hernández Íñigo, 'Producción y consumo de pan en Córdoba a fines de la Edad Media', *Meridies* 3 (1996), 175-193; Manuel Espinar Moreno, 'Precisiones sobre el avituallamiento de la ciudad de Orán (1510-1512): la contratación de Diego Espinosa, regidor de Almería', in *Actas del II Congreso Internacional 'El Estrecho de Gibraltar', Ceuta, 1990*, eds. Eduardo Ripoll Perelló and Manuel F. Ladero Quesada (Madrid: Universidad Nacional de Educación a Distancia, 1995), Vol. IV, pp. 55-70; Sebastià Riera Viader, 'El proveïment de cereals a la ciutat de Barcelona durant el 'mal any primer' (1333): la intervenció del Consell de Cent i de la Corona', in *Historia urbana del Pla de Barcelona: Actes del II Congrés d'Història del Pla de Barcelona celebrat a l'Institut Municipal d'Història els dies 6 i 7 de desembre de 1985*, eds. Anna Maria Adroer i Tasis (Barcelona: Ajuntament de Barcelona, Institut Municipal d'Història, 1989 - 1990), Vol. I, pp. 315-326; Eva Serra Puig, 'Els cereals a la Barcelona del segle XIV', in *Alimentació i Societat a la Catalunya Medieval* (Barcelona: Institució Milà i Fontanals, Unitat d'Investigació d'Estudis Medievals 1988), pp. 71-107; Francisco Blay García, 'Aprovisionamiento cárnico en Torrent (Valencia) al final de la Edad Media', in *Arqueología Medieval Española, II Congreso, Madrid 19-24 Enero 1987* (Madrid: Comunidad de Madrid, Asociación Española de Arqueología Medieval, 1987), Vol. II, pp. 35-42; Jean-Pierre Molenat, 'L'approvisionnement de Tolède au XVe siècle, d'après les ordonnances municipales', in *L'approvisionnement des villes: De l'Europe occidentale au Moyen-Age et aux Temps Modernes. Cinquièmes Journées internationales d'histoire, 16-18 septembre, 1983, Centre culturel de l'Abbaye de Flaran* (Auch: Centre culturel de l'Abbaye de Flaran 1985), pp. 215-219; for Italian cities, consult Luciano Palermo, 'L'approvvigionamento granario della capitale. Strategie economiche e carriere curiali a Roma all metà del Quattrocento', in *Roma capitale (1447-1527)*, ed. Sergio Gensini (San Miniato: Collana di Studi e Ricerche 1994), pp. 145-205; Sergio Tognetti, 'Problemi di vettovagliamento cittadino e misure di politica annonaria a Firenze nel XV secolo (1430-1500)', *Archivio Storico Italiano* 151:581 (1991), 419-452; Charles M. De La Roncière, 'L'approvisionnement des villes italiennes au Moyen Age (XIVe-XVe siècles)', in *L'approvisionnement des villes: De l'Europe occidentale au Moyen-Age et aux Temps*

Up to this day, the only major contribution is a study on the grain supply of London c.1300, undertaken by a team of British scholars in the 1990s. This project, known as the 'FTC (=Feeding the City) Project' led to a series of important publications.²

Modernes. Cinquièmes Journées internationales d'histoire, 16-18 septembre, 1983, Centre culturel de l'Abbaye de Flaran (Auch: Centre culturel de l'Abbaye de Flaran, 1985), pp. 33-51 for Byzantium (Constantinople), see Angeliki Laiou, 'The Provisioning of Constantinople during the Winter of 1306-1307', *Byzantion* 37 (1967), 91-113; Paul Magdalino, 'The Grain Supply of Constantinople, Ninth-Twelfth Centuries,' in *Constantinople and its Hinterland: Papers from the Twenty-Seventh Spring Symposium of Byzantine Studies, Oxford, April 1993*, Paul Magdalino and Gilbert Dagron (eds.) (Aldershot: Ashgate, 1995), pp. 35-47. For France, consult Louis Stouff, 'Le ravitaillement des villes de Provence au Bas Moyen Age', *Acta Historica et Archaeologica Mediaevalia* 19 (1998), 57-74; idem, 'Ravitaillement et consommation alimentaire à Carpentras au XVe siècle', *Etudes Vauclusiennes* 6 (1971), 1-6, 7 (1972), 5-18; for the Low Countries, see Richard W. Unger, 'Feeding Low Countries Towns: The Grain Trade in the Fifteenth Century', *Revue belge de philologie et d'histoire: / Belgisch Tijdschrift voor Filologie en Geschiedenis* 77:2 (1999), 329-358; Jean-Marie Yante, 'L'approvisionnement alimentaire urbain et rural. Jalons pour une reconstitution des réseaux (Liège, Namur, Luxembourg. XIIe-XVe siècles)', in *La Vie matérielle au Moyen Age: L'apport des sources littéraires, normatives et de la pratique. Actes du colloque international de Louvain-la-Neuve, 3-5 octobre 1996*, eds. Emmanuelle Rassart-Eeckhout, Jean-Pierre Sosson, Claude Thiry and Tania Van Hemelryck (Louvain-la-Neuve: Publications de l'Institut d'Etudes Médiévales, 1997), pp. 335-352; Raymond Van Uytven, 'L'approvisionnement des villes des anciens Pays Bas au Moyen Age', in *L'Approvisionnement des villes: De l'Europe occidentale au Moyen-Age et aux Temps Modernes. Cinquièmes Journées internationales d'histoire, 16-18 septembre, 1983, Centre culturel de l'Abbaye de Flaran*. (Auch: Centre culturel de l'Abbaye de Flaran, 1985), pp. 75-116; Adriaan Verhulst and J. A. Van Houtte, 'L'approvisionnement des villes dans les Pays-Bas (Moyen Age et Temps modernes)', in *Troisième conférence internationale d'histoire économique, Munich, 1965* (Paris: Mouton, 1968), pp. 73-77.

² Derek Keene, 'Medieval London and Its Region', *London Journal* 14 (1989), 99-111; J. A. Galloway and M. Murphy, 'Feeding the City: Medieval London and Its Agrarian Hinterland', *London Journal* 16 (1991), 3-14; Bruce M. S. Campbell, J. A. Galloway and M. Murphy, 'Rural Land-Use in the Metropolitan Hinterland, 1270-1339: The Evidence of *Inquisitiones Post Mortem*', *Agricultural History Review* 40 (1992), 1-22; Margaret Murphy and James A. Galloway, 'Marketing animals and animal products in London's hinterland circa 1300', *Anthropozoologica* 16 (1992), 93-99; James A. Galloway, Margaret Murphy and Olwen Myhill (eds.) *Kentish Demesne Accounts up to 1350: A Catalogue* (London: Centre for Metropolitan Studies, 1993); Bruce M. S. Campbell, James A. Galloway, Derek Keene and Margaret Murphy, *A Medieval Capital and Its Grain Supply: Agrarian Production and Distribution in the London Region, c. 1300* (Belfast: Historical Geography Research Series 30, 1993) (from now on, Campbell et al, 1993; for review of this book, consult John Langdon, 'City and Countryside in Medieval England. Review Article of: Bruce M.S. Campbell et al., A Medieval Capital and its Grain Supply: Agrarian Production and Distribution in the London Region c. 1300 (Belfast, 1993), *Agricultural History Review* 43:1 (1995), 67-72; James A. Galloway and Margaret Murphy, 'Metropolitan Impact on the Rural Economy: London and its Hinterland before and after the Black Death', *Medieval Settlement Research Group Annual Report* 8 (1993), 12-13; James A. Galloway, 'London's Grain Supply: Changes in Production, Distribution and Consumption during the Fourteenth Century', *Franco-British Studies* 20 (1996), 23-34; Margaret Murphy, 'Feeding Medieval Cities: Some Historical Approaches', in Martha Carlin and Joel T. Rosenthal (eds.) *Food and Eating in Medieval Europe* (London: Hambledon, 1998), pp. 117-131; James A. Galloway, 'Driven by Drink? Ale Consumption and the Agrarian Economy of the London Region, c.1300-1400', in M. Carlin and J. Rosenthal (eds.) *Food and Eating in Medieval Europe* (London: Hambledon, 1998), pp. 87-100. Other studies include Harry Kitsikopoulos, 'Urban Demand and Agrarian Productivity in Pre-Plague England: Reassessing the Relevancy of Von Thunen's Model', *Agricultural History* 77:3 (2003), 482-522; John S. Lee, 'Feeding the Colleges: Cambridge's Food and Fuel Supplies, 1450-1560', *Economic*

While London was the first urban case in line to be studied, it should, by no means, be the only one. First, it was a unique town in its size and functions. Second, other major hinterlands differed from the London region in their geography, climate, as well as the agricultural and manorial structure. Third, the London Project, with all its pioneering methodology and first-rate contributions, did not look at the consumption of grain in the city proper.³ The Grain Project was followed by the Fuel Project, which brought forth several pioneering articles, whose issues and concepts lie outside the scope of the present work.⁴

As far as the history of manorial (or seigniorial) agriculture in England goes, this field has a long history, commencing with some classical works, such as those of Paul Vinogradoff. While earlier studies were characterized generally by inadequate economic analysis, more recent ones used statistical data on such variables as grain prices, seeding-to-yield ratios, acreage proportions, land values and revenues, grain distribution and disposal.⁵ The pioneering scholar in this department is Bruce Campbell, whose works on

History Review 56:2 (2003), 243-264; idem, *Cambridge and Its Economic Region* (Hatfield: University of Hertfordshire Press, 2005). Although not dealing with consumption directly, Maryanne Kowaleski's *Local Markets and Regional Trade in Medieval England* (Cambridge, 1995) should be added to the list.

³ Albeit the study attempted to measure *approximate* annual needs of *potential* London consumers.

⁴ James. A. Galloway, Derek Keene and Margaret Murphy, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400', *Economic History Review* 49:3 (1996), 447-472 (an edited and somewhat different version of this study appears in C. Chant (ed.), *The Pre-Industrial Cities and Technology Reader* (London and New York, 1999), pp. 104-19); Margaret Murphy, 'The Fuel Supply of Medieval London, 1300-1400', *Franco-British Studies* 20 (1996), 85-96

⁵ The literature on this subject is vast. It will suffice, therefore, to mention the most 'classical' and influential studies: Paul Vinogradoff, *The Growth of the Manor* (London, 1905); idem, *Villainage in England: Essays in English Medieval History* (New York, 1923); George C. Homans, *English Villagers of the Thirteenth Century* (Cambridge, Massachusetts, 1941); E.A. Kosminsky, *Studies in the Agrarian History of England in the Thirteenth Century*, ed. R.H. Hilton and trans. R. Kisch (Oxford, 1956); G.A. Holmes, *The Estates of the Higher Nobility in Fourteenth-Century England* (Cambridge, 1957); J. Ambrose Raftis, *The Estates of Ramsey Abbey. A Study in Economic Growth and Organization* (Toronto: Pontifical Institute for Mediaeval Studies, 1957); J.Z. Titow, 'Some Differences between Manors and their Effects on the Condition of the Peasant in the Thirteenth Century', *Agricultural History Review* 10 (1962), 37-52; idem, *English Rural Society, 1200-1350* (London, 1969); B.H. Slicher-Van Bath, *The Agrarian History of Western Europe, A.D. 500-1850*, trans. Olive Ordish (London, 1963), pp. 29-53, 137-50, 160-94; M. Postan, *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge,

medieval English agriculture in general, and on Norfolk farming in particular, represent an indispensable tool for any student of medieval agriculture.⁶

The history of Norwich Cathedral Priory remains a relatively neglected subject, with some exceptions. In 1930, H. W. Saunders published his *Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory*, in which he introduced the reader to medieval records of the Priory and their peculiarities.⁷ In 1956, Eric Stone completed his PhD thesis on the subject of Norwich Cathedral Priory estates, c.1100-

1973); Edward Miller and John Hatcher, *Medieval England: Rural Society and Economic Change, 1086-1348* (London, 1978).

⁶ Bruce M. S. Campbell, 'Population Change and the Genesis of Common Fields on a Norfolk Manor', *Economic History Review*, 2nd ser. 33 (1980), 174-92; idem, 'The Regional Uniqueness of English Field-Systems? Some Evidence from Eastern Norfolk', *Agricultural History Review* 29 (1981), 16-28; idem, 'Commonfield Origins – the Regional Dimension', in T. Rowley (ed.) *The Origins of Open Field Agriculture* (London: Croom Helm, 1981), pp. 112-129; idem, 'The Extent and Layout of Commonfields in Eastern Norfolk', *Norfolk Archaeology* 38:1 (1981), 5-32; idem, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk', *Economic History Review* 2nd Series 36 (1983), 26-46; idem, 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *Journal of Economic History* 43 (1983), 379-404; idem, 'Population Pressure, Inheritance and the Land Market in a Fourteenth Century Peasant Community', in R. M. Smith (ed.) *Land, Kinship and Life-Cycle* (Cambridge: Cambridge University Press, 1984), pp. 87-134; idem, 'The Complexity of Manorial Structure in Medieval Norfolk: A Case Study', *Norfolk Archaeology* 39: 3 (1986), 225-261; idem, 'The Diffusion of Vetches in Medieval England', *Economic History Review* 2nd Series 41 (1988), 193-208; idem, 'Towards an Agriculture Geography of Medieval England', *Agricultural History Review* 36 (1988), 87-98; idem, 'Land, Labour and Livestock and Productivity Trends in English Seigniorial Agriculture, 1208-1450', in Bruce M. S. Campbell and Mark Overton (eds.) *Land, Labour and Livestock: Historical Studies in European Agricultural Productivity* (Manchester: Manchester University Press, 1991), pp. 144-182; idem, 'Commercial Dairy Production on Medieval English Demesnes: The Case of Norfolk', *Anthropozoologica* 16 (1992), 107-118; M. Overton and B. M. S. Campbell, 'Norfolk Livestock Farming 1250-1740: A Comparative Study of Manorial Accounts and Probate Inventories', *Journal of Historical Geography* 18: 4 (1992), 377-96; B. M. S. Campbell and M. Overton, 'A New Perspective on Medieval and Early Modern Agriculture: Six Centuries of Norfolk Farming c.1250-c.1850', *Past and Present* 141 (1993), 38-105; B. M. S. Campbell, 'Measuring the Commercialisation of Seigneurial Agriculture Circa 1300', 132-93, in R. H. Britnell and B. M. S. Campbell (eds.), *A Commercialising Economy: England 1086-c.1300* (Manchester University Press, 1995), pp. 132-193; idem, 'Ecology versus Economics in Late Thirteenth- and Early Fourteenth-Century English Agriculture', in D. Sweeney (ed.), *Agriculture in the Middle Ages: Technology, Practice, and Representation* (Philadelphia, University of Pennsylvania Press, 1995), pp. 76-108; idem, 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History* 57: 4 (1997), 827-58; idem, *English Seigniorial Agriculture 1250-1450* (Cambridge, Cambridge University Press, 2000); idem, 'The Agrarian Problem in the Early Fourteenth Century', *Past and Present* 188 (August 2005), 3-70; Bruce M. S. Campbell and Ken Bartley, *England on the Eve of the Black Death. An Atlas of Lay Lordship and Wealth, 1300-1349* (Manchester: Manchester University Press, 2006).

⁷ H. W. Saunders, *An Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930).

1300.⁸ Despite its lack of profound economic analysis and some erroneous interpretations, the dissertation remains useful. In 1980, Anne Tiwari of University of Manitoba wrote her MA dissertation on a manorial extent of one of the Priory's manors.⁹ Apart from (sometimes inaccurate) transcription, the thesis in question does not add anything new to the field. In 1996, the nine-hundredth anniversary of Norwich Cathedral, Roger Virgoe published an essay on the history of the Priory estates.¹⁰ Since it had appeared in a collection of essays dedicated to different aspects of history of Norwich Cathedral, it could not be any more than a general introduction. The most recent contributor to the field is Claire Noble of the University of East Anglia, who wrote and later published her MA dissertation on the subject of gardening of the Cathedral Priory,¹¹ while her PhD thesis (2001) deals with the daily life of the Priory.¹² Unfortunately, the latter has not been published, despite its unquestionable merits. Neither of the works above, however, looks at the question of food provisioning of the Priory by its manorial hinterland.

Sources

The current work is based, almost entirely, on unpublished original sources, located in different archives and collections in England. At the centre of these sources stand two types of annual rolls: obedientiary and manorial. As their name suggests,

⁸ Eric Stone, *The Estates of Norwich Cathedral Priory, 1100-1300*, Thesis (D. Phil), University of Oxford (Oxford, 1956).

⁹ Anne Tiwari, *A Thirteenth Century Manorial Extent of Martham in Norfolk, Transcribed from British Museum Manuscript Stowe 936*, MA Thesis, University of Manitoba (Manitoba, 1980).

¹⁰ Roger Virgoe, 'The Estates of Norwich Cathedral Priory', in Ian Atherston et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), pp. 339-359.

¹¹ Claire Noble, *Farming and Gardening in Late Medieval Norfolk* (Norwich, 1996).

¹² eadem, *Aspects of Life at Norwich Cathedral Priory in the Late Medieval Period*, Thesis (PhD), University of East Anglia (Norwich: University of East Anglia, 2001).

obedientary rolls were compiled by monastic officials, obedientiaries. At the end of each financial (as well as farming) year, at Michaelmas (29 September), each monastic official had to render a complete account of the financial state of affairs pertaining to his department.

The accounts were compiled according to the accounting system known as ‘charge-discharge’, with expenses preceding receipts.¹³ The single most important obedientary was the Master of the Cellar (*magister cellarii*), whose major duty was to look after victual provision of the monastic community and whose rolls constitute a large part of sources used in the present study.¹⁴ The dorse side of each roll has a granary account (*compositus granarii*), which provides a very detailed picture of annual requirements, receipts, consumption, sales, distribution and prices of grains. The earliest surviving account is from 1265,¹⁵ but the practice of compiling annual accounts undoubtedly had been adopted by the Cathedral Priory some time before and it is likely that many pre-1272 rolls were destroyed during the civilian revolt of 1272.¹⁶ After 1272, there is virtually an uninterrupted succession of accounts down to 1320, and thus we are extremely lucky to have the account of the disastrous year 1315-16 come down to us (although that of 1316-17 has not). No account survives for years between 1321-2 and 1328-29, while after that the chain of rolls is renewed. The grain accounts cease to be recorded altogether after 1342-43, although the Master of Cellar’s rolls proper continue without interruption down to the Dissolution of the Priory in 1538. The reasons for

¹³ For a discussion of this system, consult Eric Stone, ‘Profit and Loss Accountancy at Norwich Cathedral Priory’, *Transactions of the Royal Historical Society*, 5th series, 12 (1962), 25-48

¹⁴ His duties are discussed in a detail in Saunders, 1930, pp. 76-91.

¹⁵ NRO, DCN 1/1/1.

¹⁶ On the 1272 Riot, its causes and consequences, see W. Rye, ‘The Riot between the Monks and Citizens of Norwich in 1272’, *Norfolk Antiquarian Miscellany* 2 (1883), 17-42.

dropping the practice of compiling the grain accounts are unknown, but perhaps it is connected to the ascension of a new prior, Simon Bozoun in 1342, who might have abolished this practice. All of these Obedientary accounts are preserved at the Norfolk Record Office (henceforth, NRO).

Manorial accounts, otherwise known as bailiff's accounts, are similar, in many ways, to the obedientary rolls. In most cases, these are annual accounts rendered at Michaelmas (sometimes at Lammas, 1 August or on St. Martin's Day, 11 November) by the bailiffs of individual manors.¹⁷ Again, they contain grain accounts on their dorse, and unlike the Obedientary rolls dealing primarily with the Cathedral proper, manorial accounts speak in a great detail on various aspects of husbandry, such as acreage sown with each grain, seeding and yields, grain prices, disposal of the revenue (how much was consumed on the manor proper, given away to daily workers and livestock, sent to Norwich, kept in the granary and sold as a surplus). Besides their outstanding information on the demesne husbandry, their other main merit is the fact that they complement the obedientary rolls as far as the provisioning of the Priory is concerned. Not only do they also provide a unique opportunity to juxtapose the two kinds of accounts against each other, but they also allow us to fill many annual gaps in the obedientary accounts. For example, without the manorial rolls, we would be completely ignorant of the food provisioning of the Priory in the 1320s, as well as after 1342. The earliest manorial

¹⁷ F. B. Stitt, 'The Medieval Minister's Account', *Society of Local Archivists Bulletin* 11 (1953), 2-8; P.D.A. Harvey (ed.), *Manorial Records of Cuxham, Oxfordshire circa 1200-1359* (London, 1976), pp.12-71; eadem, *Manorial Records* (London: British Records Association, 1984); R. C. Stacey, 'Agricultural Investment and the Management of the Royal Demesne Manors, 1236-1240', *Journal of Economic History* 46 (1986), 919-934. More general works on manorial records include Nathaniel J. Hone, *The Manor and Manorial Records* (London: Methuen, 1906); Patrick Palgrave-Moore, *How to Locate and Use Manorial Records* (Norwich: Elvry Dowers, 1985); Denis Stuart, *Manorial Records: An Introduction to Their Transcription and Translation* (Chichester: Phillimore, 1992); Mary Ellis, *Using Manorial Records* (London: Public Record Office Publications, 1994); Helen Watt, *Welsh Manors and Their Records* (Aberystwyth : National Library of Wales, 2000)

accounts survive from the 1250s and it is possible that there were earlier ones, which had not come down to us. The accounts become especially plentiful after 1290, which, perhaps, go hand-in-hand with the increasing level of literacy in late medieval England.¹⁸

Unfortunately, some manors have too few surviving accounts. For example, the manor of Newton has only six surviving accounts between 1280 and 1370.¹⁹ There are very few accounts from the 1280s, and there are some gaps in the 1330s and 1340s. As far as the Great Famine years go, there is no surviving account for 1316-17 and only one roll for 1315-16, the Tithe Account of Sedgeford.²⁰ Similarly, there are 1349-50 accounts for nearly every manor, while there are no accounts for 1348/49 and there is only one account for 1350/51. However, it is quite possible that no accounts were rendered for the disastrous years of the Black Death. After the Black Death the accounts become less and less numerous, not because they did not come down to us, but simply because they were no longer compiled on some manors, which were leased out by the Priory.²¹ The greater part of these manorial accounts are kept at the NRO, with the exception of the manor of Eaton, some of whose rolls are preserved at the Bodleian Library, Oxford.²²

Another source of major importance is a unique compilation called *Proficuum maneriorum*.²³ A sort of agrarian chronicle, the *Proficuum* records, year by year, yields, prices, land value and profits of each Priory estate, covering the periods of 1292-1308 and 1324-1341.²⁴

¹⁸ On the literacy in high- and late medieval England, consult Michael Clanchy, *From Memory to Written Record: England, 1066-1307* (Harvard: Harvard University Press, 1979).

¹⁹ Although it is possible to retrieve an information concerning husbandry on this manor from other accounts, such as 'Grouped Accounts', 'Proficuum maneriorum' and the 'Profit of Granges'.

²⁰ NRO, LEST IB/79.

²¹ See below, Chapter 2, p.

²² Oxford, BL, MS. Norfolk Rolls, 20-49.

²³ NRO, DCN 1/13.

²⁴ For chronological discrepancies in the *Proficuum* see below.

Other sources used in the dissertation include old maps, compiled from the fifteenth through eighteenth century. They provide a unique topographical insight into the layout of medieval manors, well before the later Tudor-Stuart enclosure movement. They also serve as guides to roads connecting different parts of the county and leading to its centre – Norwich. Some maps also reveal the nature of the old Norfolk landscape. This information will become especially relevant in the chapter dealing with the transportation of grain to Norwich. The maps in question are deposited at the NRO.

Manorial terrains, or extents, were yet another important source of information. These were compiled during the 1270s and 1280s covering most manors. The terrains give a complete list of tenants living on the manors, showing their dues and obligations, as well as the extent of their holdings in acreage and money value. These terrains are kept at the British Library in two separated manuscripts, which used to be a single codex.²⁵ Besides the holding of the peasants, these terrains cast light on the (approximate) size of their population. This will be an important piece of information when we will be dealing with the size of the Priory manors and the size of population it was capable of supporting. They also provide a missing link between the *Domesday Book* of 1086 and the Poll Tax Returns of 1377, 1379 and 1381.

Problems

Our sources pose a series of difficulties. The most evident problem is their chronological gaps. As we have seen above, in some decades the records become less numerous than in others. There can be a number of hypothetical reasons for that. First, it

²⁵ BL, MS. Stowe 936 and MS. Add. 57973. The Martham portion is discussed and transcribed by Anne Tiwari, *A Thirteenth Century Manorial Extent of Martham in Norfolk, Transcribed from British Museum Manuscript Stowe 936*, MA Thesis, University of Manitoba (Manitoba, 1980).

is possible that the bailiffs and obedientiaries did not render their accounts in some years, as might have been the case during the Great Famine and Black Death. Second, it is quite possible that some accounts were lost or destroyed in the course of time, and especially after the Dissolution of the Priory (1538),²⁶ when many monastic records made their way to private hands. This brings us to the third possible explanation: perhaps some of these missing rolls still circulate in private collections. For example, a large number of Sedgeford and Gnatingdon manorial rolls had been held in a private collection of the LeStrange estate, until it was acquired by the NRO in 1952.²⁷ Similarly, some rolls are still in the possession of the Marquess of Townsend.²⁸ Several accounts are known to have been collected and owned by Dr. O. Schram of the University of Edinburgh before their deposition in 1969.²⁹ Similarly, a series of rolls was located in Canterbury, before they were retrieved in 1992.³⁰ As we have seen, some rolls from Eaton are kept at the Bodleian Library.³¹ Generally speaking, only about 36 per cent of total rolls, both obedientiary and manorial combined, have come down to us (See Table 1.1). However, it does not mean that we are deprived of knowing what was going on in other years: once we turn to the complementary sources, described above, we get about 60 per cent of the

²⁶ Norwich Cathedral Priory was dissolved and transformed into a secular community led by a dean and chapter in May 1538. See, Ralph Houlbrooke, 'Refoundation and Reformation, 1538-1628', in Ian Atherston et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), pp. 507-539.

²⁷ I am grateful to Mrs. Susan Maddock, a senior archivist, who provided me with the accession record information. The shelfmark of the L'Estrange collection is NRO MS L'Estrange IB (Sedgeford) and IC (Gnatingdon).

²⁸ I did not consult the Townsend rolls, most of which are post-1370. These regarding the manor of Hemsby are mentioned in Campbell, 2000, p. 458.

²⁹ The rolls in question are DCN 60/29/5 (Plumstead for 1287-8)

³⁰ These are DCN 60/29/15a, 29a and 30a (Plumstead for 1304-5, 1355-6 and 1363-4); DCN 60/28/4a (Newton for 1304-5); DCN 60/14/11a (Gnatingdon for 1304-5); DCN 60/8/11a (Eaton for 1304-5); DCN 60/15/7a (Hemsby for 1304-5); DCN 60/23/10a (Martham for 1304-5); DCN 60/35/13a and 17a (Taverham for 1304-5 and 1313-14)

³¹ Oxford, BL, MS. Norfolk Rolls, 20-49. They are mentioned and (some mis)dated in William H. Turner and H. O. Coxe, *Calendar of Charters and Rolls Preserved in the Bodleian Library* (Oxford: At the Clarendon Press, 1878), pp. 235-237.

total picture and about 70 per cent when concentrating on the years between 1290 and 1350.

Table 1.1: Surviving Priory and Manorial Accounts, 1290-1370

Place	Surviving Rolls	Total Rolls	Percentage
Priory	31	62	50.00%
Denham	6	28	21.43%
Eaton	36	80	45.00%
Gateley	26	67	38.81%
Gnatingdon	28	80	35.00%
Hemsby	15	67	22.39%
Hindolveston	28	75	37.33%
Hindringham	24	75	32.00%
Martham	26	80	32.50%
Monks G	18	67	26.87%
Newton	6	80	7.50%
N Elmham	25	67	37.31%
Plumstead	29	80	36.25%
Sedgeford	35	80	43.75%
Taverham	34	80	42.50%
Thornham	17	56	30.36%
Total	384	1,068	35.96%

Another problem pertaining to our materials is their physical condition. Some rolls are in such a poor shape that they have been classified as ‘unfit for production’ (=UFP) and hence they are not to be consulted.³² Some accounts contain lacunas, occasional holes, torn margins and illegible parts. Fortunately, the accounts are quite formulaic in their structure and hence the problem of illegibility can be sometimes solved by filling the gaps with suitable and expected words, phrases or formulas. In many

³² I would like to extend my thanks to Dr. John Alban, the County Archivist, Susan Maddock, a senior archivist and Nick Sellwood, a senior conservator for their generosity which allowed me to consult most of those UFP rolls.

instances, the cross-examination of the contemporary obedientiary/manorial counterpart can obviate the problems.

The metrology is yet another problem. The Norwich Priory officials practised the old Germanic measurement system as late as the thirteenth and fourteenth centuries. In other words, one has to differentiate between ‘short’ and ‘long’ hundreds (as well as five-hundreds and thousands). The ‘short’ hundreds correspond to those we reckon and use today, with U^{xx} standing for 100. While the ‘long’ numbers are represented as C=120 for the long hundred, D= 620 for the long five-hundred and M=1200 for the long thousand.³³ There might be a similar problem with the acreage, when some manors using the standard, or ‘Imperial’ acre, while the others used the ‘outsized’, or ‘heaped’ one, with each perch equals 18.5 feet.³⁴

Another difficulty emerges from some inaccuracy of scribes’ writing and reckoning. For example, sometimes there is no arithmetic correspondence between individual components and their sum written just below them. Sometimes this derives from adding an occasional numerical symbol to a sum (say, CCCC instead of CCC, while the sum of individual components is equal to 360). Again, the best way to sort out these puzzles is to consult parallel evidence, if available.

Much harder is the problem of dating. While each roll is dated, there is a chronological discrepancy at times. There are three possible dating categories: by *Anno Domini*, regnal years or prior years. Until the late fifteenth century, no AD chronology had ever been used. The earliest surviving instance of regnal chronology is the 1354-1355

³³ This problem is mentioned in Saunders, 1930, p. 89

³⁴ This problem is discussed in Bruce Campbell, ‘Arable Productivity in Medieval England: Some Evidence from Norfolk’, *Journal of Economic History* 43 (1983), pp. 385-387.

roll from Plumstead. As a rule, the regnal date would appear side by side with the year of the prior. Before 1354-1355, all the rolls were dated by the prior's year only.

The dating by the prior's year presents several chronological problems. In most cases, the heading gives the following formula: 'From the Michaelmas to Michaelmas in the Xth year of the prior Y', without stating which of the two Michaelmases the 'Xth year' relates to (whether it is the year of 'from the Michaelmas' or of 'to Michaelmas'). This problem is solved thanks to the adoption of regnal chronology, which states 'from Michaelmas of the X regnal year to the Michaelmas of the Y regnal year of King Z, which is the year A of Prior B'.

Another problem comes from rolls which omit the feast and state the prior's year only (in the year X of prior Y). External evidence (the Obedientiary rolls in case of the manorial rolls and vice versa) suggests that such rolls cover the entire year from Michaelmas of the year in question down to the following Michaelmas. Some rolls cover only specific parts of the year, dated by the Saints' days.

The chronological discrepancy is evident especially in the *Proficuum Maneriorum*, when cross-checked with the manorial rolls. There is a frequent one and two-year gaps between two rolls, which can be, perhaps, explained by the fact that the scribe(s) of the *Proficuum* themselves used manorial rolls as their sources for the compilation and could have copied wrong dates in heading.

Methodology

With all the sources collected and transcribed, an account database of Norwich Priory estates has been created. The database in question attempts to cover every

surviving manorial and obedientiary roll from the Priory for the years 1280-1370 and it is divided into three principal sections. The first section contains all the available data on the priory manors, such as sown acreage, grain prices, population size, land value, seeding, yields and revenue of each grain variety. The second section includes all the known data on the transportation of the grain from the manors into the town, showing transportation/transaction costs, length of different roads leading into Norwich, nature of carting, amount of fodder required for sustaining carting horses and quantities of grain transported into the town. The third section has all the surviving information on the reception of the grain in the priory: level of consumption, processing and finalizing of grain (baking and brewing), the question of surplus (selling, giving in alms or storing in the granary). First, the data are entered into a Microsoft Excel spreadsheet. Later, the Excel files are converted into DBF IV format and exported into SPSS 11.0 (*Statistical Program for Social Sciences*) format for further processing, calculations and analyses. Once the statistical data have been processed and calculated with the help of SPSS 11.0, they are exported to Arc View Gis 3.2a program. This program is operating on the basis of GIS (*Geographic Information System*), which allows us to perform various kinds of spatial analysis. The way the GIS-based programs work and their advantages over previous mapping systems are described in detail elsewhere.³⁵

Basically, the process of creating a GIS-based map can be divided into five distinctive stages. First, a master image of Norfolk County (with its pre-1974 borders) is

³⁵ On mapping late medieval England, with the help of GIS-based programs, see Ken C. Bartley, 'Mapping Medieval England,' *Map Awareness* 10 (1996), 34-36; Ken C. Bartley and Bruce M. S. Campbell, 'Inquisitions Post Mortem, GIS, and the Creation of a Land-Use Map of Pre-Black Death England,' *Transactions in GIS* 2 (1997), 333-346; Bruce M. S. Campbell and Ken Bartley, *England on the Eve of the Black Death. An Atlas of Lay Lordship and Wealth, 1300-1349* (Manchester: Manchester University Press, 2006), pp. 7-11.

imported. Second, a separate surface map is created, on which polygon points corresponding to the exact locations of the Priory manors are superimposed. Third, one surface is overlaid on another, creating one map. Fourth, the statistical data processed and analysed with SPSS are imported into Arc View Gis. The SPSS rows are now conjoined with the points on the conjoined map, with each SPSS heading, bearing a name of a manor corresponding exactly to a name of each point. Finally, the statistical data have been classified into several distribution groups, each of which is represented by a different symbol, or colour. A new map has thus been created.

Although the present study deals with one specific geographical region and one particular institution/manorial lord, it is vitally important to look at this case from a comparative perspective, comparing the Norwich region to other areas, for which similar data exists. To this end, a study of the London region will be used and a close comparison between the two areas will shed light on similarities and differences between them; the comparison will also underline the uniqueness of the Norwich hinterland. Unfortunately, this comparison can be only fragmentary, since the London project covered only the period from 1290 to 1315.

Chapter 2: Geography of Husbandry on Norwich Cathedral Priory Estates³⁶

Depictions of Norfolk Land and Peasantry in Medieval Literature

Norfolk, one of the most fertile and productive regions of medieval England, received some attention in late medieval literature. In his critical edition of an anonymous thirteenth century poem *Descriptio Northfolchie*, George Rigg stated that ‘in late medieval England, the butt of satirists was the county of Norfolk’.³⁷ The poem in question is a satirical creation, composed sometime in the thirteenth century by an anonymous monk from Peterborough Abbey. According to the poem, Norfolk is said to have been the worst region in the world in the days of Caesar Augustus.³⁸ The poet calls Norfolk the most infertile area, which became unsuitable for cultivating wheat after Satan defecated on the land there (*Sathanas...terram Norfolchie caccando polluit*).³⁹ The natives of Norfolk are rude, imbecilic and superstitious, and they regard wheat (*spica frumenti*) as the devil, beating it with sticks and casting it out.⁴⁰ So bad is the Norfolk soil that even if one seeds a first-rate wheat (*electum triticum*), he shall reap either tare

³⁶ An abridged version of this chapter was presented at *Disputatio Ottaviensis*, Fifth Conference of the *Société des études médiévales du Québec*, Ottawa (8.4.2006).

³⁷ A. G. Rigg, ‘*Descriptio Northfolchie*’: A Critical Edition’, in *Nova de Veteribus: Mittel- und neulateinische Studien für Paul G. Schmidt*, ed. A. Bihrer and E. Stein, Munich and Leipzig, 2004, pp. 577-594. I am grateful to the editor for his reference to medieval depictions of Norfolk, as well as for some valuable suggestions. A much inferior edition appears in *Early Mysteries and Other Latin Poems of the Twelfth and Thirteenth Centuries*, ed. Thomas Wright, London, 1838, pp. 93-98. A rather careless translation is prepared by R. Howlett, ‘Translations of the ‘*Descriptio Norfolciensium*’ and the ‘*Norfolchie Descriptionis Impugnatio*’’, in *Norfolk Antiquarian Miscellany*, ed. W. Rye, II, Norwich, 1883, pp. 364-382. Another faulty edition and translation appears in W. Ashley, *The Bread of Our Forefathers* (Oxford, 1928), pp. 190-198. Some excerpts of the poem are printed in K. P. Harrington, *Mediaeval Latin* (Chicago, 1925), pp. 511-513. All the quotations from the poems are based on Rigg’s edition (henceforth, *Descriptio*). For a further discussion of the poem, consult Arthur G. Rigg, *A History of Anglo-Latin Literature, 1066-1422* (Cambridge, 1992), pp. 234-235

³⁸ *Descriptio*, lines 1-9.

³⁹ *Descriptio*, lines 10-13; 22-25.

⁴⁰ *Descriptio*, lines 14-17; 30-33.

(*zizannia*), or darnel (*lollium*), the two ruling grains of the region.⁴¹ The Norfolcians even bake and eat bread made of darnel,⁴² while they regard a cake (*libum*) as a food for the infirm.⁴³ The local nobles also treat bread with the same mockery: when entertaining guests, they buy a white wheat bread (*albus de tritico panis*), only to let it lie and get corrupted. After it goes bad, the nobles consume it. The local name for bread is *gumruncy*.⁴⁴ The inhabitants of Norfolk are also known for their excessive drunkenness in the tavern. Their typical drink is *buskys*, which is not a real beer, since it lacks wheat.⁴⁵ One day they lost their freedom to a knight, when, during a drinking ceremony, they removed a seal from their charter of liberty and used it as wax for a candle.⁴⁶ The author enumerates a long list of anecdotes concerning allegedly stupid habits of the people of Norfolk, which persist there from ancient times until his own day.⁴⁷ He concludes the poem wishing God either to reform them, or to destroy them together with their *patria*.⁴⁸

A response to the poem came from a certain John de Sancto Omero, of whom we know nothing, except that he was a Norfolk native living in the days of the Peterborough poet. In his own composition, entitled *Norfolchiae Descriptionis Impugnatio*, he set out to defend his compatriots.⁴⁹ Augustus' messenger, who reported to the emperor on the

⁴¹ *Descriptio*, lines 19-21.

⁴² *Descriptio*, line 26.

⁴³ *Descriptio*, lines 34-39.

⁴⁴ *Descriptio*, lines 39-51.

⁴⁵ *Descriptio*, lines 127-135.

⁴⁶ *Descriptio*, lines 57-110.

⁴⁷ *Descriptio*, lines 136-225.

⁴⁸ *Descriptio*, lines 256-259.

⁴⁹ The only Latin edition, although a faulty one, is printed in *Early Mysteries and Other Latin Poems of the Twelfth and Thirteenth Centuries*, ed. Thomas Wright, London, 1838, pp. 99-106. All citations are based on that edition (henceforth, *Impugnatio*). An English translation, which has many drawbacks, is in R. Howlett, 'Translations of the 'Descriptio Norfolciensium' and the 'Norfolchie Descriptionis Impugnatio'', in *Norfolk Antiquarian Miscellany*, ed. W. Rye, II, Norwich, 1883, pp. 364-382. The critical edition of the *Impugnatio* is a desideratum. See also, Arthur G. Rigg, *A History of Anglo-Latin Literature, 1066-1422*, Cambridge, 1992, p. 234

state of Norfolk, is a liar.⁵⁰ The land of Norfolk does not lack wheat: perhaps, it does not have it in great abundance, but some parts of the county are richer than others.⁵¹ The people of Norfolk do not hate wheat; on the contrary, they value it much and never consume tare or darnel bread.⁵² The wheat seeding yields neither tare nor darnel, but fine wheat.⁵³ All these anecdotes are lies.⁵⁴ The natives of Norfolk are brave, virtuous and rich and they do not tend to get drunk: the *busky* is a mixture of water and dregs. This, however, does not mean that Norfolk lacks wheat: the inhabitants just prefer to stay sober.⁵⁵ John De Sancto Omero concludes his response cursing Augustus and his messenger, as well as his own enemy from Peterborough, hoping that one day St. Peter will destroy his monastery.⁵⁶

Another curious example of the depiction of Norfolk peasants comes from a late medieval anecdotal story called *De simplicitate hominum de Wilebege*. The place-name in question is a village of Wilby in Norfolk. According to it, two villains had to pay their customary dues to their lord. In order to make the delivery fast, they took a purse, filled it with the due money, tied it to a hare's tail and let it go. The rabbit ran away to the forest and never came back.⁵⁷

⁵⁰ *Impugnatio*, lines 1-20.

⁵¹ *Impugnatio*, lines 41-60.

⁵² *Impugnatio*, lines 61-76.

⁵³ *Impugnatio*, lines 81-92.

⁵⁴ *Impugnatio*, lines 93-128.

⁵⁵ *Impugnatio*, lines 220-240.

⁵⁶ *Impugnatio*, lines 285-296; 325-356.

⁵⁷ *A Selection of Latin Stories*, Thomas Wright (ed.), Percy Society Publications 8 (London, 1842), no. XCIII.

Rudeness, as a principal character of the people of Norfolk, is also mentioned in Langland's *Piers Plowman* and Chaucer's *Reeve's Tale*,⁵⁸ as well as in a couple of medieval anecdotes.⁵⁹

From the examples above, we receive a negative picture of infertile land, full of bad grains and rude people; malnutrition and excessive drunkenness of bad beverages, as well as unfree peasantry.

The Geo-physical Description of Norfolk Landscape in the Historical Perspective

Before we discuss the Priory manors, their economic and agricultural nature and contribution, let us briefly look at geo-physical context in which they were located. A description of the county of Norfolk in general will aid our discussions.

A flat county, never exceeding a height of 350 feet, Norfolk constitutes a slightly elevated plain sloping from the west and north towards the south-east and east, comprising over a million acres of land.⁶⁰ The county borders remained largely unchanged until 1974. The county is diverse in soil types, affecting the extent and geography of the agriculture, as well as the density of the human settlement.⁶¹ Roughly speaking, Norfolk is divided into eight geological regions. The central area, otherwise known as Mid-Norfolk is a Boulder Clay area, having mostly medium and heavy types of

⁵⁸ William Langland, *Piers Plowman: The Z-Version*, A. G. Rigg and C. Brewer (eds.) (Toronto: Pontifical Institute for Mediaeval Studies, 1983), pp. 16-17.

⁵⁹ *Coffee House Jest*s (London, 1677), no. 194 tells a story of a rustic from Norfolk, who refused to show the way to Norwich to a wandering gentleman.

⁶⁰ According to the 1831 Census, Norfolk comprised of 1,292,300 acres, the 1891 Census lists 1,315,092 acres, while the 1991 Census gives 1,327,505. The figures in the thirteenth and fourteenth century should not have been much different.

⁶¹ For an extensive treatment of the Norfolk geology, see H. B. Woodward, '[Norfolk] Geology', in *A History of Norfolk*, Vol. 1, H. Arthur Doubleday (ed.), The Victoria County History of England, (London, 1901), pp. 1-30 (henceforth, *VCHN*).

soil and lying between 150-300 feet above the sea. South Norfolk, a Boulder Clay area too, has mostly the heavy type soil and it lies between 50 and 150 feet. The Eastern part of the county called Broadland consists of the alluvial area, watery and marshy, as well as the islands of the Flegg hundreds, which have a medium loam soil making it one of the most fertile and highly populated areas of the county. Its greater part lies just 60 feet above the sea level. To its north lies the so-called Loam Region rich in loam, as well as glacial sands, gravels and Pliocene crags. As its name suggests, the principal soil type of this region is medium loam. Its height never exceeds 150 feet above the sea and it also has been a densely settled area ever since. In the South-West lies the Breckland region, a chalk area owing its name to the type of soil, the breck. This is a sterile and virtually unsuitable area for grain cultivation with relatively low population and few woods, lying between 50 and 150 feet above the sea. The Northern part of the county is the so called 'Good Sand Region', full of Chalk and Boulder Clay, lying between 150 and 300 feet above the sea with a little woodland and having heavy soil as its principal soil type. To the West lies the Greensand Belt, a Chalk, Boulder Clay, Valley Gravels and Loam area, rich in Light, Medium and Clay soils. Its eastern parts resemble the Good Sand Region, while the western areas look more like the Fenland, which is lying immediately to its West. The latter is the poorest region in the whole county, full of alluvium and peat, free of woodland, unsuitable for arable cultivation, but good for rearing of sheep upon the

marsh meadows.⁶² At the same time, poor quality of Fenland soil also meant a poor quality of wool produced from local sheep.⁶³

Norfolk is known to have been settled ever since pre-historic times.⁶⁴ The first millennium BCE saw the expansion of the Celtic civilization in the county, as well as in other parts of England and Western Europe in general.⁶⁵ The most prominent tribe was the *Iceni*, whose capital was at *Venta Iconorum* (Caister-by-Norwich), located in proximity to Norwich. The advent of the Romans in the first century CE brought some human, as well as landscape, changes in the region. The population consisted of the Celtic majority and a Roman aristocratic minority. The latter established a series of *villae*, or large estates, still visible today from aerial photographs and a network of roads, which were well used during the Middle Ages, down to the modern era.⁶⁶ Norfolk was also one of the first regions to be conquered by the Anglo-Saxons, who formed the Kingdom of East Anglia.⁶⁷ The Saxon conquest of the fifth century brought about a significant change in human geography of Norfolk, with the indigenous Celtic population partially intermixed with the Germanic migrants and partially expelled to the Western parts of the island.

The first centuries of the Anglo-Saxon settlement witnessed some decline in arable cultivation in favour of livestock rearing, since pastoralism was the more common

⁶² For a more detailed discussion of the Norfolk geological regions, consult *VCHN*, pp. 1-30; *An Economic Survey of Agriculture in the Eastern Counties of England* (Cambridge, 1932), p. viii and H. C. Darby, *The Domesday Geography of Eastern England* (Cambridge, 1971), pp. 103-107 and 147-151.

⁶³ John H. Munro, 'Wool-Price Schedules and the Qualities of English Wools in the Later Middle Ages, c.1270-1499', *Textile History* 9 (1978), 118-169

⁶⁴ George Clinch, 'Early Man [in Norfolk]', in *VCHN*, pp. 253-278; Peter Murphy, 'Early Farming in Norfolk', in P. Wade-Martins (ed.) *An Historical Atlas of Norfolk*, 2nd ed. (Norwich, 1994), pp. 28-29.

⁶⁵ H. Haverfield, 'Romano-British Remains [in Norfolk]', in *VCHN*, pp. 279-324; D. Gurney, 'The Roman Period', in P. Wade-Martins (ed.) *An Historical Atlas of Norfolk*, 2nd ed. (Norwich, 1994), pp. 34-35.

⁶⁶ Haverfield, 1901, pp. 294-303; Gurney, 1994, pp. 34-35.

⁶⁷ Kenneth Penn, 'Early Saxon Settlement', in P. Wade-Martins (ed.) *An Historical Atlas of Norfolk*, 2nd ed. (Norwich, 1994), pp. 36-37.

form of husbandry among the Anglo-Saxon settlers. The change came somewhere in the eighth century, which saw a gradual shift back to agricultural husbandry.⁶⁸ The agricultural characteristics of the Saxon settlement persisted until the Norman Conquest of 1066.⁶⁹ From the mid-ninth Century, Norfolk was disturbed by the Vikings, who settled in the region after the division of the country in 878 between Alfred the Great and the Norse leader, Guthrum.⁷⁰ Just like the Saxons before them, the Danes established numerous farms (*bú* in Old Norse) in the county and the geography of the Norse settlement can be still seen in various place names. The most obvious example is a large number of villages ending with *-by* (Hemsby, Ormseby and many others). It is likely that the Saxon and Danish populations became mixed and that was the type of population that the Normans found upon their arrival in 1066. The *Domesday Book* survey, compiled twenty years after the Conquest, in 1086, records 26,370 rural households and 2,157 urban families (28,527 households in total).⁷¹ Using a possible multiplier of 4.75, preferred by some scholars, we find about 135,503 persons, to which we might add another two per cent of the clerical population (2,710 persons), making thus 138,213 people. If we accept the figure of two million for the total population of England in 1086,

⁶⁸ Sara Birtles, 'A Green Space beyond Self-Interest: The Evolution of Common Land in Norfolk, c.750-2003', PhD Thesis, University of East Anglia (Norwich: University of East Anglia, 2003), pp. 21- 35.

⁶⁹ Reginald A. Smith, 'Anglo-Saxon Remains', in *VCHN*, pp. 325-351; Andrew Rogerson, 'The Middle Saxon Period', in P. Wade-Martins (ed.) *An Historical Atlas of Norfolk*, 2nd ed. (Norwich, 1994), pp. 38-39; Kate Skipper and Tom Williamson, 'Late Saxon Social Structure', in P. Wade-Martins (ed.) *An Historical Atlas of Norfolk*, 2nd ed. (Norwich, 1994), pp. 40-41; *idem*, 'Late Saxon Population Densities', in P. Wade-Martins (ed.) *An Historical Atlas of Norfolk*, 2nd ed. (Norwich, 1994), pp. 42-43. The most recent and updated survey of the Anglo-Saxon landscape of Norfolk is Sara Birtles, 'A Green Space beyond Self-Interest: The Evolution of Common Land in Norfolk, c.750-2003', PhD Thesis, University of East Anglia (Norwich: University of East Anglia, 2003), pp. 21- 35.

⁷⁰ On the Danish settlement of East Anglia, and Norfolk in particular, see R. H. C. Davis, 'East Anglia and the Danelaw', *Transactions of Royal Historical Society* 5th Series 5 (1955), 23-39; Barbara Dodwell, 'The Free Peasantry of East Anglia in Domesday', *Norfolk Archaeology* 27 (1941), 145-157; W. Hudson, 'The Anglo-Danish Village Community of Martham, Norfolk', *Norfolk Archaeology* 20 (1921), 273-316; *idem*, 'Traces of Primitive Agricultural Organization as Suggested by a Survey of the Manor of Martham, Norfolk', *Royal Historical Society Transactions* 4th Series 1(1918), 28-55.

⁷¹ H. C. Darby, *The Domesday Geography of Eastern England* (Cambridge, 1971) p. 111.

⁷² then the population of Norfolk might have constituted about seven per cent of total population of England at that time. Needless to say, these are highly imprecise figures, but they might not be too far from the reality. If that is the case, then about 91.82 per cent of the Norfolk population lived in the countryside, while only about 8.18 per cent were the townsfolk.

The period between 1066 and 1300 was characterized by a pronounced population growth and economic expansion, chiefly in the agricultural sector. It was also a period of significant changes in the structure of husbandry and the landscape, brought about by the Norman introduction of continental feudalism. William I's redistribution of the real estate to his tenants-in-chief resulted in the conversion of many once free villages into seigniorial domains. As the population grew, the ratio of arable-to-woodland/meadow changed. The clearance of woodland, concentrated mainly on the medium soil of Mid-Norfolk, was a clear sign of population growth and demand for arable land. There is evidence that a considerable reduction of woodland had taken place between 1066 and 1086.⁷³ This development continued in the subsequent centuries. The meadow was concentrated mostly in the Breckland, Fenland and Broadland areas, which had the most unsuitable soils for grain cultivation and the densest concentrations of sheep.⁷⁴

⁷² John S. Moore, 'Quot Homines?' The Population of Domesday England', *Anglo-Norman Studies* 19 (1996), 307-334.

⁷³ On Norfolk woodland, consult H. Beevor, 'Address [to the Members of the Norfolk and Norwich Naturalists' Society]: Norfolk Woodlands, from the Evidence of Contemporary Chronicles', *Transactions of the Norfolk and Norwich Naturalists' Society* 11 (1919-20 and 1923-4), 487-508. The article also appears, in slightly different form, as idem, 'Norfolk Woodlands from the Evidence of Contemporary Chronicles', *Quarterly Journal of Forestry* 19 (1925), 87-110; H. C. Darby, 'Domesday Woodland in East Anglia', *Antiquity* 14 (1934), 211-214; idem, *The Domesday Geography of Eastern England* (Cambridge, 1971), pp. 124-127; Sara Birtles, 'A Green Space beyond Self-Interest: The Evolution of Common Land in Norfolk, c.750-2003', PhD Thesis, University of East Anglia (Norwich: University of East Anglia, 2003), pp. 25-29; Barnes, G., *Woodlands in Norfolk: A Landscape History*, Unpublished PhD Thesis (Norwich: University of East Anglia, 2003)

⁷⁴ Darby, 1971, pp. 144-146.

What percentage of total arable land did demesne arable occupy in the period under our study? The estimations are imperfect and rather speculative, but not groundless. As we have seen above, the county contained a total of slightly over a million acres. What proportion was occupied by water, buildings, roads, pits, wastes and commons is not known. Nathaniel Kent, in his 1796 survey of Norfolk agriculture stated that Norfolk commons occupied ‘somewhat more than 80,000 acres...after making a fair deduction for roads’, namely just under 8 per cent of total land.⁷⁵ Obviously, this figure is inapplicable for the late medieval period, for the proportions of the land had been significantly affected by the enclosure movement. Campbell and his colleagues estimate that by c.1300, the commons amounted to no more than 20 per cent in the Ten FTC counties.⁷⁶ In their estimation they referred to Nathaniel Kent’s nineteenth-century contemporary, Arthur Young, who in 1808 reckoned that the ten counties around London had 7.3 per cent of their land in commons – a figure quite close to that of Nathaniel Kent. Hence, we might, with some reservation, use the figure of 20 per cent suggested by Campbell and his colleagues. This would make about 200,000 acres of commons.

Let us turn now to the cultivable land. Nationally speaking, about 60 percent of the total land was comprised of arable.⁷⁷ If we apply this figure to Norfolk, then we get an approximate figure of around 600,000 acres of arable land. It is unclear what percentage of it was in demesne lands, but according to Kosminsky’s rather imperfect analysis of the Hundred Rolls of 1279, the demesne arable accounted for about one third

⁷⁵ Nathaniel Kent, *General View of the Agriculture of the County of Norfolk by Nathaniel Kent* (London, 1796), p. 82.

⁷⁶ Campbell et al., 1993, p. 37.

⁷⁷ Bruce Campbell, 2000, p. 65.

of the total arable⁷⁸ and this figure is accepted by Bruce Campbell.⁷⁹ Therefore, about 200,000 acres of all arable were demesne arable. A further 33 per cent should be deducted, since each year one third of the cultivated land lay fallow. Hence, a little more than 130,000 acres might have been constituted by demesne arable.

The Priory Estates

A more complete understanding of the composition of the demesne can be found in the very foundations of Norwich Cathedral Priory, sometime between 1094 and 1096.⁸⁰ Norwich Cathedral Priory had quickly acquired a vast amount of land and property, in shape of manors and appropriated churches.⁸¹ By the end of the thirteenth century, the Priory had as many as 52 appropriated churches in Norfolk and Suffolk and 31 manors, mostly in Norfolk. The estates were divided between the prior and obedientiaries. It was the prior who was responsible for provisioning food to the Priory, holding the office of the Master of the Cellar (*Magister Celarii*), and hence his manors were the principal source of food supply. The number of the provisioning manors varied from time to time, according to the leasing policy of the prior. For example, the manor of Denham (Suffolk) ceased being a supplier sometime around 1322, when it was leased out. Similarly, the manors of Gateley, Hemsby, Monks Grange and North Elmham were

⁷⁸ E. A. Kosminsky, *Studies in the Agrarian History of England in the Thirteenth Century* (Oxford: Basil Blackwell, 1956), pp. 87-95.

⁷⁹ Campbell et al., 1993, p. 38.

⁸⁰ On the foundation of the Cathedral Priory, consult Barbara Dodwell, 'The Foundation of Norwich Cathedral Priory', *Royal Historical Transactions* 5th Series 7 (1957), 1-18

⁸¹ For a detailed history of the building of the estates, see Roger Virgoe, 'The Estates of Norwich Cathedral Priory, 1101-1538', in *Norwich Cathedral: Church, City and Diocese, 1096-1996*, London, 1996, pp. 339-359. Some individual estates are studied, too: W. Hudson, 'The Anglo-Danish Village Community of Martham, Norfolk', *Norfolk Archaeology* 20 (1921), 273-316; idem, 'The Prior of Norwich's Manor of Hindolveston', *Norfolk Archaeology* 20 (1921), 179-214; Peter Wade-Martins, 'Excavations at North Elmham, 1969: An Interim Report', *Norfolk Archaeology* 35:1 (1970), 25-78.

all leased out shortly after the Black Death.⁸² The number of the supplying manors shrank even further after 1370.⁸³ Some estates were leased temporarily: for instance, Hindolveston and Hindringham were leased out in 1333, when the economic conditions worsened and the following year Thornham was leased, too. The first two were taken back in 1339 and about five years later Thornham was restored.⁸⁴ There were contrary examples, too, when some manors were added to the group: thus, around 1330 a new manor, Heythe, was created.⁸⁵ Between c.1280 and 1320 there were fourteen permanent sources of supply; between 1320 and 1330 the Priory drew on thirteen manors; in the two following decades, the Cathedral was fed by fourteen manors, with the addition of Heythe; in the late 1350s the number of the manors fell to nine, following the leasing of the aforementioned four manors and the disappearance of Heythe. The physical location of the manors and the duration of their cultivation are shown on Figure 2.1 and Table 2.1:

⁸² DCN 1/1/45,46.

⁸³ DCN 1/1/59-66; 75-80.

⁸⁴ DCN 1/1/32-42.

⁸⁵ DCN 62/2.

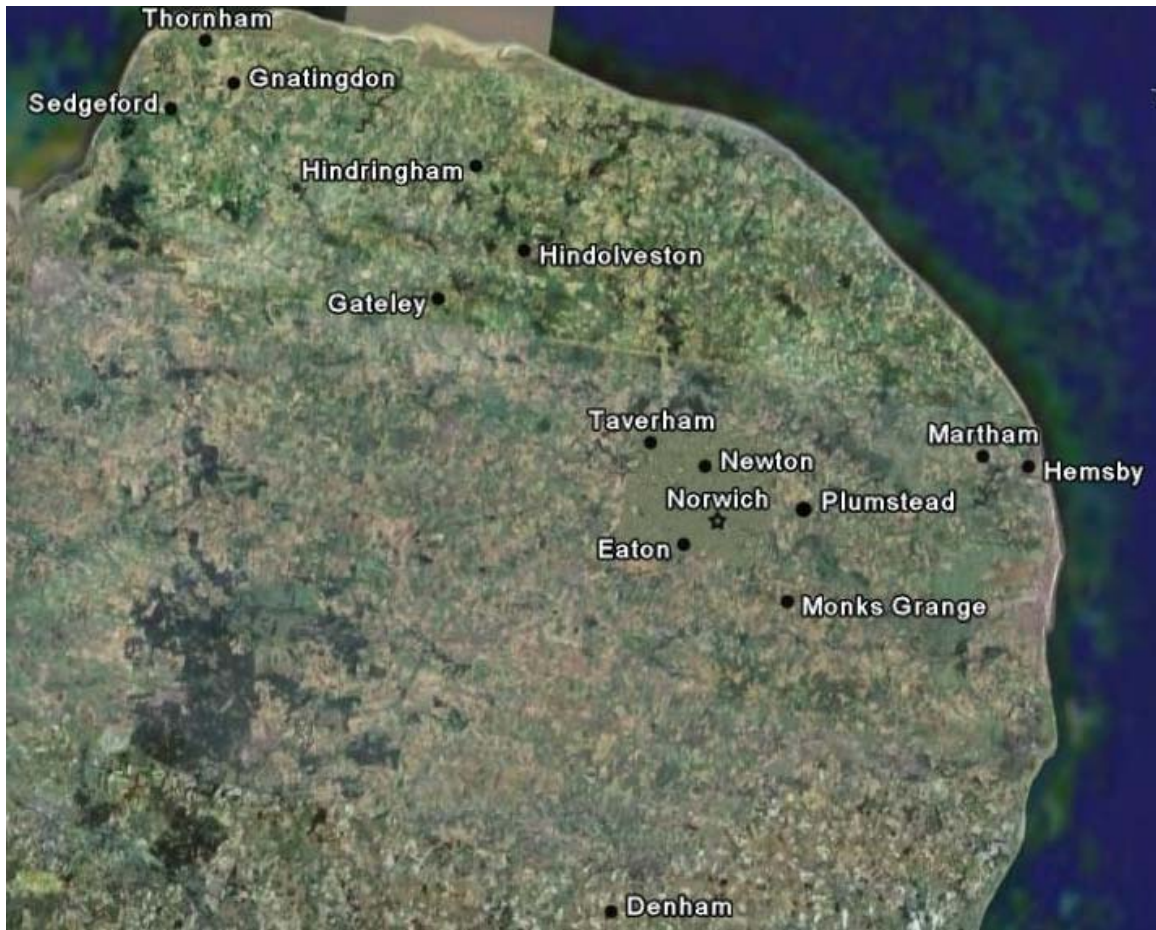


Figure 2.1. Grain Supplying Manors of Norwich Cathedral Priory, c. 1280-1370.

Table 2.1. Cultivating and Leasing Years of the Priory Manors, 1290-1370.

Manors	Cultivated	Leased Out	Cultivated Years	Leased Years	Total Years	% Cultivated	% Leased
Denham	1290-1317	c.1318 - 1369	28	52	80	35.00%	65.00%
Eaton	1290-1369		80	0	80	100.00%	0.00%
Gateley	1290-c.1356	c.1357 - 1369	67	13	80	83.75%	16.25%
Gnatingdon	1290-1369		80	0	80	100.00%	0.00%
Hemsby	1290-c.1356	c.1357-1369	67	13	80	83.75%	16.25%
Heythe	c.1330-1349		20	0	80	25.00%	0.00%
Hindolveston	1290-1332; 1339-1369	1333-1338	75	5	80	93.75%	6.25%
Hindringham	1290-1332; 1339-1369	1333-1338	75	5	80	93.75%	6.25%
Martham	1290-1369		80	0	80	100.00%	0.00%
Monks G	1290-1356		67	0	80	83.75%	0.00%
Newton	1290-1370		80	0	80	100.00%	0.00%
N Elmham	1290-1356	1357 - 1369	67	13	80	83.75%	16.25%
Plumstead	1290-1369		80	0	80	100.00%	0.00%

Sedgeford	1290-1369		80	0	80	100.00%	0.00%
Taverham	1290-1369		80	0	80	100.00%	0.00%
Thornham	1290-1333; 1345-1356	1334-1344; 1357-1369	56	24	80	70.00%	30.00%

While most villages were held exclusively by the prior and his obedientiaries, this was not a general rule. Some manorial villages were fragmented, constituting several domains owned by several lords sharing them among themselves. In other words, the prior did not always enjoy all the natural and financial resources yielded by the manorial villages. For example, according to a feudal survey of 1316 called *Nomina villarum*, the vill of Taverham was shared by no less than four lords (the prior included), while those of Hindringham, Martham and Plumstead had two lords each.⁸⁶ This was a typical picture of the rural reality in thirteenth and fourteenth century Norfolk, where population is proven to have been denser than in other parts of England.⁸⁷ It is also evident, that on those fragmented villages, the priory had always the larger part of total lands, both arable and pasture. It is impossible, however, to calculate that proportion of the priory's lands compared to the other lords' manors, since the latter did not provide such rich and consecutive information as the manorial and obedientiary accounts. Moreover, the proportion was not stable, since the estates were liable to various changes, such as land sale, acquisition, or amalgamation, as well as woodland clearance, which, in turn, would increase the acreage available for husbandry or living.

Another important point to consider here is the question of intermingled demesne and peasant tenancies. While many rural regions in late medieval England, including the

⁸⁶ The text is printed and discussed in William J. Blake, 'Norfolk Manorial Lords in 1316', *Norfolk Archaeology* 30 (1952), 263-286.

⁸⁷ For an excellent case-study of such Norfolk manor (Hevingham), consult Bruce M. S. Campbell, 'The Complexity of Manorial Structure in Medieval Norfolk: A Case Study', *Norfolk Archaeology* 39 (1986), 379-404.

Midlands and the North, where characterized by developed common fields,⁸⁸ open-field farming was weakly developed (and in some places absent altogether) in East Anglia.⁸⁹ Peasant tenancies represented small, compact blocks rather than long strips of land, or furlongs. This peculiar structure was undoubtedly influenced by the very social organization of East Anglia. As stated above, this part of the island was settled by Danish Vikings in the Ninth-Century. The Danish settlers were biased towards free peasantry and, as a result, by the time of the Norman Conquest the overwhelming majority of Norfolk peasantry were free- or semi-freemen. This situation persisted largely unaltered into the subsequent centuries. This structure of fields and peasant tenancies is well reflected in our rolls: up until the Black Death there is no indication that the demesne encroached upon or reclaimed the land from peasant tenancies. In other words, there seems to have been a clear differentiation between the demesne and tenancies, with the two sections remain separate and distinct.

Quite different, however, was the situation elsewhere in England. In most parts the demesne and peasant strips were actually intermingled, with some parts of the demesne arable lying amidst the tenants' furlongs.⁹⁰ The situation changed after the Black Death, when we find more and more occurrences of the reclamation of peasants' tenancies by the Priory authorities. For example, in Martham six acres, formerly rented

⁸⁸ C.S. and C.S. Orwin, *The Open Fields* (Oxford: At the Clarendon Press, 1967); W. O. Ault, *Open-Field Farming in Medieval England* (London: George Allen and Unwin Ltd, 1972); Sheppard, A.J., "Field Systems of Yorkshire," in Alan R.H. Baker (ed.) *Studies of Field Systems in the British Isles* (Cambridge: Cambridge University Press, 1973), pp. 145-187

⁸⁹ Barbara Dodwell, "The Free Peasantry of East Anglia in Domesday," *Norfolk Archaeology* 27 (1941), 145-157; eadem, "Holdings and Inheritance in Medieval East Anglia," *Economic History Review* 20:1 (1967), 53-66; M.R. Postgate, "Field Systems of East Anglia," in Alan R.H. Baker (ed.) *Studies of Field Systems in the British Isles* (Cambridge: Cambridge University Press, 1973), pp. 281-324.

⁹⁰ Such situation prevailed, for instance, on an Oxfordshire demesne of Cuxham (see, *Manorial Records of Cuxham, Oxfordshire circa 1200-1359*, P.D.A. Harvey (ed.) (London, 1976) and on a Shropshire estate of Adderley (National Archives, SC 6/965/4).

by a late John de Fleg (*de tenemencia quondam Johannis de Fleg*'), were taken back and incorporated into the demesne, as the accounts from 1355-6 and 1363-4 reveal. The very word 'quondam' might suggest that that person died in the pestilence, since his land was not part of the demesne in the 1349-50 roll. A similar situation prevailed also in Plumstead, Sedgeford and Taverham.⁹¹

Why did this intermingling occur only after the Black Death? As John Munro suggests, the phenomenon derived from the demographic consequences of the plague. Many families simply died out without leaving heirs. The lords, on the other hand, had difficulty in finding new tenants. On the other hand, they had right to reclaim tenancies once the leasing contract expired – through physical death, in this case. Because of that, the lords chose to reclaim some tenancies of their deceased peasants.⁹² This explanation seems to hold true in our case: after all, there is virtually no evidence about the intermingling of the demesne and tenancies before the Black Death.

Manorial Population

What was the approximate population dwelling on those manors? This question is especially relevant for a study dealing with food provisioning, since it will be impossible to appreciate the scale and extent of grain reaching Norwich from the manors without estimating the size of the population living on the same manors.

For the period of our study, the information comes principally from a unique source. The source in question is an extent of the Priory manors, known as the *Terrarium*

⁹¹ For instance, *DCN* 60/29/30-31.

⁹² The discussion is available on John Munro's University of Toronto-based personal webpage: <http://www.economics.utoronto.ca/munro5/07MedEngAgri.pdf> (last checked, 25.1.2008)

Prioratus, or *Stowe Survey*.⁹³ Initially, it was compiled as individual censuses for each manor, at different stages in the 1270s and 1280s. Later these individual accounts were copied into a single codex, which, as the palaeographical evidence suggests, was compiled not long after the individual censuses were recorded.⁹⁴ In the course of time, the manuscript was partitioned into two separate codices, presently held at the British Library.⁹⁵ However, it is equally important to compare the thirteenth- and fourteenth-century data with those of the previous centuries, in order to appreciate the significance of the plain numbers, as well as to understand properly the demographic changes that the Norfolk population was undergoing during these centuries. According to the *Domesday Book* survey of 1086, most of the estates in question were small, sometimes tiny villages. The population size varied from village to village, as the Table 2.3 shows. Eaton, Gateley, Gnatingdon and Taverham had just several households each;⁹⁶ Newton, Denham, Plumstead and Thornham had 17, 19, 20 and 21 households respectively;⁹⁷ Hindringham had 29 households;⁹⁸ Hindolveston and Martham were populated by 34 and 44 families respectively;⁹⁹ and Sedgeford and Hemsby were the largest settlements with 49 and 50 households respectively.¹⁰⁰ The information on the size of North Elmham is rather vague. Monks' Grangess is unmentioned in the survey, since it was a much later

⁹³ The manuscript is described in W. Hudson, 'Three Manorial Extents of the Thirteenth Century', *Proceedings of the Norfolk and Norwich Archeological Society* 14 (1915), 1-56; idem, 'A Problem in 'Wandered' MS', *Discovery* (1930), pp. Anne Tiwari, *A Thirteenth Century Manorial Extent of Martham in Norfolk, Transcribed from British Museum Manuscript Stowe 936*, MA Thesis, University of Manitoba (Manitoba, 1980), pp. 1-12.

⁹⁴ The manuscript is written in Semi-Quadrata Gothic script, closely resembling other manuscripts known to have been written either in the end of the 13th century, or in the beginning of the 14th century.

⁹⁵ Because of the partition, several folios are now missing.

⁹⁶ (*Little*) *Domesday Book* (*DB*), fols. 135r (Eaton); 256v. (Gateley); 271v. Gnatingdon); 229r. (Taverham).

⁹⁷ *DB*, fols. 125r. (Newton-by-Norwich); 390 v. (Denham); 123v., 195r., 199r., 224v., 228v., 269r (Plumstead); 191r. (Thornham).

⁹⁸ *DB*, fols. 192 r. (Hindringham).

⁹⁹ *DB*, fols. 192 v. (Hindolveston); 113 v., 146 v., 200 v., 217 r.; 272 v. (Martham)

¹⁰⁰ *DB*, fols. 193 v.

creation by the priory. Needless to say, there are many ambiguities and problems in the *Domesday Book* survey, but this is, so far, our only source of information on the population in the second half of the eleventh century.

No information is available for the twelfth century, with one unique exception: the Stowe Survey, which provides a list of tenants from Martham c.1200.¹⁰¹ It indicates 108 tenants by that time, making thus approximately 486 persons. This fact illustrates that the total population of the manor had increased threefold in about 100 years. It is quite possible that the case of Martham does not reflect the demography of other manors; the twelfth century was certainly a period of pronounced population growth, which went hand in hand with economic expansion and commercialization.¹⁰² Hence, it is obvious that the other estates grew too, though perhaps not at the same pace as Martham did.

As we have seen above, the compilation of *Stowe Survey* was a long process, which took almost two decades (between 1275 and 1292), when no two manors were assessed in the same year. It is, therefore, possible and quite likely that not every manor reflects the same demographic reality. For instance, Newton was the first manor to be recorded in 1275, while Martham was the last one, in 1292. The population of Newton in 1275 might have been quite different from that of 1292 and the same thing holds true for Martham in 1275. As various demographic studies show, the population of most of England had not yet reached its peak by 1275, not until the very end of the century,¹⁰³

¹⁰¹ BL, MS. Stowe 936, fols. 37v - 115v.

¹⁰² J.D. Chambers, *Population, Economy, and Society in Pre-Industrial England* (London, 1972), chapters 1 and 2; J. Titow, 'Some Evidence of the Thirteenth Century Population Rise', *Economic History Review* 2ns Series 14 (1961-2), 218-223.

¹⁰³ The literature on this topic is vast. I shall mention but few: J. C. Russell, 'The Pre-plague Population of England', *Journal of British Studies* 5:2 (May 1966), 1-21; Barbara Harvey, 'The Population Trend in England Between 1300 and 1348', *Transactions of the Royal Historical Society* 5th Series 16 (1966), 23-42; J. Z. Titow, *English Rural Society, 1200-1350* (London, 1969), pp. 64-96; J.D. Chambers, *Population, Economy, and Society in Pre-Industrial England* (London, 1972); Edward Miller and John Hatcher,

while there is a good evidence for the growth of Norfolk population well into the fourteenth century.¹⁰⁴ In other words, we have to approach the *Terrarium Prioratus* with caution, refraining from putting all the registered manors on the same chronological line. In any event, the survey points to an unquestioned demographic expansion, compared with the survey of 1086 (see Table 2.2).

Table 2.2. Peasant Population Living on the Priory Estates, 1086-c.1300, based on multiplier of 4.5

Manor	1086		c. 1200		c. 1295	
	Families	Estimated Total Persons	Families	Estimated Total Persons	Families	Estimated Total Persons
	19	85.5				
Denham						
Eaton	3	13.5			27	121.5
Gateley	3	13.5				
Gnatingdon	4	18				
Hemsby	50	225				
Hindolveston	34	153			128	576
Hindringham	29	130.5			111	499.5
Martham	44	198	108	486	345	1,552.5
Monks G					14	63
Newton	17	76.5			102	459
N Elmham	108	486			19	85.5
Plumstead	20	90				
Sedgeford	49	220.5			124	558
Taverham	6	27			30	135
Thornham	21	94.5				

Sources: *Domesday Book*; British Library, MSS. Stowe 936 and Add. 57973 (=the Stowe Survey).

On some manors (Eaton and Newton), the population grew as much as tenfold. Martham's population grew eightfold. Other recorded estates saw a more moderate growth (Taverham – fivefold; Hindolveston – about threefold; Sedgeford – at rate of 253

Medieval England: Rural Society and Economic Change, 1086-1348 (London, 1978), pp. 27-63; H. E. Hallam, 'Population Movements in England, 1086 – 1350', in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), pp. 508-93.

¹⁰⁴ Elizabeth Rutledge, 'Immigration and Population Growth in Early Fourteenth-Century Norwich: Evidence from the Tithing Roll', *Urban History Yearbook* 1988, 15-30; Bruce M. S. Campbell, 'Population Pressure, Inheritance, and the Land Market in a Fourteenth-Century Peasant Community in R. M. Smith (ed.), *Land, Kinship and Lifecycle* (Cambridge: Cambridge University Press, 1984), 87-134.

per cent). Unfortunately, the survey does not provide data for Gateley, Gnatingdon, Hemsby and Plumstead. It is worthwhile to compare the population trends on our manors with the general demographic developments of England between 1086 and c.1300. Some economic historians do not doubt that the English population had grown from approximately two to six, or perhaps as much as seven million between these years,¹⁰⁵ while others claim that the population did not exceed 4.0 to 4.5 million c.1300.¹⁰⁶ Although there is no definite answer as to what approach has the smallest margin of error, it is probable that the English population did not grow any more than 350 per cent between 1086 and c.1300, i.e. to 4.5 million. The example of the Priory estates contradicts this general picture, giving sometimes much higher growth rates. This fits well into the notion that Norfolk, and especially its eastern parts, was a unique region, with higher population growth, density and pressure than other regions of the country.¹⁰⁷

There are no similar surveys for our estates after the *Stowe Survey* and we are left with nothing but guesswork. In his study of the manor of Coltishall (Eastern Norfolk) in the fourteenth century, Bruce Campbell has shown that the population of this manor continued growing after c.1300, until the Black Death (with the exception of the famine years of 1314-1318).¹⁰⁸ It is likely that the situation was similar in other parts of the county, our manors included. This can be also confirmed by the growing size of

¹⁰⁵ For example, H. E. Hallam, 'Population Movements in England, 1086 – 1350', in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), pp. 512-513; Edward Miller and John Hatcher, *Medieval England: Rural Society and Economic Change, 1086-1348* (London, 1978), pp. 27-63.

¹⁰⁶ Campbell et al., 1993, pp. 43, 77; Pamela Nightingale, 'The Growth of London in the Medieval English Economy', in Richard Britnell and John Hatcher (eds.), *Progress and Problems in Medieval England* (Cambridge, 1996), pp. 89-106.

¹⁰⁷ Bruce Campbell, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk', *Economic History Review* 2nd Series 36 (1983), pp. 27-28.

¹⁰⁸ Bruce M. S. Campbell, 'Population Pressure, Inheritance, and the Land Market in a Fourteenth-Century Peasant Community in R. M. Smith (ed.), *Land, Kinship and Lifecycle* (Cambridge: Cambridge University Press, 1984), 87-134.

Norwich's population, which had been augmented by rural immigration, when many were unable to cope with the increasing land shortage. This must have been especially true in the case of Martham c.1300, which may have had as many as 1,500 inhabitants living on just 843 acres of land.

Because of its extraordinary density, Norfolk was also the region with the highest mortality rates during the Plague of 1348-1351, which may be regarded as a Malthusian crisis: after all, Norfolk population seems to have grown geometrically exceeding the capacity of Norfolk land to supply food, which grew arithmetically.¹⁰⁹ According to some compelling evidence, Norfolk may have lost as much as 50 per cent of its pre-Plague population. Although we do not have any direct source telling us what percentage of population our manors lost, we shall see later that it may well have been around the same high figure of 50 per cent, in view of drastic fall in sown acreage. But then again, the rates may have varied from manor to manor, and certainly from region to region (less densely populated West as opposed to a more densely settled East).¹¹⁰

After the Black Death, the Cathedral Priory began losing more and more tenants not only because of the epidemics, but also because of the Priory's policy of increased leasing. This marks the beginning of the transformation from the direct management to leasing. As mentioned above, Gateley, Hemsby, Monks Grange, North Elmham and Thornham were all leased out. From this era, the priory became less and less dependent on its rural population living and working on the manors. The other unleased manors may have experienced some demographic recovery, especially during the 1360s, since the amount of sown acreage shows (discussed in the next section).

¹⁰⁹ Thomas R. Malthus, *An Essay on the Principle of Population*, 1st ed. (London, 1798)

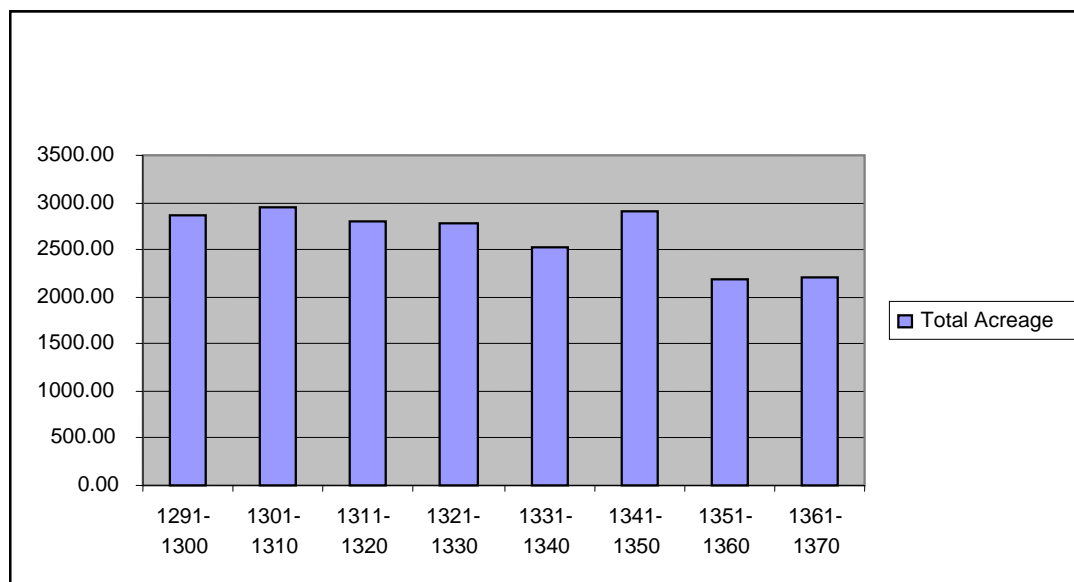
¹¹⁰ On the Black Death in East Anglia, see Augustus Jessopp, 'The Black Death in East Anglia', *Nineteenth Century* 16 (1884), 915-934.

As we have seen, demography tends to be rather a problematic issue, because of so many gaps and guesswork. A partial solution to these may be the data on acreage size, which could serve as an indicator to the population trends in the decades, for which no direct information is available.

Fluctuations in Sown Acreage

The total of acreage of the manors varied too, dictated by the economic and demographic reality of each decade. The sown acreage was determined, largely, by three factors: (1) availability of arable acreage; (2) availability of sufficient labour power to cultivate the arable acreage; (3) the price level, chiefly for farinaceous products. The general trend was to keep as much land as possible when prices were high. As we shall see below, these three factors were equally important. The following figure (Figure 2.2) shows fluctuations in acreage in different decades:

Figure 2.2. Total Sown Acreage on Norwich Cathedral Priory Demesne, 1290-1370.



Source: Accounts Database.

Note: All figures are given in standard, or Imperial acreage. Since no single Newton account is extant for the decades of 1311-1320, 1341-1350 and 1351-1360, comparative estimations were made. The data omits the Famine years of 1315 and 1316, as no account has survived and hence, the table reflects only the 'normal' years of the second decade of the 14th century. Almost identical figures are given in Campbell, 2000, p. 235.

As Figure 2.4 shows, between 1290 and 1330 the arable acreage was more or less static, with meagre fluctuations. This went hand in hand with the rise in prices, especially in 1315-7 and 1322-3, which marked exceptionally high prices.¹¹¹ Perhaps this indicates that these were good decades for the farmers, who did not need to increase their productivity in order to make ends meet.

¹¹¹ David L. Farmer, 'Prices and Wages', in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), p. 737. The more recent database, compiled by John Munro (based on Phelps Brown-Hopkins' index) is available on <http://www.economics.utoronto.ca/munro5/> (henceforth, John Munro's Price Index; last consulted on 25.1.2008). For the discussion of Norfolk prices, see below, Chapter 7.

There was a further drop of 9 per cent in the fourth decade of the century, resulting from the lease of three manors, Hindolveston, Hindringham and Thornham in 1334, whose sown lands constituted about 17 per cent of the total acreage. This was a decade of economic deterioration characterised by a sharp drop in prices, which returned to their pre-1300 level.¹¹² This encouraged the Priory to lease the manors in question, hoping to profit more from a fixed farm, rather than the direct management. The last years of the decade saw a renewed stability in prices movement, while from 1341 onwards the prices moved upwards again. This development was exploited by the prior, who took the two leased manors back, as well as Thornham, which was restored several years later. The 1340s, with the exception of a failed harvest of 1346, were the years of high farming, which explains a renewed rise of about 15 per cent of total acreage under the plough.

The major change came with the Black Death. The amount of acreage sown between 1341 and 1350 fell by about 19 per cent compared with the previous decade. A close examination of the rolls suggests that there was a pronounced drop during the Plague years. The account of 1349 shows a fall of 31 per cent of total sown acreage. However, it must be stressed that the situation differed from manor to manor. For instance, Gateley saw an astonishing drop of as much as 78 per cent, while Gnatingdon, Hindringham, Plumstead and Sedgeford experienced fall of around 30 per cent each. But what especially striking is that there was virtually no change on Hindolveston (fall of just below 2 per cent) and Taverham (slightly below 4 per cent). The Priory did its best to profit from the rising prices that immediately followed the Plague and recruited all its

¹¹² *ibid.*, p. 737.

available natural and human resources to produce grains, in order to avoid the necessity of buying foodstuff with cash.¹¹³

There was a further drop of over 25 per cent in the subsequent decade (1351-1360). This reflects the high mortality rates from the Plague, which did not stop until 1351. The extant accounts reveal that the Priory continued profiting from the weakened manors. From 1351 until 1356 there was a renewed, though relatively insignificant fall in grain prices, although textile and fuel prices continued rising, resulting in a stable composite price index.¹¹⁴ From 1356 until 1361, however, the farinaceous prices joined the trend with textiles and fuel, only to start gradually falling again from 1361 onwards, never to recover until the late fifteenth century.¹¹⁵

The price fluctuations, which led to a prolonged deflation from 1361, resulted in further leasing of several manors. Gateley, Hemsby, Monks Grange and North Elmham were all set at farm around 1360. The choice of these manors is obvious: they were the least productive ones, while the more productive ones remained in the Priory's hand. The former showed all signs of post-Plague recovery, with a rise of 17 per cent of the total sown acreage, compared to the decade of 1351-1360.

To summarize: the amount of sown acreage on the Priory's manors was controlled, to a great extent, by the rational policy of the Priory, according to the price movements of the period. If the prices soared – the manors were kept in hand, since the Priory preferred to get 'free' grain, instead of buying it with cash. But once the prices

¹¹³ *ibid.*, p. 735. A more detailed and contributing study on the post-Plague prices is John Munro, 'Before and After the Black Death: Money, Prices and Wages in Fourteenth-Century England', in Troels Dahlerup and Per Ingesman eds., *Changes and Crises in Late Medieval and Early Modern Europe*, (Copenhagen, 2006, forthcoming).

¹¹⁴ David L. Farmer, 'Prices and Wages, 1350-1500', in Edward Miller (ed.) *Agrarian History of England and Wales*, Vol. III: 1350-1500 (Cambridge, 1988), pp. 520-523; John Munro's Price Index (<http://www.economics.utoronto.ca/munro5/>)

¹¹⁵ *ibid.*

fell, it was more profitable to lease the manors out. The total acreage rose in the last decade of the thirteenth century corresponding to a gradual rise in the relative price of grains. The deflation of the 1330s resulted in the leasing of three manors, only to be taken back in 1339, once the prices started moving upwards. This continued into the Black Death and it was not until the late 50s or early 60s, when the prices started gradually falling, that the Priory returned to its leasing policy.

Crop Specialization: the Von Thünen Theory

The geography of crop specialization was first defined by the nineteenth century German economist Johann-Heinrich Von Thünen (1783-1850). In his *Der isolierte Staat* (1826), Von Thünen concluded that the types of goods produced on different rural settlements are dictated by their distance from the urban market and transport costs.¹¹⁶ ‘The crop that produces the greater economic rent per unit area will occupy sites nearest the town; the crop that yields a lower economic rent will be located on lands at greater

¹¹⁶ Johann Heinrich von Thünen, *Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie* (Berlin: Erschienen im-Akademie-Verlag, 1910). The English translation is Johann Heinrich von Thünen, *Isolated State: An English Edition of Der isolierte Staat*, trsl. Carla M. Wartenberg (Oxford: Pergamon Press, 1966). I shall refer to the German edition as Von Thünen (G), while to the English one as Von Thünen (E). Von Thünen’s theory is clarified by A. Lösch, *The Economics of Location* (New Haven: Yale University Press, 1954); E. S. Dunn, *The Location of Agricultural Production* (Gainesville: University of Florida Press, 1967) and Campbell et al., 1993, pp. 5-7; 111-113. Different reflections on von Thünen’s theory are found in Andreas Grotewold, ‘Von Thünen in Retrospect’, *Economic Geography* 35 (1959), 346-55; Colin Clark, ‘Von Thunen’s Isolated State’, *Oxford Economic Papers* 19 (1967), 370-7; Robert Sinclair, ‘Von Thunen and Urban Sprawl’, *Annals of the Association of American Geographers* 57 (1967), 72-87; H.O. Dickinson, ‘Von Thünen’s Economics’, *Economic Journal* 79 (1969), 894-902; Martin Beckmann, ‘Von Thünen Revisited: A Neo-Classical Land Use Model’, *Swedish Journal of Economics* 74 (1972), 1-7; Nan-Yeung Shieh, ‘Launhardt on Von Thünen’s Rings’, *Regional Science and Urban Economics* 22 (1992), 637-641. The most recent and relevant work on von Thünen’s model is Harry Kitsikopoulos, ‘Urban Demand and Agrarian Productivity in Pre-plague England: Reassessing the Relevancy of von Thunen’s Model’, *Agricultural History* 77 3 (2003), 482-522.

distances'.¹¹⁷ He divided the hinterland area into six different sub-zones. 'Zone 1' is a narrow area of 'free [cash] cropping' (=Freie Wirtschaft) specializing in perishable products, such as fruits, hay, fodder grains, straw and milk.¹¹⁸ 'Zone 2', the 'forestry' (=Forstwirtschaft), is devoted to woodlands supplying the town with fuel and wood materials. Such materials are bulky in their size and hence it is more profitable to have them as close to the town as possible, in order to keep the transportation costs as low as possible.¹¹⁹ Grain production begins with 'Zone 3', or 'crop alteration zone' (=Fruchtwechselwirtschaft). This zone is characterized by the most fertile soils of the entire region, on which fallows were reduced, legumes cultivated and livestock managed to the maximum extent.¹²⁰ 'Zone 4', 'improved system' (=Koppelwirtschaft), lies on lands inferior to 'Zone 3', and is marked by the alteration of land between arable and pasture and the combination of grain and dairy production. According to Von Thünen, the zone ends 24.7 miles (=39.75 km) from the town.¹²¹

Beyond 'Zone 4' lies 'Zone 5', the 'three-field system' (=Dreifelderwirtschaft) with the most extensive grain production, dedicated to arable and pasture and free of fodder cultivation. This zone stretches from 24.7 (=39.75 km) to 31.5 miles (=50.69 km) from the town.¹²² The first five zones constitute about 40 per cent of the total hinterland and they are the ones supplying the town; the remaining 60 per cent are formed by 'Zone 6', devoted mostly to livestock managing and wool production (=Viehzucht). The grain

¹¹⁷ As summarized by D. Grigg, *The Dynamics of Agricultural Change: The Historical Experience* (London: Hutchinson, 1982), p. 136 and quoted in Campbell et al., 1993, pp. 111-112.

¹¹⁸ Von Thünen (G), pp. 16-17=Von Thünen (E), pp. 9-11.

¹¹⁹ Von Thünen (G), pp. 129-145=Von Thünen (E), pp. 106-123.

¹²⁰ Von Thünen (G), pp. 161-163=Von Thünen (E), pp. 140-141.

¹²¹ Von Thünen (G), p. 163=Von Thünen (E), pp. 142.

¹²² Von Thünen (G), p. 163=Von Thünen (E), p. 143.

grown here is not for supplying the town, because it lies within a considerable distance from this zone.¹²³

Von Thünen understood that this is rather an unrealistic model, possible only in the ideal geographical and geological conditions. However, studies of the London provisioning zone have shown that the German economist was not too far from reality, in case of the London provisioning hinterland.¹²⁴ Interestingly enough, this model is partially reflected in a late twelfth century description of London by William Fitz Stephen (written probably around 1175). In his brief reference to the immediate hinterland, Fitz Stephen states that *‘there are spacious and beautiful gardens lying adjacent to each other, beyond the houses of the suburban citizens and consisting of trees. Furthermore, to the North there are fields, pastures and pleasant surface of fields, with streams flowing over them with water; towards which move with pleasing sound revolving wheels. In the proximity, appears a vast forest, woodland of foliage, concealing wild deer, does, boars and forest bulls’*.¹²⁵ In other words, the orchards were located in the suburbs (Zone 1); beyond them lie meadow fields yielding straw and forests (Zone 2). Describing further zones lied outside Fitz Stephen’s scope, whose preoccupation was the City itself.

Is the Von Thünen model applicable on the Norwich hinterland? The present chapter can provide only a partial answer, since our work is preoccupied with grain

¹²³ Von Thünen (G), pp. 167-178=Von Thünen (E), pp. 149-158.

¹²⁴ Campbell et al., 1993, pp. 141-143, 175-176.

¹²⁵ *Undique extra domos suburbanorum horti civium, arboribus consiti, spatiosi et speciosi, contigui habentur. Item a borea sunt agri, pascuae, et pratorum grata planities, aquis fluvialibus interfluis; ad quos molinorum versatiles rotae citantur cum murmure jocoso. Proxime patet ingens foresta, saltus nemorosi, ferarum latebrae, cervorum, damarum, aprorum et taurorum sylvestrium.* Descriptio Nobilissimae Civitatis Londoniae Auctore Willelmo Filio Stephani’, James Craigie Robertson (ed.), *Rolls Series* 67:3 (London, 1877), p. 3. English translation is mine.

supply, not fruits, dairy products, meat, wood or fuel. Thus, it will attempt to answer the question regarding zones 3 to 5 only.

Geography of Crops: Testing Von Thünen's Predictions

Before we start looking at individual crop varieties cultivated on different manors of the Priory, we must give a general overview of the degree of crop specialization within the entire supplying zone. This is to be done by identifying each crop's share of the total grain acreage *sown on each individual manor separately*. The total picture of crop specialization will be represented as the top percentage of the total grain acreage under the principal grain crops. Table 2.5 demonstrates general tendencies and biases in crop specialization on the Priory manors in the last decade of the thirteenth century. The most widely cultivated and specialized grain was barley, with no less than five manors (that is, one third of all manors) devoting over 60 per cent of their demesne arable to this crop. Three of these (Eaton, Newton and Taverham) are situated in the vicinity of Norwich (within the radius of approximately 10 km). Wheat was the second most specialized grain. Two relatively distant manors, Denham and Gateley (31.84 and 30.8 km from Norwich), devoted between 30 and 35 per cent of their demesne arable to this grain. Oats were the specialization of Gateley, the only manor to allocate around 32 per cent of the arable to this spring grain. Rye, whose top value was 28.42 per cent, was the fourth grain variety in line. The manors specializing in it were Eaton and Monks Grange, both located in the great proximity of Norwich (within the radius of approximately three km). The legumes, beans and peas, were especially prominent on the estates specializing in wheat:

Denham and Gateley. It is tempting to interpret it as a decision to specialize in legumes as fertilizing agents of wheat. After all, in the end of the thirteenth century, legumes were the most effective replacement for fallow, because of their ability to replenish nitrogen by fixing it from the atmosphere.¹²⁶ As Bruce Campbell has shown, because of progressive farming methods, Norfolk lords succeeded in obtaining high grain yields, without relying much on grazing animals and their manure as sources of nitrogen.¹²⁷ Instead, a considerable role was played by legumes, serving as fertilizing agents.¹²⁸

It might be important to show how nitrogen works. Nitrogen is carried, in its initial form (dinitrogen gas, N_2), from the atmosphere into the soil, in which it is converted into ammonia (NH_3), nitrite ions (NO_3^-), or urea $(NH_2)_2CO$. This phase is known as *fixation*. The second phase is called *mineralization*, when plant roots absorb the said minerals. Afterwards, parasitic bacteria living on the grain roots transform the ammonia in soil to nitrite. This process is referred to as *nitrification*. The fourth stage, known as the *Plant Intake*, occurs when nitrite (a negatively charged anion) is absorbed by plants through their roots to produce protein. The remains of the nitrite, unabsorbed by plants, go deeper into the soil; this process is referred to as *leaching*. The final phase in the nitrogen cycle is called *denitrification* and it is characterized by the disappearance of

¹²⁶ Campbell, 2000, p. 229; Hermann Bothe, *Biology of the Nitrogen Cycle* (Amsterdam: Elsevier, 2007).

¹²⁷ On the importance of manure, see Robert S. Shiel, 'Improving Soil Productivity in the Pre-Fertiliser Era,' in *Before the Black Death: Studies in 'Crisis' of the Early Fourteenth Century*, M.S. Campbell (ed.) (Manchester and New York: Manchester University Press, 1991), pp. 51 – 77; idem, 'Nutrient Flows in Pre-Modern Agriculture in Europe,' in *Soils and Societies. Perspectives from Environmental History*, J. R. McNeill and Verena Winiwarter (eds.) (Isle of Harris: The White Horse Press, 2006), pp. 216-242.

¹²⁸ Bruce Campbell, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk,' *Economic History Review* 2nd Series 36 (1983), 26-46; idem, 'Arable Productivity in Medieval England: Some Evidence from Norfolk,' *Journal of Economic History* 43 (1983), 379-404.

nitrogen from the soil and its return to the atmosphere, as the result of its inability to receive oxygen in deeper strata of the soil.¹²⁹

The difference in figures is significant: while the top percentage value for peas is 24.00 per cent, that for beans is as low as 1.55 per cent of the total arable. The latter was the least cultivated crop. Maslin, a mixture of wheat and rye, reflects also the mixture of distances: it was the specialism of Martham, located 24.6 km North-East of Norwich (which is closer than the wheat manors, but much further than the rye ones). This demesne devoted merely 2.82 per cent of its total arable to maslin, making it the second least specialized crop after beans.

Was the Norfolk pattern of crop specialization unique? An answer might be partially obtained by comparing the Norfolk region to the Ten Counties surrounding London (=FTC counties).¹³⁰ The comparison reveals a certain degree of similarity. Just as in the case of Norfolk, manors specializing in rye and barley tended to be closer to London, while those biased towards wheat were, as a rule, located farther away from the capital. Both cases seem to confirm partially Von Thünen's prediction of spatial specialism, with the bulkiest grains grown closest to the town. Since wheat could withstand the transportation costs better than any other grain, having the shallowest rent-gradient, it should have been the furthest cereal from the town. In that case, the suburban manors would concentrate on rye on the winter field. So far, this holds true regarding both the Norwich and London region. Oats are the bulkiest grain and hence their costs of transport are the highest. Consequently, they should be the speciality of manors lying

¹²⁹ Hermann Bothe, *Biology of the Nitrogen Cycle* (Amsterdam: Elsevier, 2007); see also, Robert Allen, 'The Nitrogen Hypothesis and the English Agricultural Revolution: A Biological Analysis', *Journal of Economic History*, 68:1 (2008), 182-210.

¹³⁰ Campbell et al., 1993, pp. 111-144.

close to the town, while the barley-oriented estates should be situated farther away. This was true in case of the London region, but this prediction does not seem to work on the Priory manors. The only oat-biased manor, Gateley, was in good distance from Norwich, while the suburban estates were strongly barley-biased. The reasons behind it will be discussed below.

Equally revealing is the extent of the specialization. The following table demonstrates the top percentages of total output of each grain for each grain in both regions:

Table 2.3. Top Percentage of Arable Acreage Devoted to Each Grain in the Norwich and London Regions, c. 1300

Grain	Norwich Region	London Region
Wheat	34.73	50.60
Rye	28.42	33.50
Maslin	2.82	Unknown
Oats	32.23	50.80
Barley	62.83	31.50
Dredge	Nil	23.33
Peas	24.00	Unknown
Beans	1.55	Unknown

Note: The top percentage values are represented as a percentage of the demesne acreage, and they denote the most important grain produced on each manor, with the importance indicated by the percentage of the demesne arable devoted to that crop. Most demesnes practiced three-field system; the fallow is not included here.

Both regions show an uneven distribution of different grains. The London region, on the one hand, was strongly biased towards wheat and oats, the preferred grains for humans and horses respectively. Rye and barley were far less specialized grain varieties. In addition, there was a limited practice of dredge (a mixture of oats and spring barley)

specialization, while Norfolk manors did not come to cultivate this grain until the late fourteenth century, let alone specialize in it. Unfortunately, the London Project did not specify the extent of the legume specialization.

The Norwich region shows an entirely different picture. The most intensively cropped grain was barley, with several manors sowing it on over half of their total arable land. This reflects two major developments of the late thirteenth century: (1) replacement of oats and dredge with barley as a principal brewing grain;¹³¹ (2) tendency of Norfolk agriculture to concentrate on barley production and its gradual development into the country's main producer of this grain.¹³²

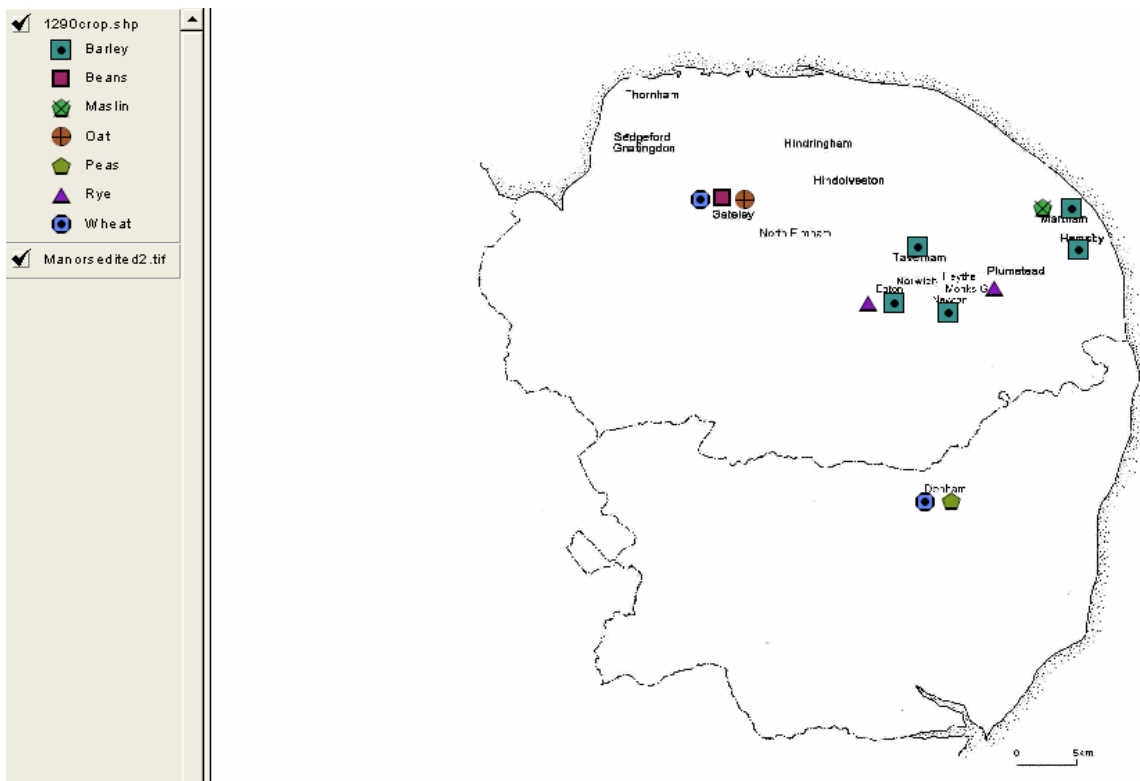


Figure 2.3. Grain specialization on the estates of Norwich Cathedral Priory, 1291-1300, showing the top percentages of total output for the percentage of each grain (wheat –

¹³¹ Mark Bailey, *A Marginal Economy? East Anglian Breckland in the Later Middle Ages* (Cambridge: Cambridge University Press, 1989), pp. 140-142; Campbell, 2000, p. 224.

¹³² Campbell, 2000, p. 223.

34.73; rye – 28.42; maslin – 2.82; oats – 32.12; barley – 62.83; beans – 1.55; peas – 24.00).

A slightly different picture emerges in the 1330s (Figure 2.4). Barley and rye specialization was still the privilege of the manors close to the town. It does not demonstrate, however, the same correlation of legumes to wheat. Legume specialization has now switched to the three distant manors, Martham and Hemsby, which cultivated peas and North Elmham, which grew beans. The figures have changed too. While the top deciles for wheat, rye, oats and peas remained virtually unchanged, one witnesses a pronounced rise in barley, beans and especially maslin sectors. Taverham, Martham, Newton and Hemsby all fell from the top decile in barley-specialization, giving way for Monks Grange, which joined Eaton in the specialization of the grain. Its top percentage is now 66.75 per cent (a rise of almost 6 per cent). Geographically, barley continued to be the specialization of manors near to the town. The output of beans rose astoundingly, by about 324 per cent, making the top percentage value 5.02 per cent, when North Elmham (27.1 km from Norwich) replaced Gateley (30.8 km from Norwich) as its principal cultivator. The change in the maslin sector is even more impressive: from meagre 2.82 per cent of 1291-1300, it rose to 10.57 percent (a rise of 375 per cent). The centre of its specialization has moved from Martham (24.6 km from Norwich) to Plumstead (8.2 km from Norwich). In other words, figures rose, while distances remained much the same (with the exception of maslin). Since the FTC Project does not go beyond c.1315, it is impossible to look at the Norfolk grain geography in a further comparative perspective.

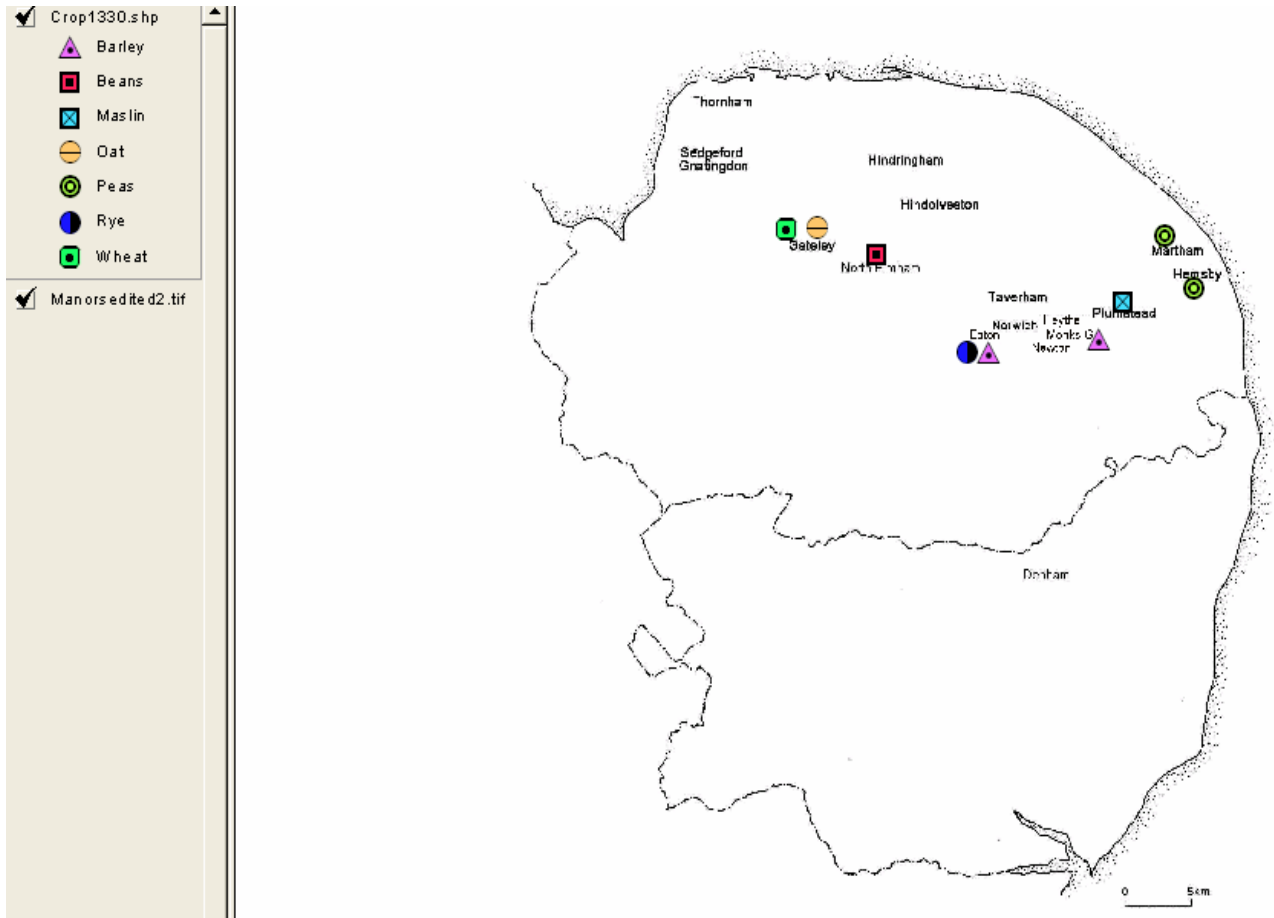


Figure 2.4. Grain specialization on the estates of Norwich Cathedral Priory, 1331-1340, showing the top percentages of total output for the percentage of each grain (wheat – 33.95%; rye – 30.06%; maslin – 10.07%; oats – 31.00%; barley – 66.75%; beans – 5.02%; peas – 21.15%).

To complete the picture, we should investigate the change in crop specialization after the Black Death. The case study period for that purpose is the seventh decade of the fourteenth century (1361-1370), illustrated on Figure 2.5

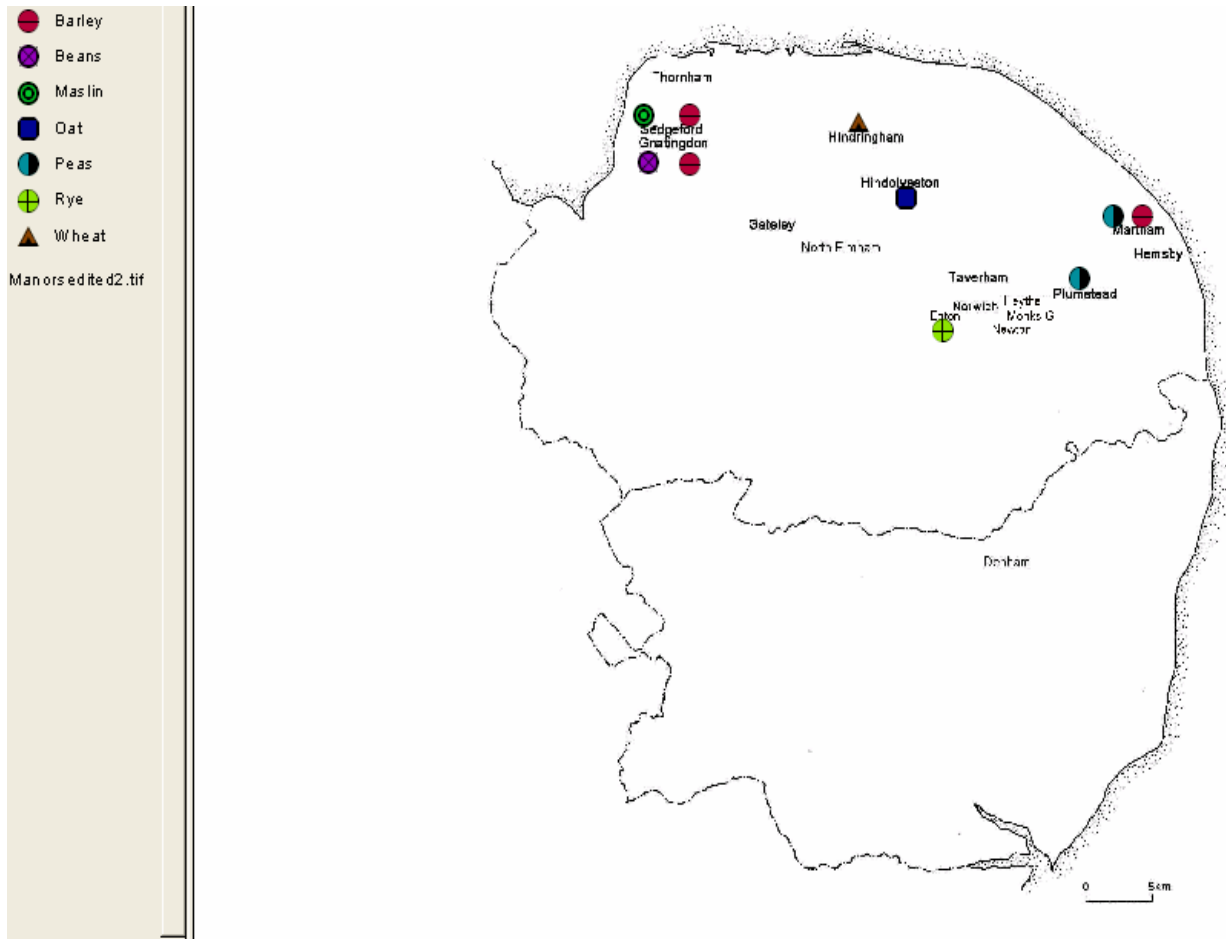


Figure 2.5. Grain specialization on the estates of Norwich Cathedral Priory, 1361-1370, showing the top percentages of total output for the percentage of each grain (wheat – 21.60%; rye – 33.50%; maslin – 0.21%; oats – 21.81%; barley – 62.80%; beans – 0.10%; peas – 16.28%).

Figure 2.5 shows a situation entirely different from the pre-Plague reality. First, as we have seen, the total amount of acreage was reduced after several manors were leased out. Second, there was a significant loss of population (perhaps as much as 40-50 per cent, since Norfolk was probably the most densely populated county). Third, as the consequence of the first two, we witness a considerable change in crop intensity and specialization, from both geographical and proportional points of view. With the exception of rye, all grain varieties show some degree of fall in the extent of their

cultivation. It was the least pronounced in the barley sector (a slight fall from 66.75 to 62.80 per cent); it is certainly felt in other sectors. Wheat and oat percentage seem to have been reduced by 36 and 30 per cent respectively. The top percentage value for peas fell by about 23 per cent (from 21.15 to 16.28 per cent). On one manor, Eaton, there was a meagre rise in rye sector (from 30.06 to 33.50 per cent). But what is especially striking is the fate of beans and maslin. The two varieties were virtually excluded from the cultivation practice altogether.

Geographical changes are visible too, although to a lesser extent. With all the suburban manors, save one, Eaton, leased out, the chief barley region moved much farther away, to the north-western estates of Sedgeford and Gnatingdon and to Martham, in the North-East, expanding the radius of cultivation to 60 km away from the town. Provided that their food supply was essential to the Priory, it is perhaps somewhat surprising that the suburban manors, except Eaton, were leased out. It should be noted, however, that every manor sowed at least 45 per cent of its total sown acreage with barley. The geography of rye remained intact, with the suburban Eaton as the principal producer of this grain. In other words, there was a chronological and geographical continuity in the specialization of rye. Wheat continued to be cultivated most intensively on distant manors, with Hindringham, which replaced Gateley as the main centre of its specialization. Oats were still the speciality of distant areas, such as Hindolveston, which replaced Gateley. The geography of peas seem to have been virtually unchanged, too: it was still the specialty of the western manors, Martham and Plumstead (which replaced Hemsby, after its lease). But unlike the situation in the last decade of the thirteenth

century, there was no longer any correspondence between wheat and peas specialization.

The reasons for it will also be discussed below.

In other words, although centres changed (with the exception of barley), principles did not. Rye-specializing manors were the closest to the town, while those concentrating on other varieties were located farther away. The following table demonstrates the continuity and change in crop specialities over the entire period of our study:

Table 2.4. Geographical and Spatial Change in Crop Specialization in 1291-1300, 1331-1340 and 1361-1370

Grain	1291-1300		1331-1340		1361-1370	
	Top Percentage	Radius in km	Top Percentage	Radius in km	Top Percentage	Radius in km
Wheat	34.73	30.00	33.95	30.00	21.60	35.00
Rye	28.42	3.00	30.06	3.00	33.50	3.00
Maslin	2.82	25.00	10.57	10.00	0.21	60.00
Oats	32.12	30.00	31.00	25.00	21.81	30.00
Barley	62.83	10.00	66.75	3.00	62.80	60.00
Peas	24.00	30.00	21.15	30.00	16.28	30.00
Beans	1.55	30.00	5.02	30.00	0.10	60.00

Note: The top percentage values are represented as a percentage of the grain acreage on the Priory demesnes; the radius figures are given in km from Norwich.

Source: accounts database.

Several factors determined regional and spatial specialities. The first factor to be considered is the physical distance and its economic derivatives: transaction and transportation costs. Since it was Von Thünen who coined and developed this theory, I shall refer to it as the Von Thünen factor. This factor is especially important in the agrarian sector, since each grain variety differed in its weight and caloric value affecting the transportation costs and cash prices. As noted earlier, oats, for example, were the bulkiest grain, while wheat was the least bulky.

Table 2.5. Absolute Weight, Calorific Value, Price and Carting Costs of Grain, c. 1300

Grain	Weight	Value		National Price		Carting cost over 10 miles as % of price per Bushel
	lb. per bushel	kcal per lb	kcal per kilo	Kcal per bushel	(in pence per bus)	
Wheat	53	1,520	3,355	80,560	8.88	1.00
Maslin	52	1,520	3,355	79,040		
Rye	51	1,520	3,355	77,520	6.98	1.23
Barley	46	1,452	3,205	66,792	6.47	1.19
Oats	36	1,676	3,695	60,336	3.53	1.93
Peas		304-1300	671-2879		6.32	

Notes: Carting prices are those of the Ten Counties around London.

Sources: Campbell et al., 1993, p. 41; Campbell, 2000, p. 215.

It is possible that the von Thünen factor was not the only reason for allocating wheat to distant manors. It is equally important to look at soil type around Norwich. As we shall see later, wheat is the least tolerant of all grains, unable to grow on light, sandy and acidic soils and requiring larger proportions of nitrogen (N) than other cereals. Not all the manors of the Priory were blessed by suitable soil for a successful absorption and processing of nitrogen. As Figure 2.6 shows, most suburban estates were located on medium clay, which is a sandy soil, suitable for rye, oats and barley rather than wheat cultivation;¹³³ one manor, Thornham, was situated on light clay (an excellent soil type for barley); Sedgeford, Gnatingdon and Plumstead were lying on light loam (again, suitable for barley, as well as for rye and oats); and two eastern estates, Martham and Hemsby had medium loam as their soil type (which is especially convenient for wheat growing). Hence, it is quite possible that the type of soil of suburban estates, which is less suitable for wheat, was yet another reason why wheat was cultivated on a limited scale there. If

¹³³ For the suitability of different soil types, see below, page .

that is true, then the type of soil and its suitability to grow a particular grain might be yet another factor that influenced the geography of crop specialization.

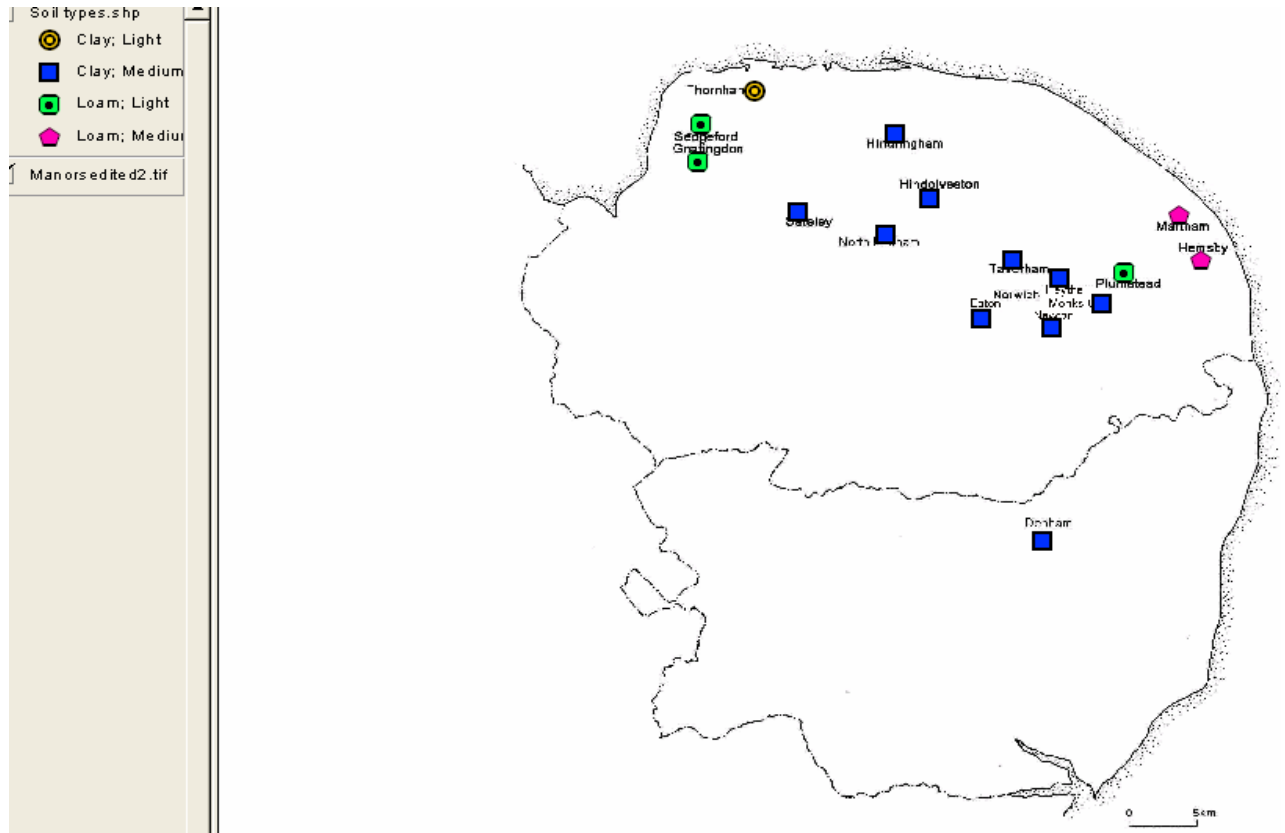


Figure 2.6: Soil types on the Priory estates.

Sources: *VCHN*, p. 1 and 14; *An Economic Survey of Agriculture in the Eastern Counties of England* (Heffer, Cambridge, 1932), p. 8; Darby, 1971, pp. 104-105.

Conclusions

The geography of grains in the Norwich region was determined by a combination of several factors. One was the distance between the point of production (manor) and the point of destination (Norwich) (the Von Thünen factor). The Von Thünen model seems to work well in the case of wheat and rye (the winter-field grains), but it fails when we look

at the spring cereals (oats and barley). Instead of concentrating on oats, the closest manors to the town were barley-oriented. Theoretically, this would make the transportation of oats more costly. In reality, the transportation of oats to the town was irrelevant, since the monastic community did not demand this grain. This brings us to the other important factor, the urban demand. The monastic community demanded large quantities of ale, brewed from malted barley, while oats were occasionally bought in much smaller quantities to feed horses, as well as labourers, as we shall see in later chapters. Hence, it would have been much more profitable to grow barley, rather than oats, closer to the town and to purchase oats on local markets in Norwich. The type of soil might be yet another reason for the fact that wheat was the specialty of more distant manors, which were situated on less sandy and hence more suitable soil for wheat cultivation. All this might prove that von Thünen's theory works only partially in case of Norfolk. Nevertheless, it should not be discarded, as Harry Kitsikopoulos did.¹³⁴ Nor should it be (almost entirely) accepted, as the FTC team did.¹³⁵ Instead, it should be regarded as merely *one potential factor* among other possible factors. Obviously, all other factors, such as the urban demand and soil type, should be checked too; otherwise, the picture will be rather incomplete.

¹³⁴ Harry Kitsikopoulos, 'Urban Demand and Agrarian Productivity in Pre-plague England: Reassessing the Relevancy of von Thunen's Model', *Agricultural History* 77: 3 (2003), 482-522

¹³⁵ Campbell et al., 1993, pp. 141-142.

Chapter 3. Grain and Legume Production on Norwich Cathedral Priory Manors¹³⁶

Bladum VS corallum

Medieval literary sources had always made a strict differentiation between good consumable grains and chaff, which is an inferior type, barely suitable for human nutrition. On the biblical-theological level, chaff was considered the embodiment of vice, with its roots going back to the Parable of the Sower (Matthew 13: 3-23). A late fifteenth century Norfolk play *Mankind* (composed around 1470) depicts chaff as valuable horse nutrition, criticizing the human habit of throwing it away, instead of giving it to the animals.¹³⁷ Walter of Henley, a late thirteenth-century author of a treatise on husbandry, advised farmers not to give barley chaff to their working animals, since it hurts the mouth of oxen.¹³⁸

The grange accounts, too, distinguish between good grains, specified by their proper names (*frumentum*, *siligo* et cetera) and chaff (*corallum* / *curallum* / *chorallum*). The proportion of chaff to grain proper was marginal: it rarely exceeded three per cent of total grain harvest. It should be noted that no distinction was made between *bladum* and

¹³⁶ An abridged version of this chapter has been presented at the Forty-First International Congress on Medieval Studies at the University of Western Michigan, at the session entitled 'Town and Country in Medieval England', organized and sponsored by the 'Society of the White Hart'. Kalamazoo, MI. 7.5. 2006.

¹³⁷ *Mankind* (Morality Play), in *The Macro Plays*, Mark Eccles (ed.), Early English Text Society (Oxford: Oxford University Press, 1969), lines 36-63. I owe this reference to my colleague and friend, John Geck, of University of Toronto.

¹³⁸ On Walter, see Noel Denholm-Young, 'Walter of Henley', in *Collected Papers of N. Denholm-Young* (Cardiff: University of Wales Press, 1969), pp. 227-235; *Walter of Henley and Other Treatises on Estate Management and Accounting*, D. Oschinsky (ed.) (Oxford, 1971), pp. 145-148; Elizabeth Lamond, *Walter of Henley's Husbandry together with an Anonymous Husbandry Seneschaucie and Robert Grosseteste's Rules*, Royal Historical Society (London, 1890), p. xxii.

corallum for oats, predominantly fodder, and beans, mostly used as fertiliser, since these crops have hardly ever been consumed by humans. Some accounts do not state the proportion of chaff to the grain proper, partially because some accounts did not differentiate between the two types. The following table demonstrates the ratio of chaff-to-consumable crops, sampled from various manors of the Priory, between c.1285 and 1370:

Table 3.1: Grain-to-Chaff Ratio, c.1285-1370

Grain Name	Crop in quarters	Chaff in quarters	Crop as %	Chaff as %
Wheat	71.88	1.93	97.34%	2.68%
Rye	53.70	2.04	96.34%	3.66%
Maslin	25.21	1.29	95.13%	4.87%
Barley	338.35	8.70	97.49%	2.51%
Peas	47.56	0.69	98.57%	1.43%
Average Proportion			96.98%	3.03%

Sources: the accounts database.

Notes: all figures are given in standard quarters (1 quarter = 8 bushels = 64 gallons) and based only on those accounts mentioning chaff.

It is unclear whether the table above reflects the situation in other regions of England, but it is clear that chaff was the undesired part of crop all over the country. It was either used as animal fodder,¹³⁹ or sold (for the same purpose).¹⁴⁰ There is no evidence that it had ever been fed to the *famuli*, or to daily-hired labourers.

¹³⁹ Campbell, 2000, p. 218

¹⁴⁰ Most of the Priory manors preferred to get rid of all of its chaff by selling it.

Principal Crops

Wheat (*frumentum*, *triticism*) was the supreme baking and brewing grain, preferred by the higher echelons of the society, a preference reflected in high price.¹⁴¹ Its most obvious advantage over the other grains was its exceptionally high gluten content, which made wheat loaves lighter than rye and barley ones. It was also the heaviest and densest grain rendering the largest amount of kilocalories (see above, Table 2.10). Originally a Mediterranean grain,¹⁴² wheat has always been a ‘winter’ crop sown in the autumn and germinating in the winter. Furthermore, it was the most difficult grain to cultivate: it demanded more nitrogen than other grains. The optimal soil type for wheat would be heavy to medium loam. Clay soils are suitable, too, though they may be less so, because of a lower ratio of nitrogen. Hence, it was very rarely sown on the same land in consecutive years and it was not unusual to dedicate large spaces to legumes on the same manors biased towards wheat.

Rye (*siligo*) was wheat’s companion in the winter field. It was known mostly as the baking grain of the common folk, who were unable to afford higher quality wheat bread.¹⁴³ Although it was almost as nutritious as wheat, it commanded a lower price (78 per cent of wheat price c.1300 and 70 per cent c.1400).¹⁴⁴ A native Northern grain, rye was much hardier and more tolerant than wheat, requiring less nitrogen. It was capable of germinating in cold regions and growing on virtually any type of soil. Unlike wheat, rye was virtually never malted and brewed.

¹⁴¹ Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), pp. 66-68; Campbell, 2000, pp. 214 and 218.

¹⁴² On the expansion of wheat northwards, see Michael McCormick, *Origins of the European Economy : Communications and Commerce A.D. 300-900* (Cambridge: Cambridge University Press, 2001), pp. 34-5.

¹⁴³ W. Ashley, *The Bread of Our Forefathers* (Oxford, 1928), pp. 86-100.

¹⁴⁴ Campbell, 2000, p. 219.

Maslin (*mixtura*, *mixtilio*, *maislin*) was a mixture of wheat and rye, combining the features and characteristics of both cereals. As a rule, maslin occupied much smaller proportion than wheat and rye and it tended to replace rye, rather than to grow by its side.

Oats (*avena*) was a 'summer' grain, sown in the spring and germinating in the summertime. It was used as a pottage crop, a source for inferior ale and fodder for working animals. Its food value, and hence its price, was the lowest of all grains (around 40 per cent of wheat price). Its milling resulted extraction rate of just 56 per cent and around 30 per cent when malted and brewed.¹⁴⁵ It is not surprising that oats were considered the most inferior crop. Oats were also the most tolerant crop, suitable equally for any type of soil.

Barley (*hordeum*, *ordeum*) was the premier brewing grain, yielding about one sixth fewer kilocalories per bushel than wheat (see above, Table 2.10).¹⁴⁶ Just as was the case with oats, it was mostly a spring-sown grain; winter-sown barley was unknown in Norfolk. As we shall see later, Norfolk was strongly a barley-oriented county and hence more than half of total arable acreage was occupied by this grain. Barley favoured medium to light soils, while an excessive source of nitrogen might diminish its brewing quality.¹⁴⁷ Unlike oats, the malting process decreased barley's weight and increased its value, explaining its capability of withstanding higher transportation costs.¹⁴⁸

Legumes, peas (*legumina*, *pise*) and beans (*fabe*) were grown for both human and animal consumption, invariably on the spring field. Their additional function was to serve as fertilizers, chiefly for wheat, for reasons explained earlier. This was especially true on

¹⁴⁵ Campbell et al., 1993, p. 25; Campbell, 2000, p. 244.

¹⁴⁶ Campbell, 2000, p. 222.

¹⁴⁷ Mark Bailey, *A Marginal Economy? East Anglian Breckland in the Later Middle Ages* (Cambridge: Cambridge University Press, 1989), p. 140; Campbell, 2000, p. 222.

¹⁴⁸ Campbell, 2000, p. 223.

manors with limited or no fallow, as we shall see below. Legumes were also sown as *inhok* (a part of the fallow field used for cultivation). The cultivation of beans, as opposed to that of peas, was marginal on the Priory estates.

Grain Acreage Allocation

a. Field One: Winter Grains (Wheat, Rye and Maslin)

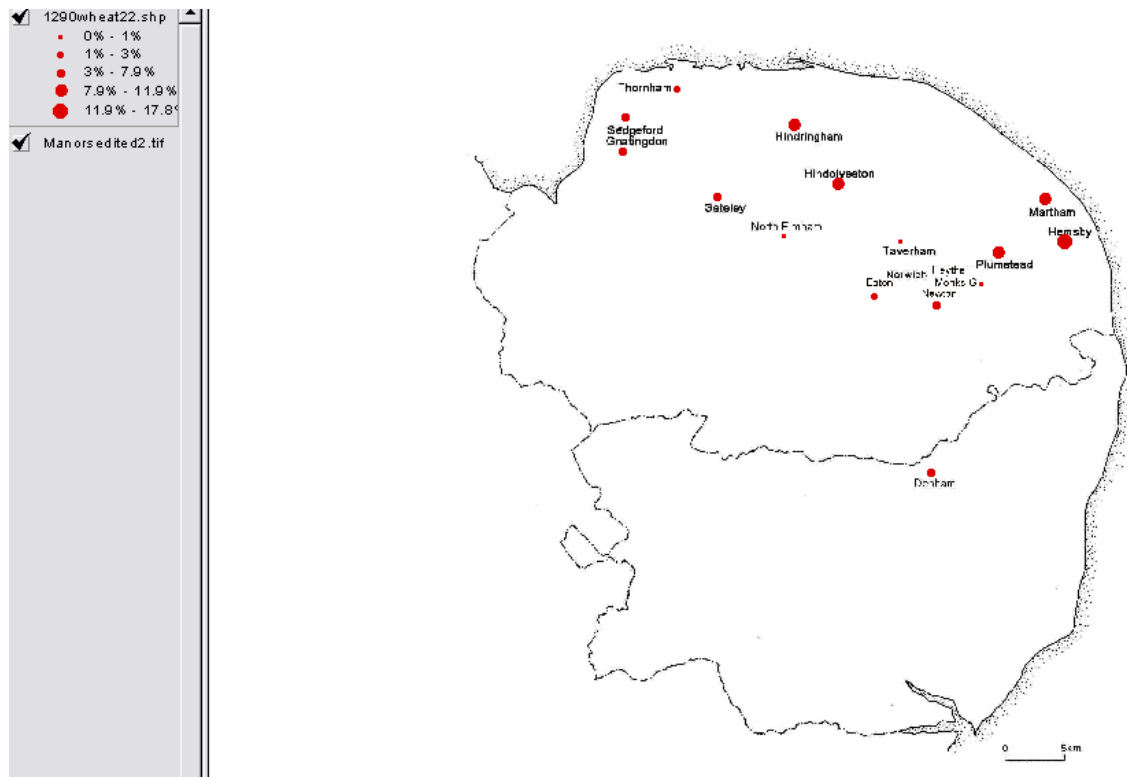


Figure 3.1. Acreage sown with wheat as a percentage of the total acreage on the Priory manors, 1291-1300.

Source: accounts database.

Just as in any other part of England, various crops under cultivation were sown unevenly, occupying different proportions of total sown acreage. For example, in the FTC counties, wheat accounted for the largest proportion of sown crops (37 per cent of total grain

acreage).¹⁴⁹ The Norfolk case was different, since, as we shall see later, this was a county famed for its barley specialization and production, dedicating much less sown space to wheat and other grains, because of the soil suitability to barley better than wheat. In the last decade of the thirteenth century, the latter crop occupied just over 12 per cent of the total sown area on the Priory manors, over the entire period.¹⁵⁰ This is a strikingly low figure, compared to the FTC counties (37 per cent) and the national average (36 per cent).¹⁵¹

Table 3.2. Grain Acreage on the Priory Manors, 1291-1370

(1). In Acres

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans	Total Acreage
1291-1300	277.89	332.00	15.37	359.06	1,511.38	375.98	4.23	2,875.91
1301-1310	280.27	267.96	5.67	334.59	1,505.21	383.47	5.02	2,782.19
1311-1320	306.79	257.36	32.64	326.56	1,498.60	403.32	5.07	2,830.34
1321-1330	325.45	285.58	32.58	310.69	1,456.95	340.86	8.24	2,760.35
1331-1340	267.01	274.13	27.70	241.87	1,190.15	314.14	6.75	2,321.75
1341-1350								
1351-1360	274.38	112.03	14.43	158.73	772.12	147.63	0.25	1,479.57
1361-1370	268.04	123.96	0.63	208.72	979.09	170.04	0.36	1,750.84
Average	285.69	236.15	18.43	277.17	1,273.36	305.06	4.27	2,400.14

(2). As Percentage of Total Crop Acreage

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans	Total Acreage
1291-1300	9.66%	11.54%	0.53%	12.49%	52.55%	13.07%	0.15%	100.00%
1301-1310	10.07%	9.63%	0.20%	12.03%	54.10%	13.78%	0.18%	100.00%
1311-1320	10.84%	9.09%	1.15%	11.54%	52.95%	14.25%	0.18%	100.00%
1321-1330	11.79%	10.35%	1.18%	11.26%	52.78%	12.35%	0.30%	100.00%
1331-1340	11.50%	11.81%	1.19%	10.42%	51.26%	13.53%	0.29%	100.00%
1341-1350								
1351-1360	18.54%	7.57%	0.98%	10.73%	52.19%	9.98%	0.02%	100.00%
1361-1370	15.31%	7.08%	0.04%	11.92%	55.92%	9.71%	0.02%	100.00%
Average	12.53%	9.58%	0.75%	11.48%	53.11%	12.38%	0.16%	100.00%

Notes: All figures are given in standard acres.

Sources: the accounts database.

¹⁴⁹ Campbell et al., 1993, p. 124.

¹⁵⁰ See below, Table I

¹⁵¹ Campbell et al, 1993, p. 124

Again, this is hardly surprising, since Norfolk was not a wheat-biased county. The most productive manors were Denham and Gateley, devoting respectively 34 and 35 per cent of their total grain acreage to wheat. But these two were rather an exception: the next largest group, consisting of Hindringham, Hindolveston, Martham, Hemsby and Plumstead, sowed merely between 12 and 18 per cent of their cultivated acreage with wheat, the remaining ones sowed less than 12 per cent, while Monks Grange did not cultivate wheat at all (Figure 3.1). To repeat, the most productive manors were also the furthest ones from the town, for the reasons discussed in the previous chapters.

Identifying wheat's share of the total grain acreage on each manor reveals only part of the picture. To complete it, one has to look at each manors' contribution to the total sown acreage of all the manors. This is revealed in the next table (Table 3.3):

Table 3.3: Each Manor's Share of Wheat as a Percentage of the Total Sown Acreage on All the Manors, 1291-1370.

Manor	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370
Denham	6.12	4.64	4.62					
Eaton	1.58	0.00	1.45	0.18	0.00		2.55	2.61
Gateley	6.93	10.17	6.15	6.64	8.53			
Gnatingdon	8.13	6.66	5.76	6.45	8.86		7.79	10.33
Hemsby	17.90	20.16	19.39	18.97	25.23			
Heythe					0.74			
Hindolveston	9.99	10.57	11.79	10.02			9.93	10.07
Hindringham	12.24	13.23	11.15	12.04			14.58	13.06
Martham	8.52	11.80	11.23	11.74	11.74		17.86	14.18
Monks G	0.00	0.00	0.23	0.65	0.80			
Newton	4.68	5.35	9.78	13.52	18.55		18.22	21.64
N Elmham	1.26	0.98	1.83	1.34	1.86		5.47	
Plumstead	11.32	7.14	7.99	8.76	12.62		9.66	10.82
Sedgeford	8.05	6.24	5.88	6.76	10.48		9.29	13.35
Taverham	0.72	0.00	0.00	0.09	0.46		1.91	3.95
Thornham	2.57	3.05	2.75	2.84			2.73	

Sources: the accounts database.

Before the Black Death, the most important wheat-producing manor was Hemsby, because of its extensive tithes. Its wheat acreage constituted as much as 18 per cent of total wheat acreage on all manors. The share of the two next manors, Hindringham and Plumstead, was 12 and 11 per cent respectively. Most manors, however, contributed between 5 and 10 per cent (Denham, Gnatingdon, Gateley, Hindolveston, Martham and Sedgeford). Five other manors (Eaton, Newton, North Elmham, Taverham and Thornham) rendered between 1 and 5 per cent, while Monks Grange did not contribute at all, since it did not cultivate wheat.

These proportions remained virtually unchanged until the Black Death. The post-Plague decades, however, show a somewhat different picture. The following figure (Figure 3.2) illustrates each manor's share of the total wheat acreage in the 1360s.

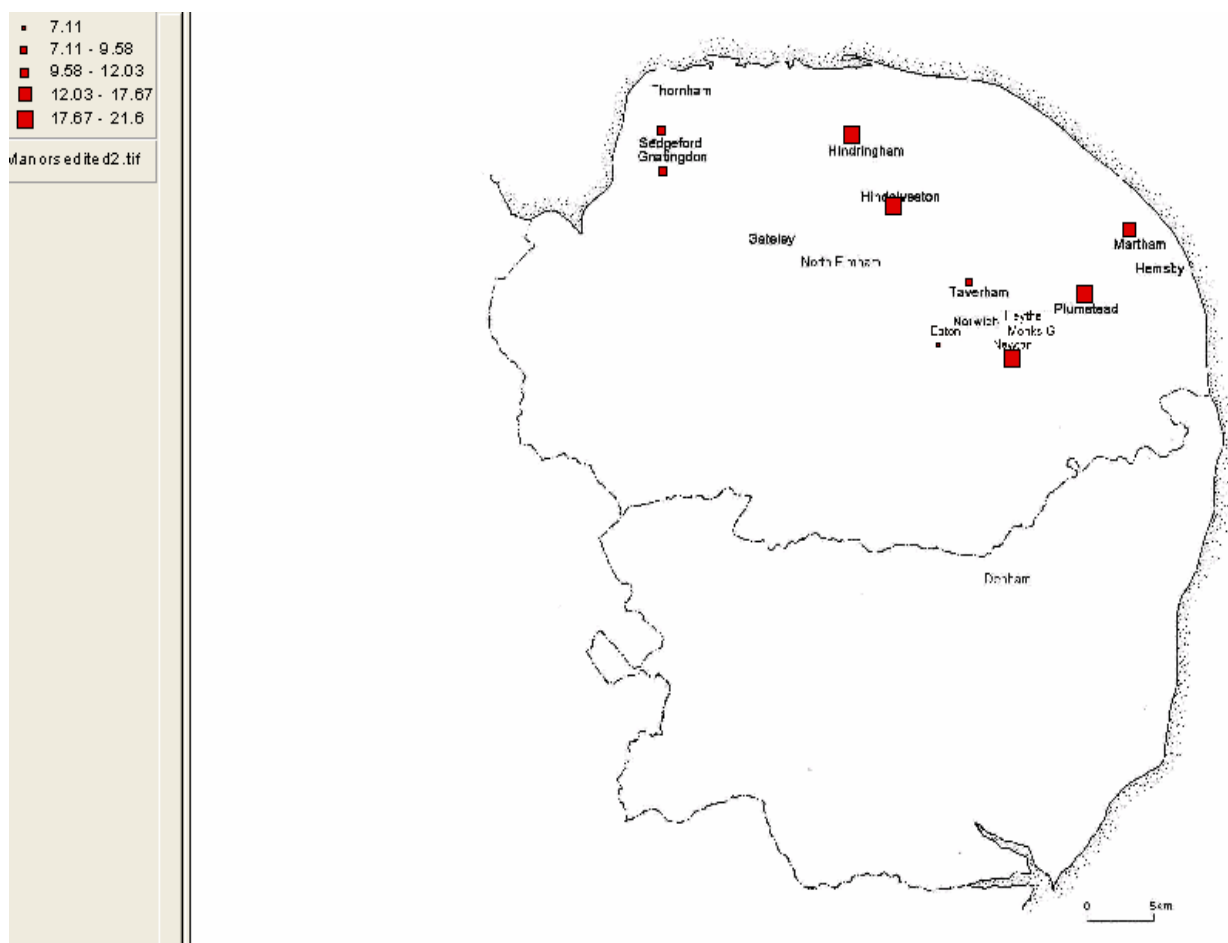


Figure 3.2. Acreage sown with wheat as a percentage of the total acreage on the Priory manors, 1361-1370. *Source:* accounts database.

The most striking change was the emergence of Newton as the most productive and contributing wheat manor. From a meagre 4.68 per cent as a percentage of its total acreage and 5.37 per cent as a share of the total sown acreage on all manors in the 1290s, the wheat acreage rose to 21.64 and 18.44 per cent respectively in the 1330s. Taverham rose from 1.51 and 0.72 per cent in 1291-1300 to 9.58 and 3.95 per cent in 1361-1370. A similar, albeit more limited rise can be seen on other manors, chiefly Eaton, Gnattingdon, Hindringham, Martham, Plumstead and Sedgeford. This rise was due to not only the

change in the general structure of the Priory manors, after several of them were leased out, but also to the change in the foodstuff requirements after the Black Death. It is a well known truism that wheat began taking the place of rye and barley in the post-Plague era, when the living conditions and standards of the common folk gradually began to improve.¹⁵² A close examination of all the surviving rolls, year after year, decade after decade, reveals that the major rise in wheat acreage came indeed after the mortality. However, it also shows a certain degree of rise, albeit much more gradual and smooth, in the decades preceding the plague, as Table 3.2 above shows.

Unfortunately, there are too few rolls surviving from the 1340s to complete the picture, but all the extant accounts indicate that this decade showed a pre-Plague trend, rather than a post-Plague one. In other words, the pre-Plague decades showed a slow rise in wheat acreage, while those post-Plague ones saw a stark increase. How are these dynamics to be explained? Until not so long ago, a myth of an abrupt rise in real wages and hence, improved living conditions of peasants and artisans, was a prevailing one in medieval economic history. However, as John Munro's most recent study has shown, the rise in *nominal wages* were so insignificant compared to the post-Plague rise in the relative price of grains that the *real wages* fell and it was not until c.1375 that the latter soared again and the living conditions improved.¹⁵³ Hence, we should consider the rise in

¹⁵² Christopher Dyer, 'English Diet in the Later Middle Ages', in T. H. Aston et al. (eds.), *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge: Cambridge University Press, 1983), pp. 191-206; idem, 'Changes in Diet in the Late Middle Ages: The Case of Harvest Workers', *Agricultural History Review* 36 (1988), 21-37; idem, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), pp. 151-160.

¹⁵³ John Munro, 'Before and After the Black Death: Money, Prices and Wages in Fourteenth-Century England', in Troels Dahlerup and Per Ingesman eds., *Changes and Crises in Late Medieval and Early Modern Europe*, (Copenhagen, 2007, forthcoming); idem, 'Postan, Population, and Prices in Late-Medieval England and the Low Countries', in John Drendel (ed.) *Michael Postan, Georges Duby, and the Malthusian Paradigm of Crisis in the Later Middle Ages* (Leiden: E. J., Brill, 2007, forthcoming). Similarly, consult idem, 'Wage Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low

the relative price of grains as a possible factor in the rise of wheat acreage. Between c.1350 and 1375, the price ratio between wheat and rye in Norfolk was about 1.00 to 0.65,¹⁵⁴ which is about 7 per cent lower than nationally, because of the unsuitability of Norfolk's soil to bear much wheat. It was largely at the expense of rye and peas that wheat acreage was increased. The hypothesis that it was a deliberate policy of the Priory to increase wheat production to respond to the rise in grain prices is not groundless, then. This, however, requires a more profound study, impossible to be undertaken within the present framework.

Let us now turn to rye. Rye occupied just below 10 per cent of total arable land. Unlike wheat, this is not an extraordinary figure at all; in fact, this figure is virtually identical to that of the FTC counties (about 10 per cent), and very close to the average national one (8 per cent).¹⁵⁵

What were the trends of rye? Again, we should differentiate between the pre- and post-Plague decades. In some respects, the history of rye reflects a contrary development to that of wheat. While the latter experienced a rapid rise in sown acreage, the former saw a gradual decline in cultivation. In both cases, this development was visible before the pestilence, while after the epidemics it became significantly more pronounced. Again, this did not owe as much to the rise of living standards, long believed to have occurred

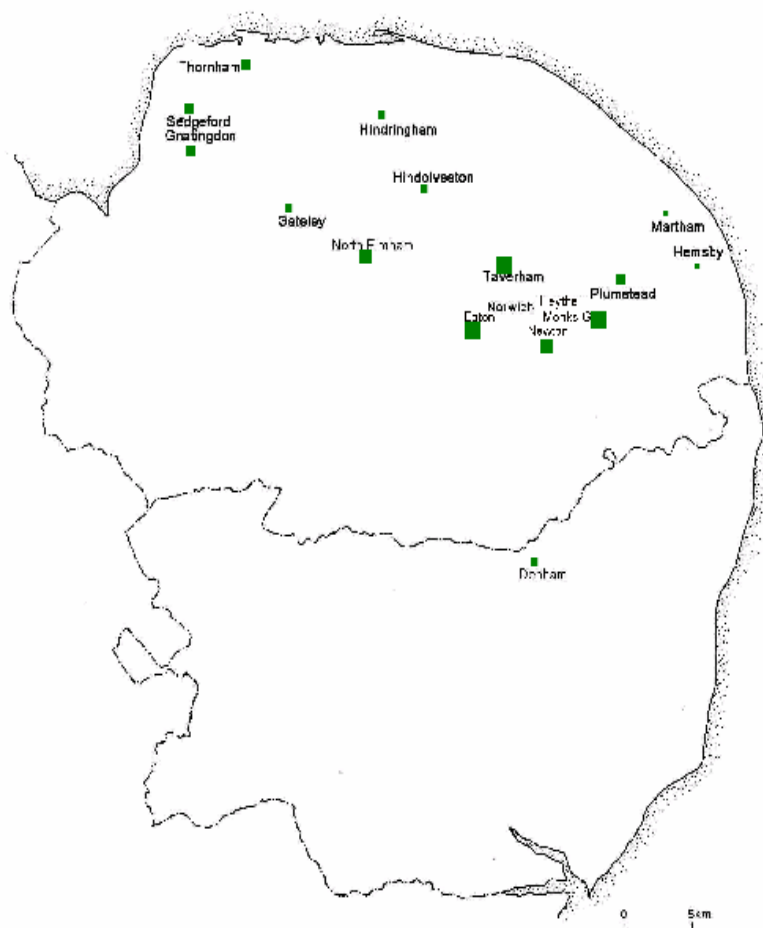
Countries, 1300-1500: Did Money Matter?', *Research in Economic History* 21 (2002), 185-287; idem, 'Builders' Wages in Southern England and the Southern Low Countries, 1346 -1500: A Comparative Study of Trends in and Levels of Real Incomes', in Simonetta Caviococchi (ed.) *L'Edilizia prima della rivoluzione industriale, secc. XIII-XVIII, Atti delle 'Settimana di Studi' e altri convegni, no. 36, Istituto Internazionale di Storia Economica 'Francesco Datini'* (Florence, 2005), pp. 1013-76. On changes of living standards, see Christopher Dyer, 'Changes in Diet in the Late Middle Ages: The Case of Harvest Workers', *Agricultural History Review* 36 (1988), 21-37; idem, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), pp. 151-160.

¹⁵⁴ Campbell, 2000, p. 239.

¹⁵⁵ Campbell et al., 1993, p. 122.

right after the Black Death, as to the post-Plague price fluctuations, with wheat prices rising more rapidly than rye. The only exceptions were Eaton, a suburban manor never dedicated to extensive wheat cultivation, and North Elmham. Contrary to the other demesnes, they enlarged the proportion of rye acreage after the Black Death. But these estates were rather extraordinary cases and unlike the other manors, there was no correlation between augmentation/diminishing of wheat and rye acreage. The expansion of rye acreage occurred there at the expense of oats (North Elmham) and barley (Eaton).

Figure 3.3 shows the pre-Plague geography of rye. As it demonstrates, the most rye-biased manors were concentrated around Norwich, while those away from the town practised a modest, sometimes marginal rye cultivation. This is hardly surprising, since, the cultivation of rye has to reflect negatively that of wheat not only chronologically, but also geographically. Both were winter (=late Fall) sown grains growing on the same field and hence, we cannot expect manors specializing in wheat to specialize also in rye, let alone in Norfolk, which was the barley county. Cultivating both wheat and rye to the same extent would have distorted the proportions between the winter and spring grains and limit the potential of specializing in barley, for expanding the winter fields meant shrinking the spring field. This relation between wheat and rye is well reflected in Table 3.2 and Figures 3.2 and 3.3. For example, Denham and Gateley were among the least rye-oriented manors, while they were also the most productive ones as far as wheat is concerned. There was no rye cultivation at all on either Martham or Hemsby, since both practised maslin cultivation, albeit on a very limited scale, corresponding extensive wheat cropping.



Source: accounts database.

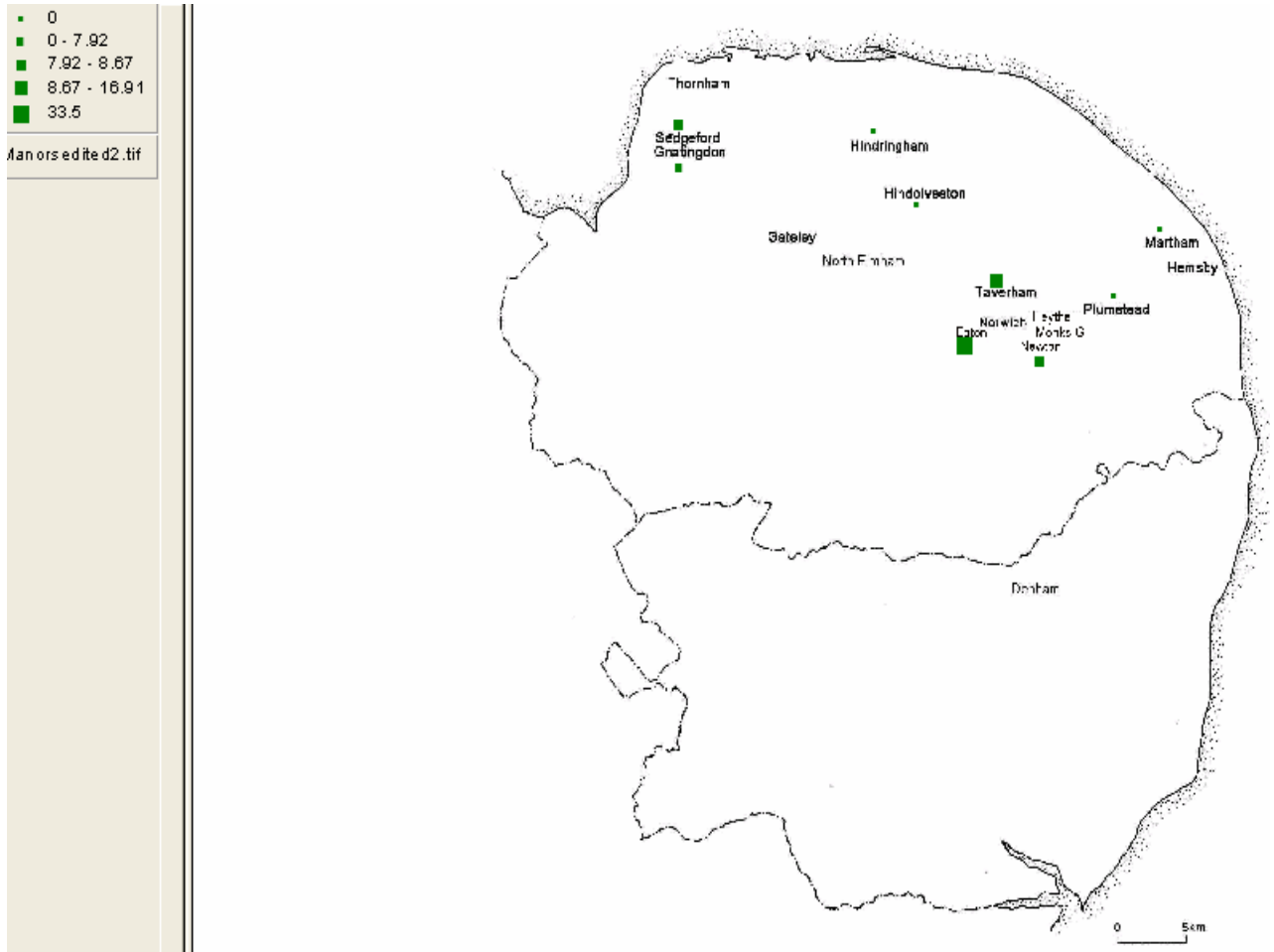


Figure 3.4. Acreage sown with rye as a percentage of the total acreage on each manor, 1361-1370.
Source: accounts database.

The post-Plague decades show a similar behaviour (Table 3.4). The extant suburban manors were still the most productive ones as far as rye is concerned, while the distant ones hardly practised any rye cultivation. The pronounced difference between the pre- and post-Plague generations is in the quantity and proportion of acreage sown with this grain. With the exception of Eaton, most manors diminished the proportion of rye acreage, which gave way to wheat. The latter was on its way to become the principal

winter-sown grain. This fact is illustrated in the following table showing rye-to-wheat acreage ratio between 1291 and 1370 (Table 3.4):

Table 3.4: Rye-to-Wheat Acreage Ratio, 1291-1370

Manor	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370
Denham	0.06	0.08	0.00					
Eaton	8.50		4.45	61.33		1.15	2.14	4.71
Gateley	0.11	0.05	0.17	0.02	0.13	0.23		
Gnatingdon	2.27	2.87	2.94	2.70	2.69	2.15	1.50	0.74
Hemsby	0.00	0.00	0.00	0.00	0.00			
Heythe					4.75			
Hindolveston	0.17	0.04	0.02	0.00		0.00	0.00	0.00
Hindringham	0.23	0.06	0.03	0.00		0.00		0.00
Martham	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00
Monks G			60.28	22.96				
Newton	4.08	2.67	1.40	0.98	0.88			0.45
N Elmham	1.71	3.09	1.79	1.44	1.30	1.30	0.00	
Plumstead	0.74	0.33	0.18	0.00	0.18	0.00	0.14	0.00
Sedgeford	2.29	3.34	2.70	2.45	1.98	1.74	1.25	0.72
Taverham	16.00			120.33	25.60	24.31	4.67	1.76
Thornham	1.04	0.66	0.19	0.38		1.29	0.67	
Average	2.66	1.10	5.30	15.18	3.76	2.93	1.15	0.93

Source: accounts database.

Notes: Wheat=1.00.

Generally speaking, there was a continuous fall of rye acreage in accordance with the rising wheat acreage (with the exception of the 1330s). If the rye acreage in the 1290s was almost identical to wheat acreage (0.96 to 1.00), the post-Plague decades show that rye acreage was little more than half that of wheat. Again, this was by no means a sharp drop occurring immediately after the pestilence; it was rather a gradual development, beginning long before the Black Death. The only exception was the 1330s, when rye

acreage exceeded that of wheat. It is possible that this reflects the economic deterioration that this decade witnessed, marked by a sharp deflation.

As far as each manor's share of the total acreage of all manors is concerned, there is an evident change, too, since in many cases the sown acreage decreased in its physical size. This is especially pronounced on Hindolveston and Hindringham, which lost their place as significant contributors of grains. Newton, on the other hand, had acquired new lands, increasing its physical size and hence its capacity to contribute a larger share to its rye production (see the following Table 3.5).

Table 3.5: Each Manors' Share of Rye as a Percentage of the total sown acreage on all the manors combined, 1291-1370.

Manor	1291-1300	1301-1310	1311-1320	1321-1330	1331-1340	1341-1350	1351-1360	1361-1370
Denham	0.30	0.37	0.00					
Eaton	11.22	4.66	7.67	12.89	9.85	4.92	13.39	26.62
Gateley	0.64	0.56	1.24	0.14	1.09	2.01	0.00	0.00
Gnatingdon	15.42	20.00	20.16	19.87	23.44	29.27	28.56	16.54
Hemsby	0.00	0.00	0.00	0.00	0.00	0.00		
Heythe					3.47			
Hindolveston	1.43	0.47	0.24	0.00		0.00	0.00	0.00
Hindringham	2.33	0.87	0.45	0.00		0.00	0.00	0.00
Martham	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00
Monks G	16.57	16.61	16.63	17.12	8.03	0.00	0.00	
Newton	15.96	14.93	16.32	15.06	16.05			20.97
N Elmham	1.81	3.17	3.89	2.19	2.37	2.18	0.00	
Plumstead	6.99	2.43	1.75	0.00	2.25	0.00	3.26	0.00
Sedgeford	15.44	21.83	18.90	18.87	20.37	33.21	28.46	20.81
Taverham	9.64	12.01	12.11	12.64	11.67	21.69	21.87	15.06
Thornham	2.24	2.10	0.63	1.23		6.71	4.46	

Source: accounts database.

b. Field Two: Spring Grains (Oats and Barley)

Just as the winter grains (wheat and rye) were closely dependent on each other, as far as the scale and proportion of their cultivation is concerned, so were the spring-sown crops, namely oats and barley. However, the dynamics were much less pronounced here compared to the winter grains, since the Priory administration had always attempted to keep more or less the same high rates of barley cultivation. Let us study the behaviour of the two grains in a comparative perspective.

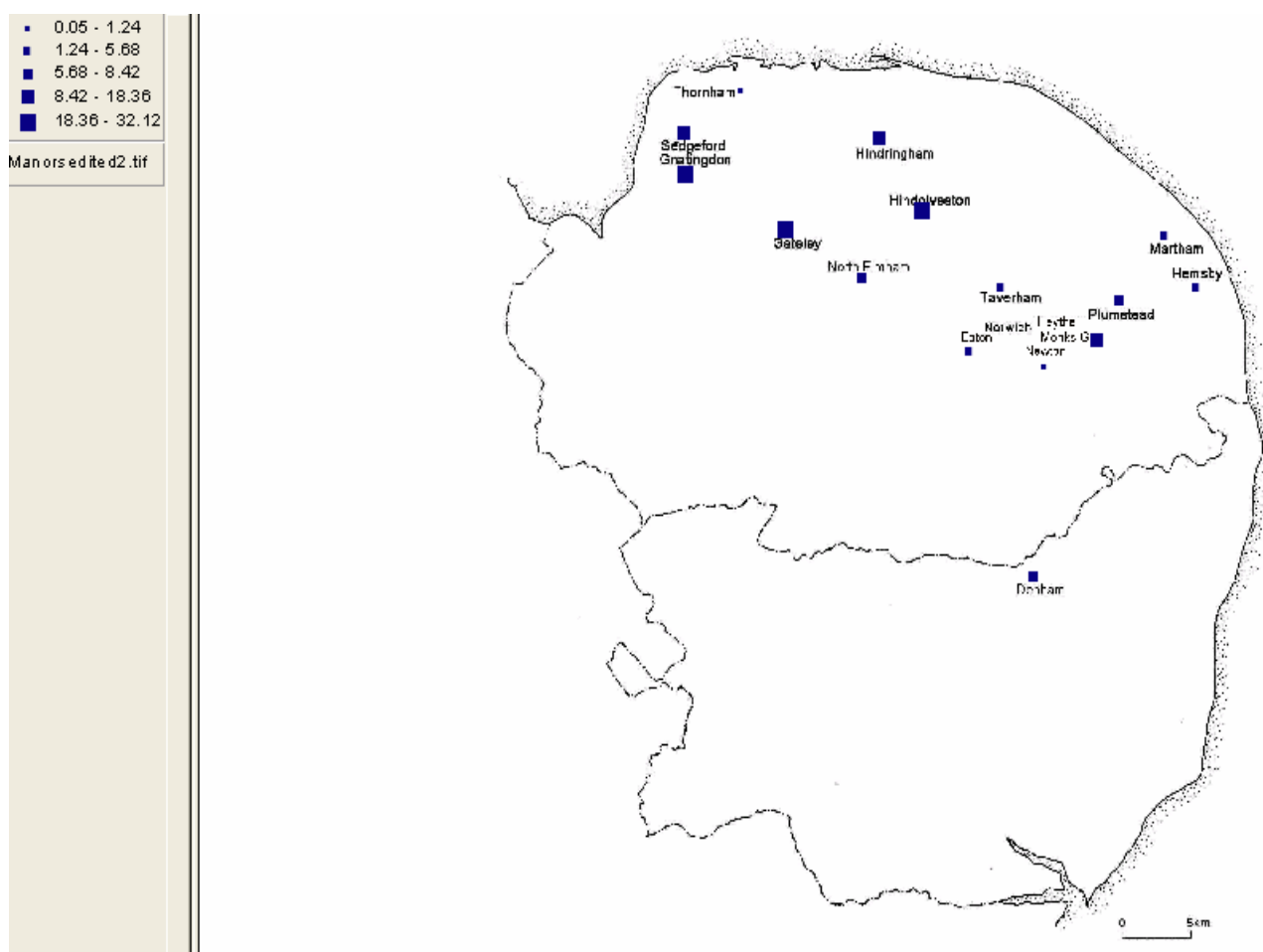


Figure 3.5. Acreage sown with oats as a percentage of the total acreage on each manor, 1291-1300.

Source: accounts database.

By the turn of the thirteenth century, the geography of oats resembled, to a great extent, that of wheat, when the suburban manors (with the exception of Monks Grange) devoted the smallest proportions of the arable to that grain and the more distant ones cultivated it on a great scale. The most oats-biased estate was Gateley, dedicating as much as 32 per cent of its total arable to this grain. Just as in the case of wheat, the geography of oats is to be explained by both the physical distance from the town and the Priory's nutrition requirements.

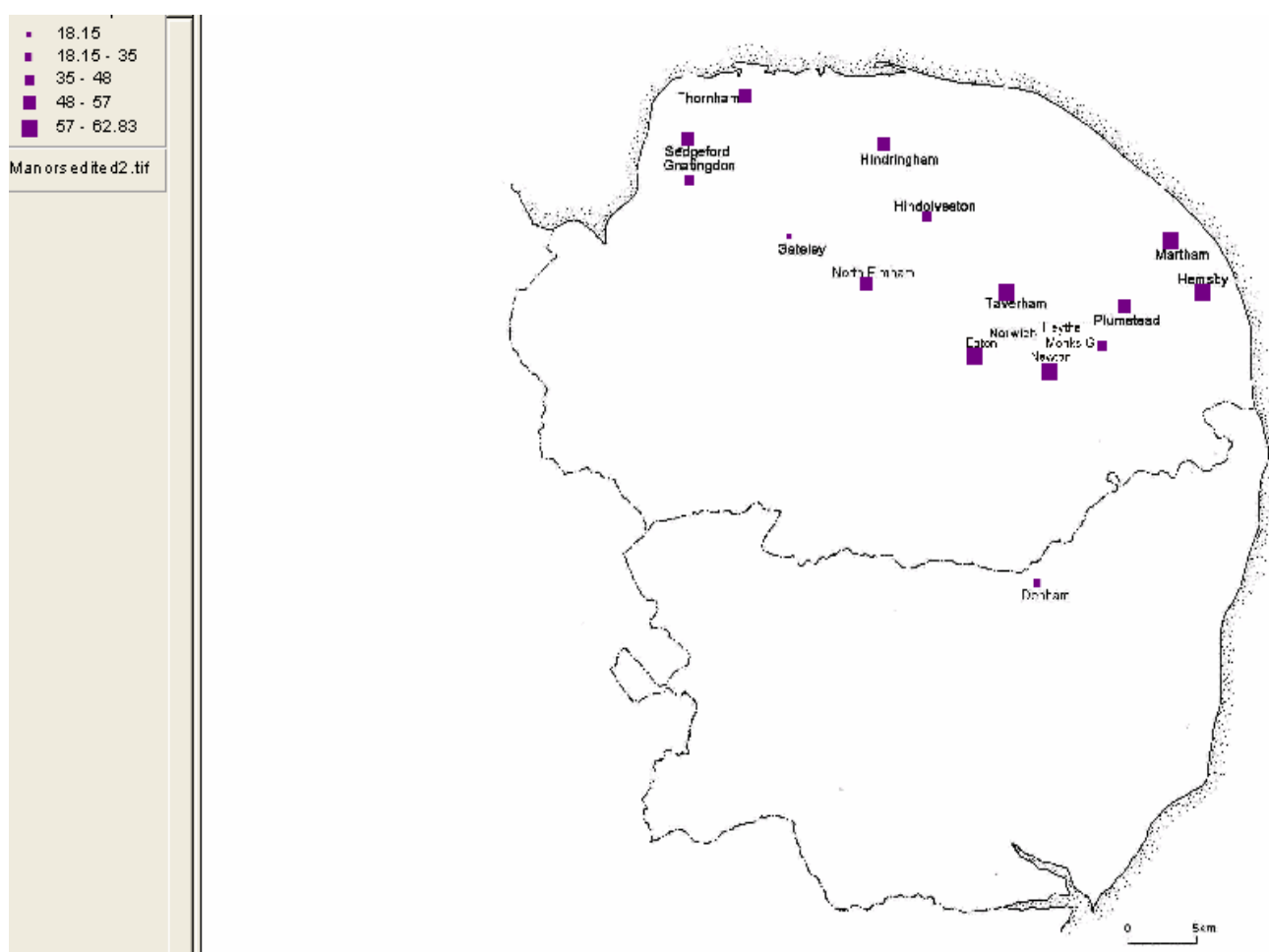


Figure 3.6. Acreage sown with barley as a percentage of the total acreage on each manor, 1291-1300.

Source: accounts database.

As Table 3.2 shows, oats amounted to just over 11 per cent of total arable of the Priory estates. This is an extraordinary low figure, compared to the FTC countries (33 per cent) and the national average (36 per cent).¹⁵⁶ But this figure becomes less surprising when we look at the large proportions of barley.

Contrary to oats, whose most productive manors were away from the town, the most barley-biased estates were located in the vicinity of Norwich, for the reasons stated above: its heavier weight and the monastic requirements. Contrary to the FTC counties (13 per cent)¹⁵⁷ and the national level (16 per cent),¹⁵⁸ the Priory manors dedicated as much as over 52 per cent of their total arable to barley.

The situation was somewhat different after the Black Death, as Figure 3.7 indicates.

¹⁵⁶ Campbell et al., 1993, p. 116.

¹⁵⁷ *idem*, p. 1993, p. 120

¹⁵⁸ *ibid.*

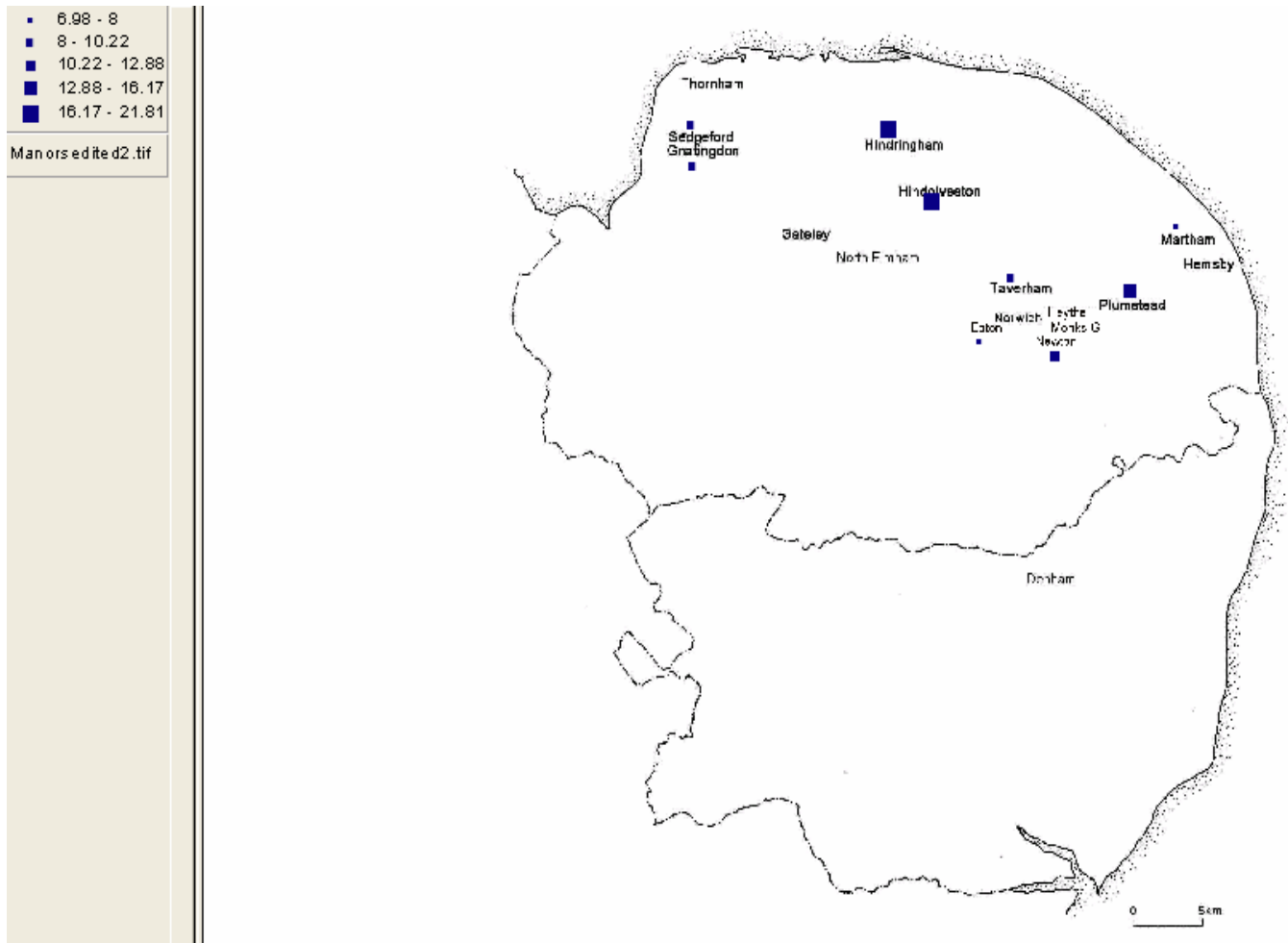


Figure 3.7. Acreage sown with oats as a percentage of the total acreage on each manor, 1361-1370.

Source: accounts database.

In case of oats, the suburban manors were still among the least important cultivators of oats, but they were not the only ones. Gnatingdon, Sedgeford and Martham all diminished the extent of their oats cultivation, while increasing their barley acreage. It does not mean, however, that the general balance had switched even further towards barley, while total oats acreage had sharply declined. This is well illustrated on table 3.8, showing the extent of barley cultivation after the Black Death. Hindringham and

Plumstead increased their oats production, in response to changes in barley, corresponding Gnatingdon, Sedgeford and Martham, which diminished their oats acreage. The suburban manors were still among the most barley-oriented ones, although they lost their supremacy as such to Sedgeford and Gnatingdon, the two largest estates. On the other hand, it should be noted that unlike the pre-Plague era, most of post-1350 manors were almost equally productive, dedicating between 50 and 63 per cent of their acreage to barley and hence, the distinction between ‘more biased’ and ‘less biased’ is somewhat irrelevant here. The ratio of oats-to-barley acreage is illustrated in Table 3.6:

Table 3.6: Oats-to-Barley Acreage Ratio, 1291-1370

Manor	1291-1300	1301-1310	1311-1320	1321-1330	1331-1340	1341-1350	1351-1360	1361-1370
Denham	0.19	0.17	0.20					
Eaton	0.07	0.10	0.12	0.12	0.07	0.05	0.24	0.14
Gateley	1.77	1.03	1.11	0.97	1.29	0.81		
Gnatingdon	0.49	0.47	0.37	0.35	0.33	0.31	0.15	0.16
Hemsby	0.08	0.07	0.05	0.05	0.05			
Heythe					0.39			
Hindolveston	0.57	0.48	0.52	0.44		0.56	0.39	0.49
Hindringham	0.27	0.27	0.25	0.28		0.42		0.36
Martham	0.09	0.06	0.04	0.05	0.05	0.13	0.09	0.12
Monks G	0.33	0.13	0.17	0.09	0.11			
Newton	0.02	0.02	0.09	0.16	0.16			0.23
N Elmham	0.13	0.00	0.17	0.13	0.11		0.29	
Plumstead	0.16	0.13	0.12	0.18	0.19	0.20	0.22	0.33
Sedgeford	0.37	0.39	0.38	0.36	0.29	0.22	0.18	0.14
Taverham	0.09	0.11	0.12	0.12	0.13	0.14	0.10	0.15
Thornham	0.09	0.11	0.10	0.15		0.25	0.09	
Average	0.24	0.19	0.22	0.21	0.21	0.29	0.20	0.23

Source: accounts database.

Notes: Barley=1.00 (hence, 0.19 means oat acreage equals 19 per cent of acreage sown with barley).

As indicated in Table 3.6, the ratio of oats-to-barley acreage did not change as dramatically as that of rye-to-wheat did and, as we shall see later, peas-to-wheat. It was 0.24:1.00 in the 1290s and 0.24:1.00 in the 1360s, with insignificant fluctuations in between. This can perhaps be explained by the fact that the cultivation of barley in the end of the thirteenth century was already on a very large scale and hence, there was no place to expand it further, on an account of acreage devoted to oats, as it happened in the case of wheat, which gradually seized more and more rye acreage. This is also contrary to the view that the post-Plague period is marked by the expansion of oats acreage, to feed the increasing livestock population, as a result of the conversion from mixed husbandry to pastoral farming.¹⁵⁹ Perhaps, our manors do not reflect the general situation in England, since they were owned by a religious lord whose demand for malted barley was much higher than for meat, since the latter was prohibited by the *Regula Sancti Benedicti*.¹⁶⁰ Moreover, the farinaceous prices stood higher than those meat/dairy and hence it might have been the Priory's decision to continue concentrating on barley.¹⁶¹ It is equally important to keep in mind that Norfolk was a barley county.

¹⁵⁹ On this conversion, consult B. H. Slicher Van Bath, *An Agrarian History of Western Europe (500-1850)* (Olive Ordish (transl.) (London: E. Arnold, 1963), pp. 164-183; Ian Blanchard, 'The Continental European Cattle Trades, 1400-1600', *Economic History Review* 2nd Series 39 (1986), 427-460; Maryanne Kowaleski, 'Town and Country in Late Medieval England: The Hide and Leather Trade', in Penelope J. Corfield and Derek Keen (eds.) *Work in Towns 850-1850* (Leicester, 1990), pp. 63-64. On pastoral husbandry, in general, consult, Kathleen Biddick, 'Animal Husbandry and Pastoral Land-Use on the Fen-Edge, Peterborough, England: An Archaeological and Historical Reconstruction, 2500 BC-1350 AD', PhD Thesis, University of Toronto (Toronto, 1982); eadem, *The Other Economy: Pastoral Husbandry on a Medieval Estate* (Berkeley, 1989). On a later, 15th century pastoralism, consult Ian Blanchard, 'Population Change, Enclosure, and the Early Tudor Economy', *Economic History Review* 2nd ser. 23 (1970), 427-45; Mavis Mate, 'Pastoral Farming in South-East England in the Fifteenth Century', *Economic History Review* 2nd ser. 40 (Nov. 1987), 523-36.

¹⁶⁰ *Benedicti Regula, Editio Altera Emendata*, Rudolph Hanslik (ed.), *Corpus Scriptorum Ecclesiasticorum Latinorum* 75 (Vienne: Hoelder-Pichler-Tempsky, 1977), Cap. 39 (obviously, the prohibition of meat eating does not apply to sick brethren).

¹⁶¹ David L. Farmer, 'Prices and Wages, 1350-1500', in Edward Miller (ed.) *Agrarian History of England and Wales*, Vol. III: 1350-1500 (Cambridge, 1988), pp. 520-523.

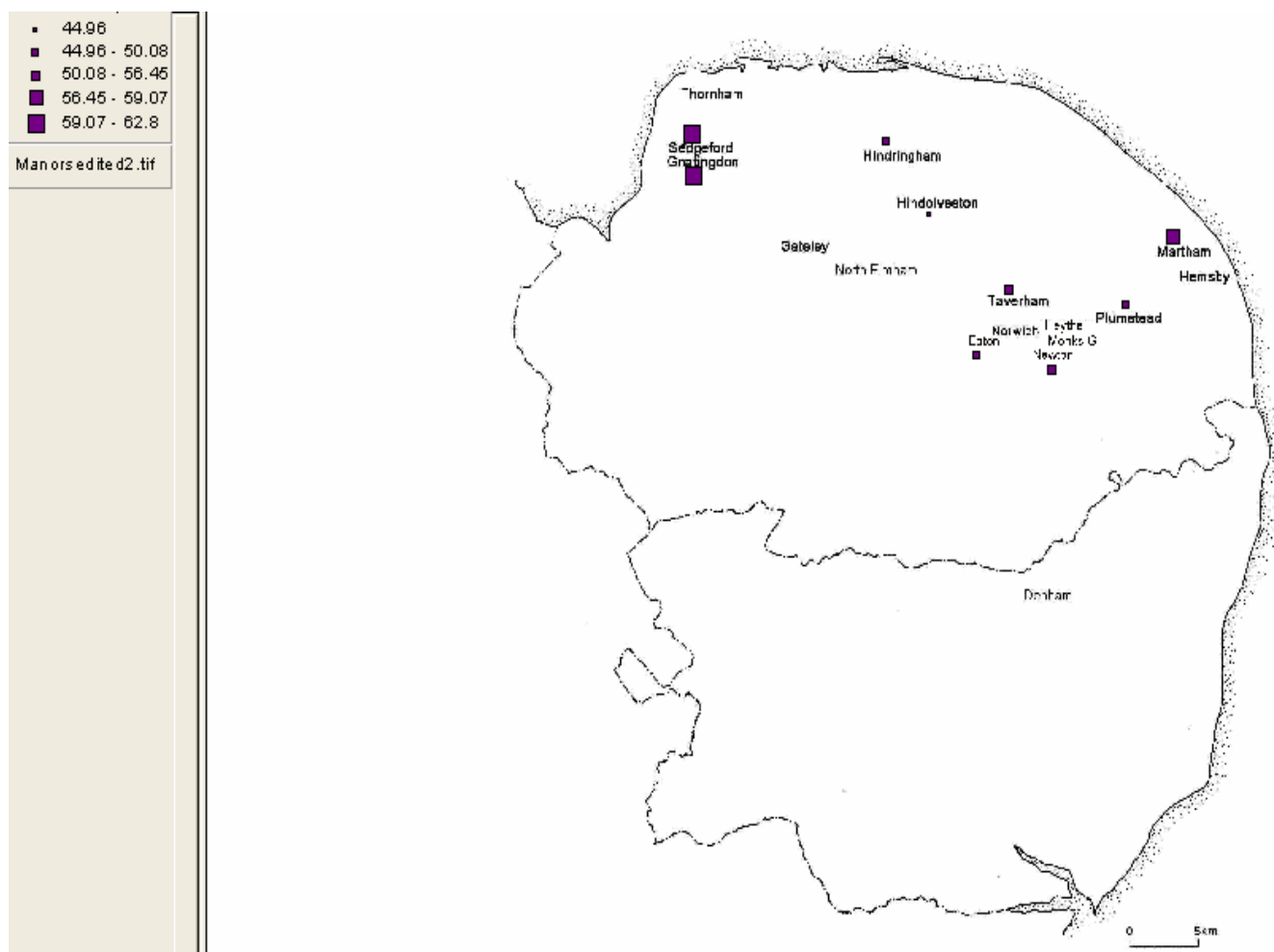


Figure 3.8. Acreage sown with barley as a percentage of the total acreage on each manor, 1361-1370.
Source: accounts database.

Table 3.7: Each Manors' Share of Oats as a Percentage of the total sown acreage on all the manors combined, 1361-1370.

Manor	1291-1300	1301-1310	1311-1320	1321-1330	1331-1340	1341-1350	1351-1360	1361-1370
Denham	0.89	1.05	1.05					
Eaton	1.60	1.87	2.45	3.57	1.65	0.99	6.30	3.35
Gateley	5.08	5.83	7.66	5.22	8.68	2.29		
Gnatingdon	27.40	28.87	23.01	22.26	28.06	23.82	10.08	12.67
Hemsby	4.32	3.74	2.62	2.52	3.51			
Heythe					3.31			
Hindolveston	9.89	9.19	9.90	8.47		18.18	18.43	15.09
Hindringham	9.19	10.74	9.48	11.27		17.40		13.89
Martham	2.85	1.99	1.43	1.67	1.79	4.25	5.67	7.19
Monks G	8.36	4.18	5.24	2.49	4.00			
Newton	0.84	0.67	3.98	7.72	9.92			19.40
N Elmham	0.63	0.00	1.13	1.04	0.96	0.85	4.41	
Plumstead	5.46	2.62	4.39	6.56	9.10	8.08	9.51	11.62
Sedgeford	20.28	25.11	23.23	22.29	25.15	17.12	18.51	12.27
Taverham	2.09	2.74	3.10	3.09	3.86	4.04	5.04	4.51
Thornham	1.13	1.42	1.34	1.83		2.98	1.89	
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: accounts database.

Table 3.7 shows in each manor's share of oats as a percentage of the total sown acreage between 1290 and 1370. The post-Plague change is identical to other grains' sector. In other words, the manors that shrank in size after the Black Death contributed less grain and vice versa.

Table 3.8: Each Manor's Share of Barley as a Percentage of the total sown acreage on all the manors combined, 1291-1370.

Manor	1291-1300	1301-1310	1311-1320	1321-1330	1331-1340	1341-1350	1351-1360	1361-1370
Denham	1.12	1.36	1.16					
Eaton	5.62	4.24	4.52	6.62	4.71	5.41	6.19	5.04
Gateley	0.68	1.26	1.50	1.14	1.37	0.77		
Gnatingdon	13.35	13.51	13.65	13.75	17.26	20.78	15.21	16.60
Hemsby	12.54	12.36	11.67	11.46	13.36			
Heythe					1.72			
Hindolveston	4.12	4.25	4.19	4.10	.00	8.95	10.96	6.63
Hindringham	8.22	8.90	8.23	8.51	.00	11.33		8.17
Martham	7.79	8.02	7.96	7.29	7.22	9.30	13.97	12.97
Monks G	6.09	7.19	6.81	6.14	7.14			
Newton	9.86	9.73	9.76	10.02	12.60			17.87
N Elmham	1.16	1.84	1.43	1.70	1.71		3.57	
Plumstead	8.16	4.62	7.69	7.90	9.58	10.87	10.17	7.40
Sedgeford	12.94	14.38	13.23	13.30	17.47	21.43	23.79	18.95
Taverham	5.49	5.59	5.43	5.38	5.87	7.90	11.50	6.37
Thornham	2.86	2.76	2.79	2.68		3.25	4.66	
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: accounts database.

c. Field Two: Legumes (Peas and Beans)

Legumes, peas and beans complemented oats and rye on spring fields, serving both as a source for pottage and fertilizing agents. As we have seen above, the scale of their cultivation was much more limited compared to grains. Nevertheless, it is worth looking at the dynamics of legume cultivation in the given period.

It has long been believed that legumes were vital source of nitrogen especially for wheat, since it was the most difficult grain to grow, demanding the highest amount of

nitrogen.¹⁶² As previously stated, the legume contribution to nitrogen, however, is rather limited, especially compared to the later grown legumes: clover (*Trifolium*), lucerne or alfalfa (*Medicago sativa*), and sainfoin (*Onobrychis*). Again, they were grown mostly as a fodder crop. It should also be kept in mind, that legumes were sown, together with oats and barley, on the spring field, or Field Two, which becomes the Fallow Field, or Field Three, in the next rotation. This means, that much nitrogen will be wasted while the field rests and so the dependence of wheat upon beans should not be overestimated. But should it be considered as such at all? As we have seen from the examples of other grains, the true indication of this dependence is when one grain expands or shrinks proportionally to the other crop, either in the same or opposite direction, both geographically and chronologically. In other words, one would expect to see peas acreage expanding proportionally to the augmentation of wheat acreage? But was that the case here?

¹⁶² P. Chorley, 'The Agricultural Revolution in Northern Europe, 1750-1850: Nitrogen, Legumes and Crop Productivity', *Economic History Review* 2nd Series 39 (1979), 71-93; R. S. Shiel, 'Improving Soil Productivity in the Pre-Fertiliser Era', in Bruce Campbell and Mark Overton (eds.) *Before the Black Death: Studies in the 'Crisis' of the Early Fourteenth Century* (Manchester: Manchester University Press, 1991), pp. 51-79; Campbell, 2000, p. 390

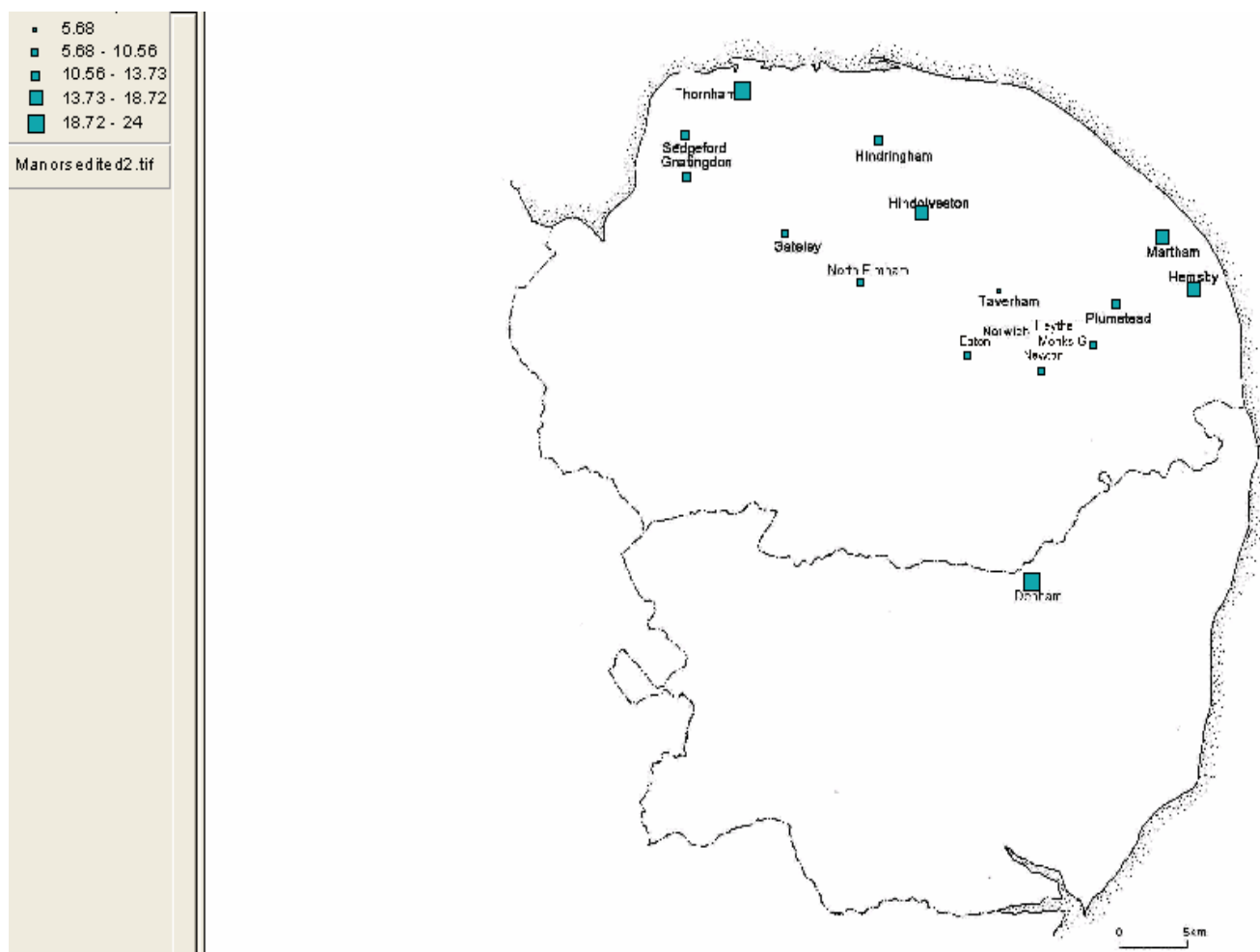


Figure 3.9. Acreage sown with peas as a percentage of the total acreage on each manor, 1291-1300.

Source: accounts database.

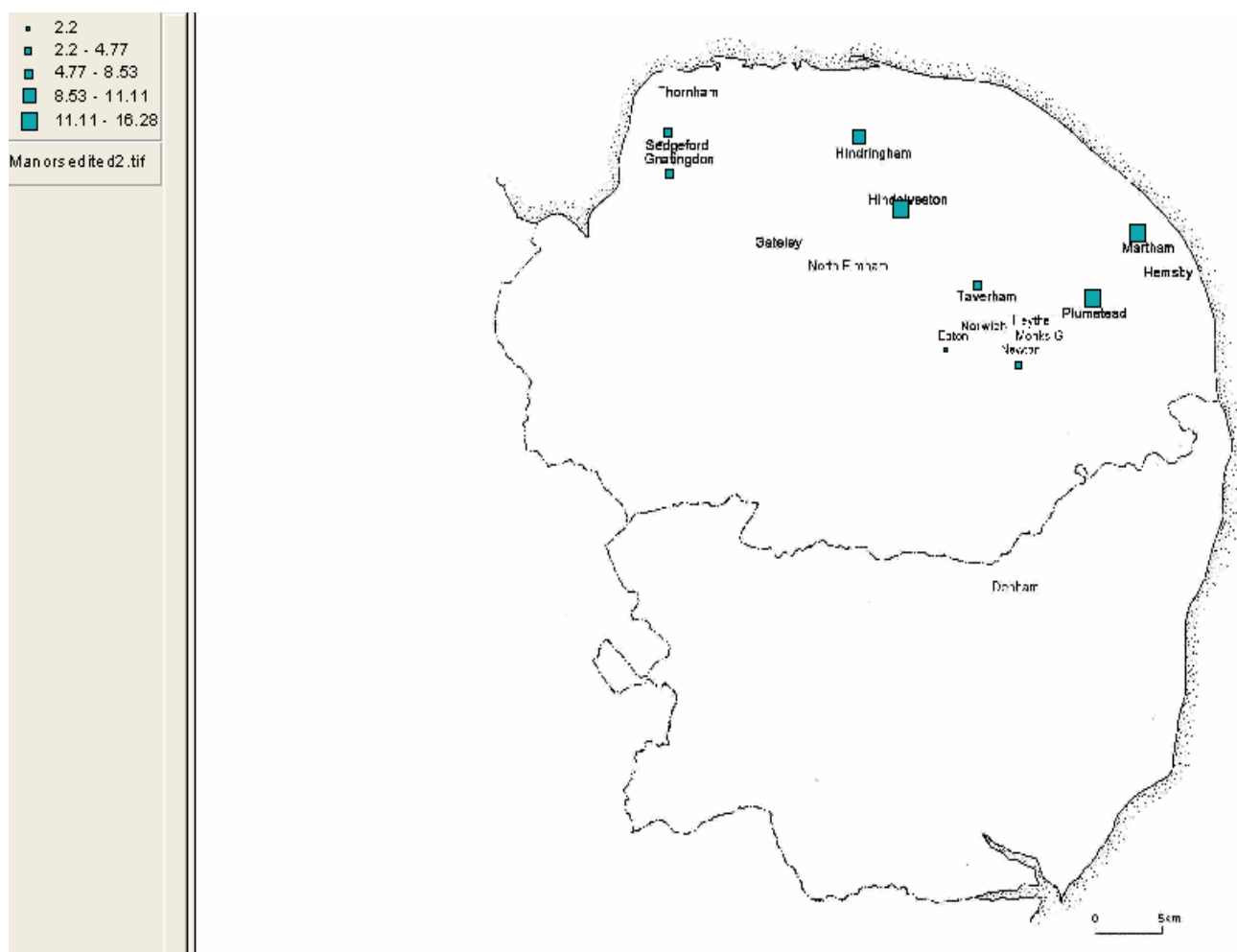


Figure 3.10. Acreage sown with peas as a percentage of the total acreage on each manor, 1361-1370.

Source: accounts database

Geographically, not much had changed between the last decade of the thirteenth century and the post-Plague decades (Figures 3.9-3.10). The peas-oriented manors were also the wheat-biased ones. However, *geography* does not reflect *proportions*. It is true that the largest peas-producing manors were also the largest wheat-cultivating estates and vice-versa, but did the peas acreage grow in the same rate as wheat? In fact, not only did peas acreage not grow in accordance with that of wheat, but it actually diminished while

the cultivation of wheat was increased, over the time. The following table (Table 3.9) illustrates the change in peas-to-wheat ratio between 1290 and 1370:

Table 3.9: Peas-to-Wheat Acreage Ratio, 1290-1370.

Manor	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370
Denham	0.69	1.00	0.88					
Eaton	2.63		1.55	11.17		0.42	0.86	0.31
Gateley	0.31	0.39	0.65	0.27	0.17	0.46		
Gnatingdon	2.28	2.62	2.90	2.19	2.39	2.34	0.74	0.77
Hemsby	1.00	0.96	1.08	1.01	0.93			
Heythe					2.00			
Hindolveston	1.08	1.34	1.01	0.84		0.69	1.10	0.78
Hindringham	0.91	0.90	0.96	0.48		0.69		0.51
Martham	1.31	1.02	1.14	1.00	0.98	0.37	0.47	0.92
Monks G			20.85	3.64				
Newton	1.85	1.55	1.00	0.82	0.80			0.26
N Elmham	0.82	1.05	0.88	0.80	0.73	0.00	0.10	
Plumstead	1.00	0.81	0.88	0.89	0.75	0.73	0.58	0.84
Sedgeford	2.43	2.96	2.82	1.92	2.33	1.37	0.80	0.67
Taverham	3.75			29.17	4.80	7.14	1.62	0.89
Thornham	2.35	1.75	1.83	1.31		1.42	0.67	
Average	1.09	1.21	1.18	0.92	0.98	0.64	0.60	0.66

Sources: the accounts database.

Notes: Wheat=1.00.

In other words, there was an unquestionable change in peas-to-wheat acreage ratio during the eight decades under the study. Before c.1320, there peas had the upper hand (over 1.00:1.00), while after that more and more proportion was dedicated to wheat growing. It is interesting to note that this shift was especially pronounced in the 1340s, and especially in the last years of the decade, namely during the Black Death. There was not much change after the pestilence, with peas-to wheat acreage ratio fluctuating

between 0.60:1.00 to 0.66:1.00. Can these calculations serve as a further proof that legumes, peas in particular, played an insignificant, if any, role in fertilizing wheat? As far as the pre-1350 decades are concerned, it rather implies that the most peas-oriented manors, Thornham, Plumstead, Hemsby and Martham, which were also wheat-biased, had very limited fallow, or perhaps even had eliminated fallow.

As we shall see later in this chapter, these four estates were valued considerably higher than other manors (between 18 and 36 pence an acre, which is a very high value indeed).¹⁶³ Nothing else can explain their high value, except the intensity of cropping that made them more productive than other manors.¹⁶⁴ This extraordinary intensity was made possible only by limiting, or perhaps eliminating the fallow, which, in turn, was not possible without seeding larger proportions of peas. It is well known now that some English regions did not switch from the Two-Field to Three-Field system until after the Black Death.¹⁶⁵ The situation changed after the Black Death, with a gradual shrinkage of peas acreage.

This brings up once more the issue of the post-Plague conversion from arable to pastoral farming. A sharp fall in population meant a sharp decrease in supply of labour. Consequently, less arable could be cultivated. This gave way to allocating more arable to pasture and fallow, with the cultivation intensity falling. On the newly created fallow lands, manure came to replace legumes as a primary fertilizer. This conversion turned especially profitable when the living standards of the common folk started rising in the late 1370s, with more and more people able to buy dairy products. Perhaps this

¹⁶³ See below, Chapter 4.

¹⁶⁴ Campbell et al. discuss similar cases in the FTC counties. See, Campbell et al., 1993, pp. 139-141.

¹⁶⁵ The most important study on that subject is H. S. A. Fox, 'The Alleged Transformation from Two-Field to Three-Field System in Medieval England', *Economic History Review* 2nd Series 39 (1986), 526-548.

underlines that this conversion from mixed husbandry to pastoral agriculture should be viewed in two stages: c.1348-1376 (fall in population – change in man-to-land ratio - labour scarcity – change in arable-to-pasture ratio – decreased intensity of cropping) and c.1376 onwards (rise in *real wages* - rise in living standards – increased demand for dairy products). But this is a separate research project, lying outside the scope of the present dissertation.

Unfortunately, the accounts do not specify the nature/colour of the peas, in most cases. The only exception were later Plumstead rolls (mostly post-1370), distinguishing between black (or, Black Eyed Peas) and green peas.¹⁶⁶ But apart from these, there is no similar information and it seems that both kinds of peas were grown on most manors.

Beans were the least cultivated crop on the Priory manors, and were chiefly used for the daily workers' pottage and fodder for working animals. Only a small percentage of manors cultivated beans and the extent of their cultivation had rarely ever exceeded one per cent of the total acreage on each manor (Table 3.20). The cultivation of beans was inconsistent and abrupt in many instances, when some manors abandoned it for good and some for several decades. This lack of chronological continuation in beans cultivation makes it impossible to create maps showing their geography; instead, the data are better represented as the following table:

¹⁶⁶ DCN 60/29/31.

Table 3.10: Acreage sown with beans as a percentage of the total acreage on each manor, 1291-1370

Manor	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370
Denham	0.00	0.00	0.00					
Eaton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gateley	1.55	0.33	0.16	1.46	0.74	0.00		
Gnatingdon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Hemsby	0.42	0.48	0.53	0.50	0.42			
Heythe					0.00			
Hindolveston	0.00	0.00	0.00	1.35		0.00	0.00	0.00
Hindringham	0.61	1.02	0.64	0.46		0.00		0.00
Martham	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monks G	0.00	0.00	0.00	0.00	0.00			
Newton	0.00	0.11	0.53	0.58	0.81			0.00
N Elmham	0.00	0.00	0.00	0.21	5.02	0.00	0.00	
Plumstead	0.15	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sedgeford	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.04
Taverham	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thornham	0.08	0.50	0.53	0.36		0.39	0.46	

Source: the Accounts Database.

Beans cultivation became virtually extinct in the 1340s and there were no signs of recovery after the great mortality. Clearly, the producers showed less and less interested in cultivating this legume.

d. Field Two: Other Crops

Besides the common grains and legumes mentioned above, all of which were grown on virtually every manor, there were several other, minor crops, which were occasionally sown. Since their cultivation does not seem to have succeeded, they might be regarded as experimental. One such crop was dredge, or oats-barley mixture. We hear of its occasional cultivation on two adjacent manors, Gnatingdon (1344/45, 1349/50,

1353/54, 1366/67 and 1367/68)¹⁶⁷ and Sedgeford (1363/64 and 1367/68).¹⁶⁸ The extent of dredge cultivation differed from year to year. For example, as many as 23 acres were sown with it on Gnatingdon in 1344/45; while nine years later there were only six acres sown with this mixture. Dredge was grown only on these two adjacent manors, perhaps because of their regional uniqueness.

Another experimental crop, which did not last long, was oats-legume mixture, known as *pulmentum*, or ‘horsemeat’.¹⁶⁹ The accounts do not specify with what legume oats were mixed, but it is reasonable to suppose that it was peas, since the latter were cultivated on a much larger scale than beans, as we have seen in the previous section. It was sown only on Sedgeford, in 1363 and 1367, with no more than four acres dedicated to it.¹⁷⁰ Again, the rolls do not specify whether it was mixed with peas, beans or vetches, but it is likely that their grain component was oats, as it was in other parts of England.¹⁷¹

Vetches, another legume variety, used as fodder only, was far less common than peas.¹⁷² It was cultivated only on three manors, Sedgeford (since 1355),¹⁷³ Hindolveston (since 1361)¹⁷⁴ and Plumstead (not until 1368).¹⁷⁵ In all cases, it was not sown on more than 4.5 acres. This low figure the national figure of 4 per cent¹⁷⁶ (although Kent dedicated as much as 9 per cent).¹⁷⁷

¹⁶⁷ Lestr/IC/43; DCN 60/14/24; Lestr/IC/10; Lestr/IC/16; Lestr/IC/17.

¹⁶⁸ Lestr/IB/26; Lestr/IB/29.

¹⁶⁹ On this crop, consult Campbell, 2000, pp. 227-228.

¹⁷⁰ Lestr/IB/26, 29.

¹⁷¹ Campbell, 200, p. 227.

¹⁷² On vetches, see Bruce Campbell, ‘The Diffusion of Vetches in Medieval England’, *Economic History Review* 2nd Series 41 (1988), 193-208

¹⁷³ Lestr/IB/23

¹⁷⁴ DCN 60/18/38.

¹⁷⁵ DCN 60/29/31.

¹⁷⁶ Bruce Campbell, ‘The Diffusion of Vetches in Medieval England’, *Economic History Review* 2nd Series 41 (1988), p. 195.

¹⁷⁷ *idem*, p. 203.

Three things common to the experimental crops: as a rule, they were cultivated only after the Black Death; the scale of their growing was very limited; and finally, they were ultimately discontinued.

To conclude. In order to understand the trends of each sown crop, it is best to study a crop simultaneously with its companion in the field: wheat with rye and oats with barley. Their trends should be examined in both geographical and chronological dimensions. Such comparative perspective reveals that the span of time between 1290 and 1370 was largely a history of the expansion of wheat at the expense of rye, while the ratio of oats-to-barley acreage was hardly disturbed. It also reveals that geography of crops was largely dictated by the urban/monastic demands, rather than by soil type and physical distance=transportation costs (although the last two factors should not be neglected, either). And finally, it reveals that a successful wheat cultivation did not depend on peas: during the eighty years under study, the ratio of peas-to-wheat gradually decreased. It does not mean, however, that the contribution of peas as a fertilizer should be underestimated: it indeed intensified the arable cultivation, by limiting, or eliminating the fallow land on some manors. This was true, however, before the Black Death. After the plague, when more and more land was assigned for grazing and the Three-Field System was omnipresent, animal manure more and more came to replace legumes as the principal fertilizing agent.

Seeding Rates

Another important issue to be considered here is seeding rates of the grains. Seeding was one of the most important and common forms of capital investment in the rural society of the Late Middle Ages.¹⁷⁸ As Bruce Campbell puts it, seeding rates correspond to a degree of intensity of arable husbandry, price fluctuations and return from the investment.¹⁷⁹ In other words, the more productive a decade is, the higher and denser seeding rates will be. As we have seen above, arable productivity often depended on contemporary price trends, reflecting the Priory's attempt to profit from price fluctuations as much as possible. Almost as invariable a rule, spring grains' seeds exceeded the winter ones' by about 70 per cent; beans' seeding rates were almost as high as the spring crops', while the rates of peas amounted to about 90 per cent of wheat (See Table 3.12). The issue of seeding rates will be examined from both geographical and chronological perspective.

Geographically speaking, there is a pronounced correspondence between the type of soil and the quantity of seed. The more fertile the land was, the higher seeding rates were. The highest seeding rates were on two adjacent manors, Martham and Hemsby, exceeding the average rates by about 25 per cent. These estates were located on a very fertile (medium) loam soil and hence it was more profitable to seed their arable as thickly as possible. Besides, these two were the most valued estates (36 pence an acre). As we have already seen above and shall again see below, the value of land corresponds to the intensity of cropping. The low loam manors, Sedgeford and Gnatingdon were not far

¹⁷⁸ G. Clark, 'The Cost of Capital and Medieval Agriculture Technique', *Explorations in Economic History* 25 (1988), 265-294.

¹⁷⁹ Campbell, 2000, pp. 311-315.

from Martham and Hemsby, as far as their seeding rates are concerned. The clay-land manors were seeded more thinly, but the extent of their seeding was largely dependent on their proximity to the town. The suburban estates are marked by the thinnest rates, while more distant manors, and especially Hindringham, had thicker seeding. In other words, the type of soil and the proximity from Norwich were two main determinants. The following tables illustrate the seeding rates of each crop:

Table 3.11: Seeding Rates on the Priory Estates (in Bushel per One Acre), 1291-1370

Manor	Wheat	Maslin	Rye	Oats	Barley	Peas	Beans
Denham	2.36		2.00	3.81	4.37	2.20	
Eaton	2.64		2.27	4.88	4.68	2.18	
Gateley	2.19		2.29	4.23	4.28	2.28	4.78
Gnatingdon	3.44		2.54	4.45	3.91	2.64	4.00
Hemsby	3.99	3.58		7.85	5.95	4.02	7.84
Heythe	2.00		1.63	4.50	3.95	2.00	
Hindolveston	2.71		3.21	5.56	4.74	2.72	5.06
Hindringham	3.88	3.50	3.94	6.20	5.49	3.81	5.05
Martham	4.01	4.01	2.99	7.23	5.89	3.93	
Monks G	2.81		2.16	4.62	4.78	2.22	
Newton	2.67		2.35	4.73	4.80	2.26	4.00
N Elmham	2.80		2.58	4.37	4.90	2.41	2.50
Plumstead	2.76	2.78	2.70	4.94	4.87	2.83	4.80
Sedgeford	3.50	3.26	2.61	4.57	4.01	2.91	5.33
Taverham	2.12	3.00	2.11	4.04	4.07	2.14	
Thornham	3.43		2.71	4.45	4.17	2.65	
Average	2.96	3.36	2.54	5.03	4.68	2.70	4.82
Median	2.78	3.38	2.54	4.60	4.71	2.53	4.80

Sources: the accounts database.

Notes: The seeding rates are expressed in bushels of grain seed per one acre, over the entire period.

Table 3.12: Seeding Ratios of Each Crop Relative to Wheat, 1291-1370

Manor	Wheat	Maslin	Rye	Oats	Barley	Peas	Beans
Denham	1.00		0.85	1.61	1.85	0.93	
Eaton	1.00		0.86	1.85	1.77	0.83	
Gateley	1.00		1.05	1.93	1.95	1.04	2.18
Gnatingdon	1.00		0.74	1.29	1.14	0.77	1.16
Hemsby	1.00	0.90	0.00	1.97	1.49	1.01	1.96
Heythe	1.00		0.82	2.25	1.98	1.00	
Hindolveston	1.00		1.18	2.05	1.75	1.00	1.87
Hindringham	1.00	0.90	1.02	1.60	1.41	0.98	1.30
Martham	1.00	1.00	0.75	1.80	1.47	0.98	
Monks G	1.00		0.77	1.64	1.70	0.79	
Newton	1.00		0.88	1.77	1.80	0.85	1.50
N Elmham	1.00		0.92	1.56	1.75	0.86	0.89
Plumstead	1.00	1.01	0.98	1.79	1.76	1.03	1.74
Sedgeford	1.00	0.93	0.75	1.31	1.15	0.83	1.52
Taverham	1.00	1.42	1.00	1.91	1.92	1.01	
Thornham	1.00		0.79	1.30	1.22	0.77	
Average	1.00	1.03	0.83	1.73	1.63	0.92	1.57

Sources: the accounts database.

Notes: Wheat=1.00

Were these seeding rates low or high? Compared to the national level, our figures prove to be somewhat higher than average. In the London region, the mean seeding rate between 1288 and 1315 was 2.80 for wheat and rye, 4.80 for oats, 4.20 for barley and 2.80 for peas.¹⁸⁰ Similarly, the Oxfordshire village of Cuxham had 2.38 for wheat, 3.47 for oats and 3.72 for barley.¹⁸¹ Lower rates could be found only in exceptionally infertile regions, such as the Norfolk Breckland, or Cumberland.¹⁸² Similarly, forty manors of the bishopric of Winchester exhibited rather low rates, with 1.22 for wheat, 1.30 for rye, 1.16

¹⁸⁰ Campbell et al, 1993, p. 40.

¹⁸¹ Calculated from *Manorial Records of Cuxham, Oxfordshire circa 1200-1359*, P.D.A. Harvey (ed.) (London, 1976).

¹⁸² Campbell, 2000, p. 310

for maslin, 1.41 for oats, 1.87 for barley and 1.74 for dredge.¹⁸³ Most of the Priory manors show slightly higher figures than those in the London region, as far as wheat, oats and barley are concerned. On the other hand, rye and peas rates were lower on Norfolk manors.

The chronological analysis reveals a gradual reduction of the seeding rates, especially after the Black Death. However, there is compelling evidence that this reduction in wheat, barley and legume sectors had begun even earlier. The seeding rates of wheat started falling already in the 1310s; barley in the fourth decade; and the legumes in the fifth decade of the century (Tables 3.13 and 3.14).

Table 3.13. Seeding-Rates (in Bushels per One Acre), 1291-1370

Decade	Wheat	Maslin	Rye	Oats	Barley	Peas	Beans
1291-1300	3.20	3.33	2.65	5.31	4.74	2.82	5.63
1301-1310	3.36	3.40	2.67	5.29	4.83	2.81	5.25
1311-1320	3.19	3.64	2.63	5.25	4.78	2.80	5.78
1321-1330	3.14	3.63	2.49	5.22	4.82	2.84	5.09
1331-1340	2.92	3.39	2.39	5.08	4.75	2.73	5.33
1341-1350	2.91	3.29	2.55	4.89	4.61	2.77	4.00
1351-1360	2.80	3.29	2.43	4.74	4.49	2.55	4.00
1361-1370	2.77	3.19	1.99	4.72	4.18	2.66	4.00
Average	3.04	3.40	2.48	5.04	4.65	2.75	4.89

Sources: the accounts database.

¹⁸³ Calculated on the basis of J. Titow, *Winchester Yields. A Study in Medieval Agricultural Production* (Cambridge: Cambridge University Press, 1972).

Table 3.14: Seeding Ratios of Each Crop-to-Wheat, 1291-1370

Decade	Wheat	Maslin	Rye	Oat	Barley	Peas	Beans
1291-1300	1.00	1.04	0.83	1.66	1.48	0.88	1.76
1301-1310	1.00	1.01	0.79	1.57	1.44	0.84	1.56
1311-1320	1.00	1.14	0.82	1.64	1.50	0.88	1.81
1321-1330	1.00	1.16	0.79	1.66	1.54	0.90	1.62
1331-1340	1.00	1.16	0.82	1.74	1.63	0.93	1.83
1341-1350	1.00	1.13	0.88	1.68	1.58	0.95	1.37
1351-1360	1.00	1.18	0.87	1.69	1.60	0.91	1.43
1361-1370	1.00	1.15	0.72	1.70	1.51	0.96	1.44
Average	1.00	1.12	0.82	1.66	1.53	0.90	1.61

Notes: Wheat=1.00

Sources: the accounts database.

These chronological particularities cannot be studied within the framework of the present work, but the general trend is clear: the seeding rates reached their climax when the arable cultivation was at its peak: before the disastrous harvest failures of 1314-1322,¹⁸⁴ and in the 1330s. After the Black Death there was a significant reduction of seeding rates. Again, this reflects the post-Plague demographic and economic reality. First, the pronounced fall in population meant fewer peasants were able to perform the task of seeding; but it also meant that fewer mouths had to be fed. Second, the subsequent conversion from arable farming to pastoral husbandry reduced the arable proportion, thus increasing grazing and fallow fields. The intensity of cropping would inevitably fall in that case and it was felt especially on the high-valued estates, which practised either limited fallow, or the Two-Field System, prior to the plague.

¹⁸⁴ On the Great Famine, consult Henry S. Lucas, 'The Great European Famine of 1315-7', *Speculum* 5:4. (1930), 343-377; Ian Kershaw, 'The Great Famine and Agrarian Crisis in England, 1315-1322', *Past and Present* no. 59 (May 1973), 3-50; William Chester Jordan, *The Great Famine: Northern Europe in the Early Fourteenth Century* (Princeton: Princeton University Press, 1996).

Grain Yields

An anonymous late thirteenth-century author of a treatise on husbandry, known as the *Husbandry*,¹⁸⁵ set his criteria for ideal yield-to-seed ratio for each grade. The normally expected yield-to-seed ratio for wheat is 5.00:1.00, rye 7.00:1.00, maslin 6.00:1.00, oats 4.00:1.00 and barley 8.00:1.00.¹⁸⁶ These are certainly very high figures, matched by virtually no region in thirteenth- and fourteenth-century England. For example, the FTC counties did not seem to achieve any higher than 3.80:1.00 for wheat, 4.90:1.00 for rye, 2.70:1.00 for oats, 4.1:1.0 for barley and 3.7:1.00 for peas between 1288 and 1315.¹⁸⁷ Was it an imaginary figure in case of our estates, too? A partial answer is provided by the *Proficuum maneriorum* accounts, which listed, year by year, yield per seed rates on every manor between 1295 and 1308. After 1308 the data become scarcer, since each seeding entry is to be juxtaposed against yield entry found in the consecutive manorial account; and, as we have seen, there are not that many surviving accounts for two or more consecutive years. Moreover, it might be risky to rely on the manorial rolls for that purpose, since they do not always specify whether the yield is rendered as net of seed, or gross of tithe. I prefer, therefore, to illustrate the yield per seed ratios for the years 1295 – 1308 only, as illustrated on the Table 3.15:

¹⁸⁵ On the phantom author of the *Husbandry*, see D. Oschinsky (ed.) *Walter of Henley and Other Treatises on Estate Management and Accounting*, (Oxford, 1971), pp. 200-202. On yields per acre and costs of reaping, see Gregory Clark, 'Yields per Acre in English Agriculture, 1250-1860: Evidence from Labour Inputs,' *Economic History Review* 44:3 (1991), 445-460.

¹⁸⁶ *idem*, pp. 417-419

¹⁸⁷ Campbell et al., 1993, p. 40.

Table 3.15: Average yield-to-seed ratios on the Priory manors, 1295-1308

Manor	Wheat	Rye	Maslin	Beans	Peas	Oats	Barley	Composite Average
Denham	5.23	5.70			7.00	5.75	3.56	5.45
Eaton	4.00	4.00		4.00	2.38	2.98	3.64	3.50
Gateley	3.39	2.36		1.63	3.01	2.16	2.44	2.50
Gnatingdon	4.12	3.39			2.25	1.90	3.55	3.04
Hemsby	6.67	6.00	5.80	2.84	3.85	2.74	3.96	4.55
Hindolveston	5.76	3.77			3.37	2.11	3.68	3.74
Hindringham	4.87	3.28	3.70	2.38	2.75	1.97	2.88	3.12
Martham	5.17	4.50	4.25		2.75	2.82	3.15	3.77
Monks G	3.50	3.73			4.18	2.61	3.29	3.46
Newton	6.24	4.30			3.99	2.36	3.39	4.06
N Elmham	5.80	4.91			2.17	2.28	3.59	3.75
Plumstead	5.42	3.86	2.50		3.31	2.41	2.93	3.41
Sedgeford	4.51	3.15			1.86	2.25	3.80	3.11
Taverham	5.00	3.77			2.58	2.63	3.30	3.46
Thornham	2.88	2.50			1.98	2.44	2.73	2.51
Average	4.84	3.95	4.06	2.71	3.16	2.63	3.33	3.53

Notes: all figures are in bushels per acre.

Sources: the accounts database; the calculated yields are gross, namely inclusive of tithe.

As the table suggests, the figures suggested by Walter were nothing more than wishful thinking; our manors were far from matching them. The closest figure was in wheat sector, which was only marginally lower than Walter's figure. Contrary to Walter's idea that the ratio of maslin is suppose to reflect a middle ground between wheat and rye, our evidence shows that that was not the case. The yield-to-seed ratio of this grain seems to stand closer to rye rather than to wheat, while in case of Plumstead, it was even far below it. Figures vary from manor to manor, underlining the influence of soil type. The highest yield-to-seed ratios come from manors situated on either medium clay, or medium loam soil. Denham manor, in northern Suffolk, was matched by no other estate, with overwhelming composite ratio of 5.45. Hemsby, a medium loam manor yielded large figure, too (4.55 for a composite average ratio). Other manors rendered lower

yields, with 3.53 as a mean figure for all cultivated crops. The lowest figures, however, come from Thornham, situated on light clay soil, which is the least suitable for most cereals and Gateley, which is, surprisingly, located on medium clay. These two did not exceed the figure of 2.50 on average. It is unclear why Gateley rendered such low figures, despite its apparent potential for better yields. Perhaps, this implies that the soil type is not the only deterrent as far as yield per seed is concerned.

The yield per seed results were inconsistent, varying from year to year. The following table (Table 3.16) shows these variations, represented as minimal and maximal values for each manor.

Table 3.16: Minimal and Maximal Seed-to-Yield Values on the Priory Manors, 1295-1308

Manor	Wheat		Rye		Maslin		Bean		Peas		Oats		Barley	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Denham	3.00	7.00	3.00	7.00					5.00	8.50	2.50	12.00	2.50	5.33
Eaton	4.00	4.00	2.50	5.50			4.00	4.00	0.75	5.00	1.00	4.25	1.33	6.63
Gateley	2.00	5.00	1.00	4.00			1.00	3.00	0.38	4.63	1.25	3.00	1.63	4.00
Gnatingdon	3.25	5.00	3.00	4.25					0.75	3.75	1.33	2.38	2.44	4.38
Hemsby	5.00	8.50	5.00	7.00	4.00	10.50	0.60	7.00	2.00	6.00	2.33	3.50	3.00	4.87
Hindolveston	3.63	9.00	2.75	6.00					0.50	6.00	1.13	3.25	2.63	6.68
Hindringham	3.13	7.00	2.25	6.00	1.50	6.00	1.00	4.25	1.00	4.75	1.50	2.50	2.00	5.00
Martham	3.25	8.25	4.50	4.50	2.50	6.00			1.00	4.25	2.00	4.88	2.33	4.25
Monks G	3.50	3.50	1.00	6.25					0.75	9.50	1.00	3.75	1.75	4.25
Newton	4.50	8.25	3.75	5.50					1.50	6.50	1.00	5.00	2.00	5.00
N Elmham	4.00	8.00	3.00	10.00					0.38	3.50	0.93	4.00	1.50	5.50
Plumstead	3.50	8.00	3.00	5.50	2.00	3.00			1.00	6.75	1.25	3.25	1.63	4.13
Sedgeford	2.50	6.25	1.63	5.00					0.25	2.56	1.31	3.14	2.63	4.75
Taverham	4.50	5.00	2.00	6.00					1.00	4.00	0.50	8.25	1.13	8.06
Thornham	2.00	4.00	1.00	4.00					1.41	4.32	1.50	3.00	1.63	3.50

Sources: accounts database.

Notes: all figures are in bushels per acre; the calculated yields are gross, namely inclusive of tithe.

As the table demonstrates, a deviation from the average ratio was a commonplace. Sometimes the gaps between the minimal and maximal values were too big. For example, the yield-to-seed ratio of peas on Grange Monks could be as low as 0.75, meaning that the crop did not exceed the seeding, or as high as an overwhelming 9.50. Similarly, the oats ratio of Denham varied from 2.50 up to 12.00 – an exceedingly high figure, not even imagined by Walter of Henley. The only exception was Thornham, whose minimal and maximal ratios remained, more or less, adjacent over the years. In fact, this estate never knew any higher figure than 4.32 for peas and this is likely has something to do with its relatively infertile soil, incapable of bearing large crops.

Table 3.17 Average Grain and Legume Yields-per-Seed in Comparative Perspective, c. 1290-1310

<u>Per Seed</u>	Norwich Region	London Region	Winchester Manors	Cuxham, Oxfordshire	Bolton Priory, Yorkshire
Grain					
Wheat	4.84	3.80	3.90	7.07	3.90
Rye	3.95	4.90	4.02	4.94	4.85
Maslin	4.06		2.64		
Oats	2.63	2.70	2.18	2.06	2.54
Barley	3.33	4.10	3.26		4.80
Peas	3.16	3.70		4.75	
Beans	2.71				3.40
Combined Grain	3.76	3.88	3.20	4.69	4.02

Source: accounts database; Campbell et al, 1993, p. 40; *The Bolton Priory Compotus, 1286-1325*, Ian M. Kershaw and David M. Smith (eds.), Printed for Yorkshire Archaeological Society 154 (1999-2000) (Woodbridge: The Boydell Press, 2000); Jan Z. Titow, *Winchester Yields. A Study in Medieval Agricultural Production* (Cambridge: Cambridge University Press, 1972), pp. 82-120; *Manorial Records of Cuxham, Oxfordshire circa 1200-1359*, P.D.A. Harvey (ed.) (London, 1976).

Notes: the calculated yields are gross, namely inclusive of tithe.

In a comparative perspective, it is evident the Norwich region was better off in some aspects and worse off in others. For instance, its wheat yields were higher than

those obtained in the London region, on forty manors of Winchester Cathedral and on seven villages belonging to Bolton Priory (Yorkshire). On the other hand, the Priory manors were well behind the village of Cuxham (Oxfordshire), whose high yield returns were, apparently, matched by few demesnes in late medieval England. As far as rye is concerned, the Norwich region was behind all its counterparts represented on Table 3.17. In the oat sector, the Priory demesnes score the highest, while in the barley one they stood below both the London region and Bolton Priory.

Conclusions

Several important conclusions emerge from the discussion above. The analysis of our sources reveals the general agricultural trends of the Priory manors. As we have seen, these were strongly barley-biased estates, reflecting Norfolk's role as the barley county. The eighty years under our study were largely a history of wheat's expansion at the expense of rye, reflecting demographic and price trends, as well as changes in living standards of the period. Oats remained largely unchanged relative to barley. Peas were cultivated on a full scale before the Black Death, serving as a nitrogen-fixing agent. The manors specializing in peas were also the most expensive, from the point of the value of their land, indicating that they must have had limited, if not eliminated, fallow. After the Black Death, however, there was pronounced contraction of peas acreage, which gave way to an increasing allocation to fallow and grazing land. The legumes ceased being the principal fertilizing agent, replaced more and more by the manure from grazing animals. The conversion to pastoral farming must have occurred in two stages: the first one (c.1348-1376) was largely influenced by the population fall, while the second one (from

c.1376) was caused by rise of *real wages* and consequently of living standards. Beside the highest land value, the most intensely cultivated manors had also the highest seeding rates. After the Black Death the seeding rates were significantly reduced; this reduction is especially noticed on the most intense estates.

Chapter 4: Disposal Patterns of Grain and Legume Receipts on the Priory Manors.

Annual Grain Receipts, their Components and Distribution

Now it is time to look at the extent of annual grain and legume receipts. Again, the principal source of our information are manorial rolls, which describe annual collection and distribution of farinaceous receipts in a great detail. The granary accounts, rendered on a dorse side of each annual roll, carefully distinguish between several components, or forms in which the grain and legume resources were received. The components in question were the net crop receipt harvested on the demesne fields (*exitus*); tithes (*decime*) collected from churches appropriated to the Priory; farm payment rendered by tenants in grain (*redditus*); grain remaining in the granary from previous years (*remanens in compotu / anno precedenti*), gifts (*dona*) received from other manors and purchases (*emptiones*). The major component was harvest. With the notable exception of beans, around 80 per cent of total grain supply came from the manors' own harvest, while the rest was acquired elsewhere (tithes, farm payments, remaining grain, gifts and purchases) (see Table 4.1).

Table 4.1: Net Harvest as a Percentage of Total Receipt of Each Crop, 1290-1370.

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans	Average
1291-1300	86.64%	79.23%	96.94%	80.26%	89.52%	96.34%	66.20%	85.02%
1301-1310	94.99%	83.25%	98.33%	77.06%	82.71%	94.19%	62.50%	84.72%
1311-1320	78.29%	66.02%	75.55%	79.84%	78.52%	87.76%	74.92%	77.27%
1321-1330	86.37%	75.78%	96.25%	84.30%	81.10%	86.43%	78.09%	84.05%
1331-1340	85.74%	72.13%	40.56%	82.41%	81.42%	80.87%	97.20%	77.19%
1341-1350	85.04%	75.84%	73.12%	82.83%	76.67%	84.48%	58.33%	76.62%
1351-1360	82.23%	82.61%	86.73%	74.50%	74.25%	88.91%	0.00%	69.89%
1361-1370	85.92%	87.80%	81.89%	85.77%	70.60%	82.23%	84.21%	82.63%
Average	85.65%	77.83%	81.17%	80.87%	79.35%	87.65%	65.18%	79.67%

Sources: the accounts database.

Notes: 'Net Harvest' = share of the crop deriving from harvest only. The 'remainder' of the percentage came from elsewhere (i.e., tithes, purchases, etc.)

Chronologically, the harvest share of total grain receipt varied from decade to decade and from crop to crop. For example, in the 1320s, 96.25 per cent of maslin receipts came from the harvest, while in the following decade it fell to 40.56 per cent. Similarly, between 1331 and 1340 the farmers collected as much as 97.20 per cent of total beans receipt in the form of net harvest, while in the following decade the share of beans harvest did not exceed 58.33 per cent; in the next decade (1351-1360) the net harvest of beans amounted to zero per cent. Other grains, however, tended to be more stable as far as their chronology goes, although one witnesses a relative rise in the share of rye harvest from c.1320 onwards and similarly in maslin crop from c. 1340. Barley, on the other hand, reduced its share from c.1340 onwards. These proportions, of course, varied from manor to manor and from period to period (See Table 4.2):

Table 4.2: Composite Grain and Legume Harvest as a Percentage of Total Crop Acquisition, c.1290-1370

Manor	1291-1300	1301-1310	1311-1320	1321-1330	1331-1340	1341-1350	1351-1360	1361-1370	Average
Denham	67.18%	68.14%	69.03%						68.12%
Eaton	80.48%	80.28%	79.78%	77.44%	80.00%	81.62%	83.33%	82.86%	80.72%
Gateley	80.88%	81.21%	80.22%	80.37%	80.58%	79.90%			80.53%
Gnatingdon	88.13%	87.87%	87.59%	87.30%	87.10%	86.84%	86.59%	86.62%	87.26%
Hemsby	84.98%	85.90%	85.56%	86.62%	86.80%	86.77%			86.11%
Heythe					76.97%				76.97%
Hindolveston	78.59%	76.04%	75.65%	75.04%		74.37%	73.65%	73.12%	75.21%
Hindringham	85.67%	85.83%	85.85%	85.76%		85.27%	85.09%	84.76%	85.46%
Martham	87.35%	84.33%	84.33%	83.87%	83.94%	83.55%	83.44%	83.22%	84.25%
Monks G	85.29%	85.29%	85.29%	84.90%	85.52%	84.96%			85.21%
Newton	85.98%	86.32%	86.58%	86.10%	85.59%		85.03%		85.93%
N Elmham	60.62%	61.24%	62.22%	64.28%	63.69%	64.74%	64.03%		62.97%
Plumstead	86.30%	86.36%	86.36%	86.06%	85.73%	85.41%	85.04%	84.91%	85.77%
Sedgeford	91.43%	91.57%	91.39%	91.22%	91.22%	91.05%	91.38%	90.89%	91.27%
Taverham	85.72%	85.34%	85.34%	85.34%	87.65%	87.30%	87.06%	87.28%	86.38%
Thornham	70.48%	69.08%	67.97%	68.16%	68.67%	66.91%	65.75%		68.15%
Average	81.27%	80.99%	80.88%	81.60%	81.81%	81.44%	80.95%	84.21%	80.64%

Source: the accounts database.

Most manors seem to have virtually the identical share of net harvest amounting to around 80 to 85 per cent of the total crop revenue. The notorious examples were Denham, North Elmham and Thornham, which largely relied on their tithes and hence did not exceed 70 per cent, as far as their net harvest is concerned. Sedgeford, on the other hand, received as much as around 91 per cent of their total grain and legume supply in harvest.

Clearly, the share of each crop in the total net harvest receipt was different. As we have seen above, Norfolk was strongly barley-oriented county, with the largest

proportion of land dedicated to the cultivation of this grain. Hence, it is not surprising that barley was the largest component of all the crops, whose share was more than half of the total. Each crop's share in the *total net harvest receipt*, however, was not identical to its share of in the *total arable acreage* (See below, Table 4.3). One reason for that was the fact that each grain differed from the other in its weight and volume. For example, wheat was the heaviest grain and hence the proportion of its return would exceed that of the arable dedicated to it. In our case, wheat's share in total arable land between 1290 and 1370 is 12.53 per cent, while its share in total harvest was 16.33 per cent. However, it cannot possibly be the only reason, for this rule does not seem to work in every case. For instance, during the two post-Plague decades, wheat's ratio of harvest-to-acreage fell to 0.89 (1350s) and 1.07 (1360s) respectively. The ratios of maslin are unstable too, varying from 0.63 (1320s) to 3.22 (1330s). The most extreme case was that of beans with 0.44 as the lowest value (1330s) and with a striking 6.66 (1360s) as the highest one. It is likely that it was the natural factor that played its part in these variations, namely the environmental and weather conditions affecting the fruitfulness of harvest each year.¹⁸⁸

¹⁸⁸ On the climate of East Anglia in the late Middle Ages, consult H. E. Hallam, 'The Climate of Eastern England, 1250-1350', *Agricultural History Review* 32 (1984), 124-132; Mark Bailey, 'Per Impetum Maris: Natural Disaster and Economic Decline in Eastern England, 1275-1350', in Bruce M. S. Campbell (ed.), *Before the Black Death: Studies in the 'Crisis' of the Early Fourteenth Century* (Manchester, 1991), pp. 184 – 208. A detailed weather outline on Hertfordshire demesnes of Westminster Abbey, between c.1280 and 1370, is given and analyzed in Derek Vincent Stern, *A Hertfordshire Demesne of Westminster Abbey: Profit, Productivity and Weather* (Hatfield: University of Hertfordshire Press, 2000). A general survey to c.1450 is in C. E. Britton, *A Meteorological Chronology to A.D. 1450* (London: His Majesty Stationary Office, 1937). On climatic instability and weather deterioration, leading to what became known as the 'Little Ice Age' of the late middle ages, see Emmanuel Le Roy Ladurie, *L'Histoire du climat depuis l'an mil* (Flammarion, 1967); P. Alexandre, 'Histoire du climat et sources narratives du moyen âge,' *Le moyen âge* 80 (1974): 101-116; W. Bell and A. Ogilvie, 'Weather Compilations as a Source of Data for the Reconstruction of the European Climate during the Medieval Period,' *Climatic Change* 1 (1978), 331-348; M.G.L. Baillie, 'Dendrochronology provides an Independent Background for Studies of the Human Past,' in *L'uomo e la foresta secc. XIII-XIV: Atti della 'Ventisettima Settimana di Studi' 8-13 maggio 1995, Istituto Internazionale di Storia Economica 'F. Datini'*, S. Cavaciocchi (ed.) (Prato, 1996), pp. 99-119; B. Fagan, *The Little Ice Age. How Climate Made History, 1350-1850* (New York: Basic Books, 2000); J. M. Grove, 'The Initiation of the 'Little Ice Age' in Regions Round the North Atlantic,' *Climatic Change* 48

Theoretically, the medieval farmer could expect both fruitful and failing harvest, regardless of acreage and seeding. For instance, in spring 1302 the tenants of Gateley sowed 1.63 bushel of barley seed and 1.50 bushel of oats per acre, only to find in autumn of the same year that the harvest return of barley amounted to just 3.50 bushel per acre, (2.15:1.00), while that of oats was 8.00 bushel per acre (5.33:1.00), which stood above the average.¹⁸⁹ The next year (1303), however, Gateley must have been astonished to learn that the yield-to-seed ratio of the same grain was as high as 11.43.¹⁹⁰ This disproportion between the acreage, seeding and harvest share is demonstrated on Table 4.4 showing the case of Plumstead between 1295 and 1300.

Table 4.3: Each Grain's Share in Total Arable and in Total Harvest

1. Each Grain's Percentage Share in the Total Arable

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans	Total Acreage
1291-1300	9.66%	11.54%	0.53%	12.49%	52.55%	13.07%	0.15%	100.00%
1301-1310	10.07%	9.63%	0.20%	12.03%	54.10%	13.78%	0.18%	100.00%
1311-1320	10.84%	9.09%	1.15%	11.54%	52.95%	14.25%	0.18%	100.00%
1321-1330	11.79%	10.35%	1.18%	11.26%	52.78%	12.35%	0.30%	100.00%
1331-1340	11.50%	11.81%	1.19%	10.42%	51.26%	13.53%	0.29%	100.00%
1341-1350								
1351-1360	18.54%	7.57%	0.98%	10.73%	52.19%	9.98%	0.02%	100.00%
1361-1370	15.31%	7.08%	0.04%	11.92%	55.92%	9.71%	0.02%	100.00%
Average	12.53%	9.58%	0.75%	11.48%	53.11%	12.38%	0.16%	100.00%

2. Each Grain's Percentage Share in the Total Harvest

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans	Sum
1291-1300	14.17%	6.74%	0.83%	10.65%	60.21%	7.08%	0.32%	100.00%
1301-1310	13.38%	6.70%	0.64%	8.81%	63.00%	7.31%	0.17%	100.00%
1311-1320	15.45%	4.59%	0.89%	9.99%	60.96%	7.92%	0.21%	100.00%
1321-1330	17.59%	7.08%	0.74%	9.97%	60.37%	4.09%	0.16%	100.00%
1331-1340	16.34%	7.76%	0.90%	7.79%	59.13%	7.95%	0.13%	100.00%
1341-1350	20.94%	6.10%	0.82%	9.62%	54.50%	8.01%	0.01%	100.00%
1351-1360	16.58%	6.01%	0.69%	7.71%	63.97%	5.04%	0.00%	100.00%

(2001), 53-82; Rudolf Brázdil et al., 'Historical Climatology in Europe – the State of the Art,' *Climatic Change* 70 (2005), 363-430.

¹⁸⁹ DCN 1/1/13 fol. 54r.

¹⁹⁰ DCN 1/1/13 fol. 60r.

1361-1370	16.32%	3.68%	0.12%	10.58%	63.22%	5.94%	0.13%	100.00%
Average	16.18%	6.24%	0.74%	9.51%	60.32%	6.85%	0.16%	100.00%

3. Harvest-to-Acreage Ratios.

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans
1291-1300	1.47	0.58	1.56	0.85	1.15	0.54	2.12
1301-1310	1.33	0.70	3.22	0.73	1.16	0.53	0.92
1311-1320	1.42	0.50	0.77	0.87	1.15	0.56	1.14
1321-1330	1.49	0.68	0.63	0.89	1.14	0.33	0.54
1331-1340	1.42	0.66	0.76	0.75	1.15	0.59	0.44
1341-1350							
1351-1360	0.89	0.79	0.70	0.72	1.23	0.51	0.00
1361-1370	1.07	0.52	2.93	0.89	1.13	0.61	6.66
Average	1.30	0.62	1.29	0.82	1.12	0.59	2.67

Source: the accounts database.

Notes: the acreage figures are calculated in standard acres, while those of harvest in standard quarters.

Table 4.4: Relation between Acreage and Harvest Share of Each Crop on Plumstead, 1296-1300

1. Each Grain's Share in Total Arable (in Quarters) and its Percentage Value

Year	Wheat	Rye	Oats	Barley	Peas	Total Acre
1295/6	32.25	30.25	17.00	128.00	33.00	240.50
1296/7	32.00	28.00	19.00	140.00	35.00	254.00
1297/8	33.00	30.00	22.00	115.00	30.00	230.00
1298/9	32.00	36.00	20.00	113.75	24.00	225.75
1295/6	13.41%	12.58%	7.07%	53.22%	13.72%	100.00%
1296/7	12.60%	11.02%	7.48%	55.12%	13.78%	100.00%
1297/8	14.35%	13.04%	9.57%	50.00%	13.04%	100.00%
1298/9	14.17%	15.95%	8.86%	50.39%	10.63%	100.00%

2. Each Grain's Share in Total Seeding (in Quarters) and its Percentage Value

Year	Wheat	Rye	Oats	Barley	Peas	Total Seed
1295/6	9.44	7.75	10.75	67.19	11.63	106.75
1296/7	12.88	9.25	14.00	85.94	13.13	135.19
1297/8	13.00	10.50	15.00	62.13	11.00	111.63
1298/9	13.25	10.00	12.50	71.13	9.00	115.88
1295/6	8.84%	7.26%	10.07%	62.94%	10.89%	100.00%
1296/7	9.52%	6.84%	10.36%	63.57%	9.71%	100.00%

1297/8	11.65%	9.41%	13.44%	55.66%	9.85%	100.00%
1298/9	11.43%	8.63%	10.79%	61.38%	7.77%	100.00%

3. Each Grain's Share in Total Harvest (in Quarters) and its Percentage Value

Year	Wheat	Rye	Oats	Barley	Peas	Total Harvest
1296/7	68.50	35.38	32.13	227.88	36.88	400.75
1297/8	79.00	34.35	25.63	161.06	17.88	317.91
1298/9	48.13	29.63	47.75	230.75	41.13	397.38
1299/1300	69.63	31.38	32.88	211.63	33.75	379.25

1296/7	17.09%	8.83%	8.02%	56.86%	9.20%	100.00%
1297/8	24.85%	10.80%	8.06%	50.66%	5.62%	100.00%
1298/9	12.11%	7.46%	12.02%	58.07%	10.35%	100.00%
1299/1300	18.36%	8.27%	8.67%	55.80%	8.90%	100.00%

Source: DCN 60/29/11-14.

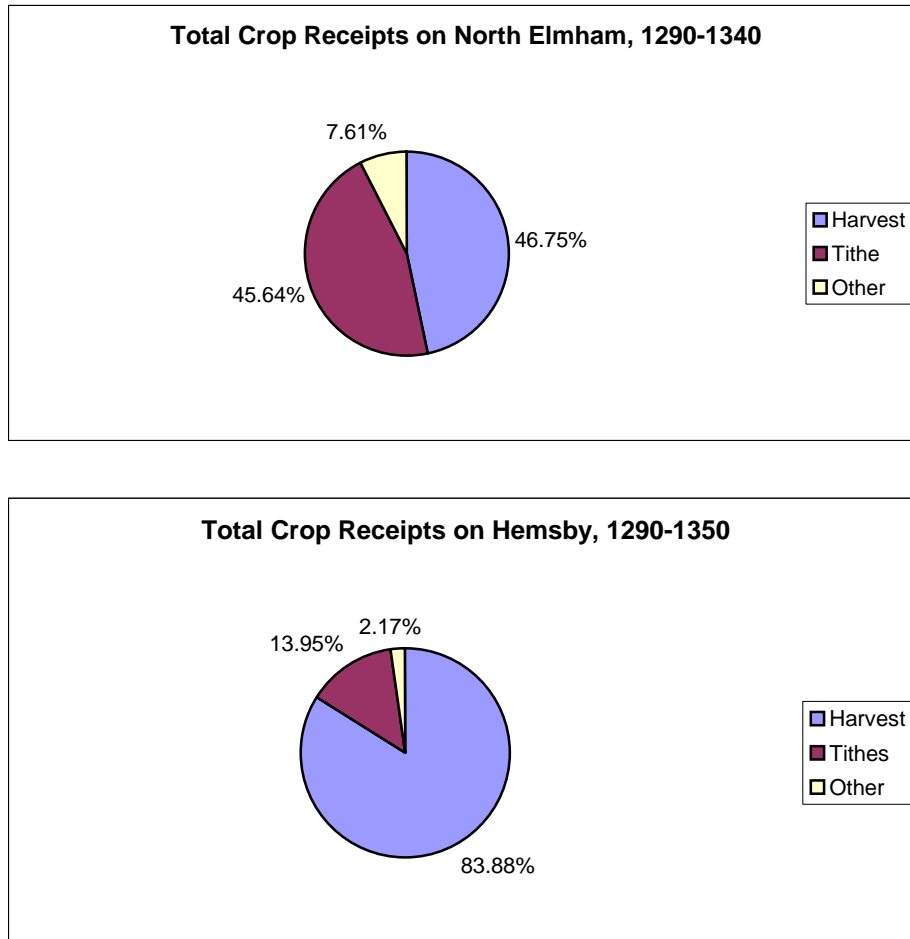
Notes: All numeral figures for acreage are given in Standard Acres; those for seeding and harvest in Standard Quarters. One quarter = eight bushels = 64 gallons.

In other words, there was never an exact correlation between the acreage, seeding and harvest, as far as each grain's share is concerned.

Each manor contributed a different amount of grain supply each year, depending primarily on acreage available for arable cultivation, the extent of tithes collected from appropriated rural churches, farm rendered by tenants and type of soil. A medium-size manor with large tithes/farm could actually contribute more quarters of grain than a large-size one without or with smaller tithes/farm. For example, in the last decade of the thirteenth century, Newton had 220.84 arable acres, only 13.00 of which was dedicated to wheat, while North Elmham's total cultivable space amounted to just 29.56 acres, 3.50 of which were under wheat cultivation. Despite this significance difference in size of total and wheat acreage, Newton received 37.19 quarters of wheat, while North Elmham obtained 32.79 quarters of the same grain. This is wholly due to extensive tithes that the

Priory owned in North Elmham, which actually represented as much as over 45 per cent of total gross wheat receipt on that estate, between 1290 and 1340. Newton's tithes were nothing compared to those of North Elmham.¹⁹¹

Figure 4.1: Total Crop Receipts on North Elmham and Hemsby.



Sources: DCN 60/15/3-16; DCN 60/10/9-25.

The pie charts above (Figure 4.1) demonstrate how differently crop receipts could be distributed on different manors. It should be noted, however, that both North Elmham and

¹⁹¹ On late medieval tithes as an indication of productivity, consult Ben Dodds, 'Estimating Arable Output Using Durham Priory Tithe Receipts,' *Economic History Review* 57:2 (2004), 245-285.

Hemsby were exceptions rather than rule. In most cases, the tithes did not exceed 8.00 per cent of total crop receipt.

Purchases of grains were never made on a large scale. Their normal amount was no higher than a per cent or two of total farinaceous receipts. As a rule, grain was purchased either in bad harvest years, or when a certain manor did not cultivate it. Unfortunately, the accounts do not specify where these grain supplies were bought. The gifts constituted an even more modest share of total crop receipt, rarely exceeding one per cent of the total. As a rule, they were given by the Master of the Cellar, or sent from other manors, after the Prior commanded to do so. This was considered as an act of charity, especially when the Priory tenants coped with bad harvests and famine.

The composition of total farinaceous receipts seems to have been similar in other regions of fourteenth-century England. For instance, about 88 per cent of the total wheat acquisition on the manor of Cuxham, Oxfordshire, was constituted by net harvest, between c.1290 and 1360.¹⁹² The estates of Bolton Priory, Yorkshire, derived as much as 93 per cent of their total grain supply from harvests.¹⁹³

So far, we have spoken in percentages. But of what? What were the real figures standing behind these percentages, in terms of quarters and bushels? The following figures (Figures 4.2 to 4.8) illustrate the grain receipt on each manor:

¹⁹² Calculated from *Manorial Records of Cuxham, Oxfordshire circa 1200-1359*, P.D.A. Harvey (ed.) (London, 1976).

¹⁹³ Calculated from *The Bolton Priory Compotus, 1286-1325*, Ian M. Kershaw and David M. Smith (eds.), Printed for Yorkshire Archaeological Society 154 (1999-2000) (Woodbridge: The Boydell Press, 2000).

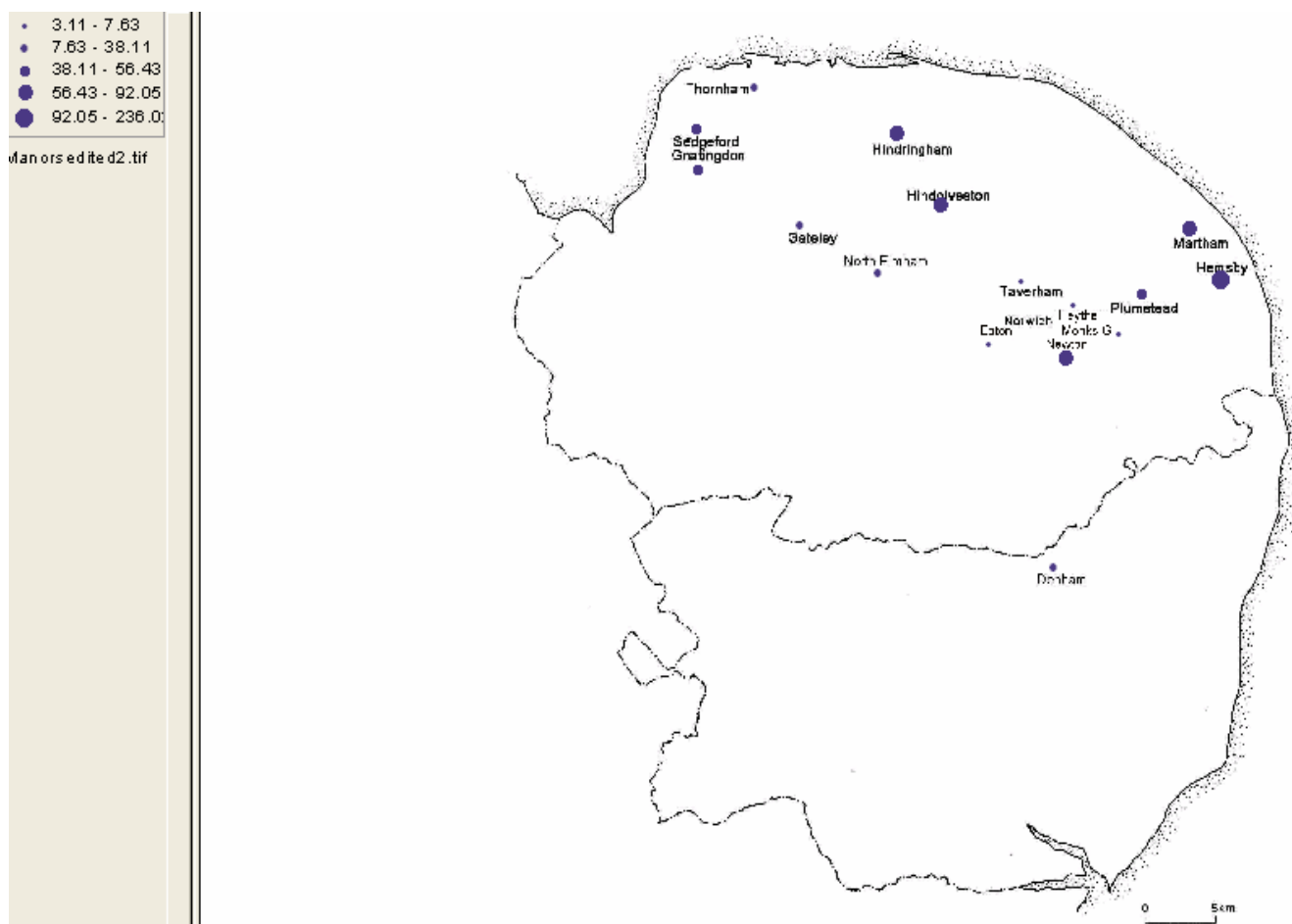


Figure 4.2: Average Wheat Receipt in Quarters on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in standard quarters.

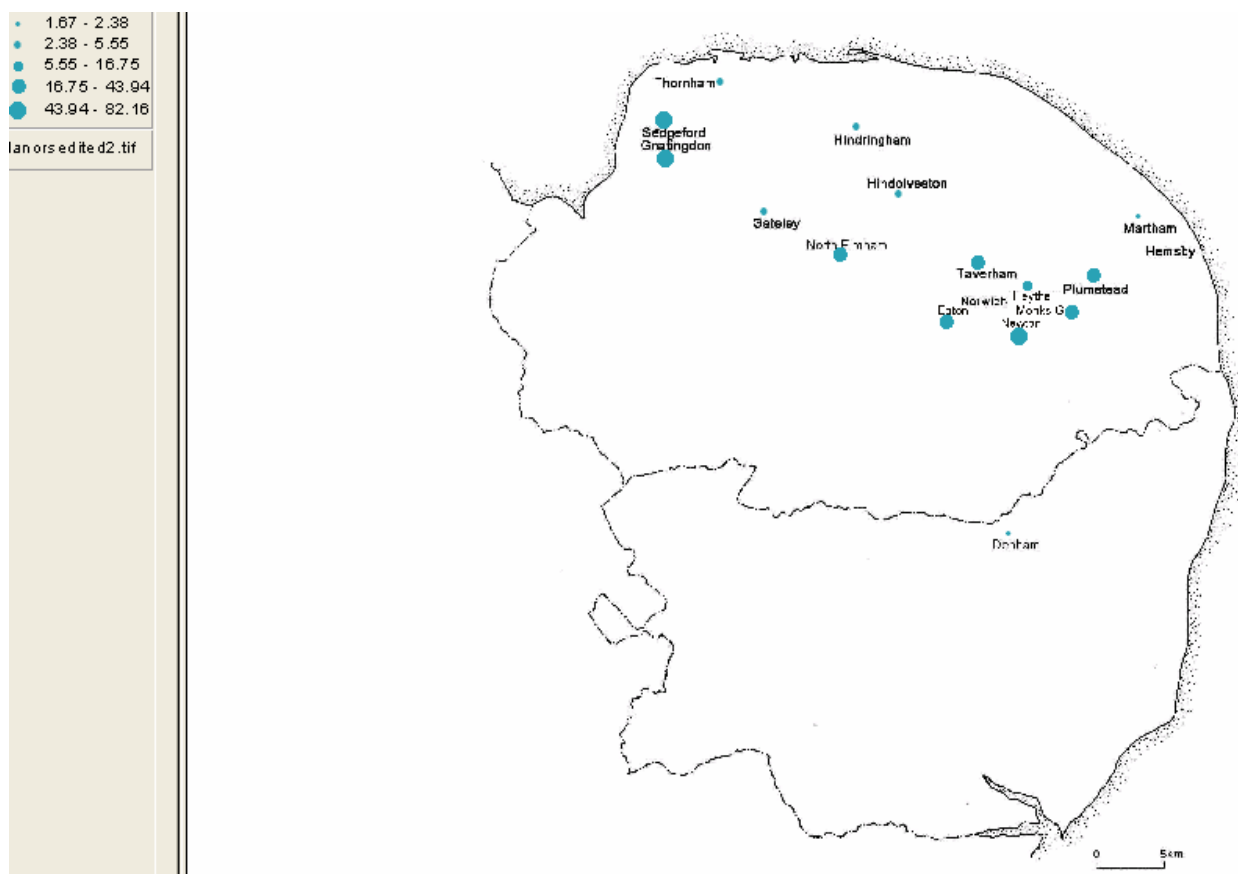


Figure 4.3: Average Rye Receipt in Quarters on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in standard quarters.

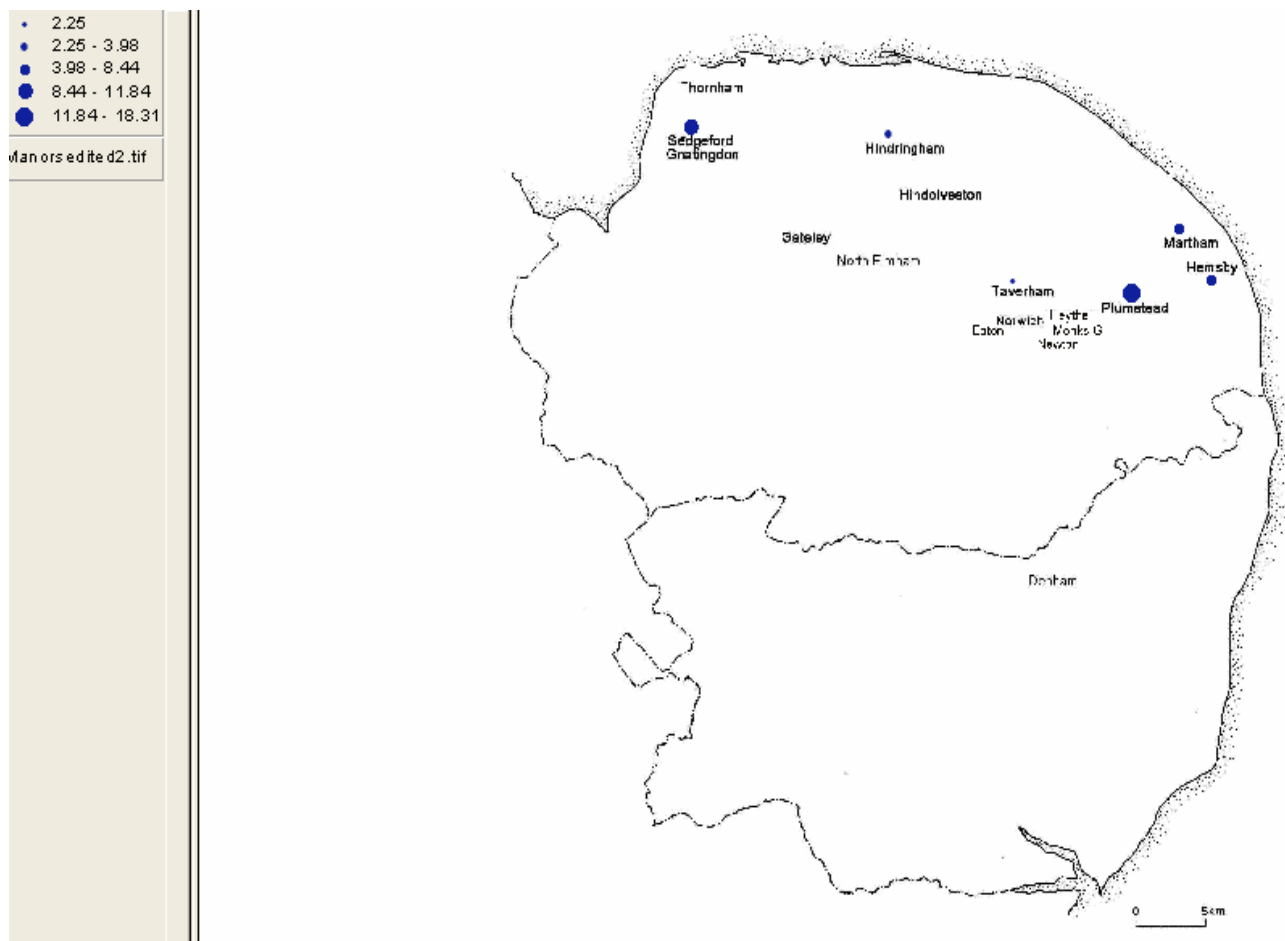


Figure 4.4: Average Maslin Receipt in Quarters on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in standard quarters.

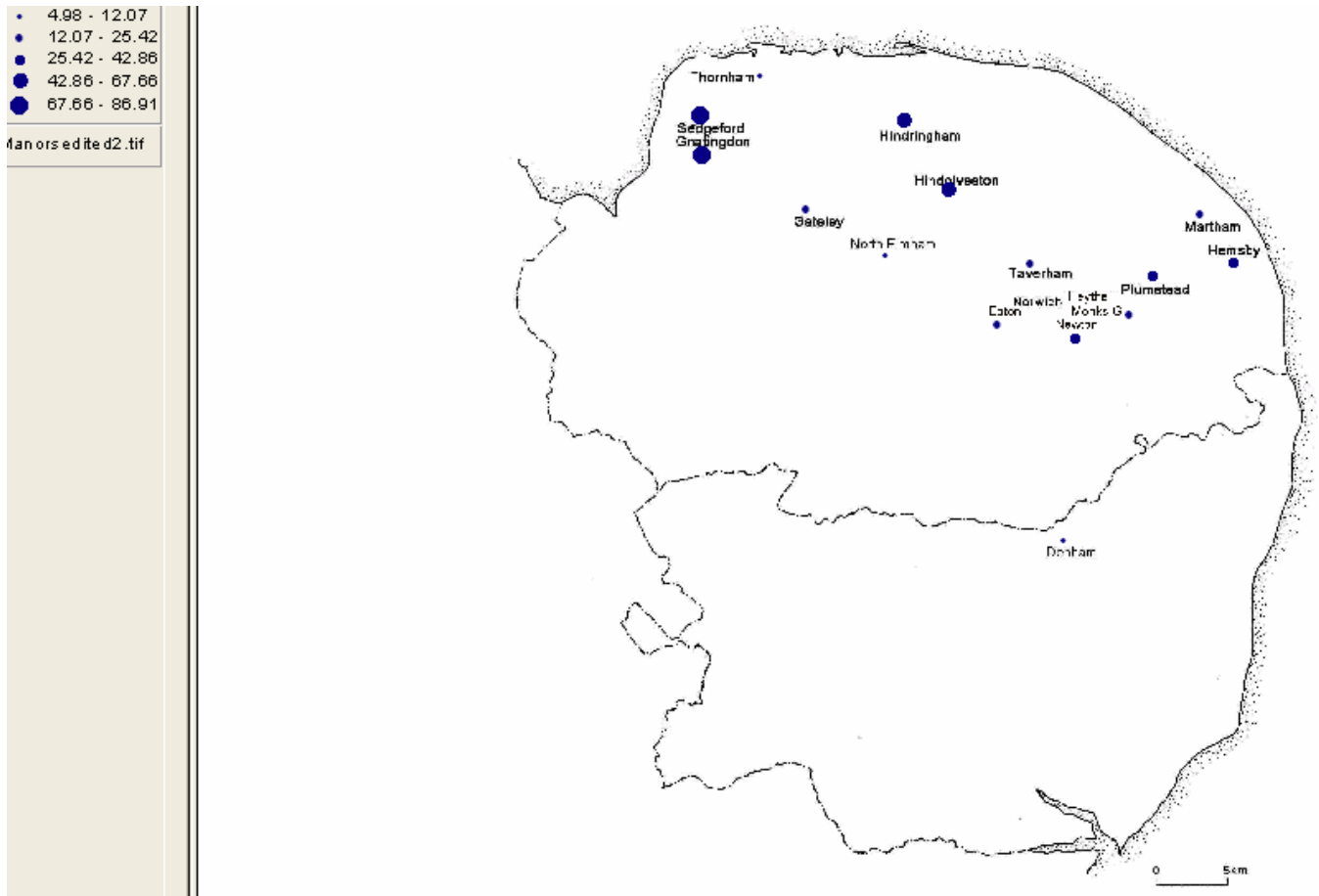


Figure 4.5: Average Oats Receipt in Quarters on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in standard quarters.

The extent of the receipt was determined by three factors: physical size of each estate, crop specialization and the amount of tithes it rendered. Naturally, the larger the manor, the more quarters of grain and legumes it tended to render. The crop specialization factor determined which cereal would have come in large quantities. For example, if a manor was rye and barley-biased, then it is obvious that it would have supplied more rye and barley than wheat and oats. Such was the case of the suburban manors. As far as tithes are concerned, they determined mostly the amount of wheat and

barley receipts, since it was chiefly these grains that were paid in tithes. For example, the estate of Hemsby received very large barley and wheat receipts, chiefly because of its tithes, as well as its physical size. Gateley's receipts, on the other hand, were very modest compared to other manors, since this estate was small in its size and did not have tithes attached.



Figure 4.6: Average Barley Receipt in Quarters on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in Standard quarters.

Chronologically speaking, one has to distinguish between the pre- and post-Plague era. The extent of gross receipt, that is of harvest, tithe and farm, was more or less stable before the outburst of the pestilence. The decade of 1351-1360, following the Black Death, experienced a fall of 63.87 per cent in the amount of total farinaceous receipts, reflecting the fall in population, reduction of potential working force and hence of cultivated acreage. The subsequent decade (1360-1370) saw a pronounced rise of about 45.89 per cent, corresponding to the demographic and agricultural recovery (Table 4.5). The receipts would never return to their pre-Plague levels, for obvious reasons. First, the human population was considerably smaller compared to the pre-1349 years. Second, as we have seen above, one of the economic and agricultural consequences of the plague was (an almost immediate) shift from agrarian husbandry to pastoralism, with more and more acreage devoted to grazing and fallow, at the expense of once arable land. Hence, we cannot possibly expect the farinaceous receipts to have been restored to their pre-Plague level.

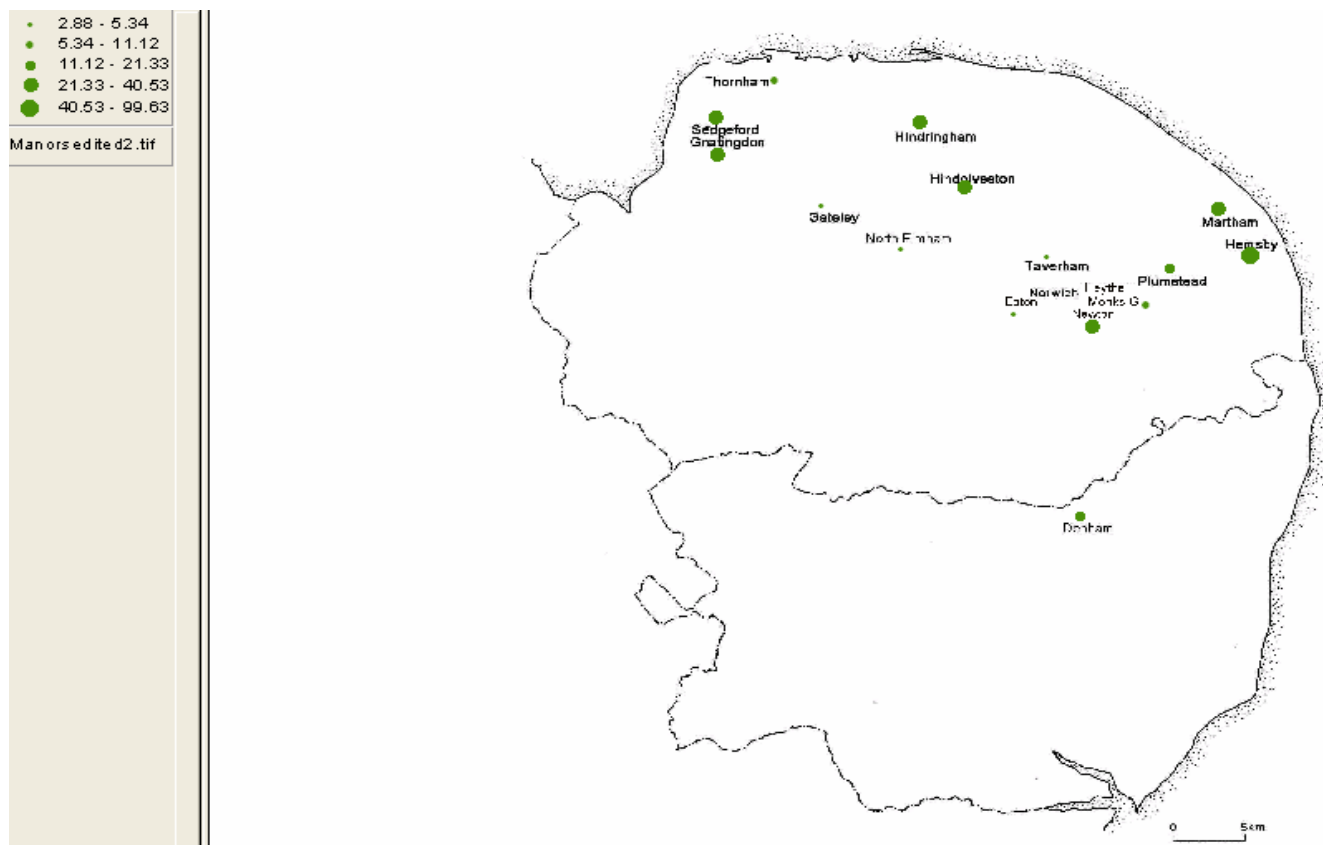


Figure 4.7: Average Peas Receipt on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in standard quarters. One quarter = eight bushels = 64 gallons.

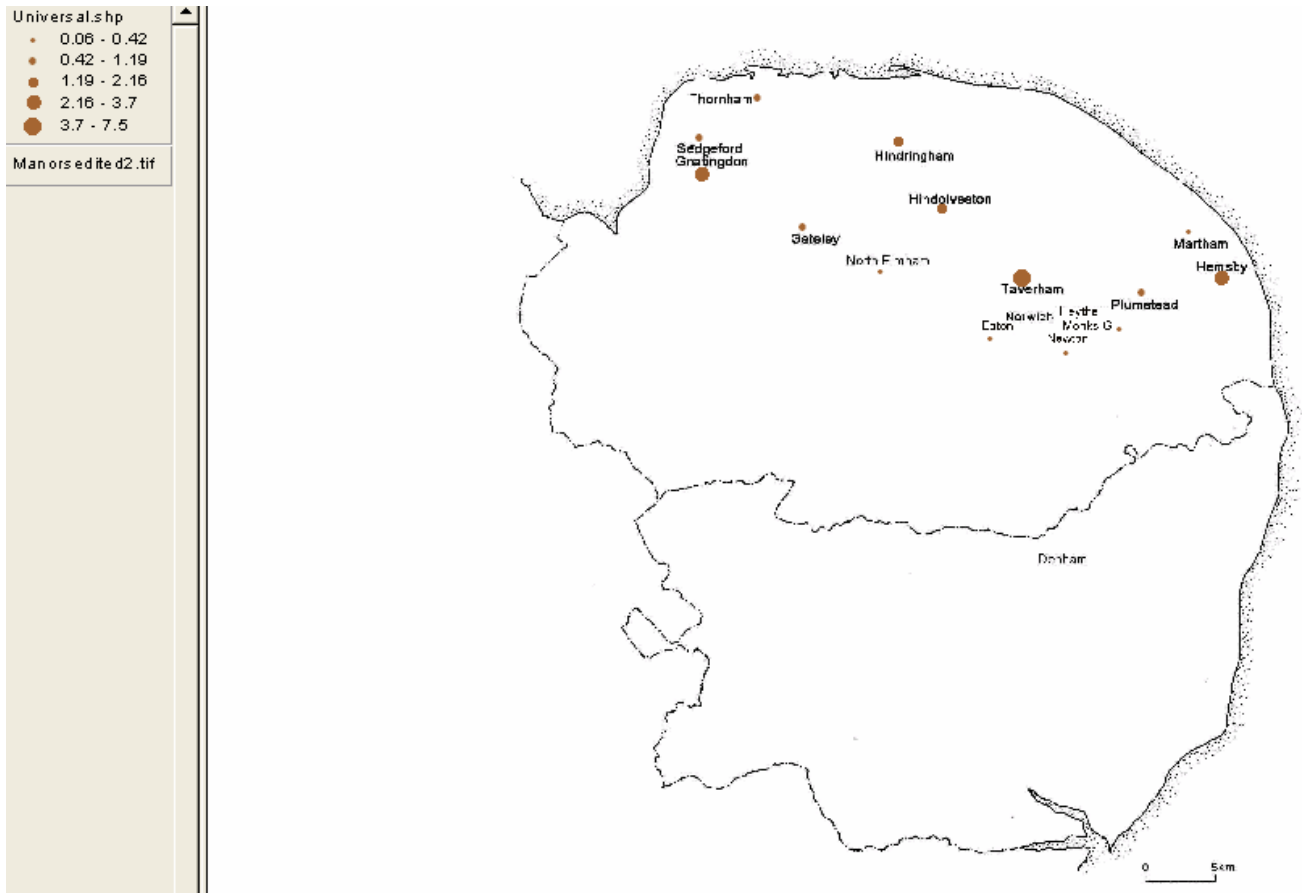


Figure 4.8: Average Beans Receipt on Norwich Cathedral Priory Manors, 1290-1370

Source: accounts database.

Notes: All figures are given in standard quarters. One quarter = eight bushels = 64 gallons.

Table 4.5: Average Annual Gross Receipt (in Quarters of Grain) of Farinaceous Products, 1290-1370.

Decade	Wheat	Rye	Maslin	Oats	Barley	Peas	Beans	Total
1291-1300	876.88	436.16	47.37	677.28	3749.35	409.80	18.55	6215.39
1301-1310	782.50	415.57	35.05	582.61	4085.61	424.39	9.51	6335.24
1311-1320	796.21	263.47	46.09	514.50	3412.84	393.19	15.81	5442.10
1321-1330	857.64	389.56	35.91	520.40	3397.46	208.51	8.40	5417.88
1331-1340	722.78	383.27	48.14	408.59	3050.39	356.91	5.91	4975.99
1341-1350	966.55	330.41	43.94	494.52	3215.43	397.86	0.71	5449.41
1351-1360	294.81	116.12	14.60	166.05	1439.66	88.11	0.38	2119.73
1361-1370	468.73	111.52	3.92	352.47	2480.17	184.10	3.95	3604.86
Mean	871.25	400.56	52.66	530.60	3593.29	379.03	23.17	5850.57

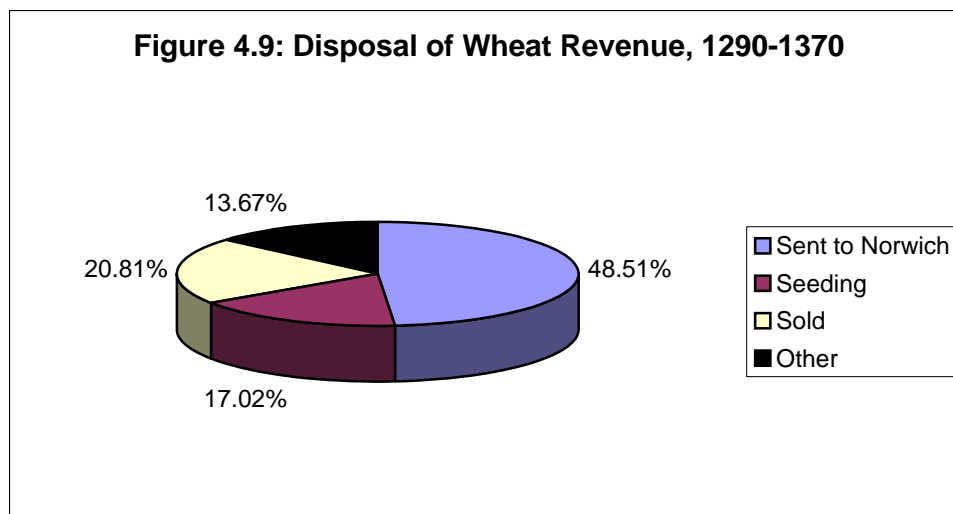
Source: accounts database.

Notes: All figures are given in Standard quarters.

Grain Disposal and Distribution

How were these annual resources distributed? What was their further destination? Several disposal patterns were practised by the Cathedral Priory regarding its farinaceous supply. The main ones were dispatching to Norwich (*missum apud Norwicum*), selling (*in venditione*), storing (*remanens in granario*), seeding (*in semine*), livery, namely, feeding daily labourers, tenants, autumn harvest workers and working animals (*in liberatione*), conversion of barley into malt and brewing (*fundatio in braseum*) and giving as gifts, or in alms (*in elemosinam*).

The manorial accounts provide information about only demesne production, so that we remain ignorant about the tenants' production. A large proportion of wheat and malted barley was sent to the Priory in Norwich. The exact figures in quarters and bushels will be discussed in the following chapter. For the purpose of the present section it will suffice to mention general percentages. Almost half of the wheat revenue was sent to Norwich; about 17 per cent of total wheat returns was invested in seeding; further 20.81 per cent were allowed for sale and the remaining 13.67 per cent were spent otherwise, mostly as gifts to different persons or distribution among autumn harvest workers (Figure 4.9). No account mentions the use of wheat either for brewing, or as animal fodder. Obviously, these figures were different from estate to estate. For example, during its brief existence, the manor of Heythe used to send as much as 93 per cent of its annual wheat resources to Norwich, spending only over 6 per cent in seeding. North Elmham dispatched over 78 per cent of wheat into the town,



Source: accounts database.

invested 4 per cent in seeding, over seven per cent in sale and over nine per cent in other purposes. Gnatingdon and Sedgeford, two adjacent estates, were known better as sellers of wheat, rather than suppliers of the monastic community. They sold as much as around half of their wheat revenue on the market and sent only about 10 per cent into Norwich. These regional differences are shown on Table 4.6:

Figure 4.6: Disposal of Wheat Revenue on Each Manor, 1290-1370.

Manor	Sent to Norwich	Seeding	Sold	Other	Total
Denham	27.30%	10.43%	51.50%	10.77%	100.00%
Eaton	22.53%	28.78%	26.30%	22.39%	100.00%
Gateley	59.76%	28.71%	10.42%	1.11%	100.00%
Gnatingdon	11.96%	23.35%	56.72%	7.97%	100.00%
Hemsby	81.25%	12.69%	1.88%	4.18%	100.00%
Heythe	93.44%	6.56%	0.00%	0.00%	100.00%
Hindolveston	64.25%	15.16%	15.10%	5.50%	100.00%
Hindringham	45.23%	20.89%	21.54%	12.34%	100.00%
Martham	61.66%	20.62%	10.15%	7.56%	100.00%
Monks G	34.95%	12.34%	1.80%	50.91%	100.00%
Newton	60.15%	15.91%	12.02%	11.92%	100.00%
N Elmham	78.17%	4.62%	7.56%	9.65%	100.00%
Plumstead	65.28%	19.19%	7.85%	7.68%	100.00%
Sedgeford	10.22%	18.03%	45.63%	26.12%	100.00%

Taverham	47.98%	22.96%	0.97%	28.09%	100.00%
Thornham	12.01%	12.04%	63.45%	12.50%	100.00%
Average	48.51%	17.02%	20.81%	13.67%	100.00%

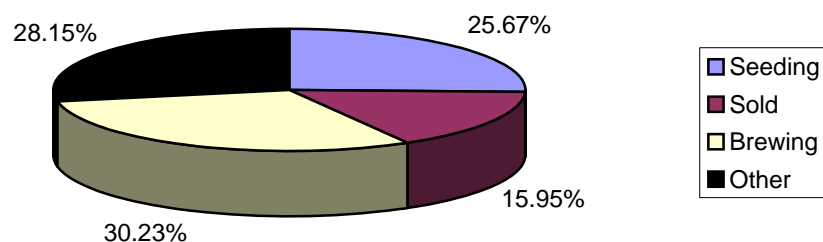
Source: accounts database.

Similarly, barley disposal patterns were also distributed unevenly. Almost as much as one third of total revenue was malted and later brewed; about one quarter was invested in seeding; nearly 16 per cent was sold and the rest (around 28 per cent) spent on other matters (Figure 4.10). Again, these are average figures; the real figures were different on each manor. For example, on Hemsby and Newton as much as almost 60 per cent of total barley revenue was converted into malt. On the other hand, there was zero brewing activity on Denham; instead, close to 60 per cent of barley receipt was sold (See Figure 4.7).

Unlike wheat, barley was sent to the Priory almost exclusively in malted form. There were some rare cases, when barley was dispatched there in non-processed shape, but these were very few and the amount of barley in question did not exceed several bushels. Thus, the Priory received raw barley from Plumstead in 1294 and 1343 and from Newton in 1367.¹⁹⁴ In some cases, barley was sold to the Master of the Cellar, as in 1305 in Taverham and in 1300 and 1306 on Monks' Granges.¹⁹⁵

¹⁹⁴ DCN 60/29/7; DCN 60/29/25; DCN 60/28/6.

¹⁹⁵ DCN 60/35/13a; DCN 60/26/10-11.

Figure 4.10: Disposal of Barley Revenue, 1290-1370.

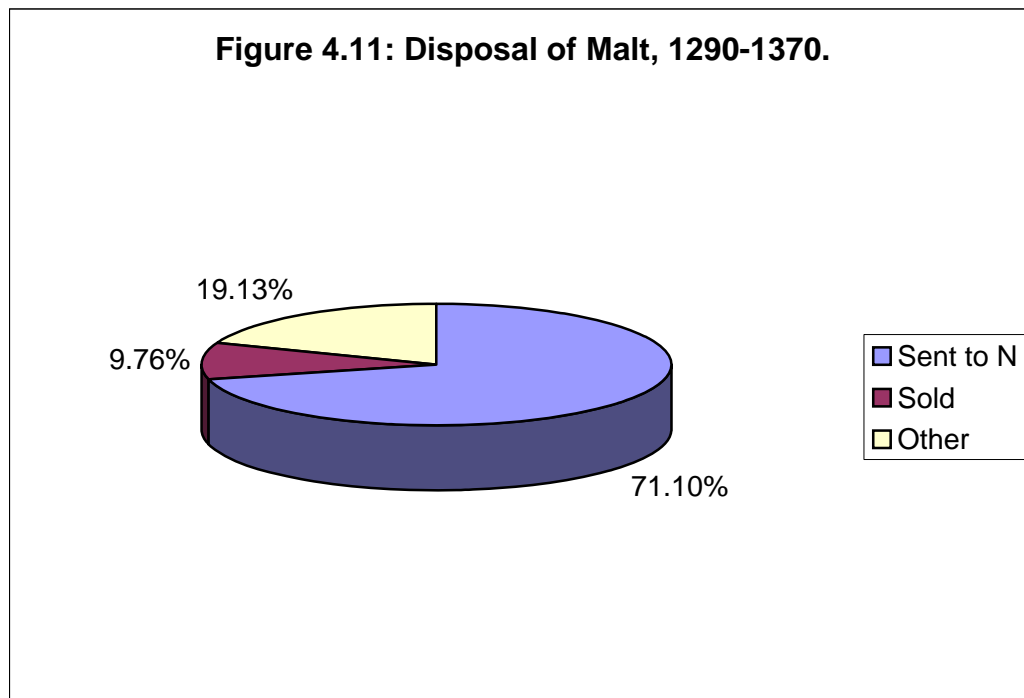
Source: accounts database.

Table 4.7: Disposal of Barley Revenue on Each Manor, 1290-1370.

Manor	Seeding	Sold	Malting	Other	Total
Denham	16.10%	58.58%	0.00%	25.32%	100.00%
Eaton	29.87%	13.73%	31.36%	25.04%	100.00%
Gateley	32.46%	8.19%	3.64%	55.72%	100.00%
Gnatingdon	27.49%	29.47%	13.25%	29.79%	100.00%
Hemsby	18.98%	8.49%	57.79%	14.75%	100.00%
Heythe	32.71%	3.23%	42.00%	22.05%	100.00%
Hindolveston	23.12%	7.89%	25.68%	43.32%	100.00%
Hindringham	29.76%	13.91%	29.01%	27.31%	100.00%
Martham	26.62%	9.83%	42.63%	20.92%	100.00%
Monks G	29.72%	2.94%	47.25%	20.08%	100.00%
Newton	21.93%	1.84%	58.02%	18.21%	100.00%
N Elmham	11.79%	24.77%	35.59%	27.86%	100.00%
Plumstead	27.96%	7.04%	38.83%	26.17%	100.00%
Sedgeford	23.03%	28.13%	17.37%	31.47%	100.00%
Taverham	34.43%	2.74%	40.41%	22.42%	100.00%
Thornham	24.78%	34.35%	0.83%	40.04%	100.00%
Average	25.67%	15.95%	30.23%	28.15%	100.00%

Source: accounts database.

What happened to barley once it was converted to malt? Our accounts indicate that the largest share of malt (over 70 per cent) was sent to Norwich. Around 10 per cent was sold and less than 20 per cent was either stored in the granary, or distributed among tenants and *famuli* (Figure 4.11). The estates of Hemsby, Heythe, Monks Grange, Newton and Taverham used to send as much as between 90 and 100 per cent of their malt resources to the Priory. Gnatingdon, Hindringham and Sedgeford did not usually contribute more than half of their malt to the Cathedral. While Thornham could not send any malt to the town, since this manor did not malt barley at all (Table 4.7).



Source: accounts database.

With the exception of the distribution of grain among tenants, daily herds and labourers, there was no direct consumption of the demesne revenue by the tenants, as our

rolls suggest. A possible explanation is the fact that the tenants were simply not allowed to consume wheat on the demesne, having their tenancies for that purpose. There are numerous entries in manorial court rolls regarding tenants' attempts to steal dominical grain, chiefly wheat.¹⁹⁶ On the other hand, there are copious examples of rye livery to the tenants.

Table 4.8: Disposal of Malt on Each Manor, 1290-1370.

Manor	Sent to Norwich	Sold	Other	Total
Denham				
Eaton	75.45%	4.33%	20.22%	100.00%
Gateley				
Gnatingdon	49.42%	22.01%	28.56%	100.00%
Hemsby	91.69%	3.03%	5.29%	100.00%
Heythe	100.00%	0.00%	0.00%	100.00%
Hindolveston	76.96%	6.60%	16.45%	100.00%
Hindringham	49.51%	22.45%	28.03%	100.00%
Martham	68.77%	12.85%	18.39%	100.00%
Monks G	90.93%	5.49%	3.58%	100.00%
Newton	93.87%	2.28%	3.85%	100.00%
N Elmham	73.72%	5.82%	20.46%	100.00%
Plumstead	84.09%	5.24%	10.68%	100.00%
Sedgeford	50.59%	12.21%	37.19%	100.00%
Taverham	90.47%	1.06%	8.47%	100.00%
Thornham	0.00%	33.33%	66.67%	100.00%
Average	71.10%	9.76%	19.13%	100.00%

Source: accounts database.

Are the above figures extraordinary? According to the study of the grain disposal in the FTC counties, about 40 per cent of total grain receipt was sold in the period

¹⁹⁶ Such entries are omnipresent in virtually every roll. Naturally, some years (especially troublesome ones) had especially high number of such charges; while tranquil and stable years tend to record fewer charges. This could make an interesting topic of its own, which, unfortunately, cannot be studied within the scope of the present paper. The relevant manorial court rolls are DCN 60/7, 11, 19, 21, 22, 27, 32, 34, 36.

between 1288 and 1315,¹⁹⁷ and about 36 per cent between 1375 and 1450¹⁹⁸ (unfortunately, there is no detailed research on the period between 1315 and 1375). Between 1301 and 1319, the monks of Bolton Priory, Yorkshire, derived over 90 per cent of their wheat receipt from harvest, invested some 13 per cent of it in seeding and left about 68 per cent for domestic consumption.¹⁹⁹ Similarly, about 15 per cent of the total wheat receipt of Cuxham village, Oxfordshire, was spent on seeding, while over 40 per cent of it was sold, between c.1290 and 1360.²⁰⁰ Manorial accounts of Wellingborough (Northamptonshire) show similar figures between 1258 and 1323 (16.32 per cent was invested in seeding, 56.35 per cent were sent to Crowland Abbey). On average, around 44 per cent of drinking grains were converted into malt and brewed (58.30 per cent of barley, 57.43 per cent of dredge and 15.54 per cent of oats). Almost 86 per cent of total malt was shipped to Crowland (82.30 per cent of barley malt, 87.58 per cent of oats malt and 87.63 per cent of dredge malt).²⁰¹

As Bruce Campbell has shown, in the fourteenth century the manorial lords preferred to retain the largest portion of the farinaceous receipts for their direct consumption, instead of selling their revenue and feeding their households with grains purchased on market. This choice was largely dictated by the degree of

¹⁹⁷ Campbell et al., 1993, pp. 153-155; Bruce Campbell, 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History* 57: 4 (1997), 827-58 (esp. p. 846)

¹⁹⁸ *ibid.*, p. 846.

¹⁹⁹ Calculated from *The Bolton Priory Comptus, 1286-1325*, Ian M. Kershaw and David M. Smith (eds.), Printed for Yorkshire Archaeological Society 154 (1999-2000) (Woodbridge: The Boydell Press, 2000).

²⁰⁰ Calculated from *Manorial Records of Cuxham, Oxfordshire circa 1200-1359*, P.D.A. Harvey (ed.) (London, 1976).

²⁰¹ Calculated from *Wellingborough Manorial Accounts, A.D. 1258-1323: from the Account Rolls of Crowland Abbey*, Frances M. Page (ed.), Northamptonshire Record Society 8 (1936)

commercialization, influence of market and differential transaction costs.²⁰² This seems to be true in our case, too. Moreover, the Priory manors sold even smaller percentage of their demesne products than the FTC estates did: no more than 20 per cent. In the century of economic instability and numerous agrarian, social and political crises, it was certainly more profitable for the Priory to draw upon its domestic products. Marketing it would have meant too high a cost of risk. As Pamela Nightingale has found, the Norwich hinterland experienced a significant commercial contraction between c.1315 and 1350, when Norwich declined as an important market.²⁰³ The grain disposal on the Norfolk estates perfectly agrees with Nightingale's findings. Its significance within the wider commercial context of the fourteenth-century will be discussed in the Chapter 6, dealing with marketing the surplus.

The Value of Arable Land

Each of the manors supplying the Norwich Cathedral Priory was different not only in its productivity, intensity of cropping, farinaceous contribution, revenue and disposal patterns, but also in land value. The latter is identical to the rental value of land, which was dictated by the land's fertility, its demand, profit and intensity of cropping.²⁰⁴ The values of the arable land varied from just above 8 pence up to 36 pence an acre, with an average value of 15.39 pence (Figure 4.12). These figures are especially suggestive when compared to other regions of England. They are certainly higher than those in the

²⁰² Bruce Campbell, 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History* 57: 4 (1997), 827-58

²⁰³ Pamela Nightingale, 'Norwich, London, and the Regional Integration of Norfolk's Economy in the First Half of the Fourteenth Century', in *Trade, Urban Hinterlands and Market Integration c.1300-1600*, James A. Galloway (ed.), Centre for Metropolitan History, Working Papers Series, No. 3 (London: 2000), pp. 83-101.

²⁰⁴ Campbell et al., 1993, p. 139.

London region ranging from 1 penny to 36 pence an acre, with a mean of 4.8 pence, indicating that Norfolk land was more valuable than that of the ten counties surrounding London.²⁰⁵

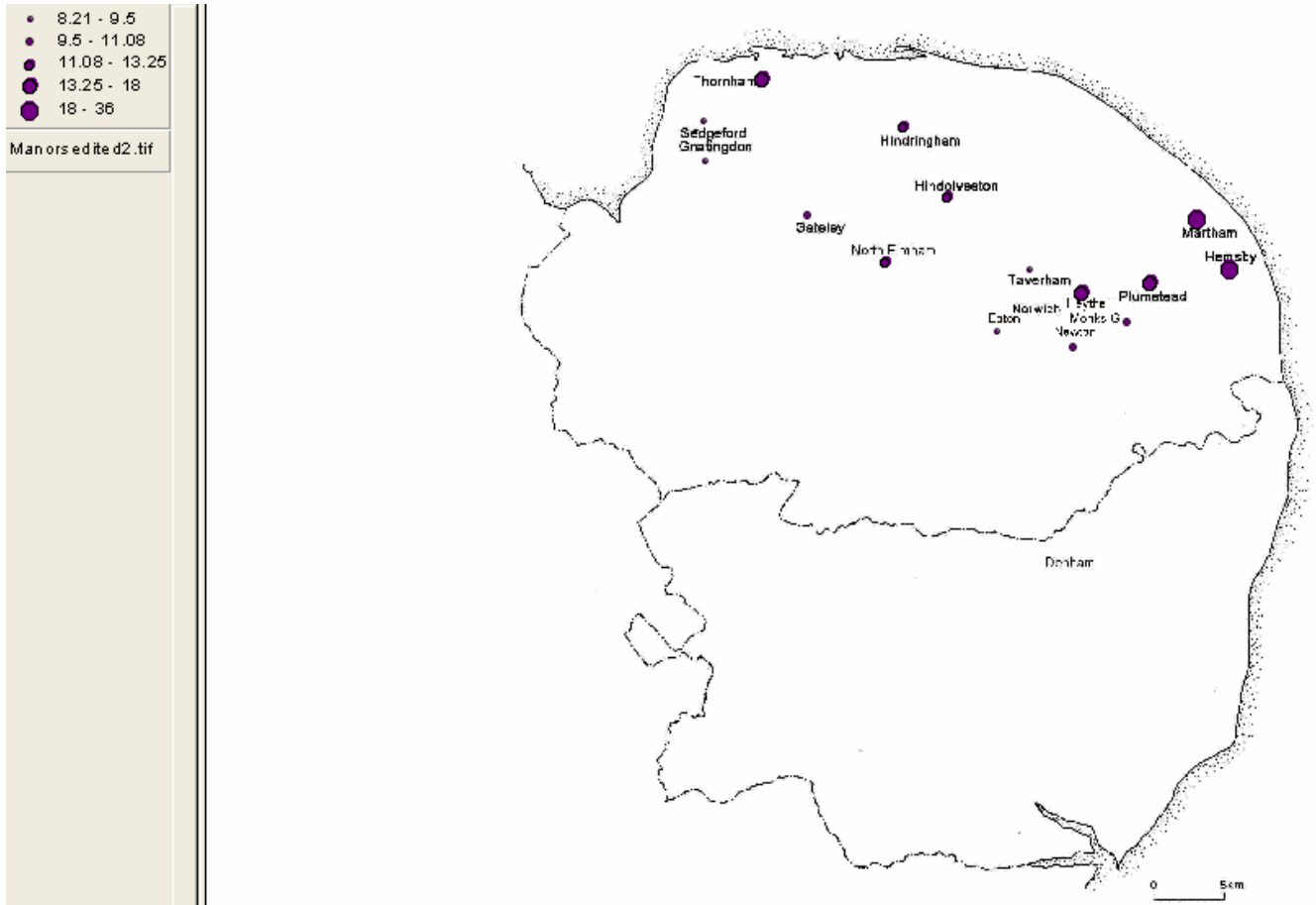


Figure 4.12: Average Value of Arable Land of the Norwich Cathedral Priory Manors, 1292-1339.

Source: DCN 1/13.

Notes: The values are represented in penny per acre.

With the exception of the short-lived Heythe manor, the suburban manors, located on medium clay soil, tended to be the least valuable, as far as their land value is concerned.

²⁰⁵ Campbell et al., 1993, p. 139.

Heythe, Plumstead and Thornham were valued at or near 18 pence an acre. But no estate could be compared to either Martham, or Hemsby with arable values of 36 pence. These two were situated on medium loam soil. The type of soil was important, but yet not the only factor in determination of arable value. For example, the estate of Thornham was located on the least favourable soil, light loam, rendering low grain and legume yields (see above, Table 2.10). Yet its land value exceeded that of many other manors, situated on better soils and rendering higher yields. What actually determined Thornham's arable value was the extent of its cropping intensity. As we have seen above, in the pre-Plague decades, as much as around 20 per cent of total arable land was devoted to peas on this manor. A closer look into rotations on Thornham reveals that this demesne practised a long fallow, or 'ley' system of rotation, whereby land was cropped for 3-4 years and then left ley (fallow with grasses grown) for another 3-4 years. The same practice was employed at Bircham, not far from Thornham.²⁰⁶ Martham and Hemsby, which similarly devoted close to 20 per cent of their arable to peas cultivation, had little fallow in the pre-Plague decades. It is not clear what made Heythe such a high-valued estate, since its land was not extraordinarily fertile, and the percentage of its legume acreage (9.09 in 1333-4) was not especially high. Again, it is likely that this estate, too, had a limited, or non-existent fallow. Unfortunately, this obscure estate is documented in too few accounts to confirm this hypothesis.

In any event, the post-Plague decades witnessed contraction in peas acreage on these manors, indicating the expansion of fallow and grazing lands, on one hand, and

²⁰⁶ I am grateful to Bruce Campbell, of Queen's University (Belfast) for this suggestion. Bruce Campbell, Personal Communication.

decrease in the value of their land, as a result of reduction of cropping intensity, on the other.

Famine Years (1314-1317)

As stated above, we are unfortunate in having only a few rolls from the years of the Great Famine (1314-1317). As a result, our knowledge of the agricultural crisis on the Priory manors is very incomplete. Nevertheless, there is one roll from Eaton for 1314-5,²⁰⁷ and a Sedgeford tithe roll for 1315-6.²⁰⁸ In addition, there are two indirect sources, two obedientiary rolls for 1314-5 and 1315-6.²⁰⁹ Unfortunately, there is no single extant roll for 1316-7, which seems to have been the most severe year of the Famine. Despite, their incompleteness, these surviving sources might be suggestive, since they provide a unique insight into the situation on the manors during these catastrophic years. However, in order to understand and appreciate better their contents, it is necessary to juxtapose them against similar rolls from 'normal' years.

Although the most severe years of the Famine were 1315-1316, the agrarian crisis did not really vanish until 1322. The year of 1318 marks the end of the first stage of the crisis, as far as the *arable* husbandry, as opposed to the *pastoral* one goes.²¹⁰ The second phase of the crisis began around Easter of 1319, when England was struck by harsh cattle murrain, ravaging the entire country and indirectly affecting harvests, because many manors still used oxen for ploughing.²¹¹ The harvest failure returned in the wet autumn of

²⁰⁷ BL/NR/25

²⁰⁸ NRO, MS. LeStrange IB/79

²⁰⁹ DCN 1/1/24, 25.

²¹⁰ Ian Kershaw, 'The Great Famine and Agrarian Crisis in England, 1315-1322', *Past and Present* no. 59 (May 1973), p. 13.

²¹¹ Kershaw, 1973, p. 14.

1320, but this was nothing compared to the disastrous crops of 1321.²¹² The conditions turned favourable only after 1322. Keeping this in mind, we have to consider every single year of the Famine crisis, instead of concentrating on 1315 and 1316 only, using all the available information.

Let us begin with the manor of Eaton. As we have seen above, Eaton was a strongly rye-biased manor, dedicating a very small proportion of its arable to wheat growing. The following table illustrates different crop return, in net-harvest receipt:

Table 4.9: Grain Harvests on Eaton, 1311-1323.

(1). Grain Receipts in Quarters

Year	Wheat Receipts	Rye Receipts	Oats Receipts	Barley Receipts	Peas Receipts
1311/12	0.00	46.25	17.25	156.25	4.75
1312/13	18.50	33.50	22.50	150.63	10.50
1314/15	0.25	9.38	1.63	42.63	1.75
1317/18	12.00	20.13	14.00	109.25	4.63
1318/19	12.50	16.13	10.50	127.00	1.00
1320/21	7.50	33.63	7.25	198.25	1.63
1322/23		24.50	13.25	127.00	4.50
Average	10.10	29.02	14.13	144.73	4.50

(2). Percentage of the Average Year (between 1311 and 1323)

1311/12		159.37%	122.12%	107.96%	105.56%
1312/13	183.17%	115.43%	159.29%	104.07%	233.33%
1314/15	2.48%	32.30%	11.50%	29.45%	38.89%
1317/18	118.81%	69.35%	99.12%	75.49%	102.78%
1318/19	123.76%	55.56%	74.34%	87.75%	22.22%
1320/21	74.26%	115.87%	51.33%	136.98%	36.11%
1322/23		84.42%	93.81%	87.75%	100.00%

Sources: NRO, DCN 60/8/15,16, OBL NR 25, NRO, DCN 60/8/17-19.

Notes: All figures are in standard quarters. The average is calculated for 'normal' years only.

²¹² Kershaw, 1973, p. 15.

As the table suggests, it was the wheat sector that suffered the most: after a heavy rainfall of Autumn 1314, it rendered only about two and half per cent of its average return, in Spring 1315. This is hardly surprising, since wheat was the most intolerant crop, unable to withstand fluvial disasters. Oats seem to have suffered too, rendering as little as 11.50 per cent of an average harvest in normal year. This is rather puzzling, given the fact that it is a most durable grain capable of withstanding heavy rainfall. Barley yielded slightly less than 30 per cent of its normally expected harvest, while the output of beans was almost 40 per cent – a high figure compared to other cereals.

The picture on Sedgeford manor is more complicated, for several reasons. First, we have only a tithe account for 1315-6, as opposed to manorial account. Obviously, the tithes do not reflect demesne harvest. Second, Sedgeford rendered *combined* tithes with Gnatingdon and Trowse manors and some rolls do not distinguish between tithes of Sedgeford and other manors'. In other words, the figures below reflect these combined tithes for the three manors, rather than individual ones for each estate. Third, all post-1320 tithe accounts from Sedgeford rendered smaller yields of oats, barley and peas, compared to the pre-Famine ones, meaning that we cannot compare the 1315-6 tithe roll to those later ones. The only extant pre-1320 tithe rolls from this manor is that of 1311-2 and 1318-9 and these are our only comparative sources. In other words, we receive only a partial and hardly satisfying picture on Sedgeford, represented in the following table:

Table 4.10: Tithe Grain Receipts on Sedgeford, 1311-2, 1315-6 and 1318-9.

(1). Grain Receipts in Quarters

Year	Wheat Receipts	Rye Receipts	Oats Receipts	Barley Receipts	Peas Receipts	Beans Receipts
1311/12	5.75	42.38	19.75	256.56	20.25	0.31
1315/16	2.25	34.50	23.00	233.00	25.25	0.13

1318/19	10.94	22.81	20.50	227.25	42.00	0.56
Average	8.34	32.59	20.12	241.91	31.12	0.44

(2). Percentage of the Average Year

Year	Wheat Receipts	Rye Receipts	Oats Receipts	Barley Receipts	Peas Receipts	Beans Receipts
1311/12	68.91%	130.01%	98.14%	106.06%	65.06%	71.43%
1315/16	26.97%	105.85%	114.29%	96.32%	81.12%	28.57%
1318/19	131.09%	69.99%	101.86%	93.94%	134.94%	128.57%

Sources: NRO, DCN 60/33/17, LESTR. IB/79, 80.

Notes: All figures are in standard quarters. The average is calculated for 'normal' years only. The percentage is of the average harvest (namely, for 1311-2 and 1318-9).

Incomplete as it is, this table reveals, nevertheless, a rather surprising picture, quite different from that of Eaton. Apart from low wheat and bean yields, there were notably good rye and oats harvests, while barley and peas output was close to that in 'normal' years. Determining the causes of this surprisingly good harvest lies outside the scope of the present study, but it might be sufficient to hypothesize that it was largely because of the fertile soil of Sedgeford-Gnatingdon, much superior to the sandy soil of Eaton. Perhaps, it also implies the regional differences between different parts of Norfolk and different degrees of bad weather and harvest failures. Whatever the true cause is, one thing was common in both estates: the harvest failure was especially pronounced in wheat sector.

Let us now turn to the third piece of evidence, the obedientiary rolls for 1314-5 and 1315-6. To repeat, these are an indirect source, since they do not inform us of grain harvests, but only of the quantity of wheat and malted barley sent to the Priory by the supplying manors. Again, a comparative approach is required to establish a more complete picture. The following table shows the quantity of grain sent to the Priory in

these years as a percentage of an average quantity sent in adjacent non-Famine years (1310-1314 and 1317-1322):

Table 4.11: Wheat Receipts of the Priory, 1310-1322, as a Percentage Relative to the Average Receipt in Non-Famine Years (The rubrics are for the Famine years (1314-1322))

Year	Denham	Eaton	Gateley	Gnatingdon	Hemsby	Hindolveston	Hindringham	Martham	Monks G	Newton	N Elmham	Plumstead
1310/11	84.15%		125.10%	85.25%	93.31%	90.91%	112.61%	81.66%		96.88%	61.80%	96.00%
1311/12			126.69%			119.77%		98.68%			127.85%	
1312/13					105.44%	125.54%		63.97%				112.17%
1313/14			76.49%		115.01%	124.82%		96.64%			120.40%	112.17%
1314/15		69.23%	89.24%		109.58%	105.34%	133.61%	84.39%		53.13%	87.37%	94.17%
1315/16	36.59%		94.02%	111.48%	63.74%	87.30%	131.72%	54.44%		77.34%	51.94%	69.39%
1317/18		115.38%	101.99%		86.80%	111.47%	133.61%	93.23%			121.46%	
1318/19	95.12%	115.38%	99.60%		125.85%	78.79%	95.80%	127.94%	116.52%	109.38%	134.25%	104.35%
1319/20								151.08%				93.91%
1320/21	120.73%	69.23%			88.97%			95.27%		93.75%	46.88%	81.39%
1322/23			70.12%	114.75%	84.63%	48.70%	57.98%	91.53%	83.48%		87.37%	

Sources: Accounts Database.

Notes: The percentage is relative to the average calculated for non-Famine years only.

Table 4.12: Barley Receipts of the Priory, 1310-1322, as a Percentage Relative to the Average Receipt in Non-Famine Years

Year	Eaton	Hemsby	Hindolveston	Hindringham	Martham	Monks G	Newton	N Elmham	Plumstead	Taverham
1310/11	171.55%	145.49%	61.74%	157.87%	126.17%	96.26%	72.99%	119.08%	97.85%	175.68%
1311/12	90.26%		86.35%	202.52%	89.47%	41.43%		92.39%		96.77%
1312/13	80.13%	123.76%	169.47%		141.03%				122.93%	160.79%
1313/14	84.74%	99.91%	130.33%	138.74%	109.18%	88.18%	81.96%	71.00%	82.49%	108.68%
1314/15	80.13%	109.40%		59.00%	102.43%	51.12%	105.38%	124.86%	26.97%	131.02%
1315/16	23.95%	99.35%	77.47%	25.51%	99.48%	99.87%	61.28%	106.40%	49.17%	70.72%
1317/18	41.45%	96.63%	49.63%	66.98%	73.70%	137.59%		107.72%		78.91%
1318/19	55.26%	96.66%	102.49%	12.76%	82.49%	65.19%	82.41%	109.81%	69.89%	65.51%
1319/20	211.50%	97.66%			118.28%	163.44%	143.43%		117.18%	125.06%
1320/21	114.90%	96.66%			115.25%	127.33%	119.21%		109.65%	78.91%
1322/23	50.20%	43.21%		21.13%	44.43%	80.58%				9.68%

Sources: Accounts Database.

Notes: The percentage is relative to the average calculated for non-Famine years only. The rubrics are for the Famine years (1314-1322)

Assuming that the grain receipts reflect the agricultural state of their producers, we may conclude two things from the tables above. First, in case of our manors and perhaps Norfolk in general, the crisis might have been regional, rather than general. Some estates seem to have been no less (and in some instances even more) productive than in non-Famine years, while some other manors were clearly hit badly by the disaster. Gnatingdon, for example, had sent as much as over 111 per cent of its average wheat dispatch, while Eaton could send no more than about 24 per cent of its regular supply of barley. Second, the Priory does not seem to have starved during the Famine years, since most manors managed to supply sufficient amounts of grain. It is true that some manors, like Denham, Easton and Plumstead, had obvious difficulty in feeding the Cathedral, but these were rather an exception than rule. This contradicts the notion that the Famine ravaged both the wealthy and poor.²¹³ It is unclear how the Priory withstood the challenge of the dearth and how most manors managed to feed it. In order to understand this puzzle, it is necessarily to look at other Norfolk (or East Anglian, in general) manors and see how they managed during the starvation period. This would make an interesting topic for a further research, which cannot be undertaken here.

Is it tempting to assume that the manors were actually sending almost all of their wheat and malt resources during the hardship years, as opposed to smaller proportions sent in normal years.²¹⁴ This might explain the fact that the Priory kept on receiving enough grain supply during the famine. The obedientiary rolls might provide a clue. The

²¹³ Henry S. Lucas, 'The Great European Famine of 1315-7', *Speculum* 5:4 (1930), p. 355; William Chester Jordan, *The Great Famine: Northern Europe in the Early Fourteenth Century* (Princeton: Princeton University Press, 1996), pp. 78-79.

²¹⁴ See above, p.

front side of each roll lists annual receipt of cash money received by the Priory from its estates, chiefly from grain, wool and wood sales. The 1314-5 and 1315-6 rolls do not show any sign of drop in financial receipts, indicating that the grain sale was ongoing.²¹⁵ The question is: to what degree? If we assume that a regular percentage of wheat and barley was sold during the famine years, then we would expect to see larger cash receipts, for the grain prices soared threefold and sometimes above it.²¹⁶ Since the 1314-5 and 1315-6 cash receipts are not higher than those of pre-famine years, it is quite likely that the manors sold relatively small proportions of grain, sending exceptionally large amounts of wheat and malted barley to the Priory. If this hypothesis is right, then it turns out that the Priory attempted to cope with the agrarian crisis by decreasing the grain proportion available for sale and increasing the amount sent for consumption by the monastic community. Unfortunately, the scarcity of evidence cannot prove whether this hypothesis is correct or not.

Conclusions

To conclude. The proportions of farinaceous receipts do not reflect the proportions of farinaceous acreage. The difference is determined by both the physical weight of each grain and climatic conditions. About 80 per cent of the total receipt was rendered in harvest, while the rest came in form of tithes, farm and purchases. Each grain was disposed of differently: almost half of wheat receipt was sent to Norwich, about 17

²¹⁵ DCN 1/1/24-25.

²¹⁶ On the prices in the famine years, see David L. Farmer, 'Prices and Wages', in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), pp. 735-737; William Chester Jordan, *The Great Famine: Northern Europe in the Early Fourteenth Century* (Princeton: Princeton University Press, 1996), pp. 49-59, 135-137.

per cent invested in seeding and around 20 per cent was sold; around one quarter of barley receipt was sown, about 16 per cent sold and further 30 per cent of barley was malted mostly for dispatching to Norwich (over 70 per cent; as opposed to about 10 per cent sold). The very few documents from the Famine years (1314-1317) reveal that the dearth had different impact on each manor; some manors seem to have suffered more (especially in wheat sector), while some others less. It is clear, however, that the monks were hardly starving, regardless of bad harvests: the grain supply of most manors was perfectly sufficient to satisfy the needs of the monks.

Chapter 5. Between Plants, Animals and Humans: Grain Transportation

Preliminary Remarks

As we have seen in the previous chapter, the grain harvest did not remain on the demesne. Much of it was sent to Norwich, to be processed and consumed by the monastic community, their servants and guests. In other words, the crops, mostly wheat and (malted) barley were loaded on carts and carted to the town. The crucial role in carting was played by the demesne horses, which served both as draught and carting animals, much preferred to the oxen. It is impossible to understand fully the issue of carting without looking at such factors as the equine population, its ratio to the bovine and human one, nutrition requirements of the horses and feeding patterns. The issue of carting itself, generally much neglected by both historians and economists, deserves special attention here. Furthermore, I shall look at the social and economic status of manorial carters, transportation costs and logistics.

Equine and Bovine Population on the Priory Manors

Obviously, the single most important carting animal was the horse. By the thirteenth century, horses played a crucially important part in English demesne economy, gradually replacing oxen in many regions, as John Langdon contends.²¹⁷ Our manorial

²¹⁷ John Langdon, *Horses*, 'Horse Hauling: A Revolution in Vehicle Transport in Twelfth- and Thirteenth-Century England?', *Past and Present*, no. 103 (1984), 37-66. See also Langdon's first-rate study on the subject: *Oxen and Technological Innovation: the Use of Draught Animals in English Farming from 1066 to 1500* (Cambridge: Cambridge University Press, 1986).

accounts contain very detailed ‘stock accounts’ (*compoti stauri / in stauro*), following and complementing the ‘granary accounts’ (*compoti granarii*), discussed above. The stock accounts record the total number of animals of each species: equine, bovine, ovine, porcine, as well as poultry. In terms of distribution of the animal population, in livestock units, horses constituted above 15 per cent of the total, with some exceptions (See Table 5.1).

Table 5.1 Distribution of Manorial Animals (Poultry Excluded), 1281-1370.

Decade	Equine	Bovine	Ovine	Porcine	Total
1281-1290	15.86%	52.76%	28.48%	2.91%	100.00%
1291-1300	18.23%	51.88%	26.96%	2.93%	100.00%
1301-1310	19.08%	52.50%	25.05%	3.37%	100.00%
1311-1320	14.58%	51.62%	29.85%	3.94%	100.00%
1321-1330	17.29%	44.79%	32.72%	5.20%	100.00%
1331-1340	12.13%	44.73%	39.20%	3.94%	100.00%
1341-1350	14.29%	49.67%	29.19%	6.85%	100.00%
1351-1360	12.73%	41.84%	39.75%	5.68%	100.00%
1361-1370	14.24%	56.54%	19.44%	9.79%	100.00%
Average	15.66%	50.02%	29.62%	4.70%	100.00%

Sources: Accounts Database.

Notes: The figures are calculated in livestock-units, rather than total animal heads. Livestock units = [horses x 1.0] + [(oxen + adult cattle) x 1.2] + [immature cattle x 0.8] + [(sheep + swine x 0.1]. See, Campbell, 2000, p. 178.

Each estate had a different specialization in animal rearing, and hence the distribution of stock differed from place to place. For instance, Sedgeford was strongly sheep-biased manor, famous for its wool production.²¹⁸ Its share of the total sheep population was about eighty per cent. It also herded sheep cooperatively with

²¹⁸ Naomi Morimoto, *The Sheep Farming of Norwich Cathedral Priory in the 13th and 14th Centuries*. Discussion Paper No. 2, Institute of Industrial Sciences, Nagoya Gakuin University (Seto City: Nagoya Gakuin University, 1977); Munro, John H., ‘Wool-Price Schedules and the Qualities of English Wools in the Later Middle Ages, c.1270-1499’, *Textile History* 9 (1978), 118-169.

Gnatingdon. The two adjacent manors, Hemsby and Martham, located on the eastern edge of the county, close to the coast, specialized in swine and poultry rearing, and their common share accounted for about forty per cent of total porcine and poultry population of the manors. Hemsby also had the largest bovine population (17.43 per cent of the total cattle on all the estates). The share of Sedgeford, Martham, Hindolveston and Hindringham had between ten and twelve per cent of the total cattle.

Obviously, not every equine and bovine head was a working (draught) animal. Only mature horses of both sexes and oxen performed ploughing and hence the tables above are only suggestive as far as the arable work goes. The following table (Table 5.2) establishes ratios within the working animals sector:

Table 5.2: Ratios within the Working Animals Sector on the Priory Manors, 1290-1370

1. Oxen per Ten Male Horses

Decade	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Denham	10.00	4.00	4.00						6.00
Eaton	8.52	6.67	7.38	8.50	6.67	0.00			6.29
Gateley	31.43	65.00		250.00		0.00			86.61
Gnatingdon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.04
Hemsby	12.69	11.25	14.07	11.59	15.00				12.92
Hindolveston	7.58	10.59	6.10	3.11		0.00	0.00	3.79	4.45
Hindringham	0.75	0.00	0.00	0.80		0.00		0.00	0.26
Martham	15.00	21.38	18.44	14.36	12.26	8.75	5.00	1.11	12.04
Monks G	6.96	9.29	3.85	4.25	1.36				5.14
Newton	9.00	6.52		12.73				0.00	7.06
N Elmham	1.25	0.00	0.00	0.87	0.00		0.00		0.35
Plumstead	8.46	7.27	9.00	8.95	12.59	8.50	0.26	0.00	6.88
Sedgeford	0.00	0.00	0.00	0.00	0.00	0.45	0.00	2.07	0.32
Taverham	12.86	12.14	11.25	14.87	12.38	4.29	0.00	0.71	8.56
Thornham	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Average	8.30	10.27	5.70	23.57	6.03	2.20	0.66	1.00	7.22

2. Oxen per Ten Mature Horses of Both Sexes

Decade	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Denham	10.00	4.00	4.00						6.00
Eaton	4.69	6.67	6.60	8.50	6.67	0.00			5.52
Gateley	14.63	10.83	10.01	10.87		0.00			9.27
Gnatingdon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Hemsby	10.18	9.00	14.07	11.59	15.00				11.97
Hindolveston	5.43	7.50	4.93	2.41		0.00	0.00	3.55	3.40
Hindringham	1.04	0.00	0.00	1.03		0.00	0.00		0.35
Martham	15.00	21.36	18.43	14.36	12.26	8.75	5.00	1.11	12.03
Monks G	6.96	9.29	3.85	4.25	1.36				5.14
Newton	8.18	5.56		9.33				0.00	5.77
N Elmham	1.25	0.00	0.00	0.87	0.00		0.00		0.35
Plumstead	8.46	7.27	9.00	8.95	12.59	8.50	0.26	0.00	6.88
Sedgeford	0.00	0.00	0.00	0.00	0.00	0.45	0.00	2.07	0.32
Taverham	10.58	8.10	11.26	11.72	12.35	4.28	0.00	0.55	7.36
Thornham	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Average	6.43	5.97	5.87	5.99	6.02	2.20	0.58	1.04	4.26

Sources: Accounts Database.

Clearly, horses outnumbered oxen and they constituted the principal draught power. The gradual fall of the oxen population and its virtual disappearance after the Black Death, shown on Table 5.2, is outstanding, even by Norfolk standards of the same time, where the horse population exceeded that of oxen, let alone the national level. As far as Norfolk is concerned, the county in general did not reach the ratio of 2.70:10.00 before 1400.²¹⁹ Nationally speaking, the oxen-to-horses ratio never went below 40.00:10.00 throughout the Middle Ages.²²⁰ The ratio calculated above was, by all means, not afforded by most religious institutions, let alone secular ones. This indicates

²¹⁹ Campbell, 2000, pp. 124-125.

²²⁰ Campbell, 2000, pp. 124-125.

that Norwich Priory was more precocious than the great majority of estates in its use of horses in agriculture.

These figures alone, however, might be of little, if any, significance and use. It is important to look at them against the data on the arable land, calculated in the previous chapters. The juxtaposition of the two sets of data, on the arable and the livestock, will enable us to calculate the livestock-to-arable ratio, knowledge of which is essential for our discussion (Table 5.3):

Table 5.3: Livestock-to-Arable Land Ratio on the Priory Manors, 1291-1370.

1. Data Represented in Actual Numbers

Decade	Average Demesne Acreage	Average Equine Units	Average Bovine Units	Livestock Combined
1291-1300	199.03	10.38	42.14	52.53
1301-1310	195.60	11.21	45.57	56.78
1311-1320	191.91	9.69	50.77	60.45
1321-1330	206.49	10.49	40.86	51.34
1331-1340	214.67	8.68	39.12	47.80
1341-1350	179.90	10.22	45.27	55.48
1351-1360	149.62	7.31	41.00	48.31
1361-1370	198.14	11.56	86.52	98.08
Average	191.92	9.94	48.91	58.85

2. Number of Animals per 100 Demesne Acres

Decade	Equine	Bovine	Livestock Combined
1291-1300	5.22	21.17	26.39
1301-1310	5.73	23.30	29.03
1311-1320	5.05	26.45	31.50
1321-1330	5.08	19.79	24.86
1331-1340	4.04	18.22	22.27
1341-1350	5.68	25.16	30.84
1351-1360	4.89	27.40	32.29
1361-1370	5.83	43.67	49.50
Average	5.19	25.65	30.84

Sources: Accounts Database.

Notes: The ratio is calculated on the basis of both immature and mature animals, of both sexes.

Just as with the arable acreage, the livestock population was subject to constant changes over the period under study. It was inevitable that the changes in arable reflected those in animals living and grazing on the same arable. For, it was the very nature of husbandry, known as ‘mixed’, that made cereals and livestock closely connected one with the other. This was a unique type of agriculture, known and practised only in northern Europe. For example, Mediterranean agriculture, because of its arid climate and infertile soil could not secure adequate supply of fodder grains and grassland and, consequently, had a smaller livestock element. As Jared Diamond contends in his influential monograph *Guns, Germs and Steel*, no other region of the world could enjoy the same advantage of the combination of domesticated animals and fertile soil.²²¹ As Joan Thirsk has demonstrated, the essence of the common field system of agriculture – reflecting the expansion of arable, with population, at the expense of pasture – was communal grazing of livestock on the post-harvest portion of the arable fields.²²²

The mixed husbandry created, certainly, favourable conditions for Norfolk agriculture. The first three decades under study (1290s, 1300s and 1310s) show a gradual, though insignificant, rise in the livestock-to-arable ratio, especially in the bovine sector. This trend might well reflect the rise in meat/diary prices between c.1290 and 1315.²²³

²²¹ Jared M. Diamond, *Guns, Germs and Steel: The Fates of Human Societies* (New York: W.W. Norton and Company, 1999).

²²² Joan Thirsk, ‘The Common Fields’, *Past and Present*, no. 29 (Dec. 1964), 3-25.

²²³ David L. Farmer, ‘Prices and Wages’, in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), pp. 809-810. As it appears, Farmer misdated most prices are by a full year, closely following Lord William Beveridge’s dataset, and hence my reservation from using it. Instead, I am relying on Prof. John Munro’s (yet) unpublished Database on Basket of Prices in England, 1264-1700. In his index, he converted the index numbers tabulated by Phelps Brown-Hopkins (see below) into actual

The 1320s demonstrate a fall from 31.50 to 24.86 livestock animals per 100 acres and there was a further slight fall in the next decade. This might be explained by both a fall in meat/diary price and the widespread murrain, ravaging the country between 1319 and 1321.²²⁴ The livestock population increased during the 1340s, but a true rise did not come until the 1360s. Again, it seems to have been tightly connected with the price movement in the meat / dairy sector: there was a pronounced rise between c.1340 and 1376.²²⁵ In other words, it is highly likely that the Priory administration sought to profit from the price movements and kept the livestock population and its ratio to arable land in accordance. Whenever the prices fell, the ratio decreased and vice versa. This closely resembles the same trend in the agricultural sector, discussed above, when change in the amount of total arable in hand reflected the price movements.²²⁶

Two possible (and contradictory) conclusions might be reached regarding the switch from mixed husbandry to pastoral farming on the Priory estates. First, if the conversion to pastoral husbandry occurred *immediately* after the Black Death, in the first years of the 1350s, then it does not necessarily also mean that the livestock population per acre increased *immediately* after the plague. It is likely that there were high mortality rates among the livestock between 1349 and 1352 and the surviving farmers failed to increase the amount of equine and bovine animals, which would be necessarily in converting to pastoral husbandry. Second, it is also possible that the switch to livestock farming did not occur *immediately* after the Black Death. Perhaps, it was not until the

prices (pence sterling). The dataset can be viewed on Prof. Munro's site (<http://www.economics.utoronto.ca/munro5/EngBasketPrices.xls>). Most recently, prices of many commodities were tabulated (in a very *longue durée*) by Gregory Clark, 'The Price History of English Agriculture, 1209-1914', *Research in Economic History* 22 (2004), 41-124; idem, 'The Condition of the Working Class in England, 1209-1914', *Journal of Political Economy* 113:6 (2005), 1307-1340.

²²⁴ Munro's Price Dataset (<http://www.economics.utoronto.ca/munro5/EngBasketPrices.xls>)

²²⁵ *ibid*

²²⁶ See above, Chapter 2, pp. 36-40.

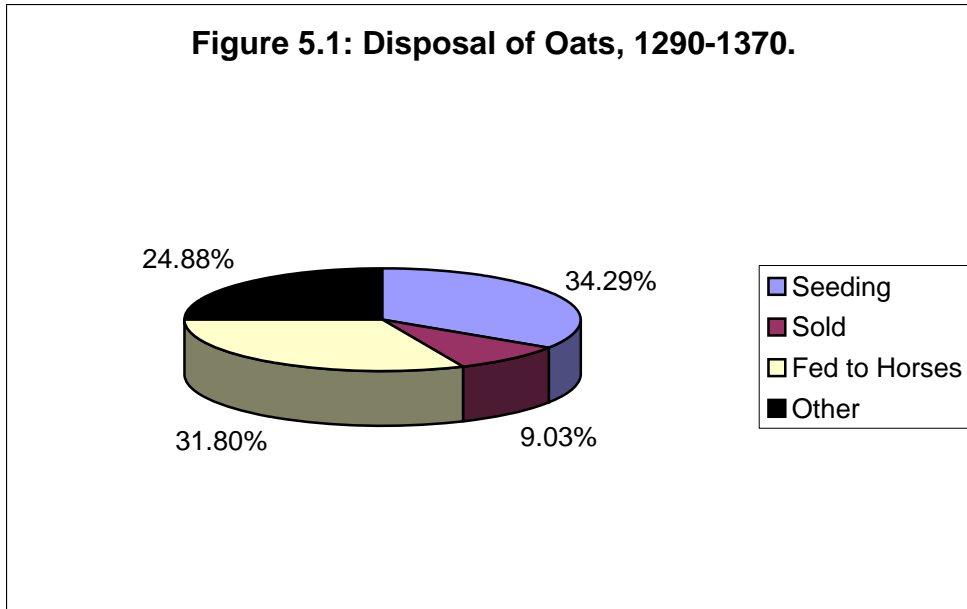
1360s that the Norfolk peasantry became fully adapted to the new, post-plague conditions. Both hypotheses, however, require more fundamental research, impossible to be undertaken here.

Fodder Disposal: Oats and Peas

In the previous chapter we have discussed the issue of wheat and barley disposal, for human consumption. Unlike these grains, oats and peas were, in most cases, animal (mostly equine) fodder, occasionally given to the manorial servants, *famuli*, but never consumed by the monastic community. The following pie-chart demonstrates average trends in the oats revenue disposal, between 1290 and 1370 (Figure 5.1). The oats revenue was disposed quite differently from wheat and barley revenue. As much as over 34 per cent was invested in seeding, compared to about 17 per cent of wheat and 25 per cent of barley.²²⁷ On the other hand, only 9.03 per cent was sold, compared to about 20 and 16 per cent of wheat and barley, respectively.²²⁸

²²⁷ See above, Tables 4.14. and 4.16

²²⁸ *ibid*



Sources: Accounts Database.

Notes: I have not included Heythe here, because its only account (1333/4) has all of its oats revenue invested in seeding and hence, may not be reflective.

As far as the consumption percentage is concerned, the data for oats resemble those for barley: around 30 percent of oats were fed to horses and nearly the same figure of barley was brewed (to be both distributed among the *famuli* and sent to Norwich for the monastic consumption), as opposed to about 50 per cent of wheat (sent to Norwich for the monastic consumption).²²⁹ The remaining 23.33 per cent were given as a feed for oxen, food for *famuli* (local labourers) and granted to various manors and individuals. Naturally, these figures varied from manor to manor, as indicated on Table 5.4:

²²⁹ See above, Figure 4.14

Table 5.4: Disposal of Oats on Each Manor, 1290-1370.

Manor	Seeding	Sold	Fed Horses	to Other	Total
Denham	15.08%	0.00%	46.02%	38.90%	100.00%
Eaton	27.18%	5.78%	41.92%	25.13%	100.00%
Gateley	46.55%	30.03%	3.91%	19.51%	100.00%
Gnatingdon	44.28%	17.37%	18.83%	19.52%	100.00%
Hemsby	31.18%	1.01%	37.86%	29.95%	100.00%
Hindolveston	37.14%	9.79%	25.58%	27.49%	100.00%
Hindringham	38.83%	14.70%	21.57%	24.90%	100.00%
Martham	35.30%	4.78%	32.66%	27.26%	100.00%
Monks G	28.76%	1.21%	52.57%	17.45%	100.00%
Newton	27.41%	3.49%	40.29%	28.81%	100.00%
N Elmham	14.86%	17.02%	24.51%	43.61%	100.00%
Plumstead	38.64%	10.62%	35.49%	15.24%	100.00%
Sedgeford	41.01%	10.92%	24.92%	23.15%	100.00%
Taverham	38.66%	3.62%	32.02%	25.71%	100.00%
Thornham	49.37%	5.12%	38.92%	6.58%	100.00%
Average	34.29%	9.03%	31.80%	24.88%	100.00%

Sources: Accounts Database.

Notes: I have not included Heythe here, because its only account (1333/4) has all of its oats revenue invested in seeding and hence, might not be reflective.

Some manors, such as Hemsby, Monks Grange, Newton and Taverham, sold a meagre percentage of total revenue, while Denham chose not to sell anything at all. Instead, they increased the share of the horse fodder. Gateley, on the other hand, allocated only under four per cent of oats to the horses, investing nearly half of its oats resources in seeding and selling around 30 per cent. This was undoubtedly affected by the small size of its equine population. Gateley was clearly an exception, since no other estate invested less than 18.83 per cent in feeding horses.

Although the patterns above reflect the rule, there were some exceptions. Oats were occasionally sent to Norwich, to be given to either the Priory horses, or *famuli*.

However, these were small quantities and rare occasions.²³⁰ As we shall see later, the Priory relied more on the market than on the direct supply of the manors, in the oat sector.²³¹ This grain was never brewed, with the exception of Hindringham in 1322-3, when 16 quarters of oats (out 80 quarters in total) were converted into ale.²³² It is unclear why the farmers of Hindringham brewed oats in 1322-23: the account roll from the same year does not indicate any deficit of barley ale on the estate.²³³

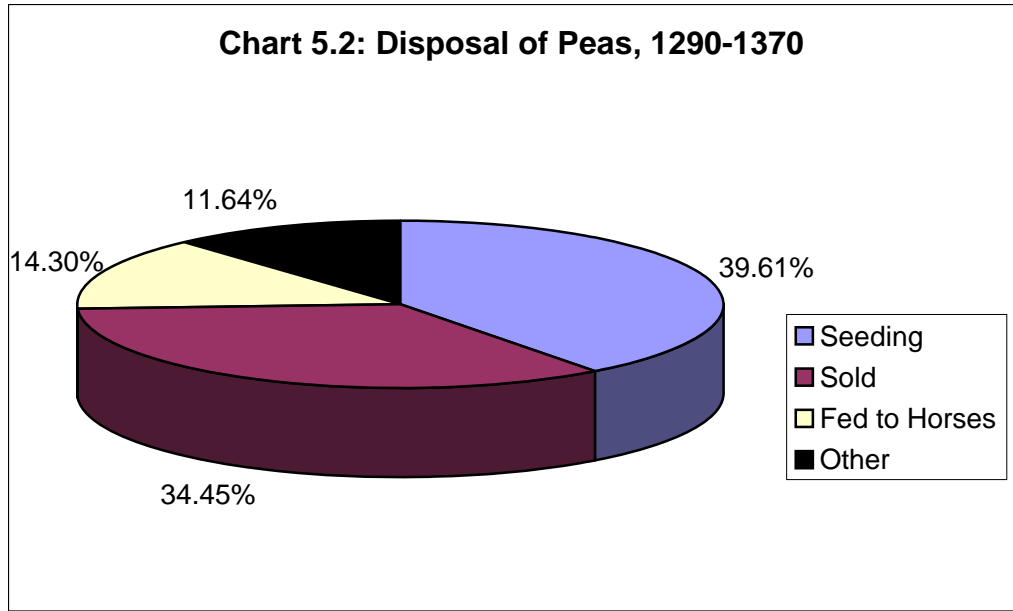
Let us now turn to peas (Pie Chart 5.7). Their disposal patterns were quite different from those of oats. On average, only about fourteen per cent were given as a feed to horses, compared to 31.80 per cent of oats. A significant proportion, over a third of the total, was sold, compared to a meagre nine per cent of oats. The seeding rates were higher than those of oats, and they were close to 40 per cent (compared to 31.80 of oats). The remainder, 11.64 per cent (compared to around 25 per cent of oats), was either given as a pottage to the *famuli*, or as a feed to oxen.

²³⁰ DCN 60/20/25,26; DCN 60/26/24; DCN 60/10/19,21; DCN 60/29/27; DCN 60/33/25; DCN 60/35/27, 29, 35.

²³¹ See below, Chapter 7

²³² DCN 60/20/21

²³³ DCN 60/20/21



Sources: Accounts Database.

Notes: I have not included Heythe here, because its only account (1333/4) has all of its peas revenue invested in seeding and hence, might not be reflective.

The regional patterns of pea disposal varied from estate to estate (Table 5.5). While Denham did not invest more than 17 per cent of the total revenue in seeding, Thornham devoted close 60 per cent to sowing. At the same time, Thornham (alongside Gnatingdon) had the lowest selling rates (above 11 per cent), while Hemsby sold close to two thirds of the total acquisition. Some manors (Hemsby, Monks Grange and Newton) invested next to nothing in fodder, while Gnatingdon, Sedgeford and Thornham gave close to 30 per cent of the total peas issue to their horses.

Table 5.5: Disposal of Peas on Each Manor, 1290-1370.

Manor	Seeding	Sold	Fed to Horses	Other	Total
Denham	16.93%	26.50%	7.58%	48.99%	100.00%
Eaton	53.24%	22.98%	12.86%	10.92%	100.00%
Gateley	36.12%	39.89%	13.59%	10.41%	100.00%
Gnatingdon	49.98%	11.58%	28.98%	9.46%	100.00%
Hemsby	25.54%	66.63%	1.38%	6.45%	100.00%
Hindolveston	32.58%	30.79%	12.13%	24.50%	100.00%
Hindringham	45.45%	24.71%	24.10%	5.74%	100.00%
Martham	42.52%	37.82%	8.83%	10.83%	100.00%
Monks G	34.01%	60.86%	0.53%	4.60%	100.00%
Newton	26.25%	60.74%	3.60%	9.41%	100.00%
N Elmham	35.13%	31.39%	22.52%	10.97%	100.00%
Plumstead	42.83%	46.38%	7.91%	2.88%	100.00%
Sedgeford	42.74%	18.48%	27.75%	11.03%	100.00%
Taverham	52.28%	26.58%	13.47%	7.67%	100.00%
Thornham	58.59%	11.42%	29.28%	0.71%	100.00%
Average	39.61%	34.45%	14.30%	11.64%	100.00%

Sources: Accounts Database.

Notes: I have not included Heythe here, because its only account (1333/4) has all of its oats revenue invested in seeding and hence, might not be reflective.

Just as oats, peas were sent to Norwich on several occasions.²³⁴ It is clear that in most cases they were fed to horses fresh and raw (unshelled), but two accounts from Plumstead (1324-5 and 1331-2) indicate that there were isolated cases when peas were turned into bread for the horses (*in pane stotorum*).²³⁵

The following table (Table 5.6) summarizes the disposal of all grains and legumes, except rye, on the Priory manors between 1290 and 1370:

²³⁴ DCN 60/28/6; DCN 60/29/7, 20; LEST IB/20.

²³⁵ DCN 60/29/20 and 23

Table 5.6: Average Disposal of Grain and Malt on the Priory Manors, 1290-1370.

Grain/Legume	Seeding	Sold	Fed / Sent to Norwich / Brewed	Other	Total
Wheat	17.02%	20.81%	48.51%	13.66%	100.00%
Oats	34.29%	9.03%	31.80%	24.88%	100.00%
Peas	39.61%	34.45%	14.30%	11.64%	100.00%
Barley	25.67%	15.94%	30.24%	28.15%	100.00%
Malt		9.76%	71.10%	19.14%	100.00%
Average	29.15%	20.06%	31.21%	19.58%	100.00%

Sources: Accounts Database.

Nutritional Requirements of Horses

John Langdon contended that ‘the distinction between horses for carting and horses for ploughing is a common convention in the accounts, especially in the south and east’.²³⁶ While this might be true in other regions, the Norfolk accounts I have consulted prove otherwise. Actually, the terms *equi* (cart-horses) and *stotti* (plough-, or draught-horses) are sometimes interchangeable in our manorial accounts. For example, the Sedgeford roll from 1300-1 states that 17.50 quarters of oats were given *in prebendum ii equorum manerii* (as fodder to two manorial *equi*), while the livestock account on the same roll does not list a single *equus*, referring to the horses as *stotti*, instead.²³⁷ Many such examples could be added here.²³⁸ In other words, our sources reveal quite clearly

²³⁶ John Langdon, ‘The Economics of Horses and Oxen in Medieval England’, *Agricultural History Review* 30 (1982), p. 33. See also note 217

²³⁷ LEST IB/16

²³⁸ DCN 60/33/14,20,22; DCN 60/14/11a, 12; DCN 60/20/15.

above. that the manorial horses functioned mostly as plough-horses, *which at times served also as carting horses*.²³⁹

Before discussing the actual process of carting of grain to Norwich and its logistics, we must establish approximate feed requirements for horses. Archaeozoological findings clearly indicate that the medieval farming horses used on English manors were smaller in their physical size than their modern descendents.²⁴⁰ Hence, it would be misleading to use the nutrition requirements of the modern horse as guidelines. It would be much more secure to rely on medieval authorities. Walter of Henley, writing in the late thirteenth century, suggested that if a horse works the whole day long, *li covent aver au meins la sime partie dun bussel la nuyt de avaine (it is appropriate to give [the horse] at least a sixth part of a bushel of oats for a night)*.²⁴¹ One sixth of the bushel (=0.17 of bushel) as a daily requirement means about 10,000 kilocalories (kcal), or 10.00 megacalories (mcal), if we assume that oats yield 60,336 kilocalories per bushel.²⁴² This closely corresponds to the estimated figure of Campbell and his colleagues, who suggested 11,000 kilocalories as a recommended daily intake for a late-medieval English horse.²⁴³ Hence, an average draught-horse horse might have required around 3.64 millions kilocalories (=3,640 mcal) a year.

²³⁹ Langdon indeed mentioned that 'there was some overlapping in function'. John Langdon, 'The Economics of Horses and Oxen in Medieval England', *Agricultural History Review* 30 (1982), p. 33

²⁴⁰ John Langdon, *Horses, Oxen and Technological Innovation: the Use of Draught Animals in English Farming from 1066 to 1500* (Cambridge: Cambridge University Press, 1986), Chapter 1; Chris Fern, 'The Archaeological Evidence for Equestrianism in Early Anglo-Saxon England, c.450-700,' in *Just Skin and Bones? New Perspectives on Human-Animal Relations in the Historical Past*, Aleksander Pluskowski (ed.) (Oxford: British Archaeological Reports, 2005), pp. 43-71.

²⁴¹ *Walter of Henley and Other Treatises on Estate Management and Accounting*, D. Oschinsky (ed.) (Oxford, 1971), p. 318. Translation from Old French is mine.

²⁴² See above, Table 2.9; Campbell et al., 1993, p. 41; Campbell, 2000, p. 215.

²⁴³ Campbell et al., 1993, p. 41.

Walter's suggestion, however, was far from being realistic: it was an unlikely task to feed horse with oats only, without peas and hay. As we shall see below, the draught-horses from the Priory estates were indeed given peas and hay in addition to oats. Keeping in mind the three main components of the equine feed, we must establish the nutrition values for each of them.

Our accounts specified the annual fodder allocation in bushels and quarters, namely in volume. One bushel of oats would contain 36 lb (=16.36 kg).²⁴⁴ Thus, 1,676 calories per pound make 60,336 kilocalories per bushel and 482,688 kilocalories per quarter. The conversion of peas is more problematic, for two reasons. First, dry peas render more calories than fresh raw ones, while our accounts do not indicate what kind of peas was given to the horses. It is likely, however, that these were dry peas, for two reasons. First, feeding the horses with fresh raw peas would mean immediate consumption, since it takes several days for peas to dry. Second, it would be more reasonable to feed them with dry peas, which contain over four times more calories than those in fresh shape. The other problem is our ignorance regarding the exact size of bushel of peas in the late Middle Ages. In any event, it should not have been too different from the modern bushel, containing 60 lb (=27.22 kg). of dry peas.²⁴⁵ On the basis of relative comparison between modern and medieval volume of grain (Table 5.10), I would propose the figure of 53 lb (=24.04 kg) per bushel of peas. If this figure is not far from reality, then one bushel of peas would yield about 68,900 calories (with 1,300 calories per pound), while one quarter would equal about 551,200 calories.

²⁴⁴ Campbell et al., 1993, p. 41; Campbell, 2000, p. 215.

²⁴⁵ For example, this is codified in State of Rhode Island Laws (Chapter 47-4 [Standard Measures] of Title 47 [Weights and Measures]).

*Table 5.7: Estimated Amounts of Pounds
per Bushel of Grain and Legumes*

Grain	Medieval	Modern	Relative
	53.00	60.00	0.88
Wheat			
Rye	51.00	56.00	0.91
Barley	46.00	48.00	0.96
Oats	36.00	32.00	1.13
Peas	53.00	60.00	0.88

Sources: Campbell et al., 1993, p. 41; Campbell, 2000, p. 215

Hay presents an even more difficult problem, since there is no indication as to the relation of pounds-to-bushel. On the other hand, it has been calculated that a pound of grain / grass hay yields around 750 calories.²⁴⁶ This fact will be an important guideline in the discussion below.

Hoping that these estimations might have been not too far from the reality, we can now convert the calorific requirements into bushels and quarters. An average daily requirement of a horse would be equal to either 0.17 bushel of oats, or 0.15 bushels of peas. In order to sustain one horse for a year, either about 7.74 quarters of oats, or about 6.60 quarters of peas would be required (Table 5.8):

²⁴⁶ *United States-Canadian Tables of Feed Composition: Nutritional Data for United States and Canadian Feeds, Third Revision* (Washington D.C.: National Academy Press, 1982), pp. 11, 37, 43 and 55. Although the accounts do not give any clue as to the nature of hay fed to the horses, it is likely that the latter consumed hay / straw of all grains grown on the Priory estates. Hence, I have calculated the average calorific value of wheat, rye, oats and barley hay. Conversion from kilograms into pounds is mine.

*Table 5.8: Estimated Calorific Requirements of Late-Medieval Horses**1. Calorific Values of Equine Fodders in Terms of Volume*

Product	Weight in lb per bus	Kcal per lb	Kcal per kg	Kcal per bus	Kcal per quarter
Oats	36.00	1,676.00	3,695.00	60,336.00	482,688.00
Dry peas	53.00	1,300.00	2,865.96	68,900.00	551,200.00
Hay	?	750.00	1,653.44	?	?

2. Daily Requirements of Horses

Product	Daily req. in bus	Daily r in lb	Daily r in kg	Daily r in kcal	Daily r in mcal
Oats	0.17	6.12	2.78	10,000.00	10.00
Dry Peas	0.15	3.63	3.52	10,000.00	10.00
Hay	?	13.33	6.05	10,000.00	10.00

3. Annual Requirements of Horses

Product	Annual req in bus	An r in lb	An r in kg	An r in kcal	An r in mcal	Annual r in q
Oats	61.88	2,227.68	1,010.48	3,640,000.00	3,640.00	7.74
Dry Peas	52.83	1,320.75	1,279.61	3,640,000.00	3,640.00	6.60
Hay	?	4,853.33	2,201.47	3,640,000.00	3,640.00	

Sources: United States-Canadian Tables of Feed Composition: Nutritional Data for United States and Canadian Feeds, Third Revision (Washington D.C.: National Academy Press, 1982), pp. 11, 37, 43 and 55; Campbell et al., 1993, p. 41; Campbell, 2000, p. 215.

Feeding Patterns on the Priory Manors

On the basis of the estimated calculations above, let us now attempt to detect patterns of horse feeding on the Priory estates and see how far they differed from Walter's suggestion to feed horses on oats alone. As noted above, each account roll specified both the number of horses and amount of feed, in oats and peas, given to them. Bringing these two pieces of evidence together enables us to reconstruct, roughly and approximately, the feeding patterns. First, the combined amount of oats (A) and peas (P) are converted into their calorific equivalent (Ac and Pc). Then this figure is subtracted

from 3,640,000 x n. The figure of 3,640,000 is an estimated amount of calories required by a horse, on the annual basis, while 'n' stands for a variable number signifying the number of horses at hand. The remainder equals approximately the share of hay and grass (H) component in the equine feed. The calculation, therefore, can be summarized in the following formula:²⁴⁷

$$H = 3,640,000 \times n - (Ac + Pc)$$

The results of these calculations, in percentage, are presented on the following table (Table 5.9)

Table 5.9: Feeding Patterns of Demesne Horses on the Priory Manors, 1290-1370.

Manor	Oats	Peas	Hay/Grass Total	
Denham	14.14%	4.54%	81.31%	100.00%
Eaton	10.55%	0.33%	89.11%	100.00%
Gateley	4.51%	2.24%	93.26%	100.00%
Gnatingdon	17.48%	10.56%	71.96%	100.00%
Hemsby	10.27%	1.73%	88.00%	100.00%
Hindolveston	20.25%	5.96%	73.79%	100.00%
Hindringham	15.97%	6.88%	77.15%	100.00%
Martham	11.28%	4.63%	84.09%	100.00%
Monks G	27.52%	0.15%	72.33%	100.00%
Newton	13.81%	1.00%	85.20%	100.00%
N Elmham	10.21%	1.99%	87.79%	100.00%
Plumstead	13.43%	2.32%	84.25%	100.00%
Sedgeford	21.52%	12.15%	66.33%	100.00%
Taverham	11.59%	1.91%	86.50%	100.00%
Thornham	8.02%	9.68%	82.30%	100.00%
Average	14.04%	4.41%	81.56%	100.00%

Sources: accounts database

²⁴⁷ The formula and its sigla are mine.

The largest component of the equine fodder was hay and grass. Oats accounted for approximately 14 per cent on average, with some exceptions, such as Gateley (approximately 4.51 per cent) and Monks Grange (about 27.52 per cent). It should be noted that the share of oats changed in the course of the decades under study, as illustrated on Table 5.10:

Table 5.10: Share of Oats in Equine Fodder, 1290-1370.

Manor	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Denham	14.09%	10.61%	17.74%						14.14%
Eaton	24.80%	16.87%	11.34%	5.51%	1.33%	3.47%			10.55%
Gateley	6.91%	1.93%	1.28%	2.45%		9.95%			4.51%
Gnatingdon	26.31%	17.09%	24.77%	14.12%	38.53%	6.60%	5.21%	7.23%	18.95%
Hemsby	14.75%	9.95%	11.66%	7.39%	7.61%				10.27%
Hindolveston	17.54%	9.32%	12.16%	17.61%		22.16%	33.15%	29.78%	18.66%
Hindringham	10.55%	9.88%	9.01%	4.59%		7.62%		54.15%	8.33%
Martham	17.77%	8.29%	9.05%	9.95%	9.51%	6.63%		17.77%	10.20%
Monks G	47.64%	39.55%	38.89%	9.41%	2.11%				27.52%
Newton	22.15%	13.94%		3.76%				15.38%	13.28%
N Elmham	30.87%	15.08%	2.87%	3.32%	6.50%		2.65%		10.21%
Plumstead	38.85%	14.01%	9.86%	13.35%	8.59%	8.25%	3.26%	11.27%	13.74%
Sedgeford	24.89%	30.67%	24.52%	21.55%	20.82%	40.77%	5.10%	3.82%	24.05%
Taverham	13.26%	11.84%	11.69%	11.80%	10.73%	11.57%	13.26%	8.56%	12.02%
Thornham	11.12%	9.95%	10.18%	14.79%		0.00%	2.07%		8.02%
Average	21.43%	14.60%	13.93%	9.97%	11.75%	11.70%	9.24%	18.50%	13.63%

Sources: accounts database

The general tendency between 1290 and the Black Death was to reduce gradually the share of the oats in fodder. This does not mean the converse tendency in the selling patterns: the selling rates were either reduced as well, or kept at the same level. It rather reflects the preference of the Priory's officials to give the oats supply to the *famuli*, rather than to horses. After the Black Death, we can detect two opposing trends. Some manors,

such as Gnatingdon, Plumstead and Sedgeford, cut the oats' share even further, while some others increased their share to the unprecedented levels. The most extreme example was Hindringham, on which oats equalled over 54 per cent of the fodder components. The share of peas, on the other hand, was more marginal, rarely exceeding ten per cent, and largely unchanged over the span of time.

Manorial Carters: Their Status, Identity and Duties

A crucially important role in maintaining horses and transporting the grain supply was played by manorial carters. They were not only middlemen between the manors and the town, but also key-figures in the network of the Priory's estates. Along with their obligation to cart the grain to the Priory, they also functioned as transporters of rural products to the market. These included not only grains and legumes, but also dairy products, poultry, game, fish, wood, stone and building materials. Who were these carters? Until now, their social status and identity has not received a proper attention of the scholars.

Our sources shed some light on social and economic status of manorial carters. Obviously, these were rural inhabitants and it is impossible to see them as a distinctive social group. In reality, these were ordinary peasants who were obliged to perform carting services for the Priory. In other words, the distinction between a farmer and carter is, sometimes blurred and the two terms might be overlapping in some cases. It should be noted, however, that most peasants were exempt from the carting service and it is unclear why some were obliged to cart for the Priory. It is likely that this was a customary

obligation imposed by the Priory upon their ancestors. The only exception was the manor of Eaton, where every tenant was obliged to carry the carting service.²⁴⁸

Our main source of information is the *Stow Survey*, discussed above. This document lists the tenants' names and also describes their holdings, customary dues and services. Thanks to this detailed survey, we can learn not only about the extent of the carting obligation of each carter, but also about his social and economic status on the eve of the fourteenth century.

The carting service, or arriage (*averagium*), was known in two main forms: as an individual obligation of a tenant, or as a collective burden of the entire manor. Far the most common form was the former. As just noted, apart from Eaton, no other estate had to carry the arriage duty collectively and this fact will be discussed below. There are no distinctive socio-economic features which served as criteria for the carrying service. Both poor and well-to-do peasants performed arriage. For instance, Nicholas *clericus*, a tenant from Eaton held as much as 28 acres of arable, three acres of meadow, 4.25 acres of heath and four acres of marsh, with his goods assessed at 6.8 s. and had to pay an annual customary payment (*ad auxilium*) of 12.50 d.²⁴⁹ Nicholas was certainly a very prosperous tenant by any standard. On the other hand, his neighbor, Benedict le Leche had no more than a cottage valued at 0.8 d. and was unable to pay any customary payment at all.²⁵⁰ An average size of a carter's holding in Eaton was 8.50 acres of arable, his possessions were valued at 2 s. and the amount of his customary payment was 5.50 d.²⁵¹ An average carrying tenant of Hindringham in the 1280s held 9.76 acres of land, paid around 8 d. as

²⁴⁸ 'Et omnes homines prioris de Etone cariabunt uj minas frumenti a Sechford usque Norwycum'. *Terrarium Prioratus* (British Library, MS Stowe 936), fol. 26r.

²⁴⁹ *Terrarium Prioratus*, fol. 23v.

²⁵⁰ *Terrarium Prioratus*, fol. 25v.

²⁵¹ Calculated from overall thirty holdings in Eaton. *Terrarium Prioratus*, fols. 23r-25v

an annual customary due, while his goods were assessed at 2.26 s.²⁵² Yet both tenants were obliged to cart. Unlike those in Eaton, not every Hindringham tenant was subjected to carrying obligations. Out of 111, or 113 surviving tenant names, 48 (that is, around 42 per cent) had to perform the arriage service.²⁵³ Hindolveston, on the other hand, had only one family performing the carrying duties (out of 128, in total).²⁵⁴ The tenants of Monks' Grangess, Newton, North Elmham, Plumstead, Sedgeford and Taverham were exempt from the arriage and it is unclear what was the situation in Denham, Gnatingdon, Gateley and Thornham.

The situation on Martham manor was far more complicated. Its extremely detailed survey provides a unique insight into chronological dynamics of the carter's office, as it depicts the state of affairs both c. 1200 and in 1292. Around 1200, there were only seven households (out of the total 108) responsible for carting. Because of demographic growth in the course of thirteenth century, its population grew more than threefold (there were 345 households by 1292)²⁵⁵ and its holdings were divided and subdivided further. As a result, we find as many as 45 household performing the carrying tasks in 1292.²⁵⁶ Needless to say, the holdings of these 45 carters were much smaller than those of their seven colleagues c.1200: on average, the latter possessed about 0.75 acres of arable land, while the former held about 5 acres each. The most typical example of the plot subdivision was the land of Thomas Knight. Around 1200, this peasant held 12.00 acres, while almost a century later his parcel was divided among eleven tenants.²⁵⁷ Hence,

²⁵² *Terrarium Prioratus*, fols. 23r-25v.

²⁵³ Calculated from around 100 holdings in Hindringham. *Terrarium Prioratus*, fols. 2r-8r.; British Library, MS. Add. 57973, fols. 1r-1v.

²⁵⁴ *Terrarium Prioratus*, fol. 10r.

²⁵⁵ See above, Table 2.2.

²⁵⁶ *Terrarium Prioratus*, fols. 37r-115v.

²⁵⁷ *Terrarium Prioratus*, fols. 39v-40v.

roughly speaking, the carters of Martham were the poorest. It is hardly surprising that the 45 carters had to carry the same customary amount of grain, malt, poultry and hay as their predecessors: after all, the population grew, the land did not. We shall return to the amounts and conditions later.

As is stated above, carters did not form any distinctive social group, since along with the carrying duties, they were burdened with multiple tasks – just as were most other peasants. For instance, Richard Raremere of Hindringham, in addition to his carrying duties, also had to plough and manure land, sow and reap crops, look after and render chicken and eggs, to thresh and weed grass, to stack grain sheaves (*cornbote*), and to malt barley.²⁵⁸ A certain Thomas of Hindringham, in addition to his carrying duties, was required to perform numerous other tasks, including serving as the bailiff (*prepositus*) of the same manor.²⁵⁹ The tenants occupying the land once belonging to Agnes Keneman in Martham had a choice of either carrying hens to Norwich or driving swine there.²⁶⁰ There are countless similar examples of tenants performing numerous agricultural and administrative tasks, apart from the carting service.

Perhaps the most striking thing is that the carrying obligations were not imposed on men only. For example, Alicia Lambert of Hindringham, who held four acres of arable land, assessed at 1.33 s., had to cart one load (*lod*, probably equal to one full carriage) of grain to the town each year.²⁶¹ Isabelle Pondermakere of Eaton, who had two acres of land, valued at just 0.42 s. (was she a widow?), was subjected to the arriage duties, just as

²⁵⁸ *Terrarium Prioratus*, fol. 2r.

²⁵⁹ *Terrarium Prioratus*, fol. 5r.

²⁶⁰ *Terrarium Prioratus*, fols. 53r-53v.

²⁶¹ *Terrarium Prioratus*, fol. 3v.

were her fellow-inhabitants.²⁶² This, however, does not mean that it was a common practice among women. First, there are too few such examples, just five in number. Second, one has to differentiate between the *duty* and *its execution*. It is unclear whether the physical task of carrying was actually performed by these women, or by someone else, perhaps by a male relative, friend, or wage-earner. It would be, however, too difficult to reach any definite *argumentum ex silentio*.

Equally puzzling is the fact that two churchmen are mentioned among the tenants subjected to the carting duties. One was Nicholas *clericus* of Eaton, whose wealth was already described. The other one was a shadowy William *capellanus*, who held 2.50 acres of arable in Martham c.1200 and whose plot was settled by four families in 1292. William's obligation was to carry the dominical hay down to the manor's bridge.²⁶³ Again, it is unclear if these clerics themselves performed the carrying job. One possibility is that these churchmen actually held their plots, along with their customary duties, from the Priory. Certainly, Nicholas *clericus* of Eaton was wealthy enough to afford to hire some layman to perform the carting task.

Now let us turn to the conditions of the carrying obligations. These varied both from family to family and from place to place. Eight families of Hindringham, holding between 0.22 and 4.00 acres of land each, had to carry hens to Norwich.²⁶⁴ Nineteen other households were prescribed to cart between one and two *lods* (presumably, full cart).²⁶⁵ Unfortunately, the survey does not specify what products were included in these *lods*. Several peasants of Hindringham were obliged to carry a coomb (half a quarter) of

²⁶² *Terrarium Prioratus*, fol. 25r.

²⁶³ *Terrarium Prioratus*, fols. 69r-69v.

²⁶⁴ *Terrarium Prioratus*, fols. 2r-8r.; British Library, MS. Add. 57973, fols. 1r-1v.

²⁶⁵ *Terrarium Prioratus*, fols. 2r-8r.

wheat, or malt to Norwich.²⁶⁶ One tenant, Richard Raremere, had to cart as much as 28 coombs a year.²⁶⁷ Clearly, he was an exception, rather than a rule. In Hindolveston, there was only one family in charge of carting. Its members, William, son of Ralf, his half-brother John, son of Simon and their common mother, Agnes, had ‘to cart, with their companions, demesne grain and malt to Norwich, until all of it will be carted completely’.²⁶⁸ In other words, they were burdened with carting the whole supply of wheat and malt to the Priory. The peasants of Eaton, on the other hand, had to carry their share of grain and malt collectively, namely the entire village community carted their demesne production.²⁶⁹

It should be noted that some carters were required to carry goods not just from their own manors. For example, all the tenants of Eaton were also obliged to carry six *mine* (=eighteen quarters) of wheat to Norwich and 21 carriages of peat (used as fuel) from Gidingheythe.²⁷⁰ Similarly, some villagers of Hindringham had also to cart grain to Hindolveston, the adjacent manor.²⁷¹

Not every household charged with carting had to perform its duty each year. For example, two tenants of Martham were obliged to cart every other year, while their three fellow-villagers had to carry every third year.²⁷² The most common carting term was Pentecost, which is hardly surprising. This feast falls between 10 May and 13 June,²⁷³

²⁶⁶ *Terrarium Prioratus*, fols. 2r-8r.; British Library, MS. Add. 57973, fols. 1r-1v.

²⁶⁷ *Terrarium Prioratus*, fol. 2r.

²⁶⁸ ‘*Av(er)are cum sociis suis bladu(m) et bras(eum) que fu(er)int de d(omi)nico ap(ud) Norwycu(m) donec totu(m) fu(er)it p(er)cariat(ur)*’.)*Terrarium Prioratus*, fol. 10r. Transcription, expansion and translation are mine.

²⁶⁹ *Terrarium Prioratus*, fol. 26r.

²⁷⁰ *Terrarium Prioratus*, fols. 25v-26r.

²⁷¹ *Terrarium Prioratus*, fols. 2r-8r.

²⁷² *Terrarium Prioratus*, fols. 53r-53v and 69r-69v.

²⁷³ A. Cappelli, *Cronologia, Cronografia e Calendario Perpetuo* (Milan: Ulrico Hoepli, 1969), pp. 35-105.

exactly when the wheat prices were at their highest.²⁷⁴ It was certainly profitable for the Priory authorities. Only one tenant was obliged to carry one carriage of malt in August, while another was requested to transport two carriages of grain in the Fall.²⁷⁵ At this time of year, the grain prices were still comparatively high, especially for barley and ale.

The carters did not perform their task entirely for free. Most were paid *ad cibum*, namely in food, served at the guest hall of the Priory (*in aula hospitum*), once the product was delivered. The extent of *ad cibum* varied from case to case. For instance, some carters from Martham would normally receive a gallon of ale and a loaf of bread.²⁷⁶ Richard Line of Hindringham was offered a loaf of bread and piece of cheese.²⁷⁷ The carters of Hindolveston were rewarded with bread and ale at the guest hall.²⁷⁸ The carters of Eaton going to Sedgeford for transporting its grain and ale to the town were served a supper (*cena*) there; upon their arrival at Norwich they received food and drink (*cibum et potum*) at the guest hall.²⁷⁹ For carrying 21 carriages of heath (used as fuel) from Gidingheythe, or nine carts of hay from Eaton to the Priory, each carter enjoyed two meals (*duo repastus*).²⁸⁰

Transportation Costs

Establishing and calculating transportation costs is by no means an easy and secure task. The sources indicating carting costs are too scarce to provide accurate data,

²⁷⁴ Campbell et al, 1993, pp. 199-202.

²⁷⁵ *Terrarium Prioratus*, fol. 3r.

²⁷⁶ *Terrarium Prioratus*, fol. 39v.

²⁷⁷ *Terrarium Prioratus*, fol. 3r.

²⁷⁸ *Terrarium Prioratus*, fol. 10r.

²⁷⁹ *Terrarium Prioratus*, fol. 26r.

²⁸⁰ *Terrarium Prioratus*, fol. 26r.

although there are some general rules laid out by some scholars.²⁸¹ Transportation costs varied from county to county and so far, I have found no references to Norfolk. Fortunately, there were no pronounced fluctuations in transportation costs, which remained virtually unchanged down to the eighteenth century, as James Masschaele has shown.²⁸² The best guideline to begin with is the sheriff's accounts for Essex for 1295-6 and 1296-7.²⁸³ I have preferred this county for two reasons. First, Essex was a part of East Anglia and the closest one to Norfolk, as far as the available accounts go. Second, similarly to Norfolk, this county had relatively a large proportion of horses as draught and cart animals.²⁸⁴ The Essex accounts give a mean of 0.35 d. to transport a quarter of wheat for a mile, or 0.22 d. for a kilometre.²⁸⁵ As we have seen above, by c.1300 a bushel of wheat weighed about 53 pounds, or 20.04 kilogram.²⁸⁶

The volume of malt bushel presents a greater problem. Malting increased the volume and lowered the density of barley, so that the weight of a bushel of malted barley would have been less than the weight of a bushel of barley, by about 25 per cent.²⁸⁷ If a bushel of barley c.1300 weighted 46 pounds, then its malted form would have been 34.50 pounds. Hence, its carting price would have been 0.23 d. per mile and 0.14 d. per

²⁸¹ Campbell et al., 1993, pp. 193-198; James Masschaele, 'Transport Costs in Medieval England', *Economic History Review* 46 (1993), 266-279

²⁸² James Masschaele, 'Transport Costs in Medieval England', *Economic History Review* 46 (1993), pp. 275-277.

²⁸³ Campbell et al., 1993, pp 193-194.

²⁸⁴ See above, Table 5.5.

²⁸⁵ Campbell et al., 1993, pp 193-194.

²⁸⁶ Masschaele prefers 48 lb. See, James Masschaele, 'Transport Costs in Medieval England', *Economic History Review* 46 (1993), pp. 270 and 278. His reckoning is, however, erroneous, in light of Campbell et al.'s discussion.

²⁸⁷ Campbell et al., 1993, p. 34, note 59.

kilometre. A single cart (*carecta, caretta*), pulled, as a rule, by three or four horses, could carry 3.0 quarters of wheat and 4.24 quarters of malted barley.²⁸⁸

On the basis of these estimates, we should take account of the following factors:

(1) Total transportation costs the Priory would have paid *had it not been a manorial lord and had it not possessed tenants performing the grain carting for free*; (2) The number of carts and voyages each manor would require to transport its cereal production to Norwich; (3) The hypothetical price change per mile / kilometre.

Each year, the Priory received a different amount of grain and malt from its estates. The actual numbers and the reasons for their variations will be discussed in length in Chapter Seven dealing with the Priory's reception and consumption of cereal products. For the purpose of the present chapter, I have converted the quarters and bushels into their transport cost equivalents in shillings. This can be obtained by using the following formula:

$$[Q_f \times T_f \times D] + [Q_b \times T_b \times D] = C$$

where (Q_f) stands for the quantity of wheat (f=*frumentum*) in quarters (sent to Norwich), (Q_b) for the quantity of malt (b=*braseum*) in quarters (sent to Norwich), (T_f) for the transportation costs of wheat (in quarters per mile), (T_b) for those of malt (in quarters per mile), while (D) is the distance from a manor to Norwich (in mile). (C) stands for cost-savings.²⁸⁹

Again, the results might be speculative, but not too far from reality. Table 5.11 illustrates the total profit in shillings for transporting the grain, namely approximately how much the Priory would have had to pay for carting its annual grain receipts.

²⁸⁸ Campbell et al., 1993, pp. 58-59; James Masschaele, 'Transport Costs in Medieval England', *Economic History Review* 46 (1993), p. 268.

²⁸⁹ Formulas and sigla are mine.

Table 5.11: Annual Cost Savings (in Pound of Sterling) for Carting Wheat and Malt from the Priory Estates, 1280-1370.

Manor	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Aldeby				0.02						0.02
Denham	0.35	0.54	0.16	0.33						0.34
Eaton	0.28	0.19	0.19	0.18	0.10	0.08	0.07		0.06	0.14
Gateley	0.49	0.43	0.36	0.43	1.25	0.26	0.12			0.48
Gnatingdon	0.89	1.44	1.28	0.45	1.65	5.40	0.51		2.16	1.72
Hemsby	12.22	14.38	14.47	11.49	7.90	11.16	5.17			10.97
Heythe						0.11	0.10			0.11
Hindolveston	1.95	1.39	2.48	3.00	1.69	1.80	3.54	0.84	1.14	1.98
Hindringham	6.92	5.50	3.56	2.43	1.68	4.57	3.06	0.58	1.21	3.28
Martham	3.97	4.16	4.37	4.08	3.88	3.58	1.63	3.09	1.49	3.36
Monks G	0.15	0.24	0.18	0.23	0.19	0.11	0.16			0.18
Newton	0.61	0.45	0.48	0.64	0.39	0.73	0.90		0.39	0.58
North Elmham	2.86	1.74	3.35	2.63	1.60	1.46	0.99	1.04		1.96
Old Catton						0.08				0.08
Plumstead	0.61	0.75	0.87	0.85	0.74	0.83	0.65	0.21	0.44	0.66
Raveningham				0.04						0.04
Sedgeford	1.23	2.75	1.57	0.54	3.80	3.61	0.16	1.55	1.94	1.91
Taverham	0.51	0.39	0.35	0.35	0.18	0.22	0.25	0.17	0.21	0.29
Thornahm	0.43	0.07			0.19			0.66		0.33
Total	33.46	34.41	33.67	27.68	25.25	34.00	17.32	8.13	9.04	28.43

Sources: Accounts Database.

Notes: I have included three additional manors, serving at some years as victual providers.

The financial profit varied both from decade to decade and from estate to estate. It was largely determined by both the amount of grain sent to the town and the physical distance between each manor and Norwich (Table 5.12). For example, Hemsby sent the largest amounts of wheat and barley, on the one hand, and it was also relatively a distant manor (17.40 miles=28.00 km), on the other. Gnatingdon and Segdford, among the most distant ones (36.23 miles=58.30 km), did not send nearly as much as Hemsby did and therefore their carting costs were significantly lower than those of Hemsby. Eaton,

located less than two miles away from the town, rendered small quantities of victuals and hence had much lower carting profitability.

Table 5.12: Distances and Transportation Costs from the Priory Manors to Norwich.

Manor	Distance (km)	Distance (miles)	Cost of wheat transportation to Norwich (in s per 1quarter)	Cost of malt transportation to Norwich
Aldeby	30.00	18.64	6.60	4.20
Denham	31.84	19.78	7.00	4.46
Eaton	3.00	1.86	0.66	0.42
Gateley	30.80	19.14	6.78	4.31
Gnatingdon	58.30	36.23	12.83	8.16
Hemsby	28.00	17.40	6.16	3.92
Heythe	8.00	4.97	1.76	1.12
Hindolveston	30.00	18.64	6.60	4.20
Hindringham	37.00	22.99	8.14	5.18
Martham	24.60	15.29	5.41	3.44
Monks G	3.00	1.86	0.66	0.42
Newton	3.00	1.86	0.66	0.42
N Elmham	27.10	16.84	5.96	3.79
Old Catton	3.30	2.05	0.73	0.46
Plumstead	8.20	5.10	1.80	1.15
Raveningham	21.10	13.11	4.64	2.95
Sedgeford	58.30	36.23	12.83	8.16
Taverham	8.70	5.41	1.91	1.22
Thornham	60.30	37.47	13.27	8.44
Average	24.98	15.52	5.49	3.50

Sources: Accounts Database.

Notes: I have included three additional manors, which provisioned the Priory in some years.

Calculation of carts used for transporting wheat and grain can be equally uncertain and misleading. As we have seen, Campbell and his colleagues calculated that on average, one cart would carry three quarters of wheat and hence we might assume that its malt equivalent would have been 4.24 quarters per cart.²⁹⁰ When it comes to the actual number of horses, the most obvious difficulty is the fact that there is not a single account

²⁹⁰ Campbell et al., 1993, pp 193-194.

from our estates that specifies the number of carts carrying the cereals. The external evidence, however, suggests that it was either three or four horses per cart.²⁹¹ Here, I have used the average figure of 3.5 horses per cart. Hence, the number of carts might be estimated by using the following formula:

$$\{ [Qf/3] + [Qb/4.24] \} = Qc$$

where (Qf) stands for the quantity of wheat (f=*frumentum*) in quarters (sent to Norwich), (Qb) for the quantity of malt (b=*braseum*) in quarters (sent to Norwich), while (Qc) means the total (estimated) amount of carts (*carecte*).²⁹² The estimation of horses used in transportation can be obtained by multiplying (Qc) by 3.5. The estimations are displayed on the following table:

Table 5.13: Estimated Number of Carts and Horses Used for Grain Transportation to Norwich (per Year), 1280-1370

1. Estimated Number of Carts

Manor	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Aldeby				0.24						0.24
Denham	4.00	6.29	1.79	3.83						3.98
Eaton	36.97	24.53	24.62	23.58	12.80	11.11	9.07	0.00	8.00	16.74
Gateley	5.88	5.17	4.29	5.13	15.67	3.08	1.38			5.80
Gnatingdon	6.04	9.53	8.57	2.97	10.89	35.59	3.22	0.00	14.16	10.11
Hemsby	168.98	198.03	199.70	157.83	108.08	152.49	139.43			160.65
Heythe						5.29	5.05			5.17
Hindolveston	24.10	17.32	31.32	37.69	21.14	22.77	44.86	10.57	14.57	24.93
Hindringham	71.12	56.65	37.18	24.89	16.79	46.81	31.60	5.77	12.00	33.65
Martham	62.09	65.31	68.85	63.79	60.24	55.67	25.30	48.90	22.33	52.50
Monks G	19.60	31.68	23.53	30.42	25.66	14.09	21.79			23.82
Newton	79.59	59.16	62.85	83.83	50.52	95.55	117.68		51.04	75.03
N Elmham	40.92	25.01	48.05	37.42	22.42	20.32	13.89	14.87		27.86
Old Catton						9.82	2.00			5.91
Plumstead	28.37	34.91	41.01	39.80	34.46	38.59	30.80	9.68	20.79	30.93
Raveningham				0.70						0.70

²⁹¹ Campbell et al., 1993, pp. 58-59; James Masschaele, 'Transport Costs in Medieval England', p. 268.

²⁹² Formulas and sigla are mine.

Sedgeford	8.05	18.37	10.64	3.58	25.57	24.13	1.00	10.04	12.64	12.67
Taverham	23.16	17.68	16.10	16.13	8.21	9.79	11.44	7.55	9.31	13.26
Thornham	2.60	0.40	0.00	0.00	0.17		0.00	4.00		1.02
Total	581.47	570.04	578.50	531.83	412.62	545.10	458.51	111.38	164.84	504.97

2. Hypothetical Number of Horses

Manor	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Aldeby				0.84						0.84
Denham	14.00	22.02	6.27	13.41						13.92
Eaton	129.40	85.86	86.17	82.53	44.80	38.89	31.75		28.00	58.60
Gateley	20.58	18.10	15.02	17.96	54.85	10.78	4.83			20.30
Gnatingdon	21.14	33.36	30.00	10.40	38.12	124.57	11.27		49.56	35.38
Hemsby	591.43	693.11	698.95	552.41	378.28	533.72	488.01			562.27
Heythe						18.52	17.68			18.10
Hindolveston	84.35	60.62	109.62	131.92	73.99	79.70	157.01	37.00	51.00	87.24
Hindringham	248.92	198.28	130.13	87.12	58.77	163.84	110.60	20.20	42.00	117.76
Martham	217.32	228.59	240.98	223.27	210.84	194.85	88.55	171.15	78.16	183.74
Monks G	68.60	110.88	82.36	106.47	89.81	49.32	76.27			83.39
Newton	278.57	207.06	219.98	293.41	176.82	334.43	411.88		178.64	262.60
N Elmham	143.22	87.54	168.18	130.97	78.47	71.12	48.62	52.05		97.52
Old Catton						34.37	7.00			20.69
Plumstead	99.30	122.19	143.54	139.30	120.61	135.07	107.80	33.88	72.77	108.27
Raveningham				2.45						2.45
Sedgeford	28.18	64.30	37.24	12.53	89.50	84.46	3.50	35.14	44.24	44.34
Taverham	81.06	61.88	56.35	56.46	28.74	34.27	40.04	26.43	32.59	46.42
Thornham	9.10	1.40			0.60		0.00	14.00		3.59
Total	2035.15	1995.14	2024.75	1861.41	1444.17	1907.85	1604.79	389.83	576.94	1767.40

Sources: Accounts Database.

Notes: I have included three additional manors, serving at some years as victual providers.

It is impossible to say what is the degree of error (or precision) in these calculations. In any event, it is clear that in most cases, more than one trip was required, since no manor had the dozens - and in some cases hundreds - of horses necessary to cart these large amounts of victuals.²⁹³ Moreover, maintaining such a large number of carts

²⁹³ For the horse population on the manors, consult above, Tables 5.3-5.6.

would have been a very costly affair. Unfortunately, there are too few accounts that specified how many voyages were undertaken by the tenants doing carrying services to complete their delivery of food. For example, the 1333-4 roll from Gateley indicates four horses (forming presumably one cart) carrying 13.63 quarters of wheat on three voyages.²⁹⁴ In Gnatingdon, nine horses carried 52 quarters of malt on four voyages in 1305-6,²⁹⁵ in 1327-8, unspecified number of horses carted 101.75 quarters of malt on six voyages,²⁹⁶ in 1344-5, 23 quarters of wheat were transported to North Elmham on three voyages,²⁹⁷ and finally, in 1362-3, 31.50 quarters of wheat were carted to Norwich on four voyages.²⁹⁸ In 1324-5, Hindringham carters carried 41.50 quarters of wheat to Norwich on four voyages.²⁹⁹ In 1355-6, it took the carters of Martham just one voyage to transport 33.50 quarters of wheat to Norwich.³⁰⁰ In 1317-8, the villagers of North Elmham had 47.75 quarters of wheat and 143 quarters of malt carted over to the town on just three voyages.³⁰¹

These statements do not provide any guideline for establishing an average number of carting voyages required for delivering foodstuffs. They do reveal, however, that it would normally have taken several trips to complete the carting service. Did the number of itineraries depend on each manor's availability to recruit enough cart horses? This brings us back to the issue of horse population, different on each estate. Presumably, the more horses that were on hand, the fewer trips would have been required. Perhaps, this was true in case of Gateley, Gnatingdon and Hindringham, where the total number of

²⁹⁴ DCN 62/2.

²⁹⁵ DCN 60/14/12

²⁹⁶ DCN 60/14/23

²⁹⁷ LEST/IC 43

²⁹⁸ LEST/IC 13

²⁹⁹ DCN 60/20/22

³⁰⁰ NNAS 5892 20 D1

³⁰¹ DCN 60/10/16

available horses was enough to cart the said quantities of wheat and malted barley. But this can hardly be true in the case of Martham and North Elmham. In 1355-6, there were only eight adult horses, while carting 33.50 quarters of wheat in one itinerary would have required around 39 horses. While North Elmham had just five horses, certainly less than enough to carry 47.75 quarters of wheat and 143 quarters of malted in three voyages (which would have required around 58 horses).

This discrepancy becomes even more evident when comparing the number of (adult) working horses on each manor to the amount of grain that each estate carted. A closer examination of our rolls reveals that the *amount* of carted cereals does not necessarily correspond to the *carting potential* of each manor. In other words, not every estate had enough equine power to cart its supplies to Norwich. Keeping in mind that each cart could haul 3.00 quarters of wheat and 4.24 quarters of malted barley and assuming that each cart was pulled by three, or four horses, we might estimate how many voyages would be required for each manor to undertake (Table 5.14).

Table 5.14: An Estimated Number of Voyages Required for Each Demesne Using Demesne Horses Only (in Annual Means), 1291-1370.

Manor	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1350	1351- 1360	1361- 1370	Average
Denham	3.24	0.92	1.97						2.04
Eaton	7.01	9.58	8.65	5.58	5.15	4.50			6.75
Gateley	3.89	1.84	2.55	10.84		7.07			5.24
Gnatingdon	2.48	2.23	0.78	2.93	9.66	0.69		4.85	3.37
Hemsby	38.16	31.93	33.61	22.82	33.46				32.00
Hindolveston	4.25	7.74	8.95	5.09		14.08	3.01	5.84	6.99
Hindringham	9.72	6.59	4.86	2.70		7.00	1.65		5.42
Martham	26.02	29.89	23.69	23.64	22.04	9.70	20.10	6.38	20.18
Monks G	14.46	11.77	16.32	11.14	8.82				12.50
Newton	18.05	15.45		10.99				9.26	13.44
North E	20.60	31.32	24.68	14.35	11.92		9.68		18.76
Plumstead	9.73	11.73	12.52	11.06	13.20	10.06	3.08	6.93	9.79
Sedgeford	4.56	2.65	0.92	7.49	5.44	0.19	2.98	3.36	3.45
Taverham	10.84	8.05	10.59	4.95	5.90	8.40	5.28	5.08	7.39

Thornham	0.35	0.00	0.00	0.92			5.14		1.28
Total	173.36	171.69	150.09	134.50	115.59	61.69	50.92	41.70	148.60

Sources: Accounts Database.

How was this deficit of carting power solved? Whenever some manor experienced a shortage of hauling power, its fellow-estates came to its help and provided their carting services. Our account rolls are full of various examples of such inter-demesne cooperation. We have already seen the example of Eaton, which was in charge in carting the grain from Sedgeford.³⁰² In the course of fourteenth century, its carters carried goods from and to Sedgeford, Hindolveston, Hindringham and North Elmham.³⁰³ Similarly, the peasants of Hemsby assisted their fellows from Hindolveston and Segdeford.³⁰⁴ The inhabitants of Newton and Taverham helped to carry goods from North Elmham,³⁰⁵ and there are many more examples.

Moreover, one should keep in mind that our accounts speak about the demesne horses only. There can be little doubt that some additional carrying done by tenants with their own animals as part of their carrying services. Because of our ignorance regarding the number of the tenant animals, however, we cannot speculate about the total amount of animals required to cart the annual supplies of wheat and malt to Norwich.

Finally, let us look at hypothetical price change per mile / kilometre. This can be calculated by dividing the transportation cost of bushel of wheat / malt (per one mile or kilometre) by its actual price in the market. For the purpose of this calculation, I prefer the Norwich prices set, as opposed to rural one, for three reasons. First, as opposed to the

³⁰² See p. 164 above.

³⁰³ DCN 60/10/9, 11a, 14, 17, 18, 19, 23 and 24.

³⁰⁴ DCN 60/15/5, 7 and 8.

³⁰⁵ DCN 60/28/4,5; DCN 60/35/17a, 18, 19

rural dataset, we have consecutive and complete data on the grain prices in Norwich, with quite a few gaps. Second, some manors used a heaped acre and bushel system and as a result, the reported prices were higher than in other places.³⁰⁶ Third, the final destination of delivery was Norwich, not the manors. The estimated price-change is illustrated below, on table 5.15:

Table 5.15: Carted Sums of Wheat and Malt, Their Prices, Transportation Costs and Hypothetical Price Change when Carted over 10 miles/km (in Annual Means).

1. Wheat

Decade	Quarters Carted	Wheat price (d/b)	Carting Cost of 1 bus. per 10 Miles (d.)	Carting cost over 10 miles	Carting Cost of 1 bus. per km (d.)	Carting cost over 10 km
1281-1290	573.87	8.62	0.44	5.07%	0.28	3.19%
1291-1300	555.66	9.09	0.44	4.81%	0.28	3.03%
1301-1310	496.62	10.52	0.44	4.16%	0.28	2.62%
1311-1320	519.59	11.93	0.44	3.67%	0.28	2.31%
1321-1330	494.55	13.54	0.44	3.23%	0.28	2.03%
1331-1340	638.24	8.08	0.44	5.42%	0.28	3.40%
1341-1350	472.81	10.41	0.44	4.20%	0.28	2.64%
1351-1360	126.28	12.11	0.44	3.61%	0.28	2.27%
1361-1370	220.71	10.13	0.44	4.32%	0.28	2.72%
Average	455.37	10.49	0.44	4.28%	0.28	2.69%

2. Malted Barley

Decade	Quarters Carted	Malt price (d/b)	Carting Cost of 1 bus. per 10 Miles (d.)	Carting cost over 10 miles	Carting Cost of 1 bus. per km (d.)	Carting cost over 10 km
1281-1290	1654.37	6.22	0.29	4.66%	0.18	2.89%
1291-1300	1631.73	7.75	0.29	3.74%	0.18	2.32%
1301-1310	1750.12	6.59	0.29	4.40%	0.18	2.73%
1311-1320	1520.61	7.46	0.29	3.89%	0.18	2.41%
1321-1330	1054.73	10.07	0.29	2.88%	0.18	1.79%
1331-1340	1409.12	6.66	0.29	4.35%	0.18	2.70%
1341-1350	1275.78	7.25	0.29	4.00%	0.18	2.48%
1351-1360	293.76	9.13	0.29	3.18%	0.18	1.97%
1361-1370	386.99	6.76	0.29	4.29%	0.18	2.66%
Average	1219.69	7.54	0.29	3.93%	0.18	2.44%

³⁰⁶ This problem is discussed in Bruce Campbell, 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *Journal of Economic History* 43 (1983), pp. 385-387.

Sources: accounts database; Norwich Price Dataset (see below, Table 7.23)

The significance of quarters and prices will be discussed in the next chapter, dealing with the monastic reception of the grains and their further destiny.

Transportation Logistics

What were the strategies undertaken by the Priory tenants in carting the annual supply of grain? Our information on this subject is rather fragmentary, because the definitive evidence comes solely from the Eaton portion of the *Stowe Survey*. As we have seen, every single peasant working on this demesne was obliged to perform carting services each year. The survey gives some interesting details regarding the carrying logistics. It states that ‘all the Prior’s men of Eaton shall carry six mines [eighteen quarters] of wheat from Sedgeford to Norwich. And they shall have supper for six men and fodder for six horses in Sedgeford for one night. Also, [they shall have] six sheaves of barley, or oats, in [North] Elmham [on their way] toward Norwich. And [they shall have] food and drink in the [guests’] Hall in Norwich for the men and hay for the horses’.³⁰⁷ Let us look closer on the environmental and road conditions between each destination.

There were approximately 25.50 miles (=41.04 km) between Segdeford and North Elmham. As some scholars have shown, an average hauling horse would make between

³⁰⁷ ‘om[n]es homines p[ri]oris de Etone cariabu[n]t uj minas frumenti a Sechford usq[ue] Norwyc[um]. Et h[ab]ebunt ap[ud] Sechford cenam uj hominu[m] et cibum uj equor[um] p[er] unam nocte[m]. Ite[m] ap[ud] Elmham u[er]s[us] Norwyc[um] uj garbas orde[i] uel auene. Et ap[ud] Norwycu[m] cibum et potu[m] in aula ad homines et fenu[m] ad equos’. *Terrarium Prioratus*, fol. 26r.

3.00 and 3.50 miles (=4.82 to 5.63 km) per hour.³⁰⁸ If these estimations are correct, then it might have taken the Eaton carters between approximately 7.30 and 8.50 hours to carry their grain supply (namely, eighteen quarters of wheat). This is, of course, excluded occasional shorter stops on the way. Late-medieval and early-modern maps allow reconstructing the actual itinerary in detail.

Having arrived at Sedgeford, around supper time, the Eaton carters unharnessed their horses, fed them with hay and received their evening meal. The expression *per unam noctem* implies that they spent the night at Sedgeford, having their supper and, perhaps, resting there. They probably commenced their voyage shortly before, or around, dawn. The obvious advantage of the early morning versus daytime journey is cooler temperatures.

Having exited Sedgeford, located in the north-east of Norfolk, the carters would have ridden two miles on narrow medieval road to the east, shortly merging into a Roman road, known as Peddar's Way.³⁰⁹ This road, commencing by the manor of Fring, would take the carters down towards Castle Acre. Before reaching Castle Acre, the carters would turn from Peddar's Way near Massingham Common, to take another medieval road. On their way to Massingham Commons, the Eaton peasants would pass the manor of Great Bircham, as well as the commons Anmer, Harpley, located right next to the road. The actual distance between Sedgeford and Fring is two miles, and between Fring and Massingham Common is 10.50 miles (=16.90 km), making it 12.50 miles (=20.12

³⁰⁸ Jacques Le Goff, *Medieval Civilization* (Oxford: Basil Blackwell), pp. 136-178; H. Elton, *Warfare in Roman Europe, AD 350-425* (Oxford: Clarendon Press, 1996), p.293; John Landers, *The Field and the Forge. Population, Production, and Power in the Pre-industrial West* (Oxford: Oxford University Press, 2003), pp. 83-84.

³⁰⁹ On this road, consult H. Haverfield, 'Romano-British Remains [in Norfolk]', in *VCHN*, pp. 302-303.

km). This means that it would take between 3.57 to 4.00 hours to reach Massingham Commons from Sedgeford.

From Massingham Commons the carters would take another road, stretching westwards down to Litcham intersection of southern and northern roads. At the intersection, they would take the northern one, passing through Litcham Commons, the Unigrain Grove, Mileham, Stanfield and Elmham Park, to North Elmham. The distance between the two points is about 13 miles (=20.92 km), meaning about 3.70 to 4.33 hours of travel. By the time they arrived at North Elmham, it must have been before, or around, the midday.

Having arrived at North Elmham, sometime around lunch time, they would receive six sheaves of oats or barley. This is rather puzzling, since the *Stowe Survey* neither specifies whether they received the grain for human or equine consumption, nor converts the sheaves into bushels. The 1332-3 *Memoranda Roll of the Exchequer* talks about *lx garbas avene, quorum v faciunt buscellum, unum quarterium et dimidium* (sixty sheaves of oats, of which five make a bushel, one quarter and a half).³¹⁰ Certainly, the Norfolk sheaves could well have rendered a different bushel equivalent, especially since some manors used customary measures, as opposed to the standard ones, used in Westminster, where the memoranda rolls were compiled. Nevertheless, the 1332-3 Exchequer roll provides an approximate clue, which shall be sufficient for our purpose. Six sheaves would equal around 1.20 bushels.

As we have seen, Walter of Henley suggested a daily intake of one sixth of the bushel per draught horse (around 1.02 bushels for six horses). Carting horses, however, would have required higher intakes. Hence, it is highly possible that these six sheaves

³¹⁰ Kew, *National Archives*, E368, 105 m. 39d.

were actually intended for the six carting horses of Eaton. Moreover, since the *Stowe Survey* does not mention the oats / barley conversion into bread / ale, we can conclude that the grain was served in its fresh, unprocessed form. The very term *garba* means a bunch, bundle of crop, bound after it was reaped.

From North Elmham, they would continue riding the same road westwards, through Billingford, until Bawdeswell, where the road splits into the northern and southern branches. Having taken its southbound branch, they made their way directly to Norwich, through Sparham, Attlebridge, Taverham, Drayton, Drayton Heath and Hellesdon. They would probably enter the city through Fye Bridge Gate (*porta de Fybrigge*, from c.1550 Magdalen Gate), take Fye Bridge Street (*Fybrigestrete*, *Fybriggegate*, from c.1700 Magdalen Street). Having crossed Fye Bridge across the Wensum river, the carters continued their way through Cook Street (*vicus cocorum*, from c.1845 Wensum Street) and shortly reached the Tombland, the western entrance to the Cathedral Close. They entered through St. Ethelbert Gate and reached their final destination, the Great Granary. The distance between the manor of North Elmham and the Great Granary is around 17.15 miles (=27.60 km).

The Rationality of Inland VS River Transportation

The case of the Eaton carters leaves one wondering why the Priory authorities preferred inland transportation, instead of relying on the supposedly much cheaper and faster river transportation. After all, the manors were either located close to the river, or had an easy access to it. A number of facts, however, can explain why it was more profitable and even rational for the Cathedral authorities to recruit carters, rather than

boatmen. First, carting was a mandatory service rendered by the estate tenants, and the Priory did not participate in the transportation costs. As we have seen above, the monastic community did not *pay* for it, but *saved* on it. Second, the accounts of the Master of the Cellar reveal that boatmen's wages were higher than those of carters, at least in the pre-Black Death age.³¹¹ And finally, and perhaps most importantly, boatmen, as opposed to carters, were professionally trained workers. After all, nearly every peasant could cart, but not use a boat. Hence, it must have been more profitable for the Priory to have 'free' carting service, with all its apparent drawbacks, rather than pay additional wages to the boatmen, who could have transported the grain supply much faster than the carters.

Conclusions

It is impossible to understand the agrarian policy of Norwich Cathedral Priory without looking at the livestock reared on its estates. The bovine population was certainly dominant, but the draught horses easily outnumbered the oxen. There were many more horses per acre in Norfolk than in any other county in England. The conversion to pastoralism following the Black Death increased the number of cattle and horses, especially in the 1360s. In order to improve the equine diet, the Priory authorities added a considerable amount of oats and peas, besides hay and straw. The manorial carters did not form any distinctive socio-economic group, because there was unequal distribution of wealth among them. Beside their carrying duties, they performed a wide range of additional tasks. It was only in Eaton that every tenant had to fulfill the carting custom, while in other estates, only certain families had to do so. Enjoying (virtually) free (except for food and drink to be supplied) and customary carrying service, the Priory authorities

³¹¹ For carters' and boatmen's wages, see below, Chapter 6.

saved a great deal of money each year. In order to avoid any payment in cash, they preferred the inland transportation over the (potentially faster and more convenient) river one. The case of the Eaton carters reveals that the logistics of transportation were carefully planned by the Priory. To avoid a potential hot weather, the carters began their voyage around the dawn. In the middle of their journey, they stopped in another estate to rest and to feed their horses, after which they hastened to the town.

Chapter 6. Space for Supply: Granary, Bakery, Brewery and Mill

Cathedral Granary and Storage Costs

A crucial role in storing and preserving the grain was played by the Great Granary of the Cathedral, to be distinguished from the Almoner's Granary, which will be discussed later. The former was located to the East of the Holy Trinity Cathedral proper and the cloister, in a square known as Brewer's Green. Its topographical location was convenient for both the brethren and carters: the two buildings immediately to the East were the bakery and brewery, while the monastic stables stood right in front of the granary (Figure 6.1).³¹² The granary was a three-storey flint building with a lead roof, about 35 meters in length, eight in width and seven in height.³¹³ Miscellaneous fifteenth-century accounts indicate that it was locked with a padlock.³¹⁴ Furthermore, it was decorated with a wall painting of a crown of thorns with the monograms of 'HIS' and 'Maria'.³¹⁵ In the fifteenth century the granary also served as a warehouse for the sacrist's mattresses and bedding.³¹⁶ After the Dissolution, the site was converted into residential houses, numbers 51 through 55. Number 53 (Dial House), collapsed in 1904, to be rebuilt

³¹² It is interesting to note that nowadays there is a car parking in the place of the stables.

³¹³ Ian Atherton, 'The Close', in Ian Atherston et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), p. 655 (Fig. 213); Barbara Dodwell, 'Monastic Community,' in Ian Atherston et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), p. 235 (Fig. 114)

³¹⁴ For instance, *DCN* 1/1/79.

³¹⁵ A. B. Whittingham, 'The Development of the Close since the Reformation', in *The Parliamentary Survey of Dean and Chapter Properties in and around Norwich in 1649*, G. A. Metters (ed.), Norfolk Record Society 51 (1985), p. 114.

³¹⁶ Claire Noble, *Aspects of Life at Norwich Cathedral Priory in the Late Medieval Period*, Thesis (PhD), University of East Anglia (Norwich: University of East Anglia, 2001), p.128.

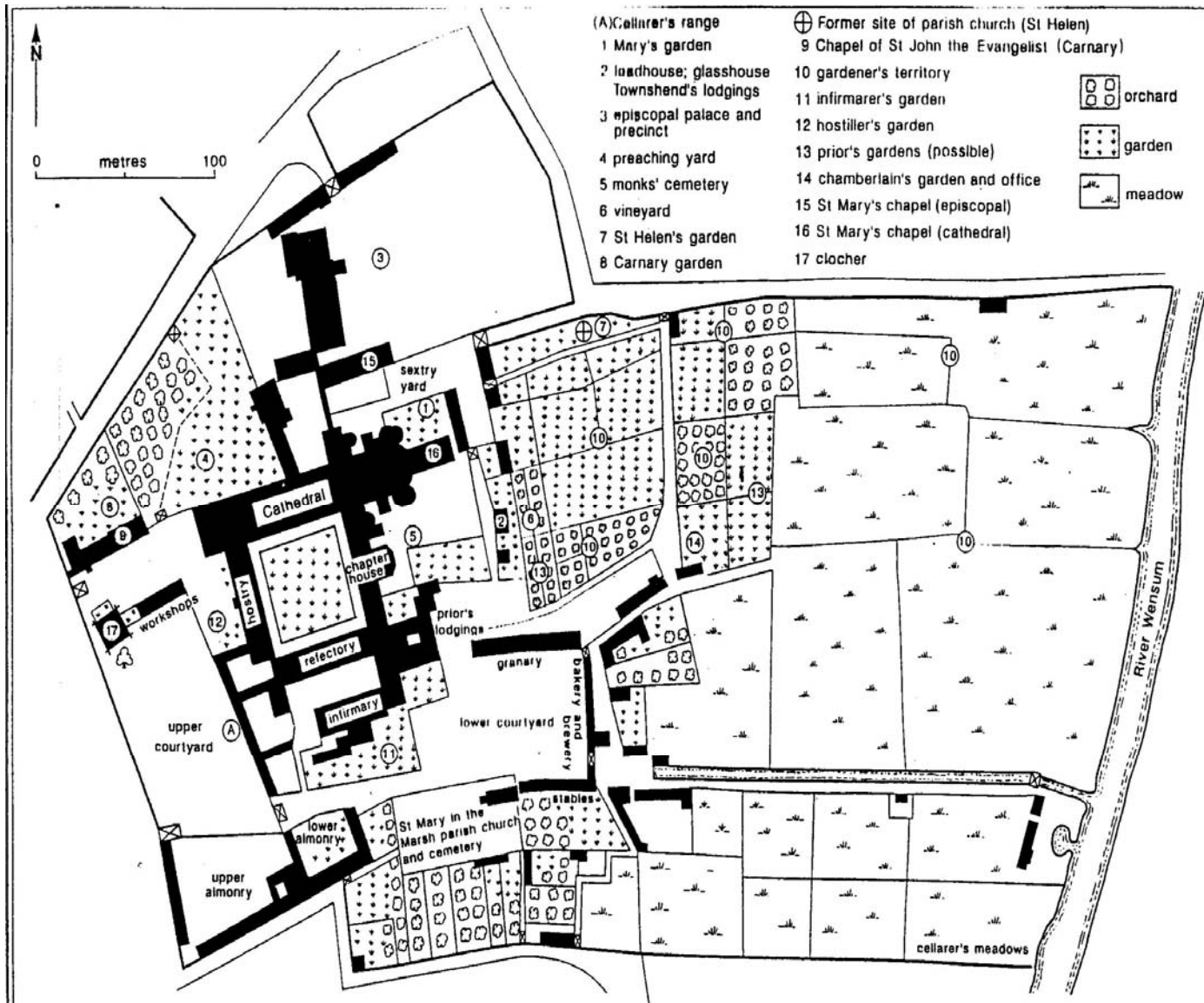


Figure 6.1 Norwich Cathedral Priory Precinct.

Source (reproduced from): Claire Noble, *Aspects of Life at Norwich Cathedral Priory in the Late Medieval Period*, Thesis (PhD), University of East Anglia (Norwich: University of East Anglia, 2001), p.128.

a year later.³¹⁷ It is quite possible that the original granary, which pre-dates the period of our study, was of more modest proportions, built of timber. Archaeological evidence proves that the granary was built on a thirteenth century arcade, no later than c.1250.³¹⁸ In 1369-70 no less than £27 were spent *in gr[a]ngi[i]s de novo rep[ar]at[is] et in aliis rep[ar]ac[i]o[n]ib[us]* (on newly repaired granaries in other reparations).³¹⁹ The Master of the Cellar was both the *de jure* and *de facto* master of the granary, for it was he who decided how to dispose and distribute the grain supply. But he was not the only person in charge of the granary and its resources.

No less important part was played by another monastic official, the granarer, or keeper of the granary (*granarius*). Not much is known about the nature of this office, its status, duties and responsibilities. The contemporary evidence suggests that unlike other monastic officials, the granarer could well have been a lay officer. For instance, William Bauchun, the Priory granarer in the 1290s is known to have been a lay person, who must have resided within the Cathedral precinct with his wife, Magdalen.³²⁰ Perhaps the most striking thing about this person is the fact that he was a renowned and wealthy merchant of the town, as well as an ardent patron of the Holy Trinity Cathedral. He is credited, among other things, with the rebuilding of one Cathedral chapel, destroyed by the enraged townsfolk during the riot of 1272. This chapel became to be known as Bauchun

³¹⁷ Ian Atherton, 'The Close', in Ian Atherton et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), p. 655.

³¹⁸ A. B. Whittingham, 'The Monastic Buildings of Norwich Cathedral', *Archaeology Journal* 106 (1949), p. 87; Claire Noble, *Aspects of Life at Norwich Cathedral Priory in the Late Medieval Period*, Thesis (PhD), University of East Anglia (Norwich: University of East Anglia, 2001), p.128.

³¹⁹ DCN 1/2/23. Transcription, expansion and translation are mine.

³²⁰ Barbara Dodwell, 'William Bauchun and his Connection with the Cathedral Priory at Norwich', *Norfolk Archaeology* 36 (1975), p. 114; Ian Atherton, 'The Close', in Ian Atherton et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), p. 635.

Chapel.³²¹ After Bauchun's departure from this office, we are virtually ignorant regarding this shadowy official. All we know is that this office was held in the 1350s and 1360s by a certain Roger de Langelee, of whom very little is known. This name appears in a 1337-8 roll, as *dominus*, receiving a gift of 2s. from the priory.³²² It is uncertain whether Roger actually came from Langley, or he just bore a toponymic surname, which he inherited from his forefathers.³²³ If my identification of Roger de Langelee from the 1337-8 with the keeper of the granary in the 1350s and 1360s is correct, then it might turn out that this office was destined for a person of a high social rank. It should also be noted that the Holy Trinity Priory might have had some ties with Langley, Norfolk, and particularly with its Premonastratensian abbey. There was at least one more official with the same toponymic surname, Robert de Langelee, or Langley, who was the Prior between 1310 and 1326. In 1336, the envoys of the abbot of Langley were sent to Norwich Priory.³²⁴

The language of the manorial rolls mentioning Roger de Langelee, however, might be somewhat suggestive. As a rule, the text says *Liberatum Rog[ero] de Langelee granar[i]o u[ersus] Norwic[um]* (delivered to Roger de Langelee the granarer, at Norwich).³²⁵ This reveals that it was the keeper of the granary, who was actually in charge of *receiving* the loads of grain, once carted from the manor to the Cathedral Close. It is rather surprising that the keeper of the granary does not appear in the rolls among

³²¹ Martial Rose, 'The Vault Bosses', in Ian Atherston et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), pp. 373-375.

³²² DCN 1/1/38, fol. 14v.

³²³ On the toponymic surnames debate, see Richard W. Emery, 'The Use of the Surname in the Study of Medieval Economic History,' *Medievalia et Humanistica* 7 (1952), 43-50; Robert S. Lopez, 'Concerning Surnames and Places of Origin,' *Medievalia et Humanistica* 8 (1954), 6-16; Richard W. Emery, 'A Further Note on Medieval Surnames,' *Medievalia et Humanistica* 9 (1955), 104-106; Benjamin Z. Kedar, 'Toponymic Surnames as Evidence of Origin: Some Medieval Views,' *Viator* 4 (1973), 123-129.

³²⁴ DCN 1/1/38, fol. 8r.

³²⁵ For instance, DCN 60/35/41.

other officials receiving a stipend or livery directly from the Master of the Cellar, since it was the latter to whom the former was subordinated.

Another interesting detail emerges from the Master of the Cellar rolls. These attest that prior to 1359-60 the keeper of the granary did not receive a salary (*stipendium*), as some other officials did. He received some modest gifts (*donaciones*) here and there, but these were rather rare instances. For example, in 1309-1310 he received 6s 8d and in 1320-21 he was given 1s.³²⁶ The situation changed after the Black Death and ever since 1359 the keeper of the granary received a steady annual stipend of 10s a year.³²⁷ Clearly, this was much below the average nominal wages of the post-Black Death era, when an average worker earned 1.5d. a day, while an average master received daily wage of 2d.³²⁸ This means that the remaining income of the keeper of the granary undoubtedly came from elsewhere and if my view of his high social class is correct, then it would probably derive from either his mercantile activities or landed estates. However, a more profound analysis is required: which is based on a more solid documentation, than is now unavailable.

Even less is known about the Almoner's Granary. We shall see later that in addition to annual liveries of bread for the poor on Maundy Thursday, the Almoner had his own supply of grain, deriving from both his appropriated manors and purchases, allocated to the needy.³²⁹ To avoid confusion between the Master of the Cellar's supply and that of the Almoner, an additional granary was required, known as the Almoner's

³²⁶ DCN 1/1/21 and 28.

³²⁷ DCN 1/146-51.

³²⁸ For wages in fourteenth century England, see David L. Farmer, 'Prices and Wages', in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), pp. 760-772. Since Farmer's data is misdated by a full year, I prefer to use Munro's index (obtained from Prof. Munro's website : <http://www.economics.utoronto.ca/munro5/EngBasketPrices.xls>)

³²⁹ See above, Chapter Nine.

Granary (Close buildings nos. 3-4). It is unclear when this granary was built, but it is first mentioned in the Almoner's roll from 1339-40.³³⁰ It is known to have been located in the south-west part of the Close, just by Ethelbert Gate. Just as the Great Granary, the location of the Almoner's Granary was very convenient for its purpose. First, it stood right between the Almonry and the Almoner's house (Figure 6.1). Second, its proximity to the entrance to the Close meant fast delivery to the poor begging just outside Ethelbert Gate. The Almoner's Granary was demolished sometime after the Dissolution and in 1701 two residential houses were built on its site by Jeremy Vynn, alderman and mayor of Norwich, and his wife Susan.³³¹ The granary occupied a large site, certainly no smaller than that of the Great Granary, even though it contained rather modest quantities of grain. The Almoner's Granary was served by its own keeper, about whom very little is known. In 1309-10, 36s. were spent on purchasing new robes for several monastic officials, the keeper of the granary included.³³² The 1328-9 and 1339-40 rolls also mention that the keeper of the granary received annual wages of 6s. 8d,³³³ but these were the only accounts to mention his wages. The same rolls do not mention his annual livery, or salary, as opposed to some other servants. Can we conclude, then, that the Keeper of the Almoner's Granary, unlike that of the Great Granary in the 1290s, was himself a monk, living within the Cathedral Precinct?

Granaries were yet another important form of capital, because it allowed grain to be stored before it was eventually sold, or turned into a secondary product, such as bread, or ale. Merchants not owing their own granary had to rent one for some period. As the

³³⁰ DCN 1/6/12.

³³¹ Ian Atherton, 'The Close', in Ian Atherton et al. (eds.) *Norwich Cathedral: Church, City and Diocese, 1096-1996* (London: The Hambledon Press, 1996), p. 639.

³³² DCN 1/1/21.

³³³ DCN 1/6/10 and 12.

contemporary evidence shows, to store 100 quarters of grain in a London granary would have cost about 5d. a week (£1 1s. 8d. a year) around 1300, and 1.7d. around 1340 (7s. 4d. a year), when the capital's property prices fell.³³⁴ It might be inwise to use these figures for estimating the storage costs of grain at the Cathedral Priory, especially since no similar data from Norwich can be found, for either period. On the other hand, the fall in property prices was a national phenomenon and Norwich was not likely to have been an exception in this matter. Hence, the London data can provide a general and approximate idea how much the Priory saved each year, owning its own granary. In the 1290s the Master of the Cellar received on average 3,512.22 quarters of grain, while in the 1340s the manors shipped 2,768.50 quarters of cereals.³³⁵ Using the London prices, we arrive at approximately £ 38.05 a year in the 1290s, and £ 10.20 in the 1340s. The storage costs in the 1290s would have been about 7.23 per cent of monetary value of the total stored grain, while those in the 1340s would have represented about 2.23 per cent of the granary resources (Table 6.1):

Table 6.1: Grain Resources, Their Financial Equivalent and Estimated Storage Costs.

Period	Total Grain in Granary (Quarters)	Its Financial Equivalent (in £ Sterling)	Estimated Storage Costs (in £ Sterling)	Estimated Storage Costs as % of Financial Equivalent of Grain
1291-1300	3535.72	843.65	38.05	4.51%
1341-1343	2818.50	721.19	10.20	1.41%

Sources: Campbell et al., 1993, pp. 100-102; Accounts database.

Notes: The prices used here are those of Norwich.

³³⁴ Campbell et al., 1993, pp. 100-2.

³³⁵ See below, Chapter 7.

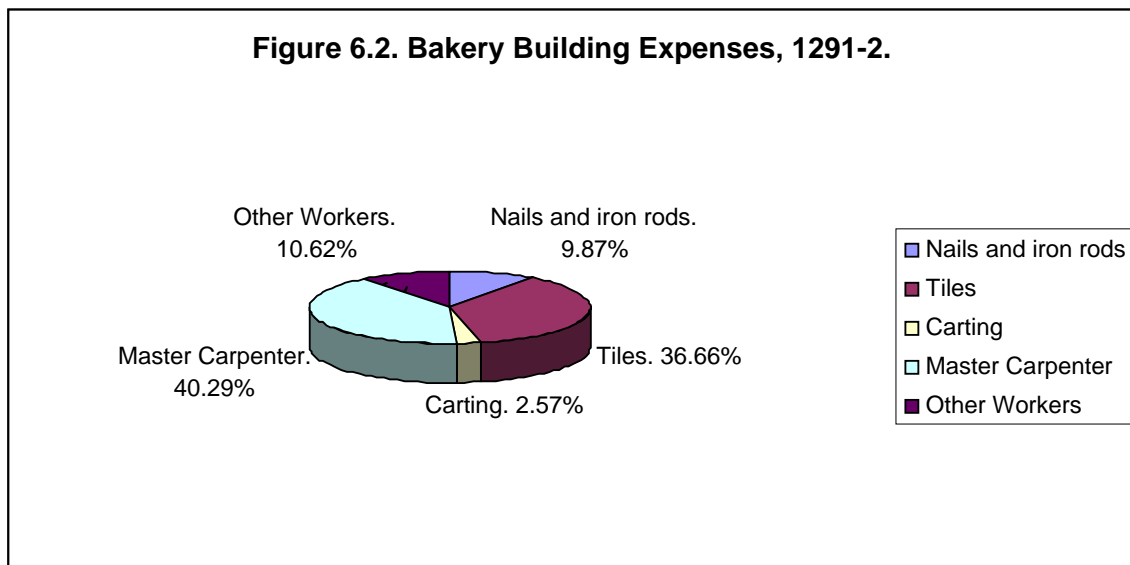
Were granaries costly? The table above suggests otherwise. Even when the property prices were at their highest, as they were in the 1290s, storage costs would have amounted to less than five per cent of the financial value of the grain received by the Priory. In the 1340s storage costs would have been marginal, compared to the financial value of grain that could be stored there. The evidence used here, however, is too scarce and a full scale study on granaries and storing costs, based on solid documentary evidence, is yet to be done.

Cathedral Bakeries and Brewery

Late thirteenth- and fourteenth-century accounts reveal two bakeries: monastic and the almoner's. Unlike the Great Granary, which was controlled by the master of the cellar alone, the monastic bakery was the responsibility of no fewer than three obedientiaries: the master of the cellar, cellarer and sacrist. The master of the cellar paid annual wages to the bakers' assistants (*famuli in pistrino*). The cellarer was in charge of paying the stipend to the bakers, as well as providing all the necessary supply, such as fuel, candles and working tools. The sacrist distributed additional stipends to the bakers. The obedientiary accounts do not distinguish between bakery and brewery and record their combined expenses under one heading 'pistrinum et bracinum' (bakery and brewery). Hence, it is necessary to consider both departments in the same section.

As noted above, the bakery and brewery were adjacent buildings, standing right next to the Great Granary, in the eastern part of the Cathedral precinct (Figure 6.2). The 1291-2 master of the cellar roll specifies that a new bake-house (*novum pistrinum*)

was build, at cost of £8 5s. 6d. and a farthing.³³⁶ These expenses included no fewer than 10,120 nails of different kinds (16s 3d), 18,000 tile pins (2s 7.5d.), 24,360 tiles (£2 15s. 9d.), an unspecified amount of ‘heap tiles’ (2s 3.5d), iron rods (1d.), carting of the materials (4s 3d) and finally wages of carpenters, masons, a tiller and stone cutter (£4 4s. 3d., in total). The distribution of the expenses is represented on the following figure (Figure 6.2):



Sources: DCN 1/1/11.

How long did it take to build the new bakery? The wages paid to the master carpenter might provide a clue. The latter received £3 6s. 8d. (=66.67s.) in total. A nominal day wage of a Southern English master carpenter at that period was 3d.³³⁷ This means that to earn the sum above, the Priory master carpenter had to labour about 267 *working* days.

³³⁶ DCN 1/1/11.

³³⁷ Munro's Prices and Wages Dataset (<http://www.economics.utoronto.ca/munro5/EngBasketPrices.xls>)

Keeping in mind that the work was not carried out on Sundays and major feasts, we can speculate that it took nearly a year to build the new cook-house.

Bakeries were more expensive to operate than granaries. First, the daily demand of bread required both hiring a permanent staff of two bakers with their assistants and spending some considerable sums on fuel and implements. Unfortunately, the cellar's accounts include the bakery and brewery expenses under the same heading without distinguishing between the two. Before the Black Death, 32s. was paid each year for two bakers and two brewers. We can only assume that each of the four received 8s., since both bakery and brewery assistants received identical wages, as we shall see later.³³⁸ If this is true, then 16s. was spent each year on the bakers' stipend. From 1355 onwards, the combined wages of the four bakers and brewers fell to 30s., meaning that each department received probably 15s. The 1356-7 roll specifies that there was a 'master baker' (*magister pistrine*), receiving 33s 4d. a year.³³⁹ Interestingly enough, this official does not appear in any other roll and hence, it is unclear what he was responsible for and whether he operated there on regular basis. In addition, the bakers received modest stipend of 8 d. from the sacrist each year.³⁴⁰ The bakers and brewers' wages were undoubtedly low, equalling less than a penny a day over the entire year. Is it possible that they received payments in kind and free meals, in addition to their meagre wages?

The number of the bakers' and brewers' assistants, whose wages were paid by the cellarer, is uncertain and it seems to have varied from year to year. For instance, there were five servants in the bakery and brewery in 1356-7,³⁴¹ while in 1368-9 seven

³³⁸ Table 6.5.

³³⁹ DCN 1/1/45.

³⁴⁰ DCN 1/4/1-onwards.

³⁴¹ DCN 1/1/45.

servants from both departments are reported.³⁴² As far as their wages are concerned, one has to distinguish between the pre- and post-Black Death period. Between 1281 and 1310, the bakery servants' wages varied between 15 and 16s. a year; from 1311 and down to c.1350 they received a steady payment of 16s. a year; while after the Black Death, we witness a fall in their stipend. They received just 10.25s. in the 1350s and 14.13s. in the subsequent decade, on annual basis. It does not, however, mean that the nominal wages *per capita* declined. Perhaps, it rather reflects the post-1348 decline in working power and the troubles faced by the Priory authorities in finding employees. The bakers, as well as brewers, received their annual salary in four equal installments: the first was paid in the St. Andrew term (30 November), the second in the Easter term, the third in the Nativity of St. John the Baptist (24 June) and the fourth in Michaelmas (29 September).³⁴³ Interestingly enough, it was not until c.1300 that brewery servants received equal stipend to the bakery assistants (they received, on average, 12.82s. in the 1280s and 12.20 in the 1290s). After 1300, both the bakery and brewery assistants received an equal stipend of 16s. a year.

A comparison between the bakers' and brewer's wages, on the one hand, and those of other Priory workers, might be illuminating. As far as pre-1348 wages are concerned, the bakers (and brewers) received about 1s. more than the Priory boatmen (15s. a year) and about 6s. more than the Priory carters (10 s. a year). The situation was different after the Black Death, when monastic authorities increased the sums paid to the transport workers on the one hand, and decreased those of the victuallers, on the other (Table 6.2):

³⁴² DCN 1/1/51.

³⁴³ DCN 1/1/13.

Table 6.2: Bakers' Annual Stipend Compared to Other Cathedral Officials (in Annual Means), 1281-1370 (in Shillings).

Year	Bakery Staff (s)	Brewery Staff (s)	Carters (s)	Boatmen (s)	Keeper of Granary (s)
1281-1290	15.94	12.82	10.00		
1291-1300	15.40	12.20	10.00	9.00	
1301-1310	15.33	15.33	9.58	14.38	1.11
1311-1320	16.00	16.00	10.00	15.00	0.17
1321-1330	16.00	16.00	10.00	15.00	0.00
1331-1340	16.00	16.00	10.00	14.46	0.00
1341-1350	16.00	15.75	10.00	14.58	0.00
1351-1360	10.25	10.25	24.29	19.55	2.50
1361-1370	14.13	14.13	26.67	19.33	10.00
Average	15.01	14.28	13.39	15.16	1.97

Sources: DCN 1/1/6-51.

Clearly, the sums above could not serve the assistants over the entire year. There were seven assistants to the bakery in 1368-9, who received a combined annual stipend of 17.17 s., namely just about 2.45 s. per person. This sum could buy 118 loaves of the cheapest, farthing bread, which, certainly, would be less than sufficient for a year-long survival. Does it mean, then, that the bakers' assistants were hired as part-time workers and while outside their work at the Priory, they had to look for some alternative means to earn their livings? Or, does it mean that they were badly exploited by their monastic employers? Either possibility might not necessarily be the case. Again, the bakery and brewery assistants were classified as *famuli*, meaning servants living within the Cathedral precinct and receiving their meals in the Priory Hall (*aula*) on regular basis. In other words, these people were, in fact, free from the most basic daily concerns: food, drink and housing. Working for bed and meal with a small additional stipend might have not been the worst option for a fourteenth century, and especially pre-1348, servant. Another

possibility is that the assistants in question were, in fact, children of the bakers and brewers. Examples of similar child labour among the *famuli* of the accounts have been recently noted by John Langdon and his colleagues.³⁴⁴

The other expenses included annual purchases of fuel and implements, recorded in the cellarer's rolls. Unfortunately, all surviving pre-1320 accounts were concerned only with the rents coming from the manors appropriated to the cellarer. As a result, we know nothing about these expenses before that decade. In the 1320s, about 10s. were spent on candles for the bakery and brewery (presumably about 5s. for each department). Over 20s. were invested in various baking tools. Those included sieves (*bultella*, *tantartara*, *temisia*, *cribra*), baker's peels (*pele*), pans (*sartagones*), knives (*cultelli*), brewing scoops (*scope*), pots (*olle*) and baskets (*corbella*). Clothes (*panni*) and canvases (*cannabasia*) were also purchased, presumably for making dough. Finally, around 55s. were spent on wood and faggots, and as much as £20 on fuel (turf).³⁴⁵ In sum, over £27 was spent on bakery and brewery departments each year in the 1320s.

After the Black Death, considerably smaller sums were allocated by the cellarer to the bakery and brewery. The average expenses in the 1350s and 1360s did not usually exceed £2.³⁴⁶ The Master of the Cellar rolls reveal that about £7 was spent on *whynnes*, or gorse faggots (faggots made of gorse, thorny papilionaceous shrub),³⁴⁷ for the two departments. In addition, these rolls specify other fuel expenses, chiefly talwood (*astella*, separate pieces of wood too thick to be bound in faggots), faggots (*fagotti*, bundles of

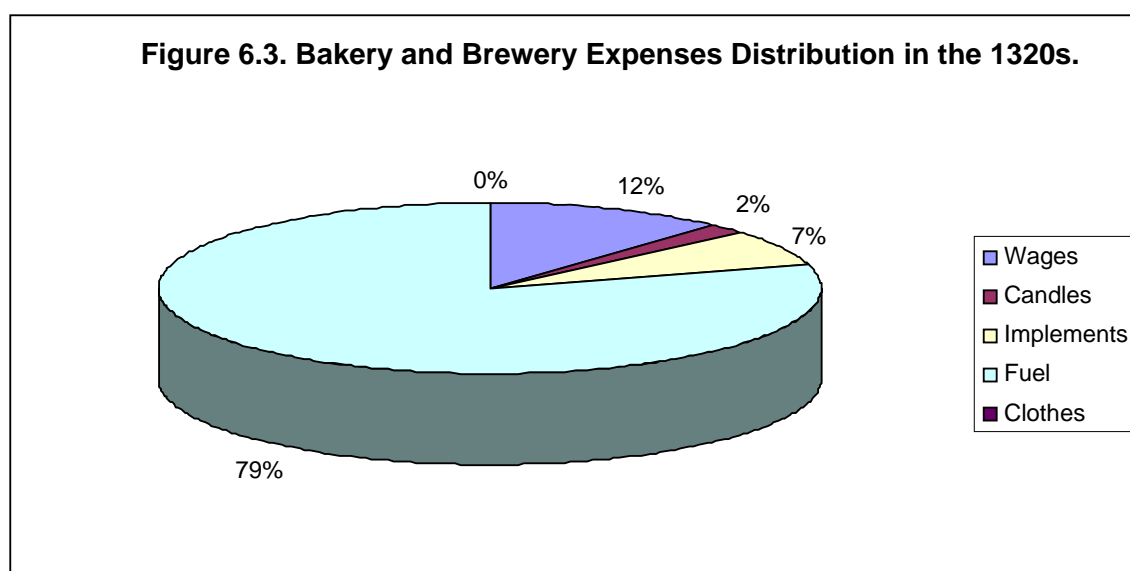
³⁴⁴ B. Gregory Bailey, Meaghan E. Bernard, Gregory Carrier, Cherise L. Elliott, John Langdon, Natalie Leishman, Michal Mlynarz, Oksana Mykhed, and Lindsay C. Sidders, 'Coming of Age and the Family in Medieval England', *Journal of Family History* 33 (2008), pp. 50-1.

³⁴⁵ DCN 1/2/14a and 16.

³⁴⁶ DCN 1/2/19-24.

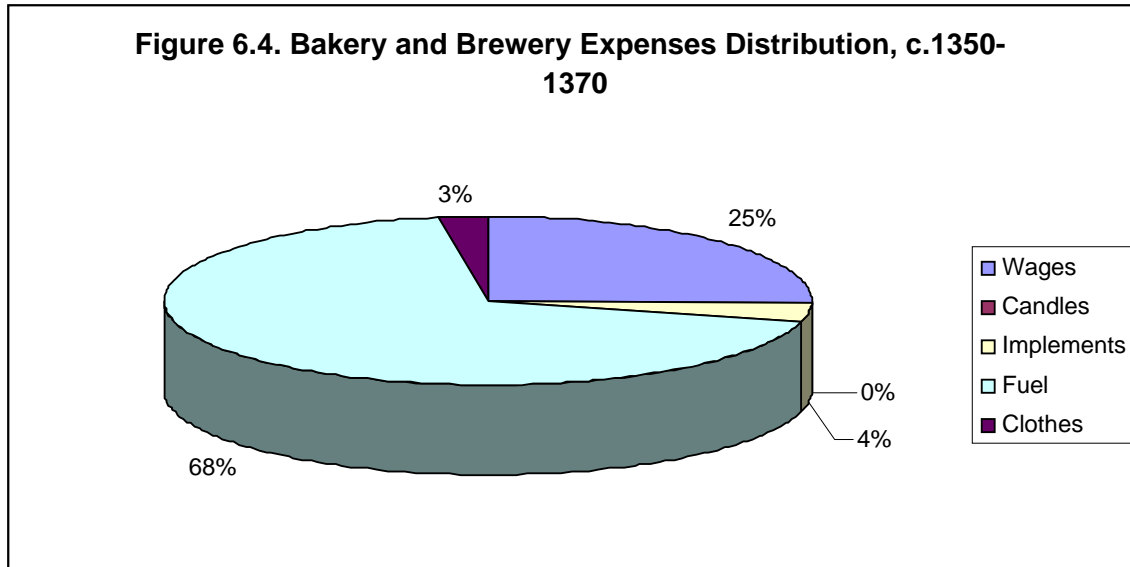
³⁴⁷ For the meaning and occurrences of this word, consult *Middle English Dictionary*, Robert E. Lewis et al. (eds.), Part W.5, (Ann Arbor: The University of Michigan Press), p. 511.

brushwood, rods and sticks bound together) and underwood (*boscum*), making total of £17.66, on average.³⁴⁸ Unfortunately, they do not specify if some of these burning materials were assigned to the bakery and brewery. From time to time, also the sacrist partook in purchase and repair of the bakery implements. For instance, he spent 19.92 s. in 1299-1300, 0.92 s. in 1330-1 and 3.04 in 1342-43.³⁴⁹ But then again, these cases were too rare to overestimate the sacrist's role in this department. In other words, the Priory is known to have spent at least around £25 in the 1320s and around £10 in the 1350s and 1360s on bakery and brewery department. The distribution of the expenses in summarized on Figures 6.3 and 6.4:



³⁴⁸ DCN 1/1/43-51.

³⁴⁹ DCN 1/1/15, 31 and 40.



Source: DCN 1/1/28-30, 43-51; DCN 1/2/14a-23

In both periods, the largest proportion was allocated to buying fuel, without which bread cannot be baked, nor ale be brewed. Whether the purchased quantities of firewood were sufficient for annual baking and brewing will be examined later.

Let us now proceed to the Almoner's Bakery, whose presence is noted first in the 1310-1 roll.³⁵⁰ The information is rather fragmentary, since there are just eight surviving pre-1370 accounts specifying the expenditure on the bakery. According to those rolls, there was a constant staff of a baker and his two assistants. We find that the baker received an annual stipend of 29s. in 1310-1 and 7s. in 1339-40.³⁵¹ The bakery servants are known to have earned 9s. in 1310-1 (for the period between 24 February and 22 July), 6s. in 1328-9 and 5s. in 1339-40.³⁵² The remaining rolls do not mention the bakers' earnings at all. Just as in case of the monastic granary, the Almoner's granary spent considerable amounts on fuel (varying from about 57 to 93 per cent of the total bakery

³⁵⁰ DCN 1/6/9.

³⁵¹ DCN 1/6/9 and 12.

³⁵² DCN 1/6/9,10 and 12.

expenditure). Marginal sums (usually, between about 2.0 to 3.50 per cent) were invested in acquiring implements. The only known exception here was 1328-9, when about 28 per cent of total bakery expenditure was spent on working tools. When paid, the stipends varied from about 14 to over 32 per cent. From 1345 onwards, the almoner allocated certain amounts to milling the received grain; these sums varied from just above one per cent to nearly 15 per cent of the total expenditure. The allocation of the expenditure is tabulated in the following table (Table 6.3):

Table 6.3. Annual Expenditures (in Shillings and Percentage) of the Almoner's Bakery Expenditure, 1310-1354.

Years	Fuel	Implements	Stipends	Milling	Sum
1310-11	75.33	3.50	38.00	0.00	116.83
1328-9	24.00	11.25	6.00	0.00	41.25
1339-40	64.08	2.91	12.00	0.00	78.99
1345-46	69.50	2.75	0.00	3.25	75.50
1346-47	82.83	1.43	0.00	7.00	91.26
1348-9	66.00	1.92	0.00	0.83	68.75
1353-54	34.43	0.93	0.00	6.16	41.52

Years	Fuel	Implements	Stipends	Milling	Sum
1310-11	64.48%	3.00%	32.53%	0.00%	100.00%
1328-9	58.18%	27.27%	14.55%	0.00%	100.00%
1339-40	81.12%	3.68%	15.19%	0.00%	100.00%
1345-46	92.05%	3.64%	0.00%	4.30%	100.00%
1346-47	90.76%	1.57%	0.00%	7.67%	100.00%
1348-9	96.00%	2.79%	0.00%	1.21%	100.00%
1353-54	82.92%	2.24%	0.00%	14.84%	100.00%

Source: DCN 1/6/9-10, 12, 15, 17.

Fortunately, all the pre-1350 accounts specify the amount and price of firewood purchased. There were two types of firewood, faggots (*fagotti*) and talwood (*astella*), represented in the following table (Table 6.4):

Table 6.4: Quantities and Prices of Firewood Acquired for the Almoner's Bakery, 1328-1349 (Value in Shilling).

	Type	Value		Type	Value	Price	per	Total	Total
	<i>Fagotti</i>	(s)	Price per 100	<i>Astella</i>	(s)	1000		Amount	Value
1328-9	1000.00	24.00	24.00					1000.00	24.00
1339-40	3841.00	64.08	16.68	500.00	3.75		7.50	4341.00	71.58
1345-6	4200.00	69.50	16.55					4200.00	69.50
1346-7	5400.50	82.83	15.34					5400.50	82.83
1348-9	4800.00	66.00	13.75	240.00	1.50		6.25	5040.00	72.25
Average	3848.30	61.28	17.26	370.00	2.63		6.88	4218.30	68.16

Source: DCN 1/6/10, 12, 15, 17.

The missing information regarding the fuel prices before 1328 and after the Black Death can be complimented by the master of the cellar's rolls, some of which contain the heading 'fuel' (*focalium*) (Table 6.5):

Table 6.5. Firewood Prices in Norwich, 1284-1353.

Year	Faggots	Value (s)	Value 1000	per	Talwood amount	Value (s)	Value 1000	per
1284-5					6360.00	41.58		6.54
1307-8					1200.00	8.00		6.67
1310-11					4800.00	36.00		7.50
1328-29	1000.00	24.00	24.00					
1339-40	3841.00	64.08	16.68		500.00	3.75		7.50
1345-46	4200.00	69.50	16.55					
1346-47	5400.50	82.83	15.34					
1348-49	4800.00	66.00	13.75		240.00	1.50		6.25
1353-54								
Ditto	5760.00	36.00	6.25		4320.00	12.16		2.81

Source: DCN 1/1/, 8, 18, 22,44; DCN 1/6/10, 12, 15, 17.

The tables above reveal the general trend in fuel prices in Norwich. Between the 1280s and 1320s we witness a gradual rise in prices; from the 1330s onwards the prices started falling, reaching their lowest after the Black Death. The prices in 1353-4 were 55 per cent

lower than those in 1348-9. Unfortunately, the subsequent rolls do not mention fuel purchases and hence, we cannot follow the post-Black Death developments. The 1353-4 prices are rather surprising, when compared to other commodities, whose prices kept on rising. After all, there must have been many fewer people to cut wood and bundle faggots after the plague. But then again, one account does not permit generalizations.

The Cathedral Mill

Milling and grinding together was one of the most widely used techniques of food processing in the Middle Ages.³⁵³ Mills had an especially crucial role in medieval monasteries, whose communities were largely dependant on bread, as a central staple prescribed by St. Benedict of Nursia in his *Regula*.³⁵⁴ To what degree the Norwich monks observed Benedict's commandment is another issue, which will be dealt later in this study.

The physical location of the mill is attested in a late, 1532-33 account, according to which a new mill-stone was bought for the mill within the brewery.³⁵⁵ This certainly does not mean that the mill of our period was the same ones that mentioned in the 1532-33 roll. However, it is highly possible that the late-medieval mill was located in the same

³⁵³ The most important works on mills and milling in late medieval England are: John Langdon, 'Water-mills and Windmills in the West Midlands, 1086-1500,' *Economic History Review*, 2nd ser. 44 (August 1991), 424 – 44; David Farmer, 'Millstones for Medieval Manors,' *Agricultural History Review* 40 (1992), 97 – 111; John Langdon, 'Lordship and Peasant Consumerism in the Milling Industry of Early Fourteenth-Century England,' *Past and Present*, no. 145 (November 1994), 3-46; John Munro, 'Industrial Energy from Water-Mills in the European Economy, 5th to 18th Centuries: the Limitations of Power,' in *Economia ed energia, secoli XIII - XVIII, Atti delle 'Settimane di Studi' e altre Convegni, Istituto Internazionale di Storia Economica, 'Francesco Datini da Prato'* (vol. 34), Simonetta Cavaciocchi (ed.) (Florence, Le Monnier: 2003), pp. 223-69; John Langdon, *Mills in the Medieval Economy: England, 1300-1540* (Oxford: Oxford University Press, 2004).

³⁵⁴ *Benedicti Regula, Editio Altera Emendata*, Rudolph Hanslik (ed.), Corpus Scriptorum Ecclesiasticorum Latinorum 75 (Vienne: Hoelder-Pichler-Tempsky, 1977), Cap. 35.12 and 39.4.

³⁵⁵ DCN 1/1/106.

place, namely by the brewery. After all, it would be reasonable to place it within the cluster of the buildings linked to food production, namely bakery, brewery, granary and stables.³⁵⁶ Moreover, its dependence of water required its placement near the Priory canal connecting the monastery with the Wensum River.

Our rolls reveal that it was both a water- and horse-mill: i.e., the mill was operated by water and a horse, both used as the power source.³⁵⁷ Keeping such a mill was both risk-averse and a costly venture. Its obvious advantage over wind mills was that the Cathedral authorities were virtually free from weather concerns. Compared to an ordinary water- or horse-mill, the efficiency and capacity of the Priory mill was increased, because it used two power sources at the same time. While the risky part must have been avoided by the Priory authorities, maintaining the horse mill meant additional expenses. It required keeping at least one working horse, feeding, looking after and shoeing it. In addition, it required at least one person to perform all these duties. The obedientiaries who shared these concerns were the cellarer and chamberlain. Their various rolls provide intriguing details about the structure and expenses of the mill.

Both obedientiaries participated in repairs of the mill, buying all the necessary implements and paying the miller's stipend. Prior to the Black Death, the largest part of the expenses was covered by the chamberlain. His expenses equaled about £4.5 a year, on average.³⁵⁸ The largest sums were invested in implements, such as mill-stones and nets. The expenses of the mill stones alone varied from about 30s. to 70s. a year, i.e. about £2.50 on average. Considerable sums were spent on buying and maintaining horses. For

³⁵⁶ On the adjacent sites of bakery, brewery, granary and stable, see above, pp. 188-203. This idea has been already mentioned by Noble, 2001, pp. 129-130.

³⁵⁷ DCN 1/5/2,4,5 and 10.

³⁵⁸ DCN 1/5/1-12.

instance, in 1292-3 a mill-horse was purchased for 12s. 6d, while in 1317-18, when the livestock prices were especially high, £49.29 was paid for two horses.³⁵⁹ Other expenses included wood, as well as repairing the mill. These varied between 1 s. paid in 1295-6 for repairing a mill post, and over one pound sterling spent in 1343-4 on a capital restoration of the entire building.³⁶⁰ In the early 1350s, the annual expenses of the chamberlain fell to about £1.15 on average and these were mostly confined to replacing mill parts, such as wheels.³⁶¹ Unfortunately, after the 1354-5 roll we are left in a complete ignorance for the next 27 years, for the next surviving account is that of 1381-2. The roll points to a renewed rise in the chamberlain's expenses in the mill department (slightly less than four pounds).³⁶²

The cellarer's participation in the mill department was limited and rare before c.1350. The only known pre-Black Death instance was in 1327-8, when he spent 15.50 s. on repairing the mill wheels.³⁶³ After 1355, however, we find him spending almost £6 a year on buying and maintaining mill horses, repairing and purchasing mill stones and other implements, as well as paying the millers' stipend, varying between 8s. to 9s. a year.³⁶⁴ The expenses of both obedientiaries are represented on the following tables (Table 6.6 and 6.17):

³⁵⁹ DCN 1/5/2 and 5.

³⁶⁰ DCN 1/5/3 and 12.

³⁶¹ DCN 1/5/13-14.

³⁶² DCN 1/5/15.

³⁶³ DCN 1/2/14a.

³⁶⁴ DCN 1/2/20-25.

*Table 6.6. The Chamberlain's Expenses on the Priory Mill, c.1290-1350*1. In Shillings

Year	Building Repairs	Mill Parts	Horses	Wood	Implements (millstones, nets)	Raw Material	Workers	Total
1292-3	0.00	0.00	43.17	0.00	54.50	0.00	0.00	97.67
1295-6	1.00	3.00	0.00	32.50	0.00	0.00	0.00	36.50
1308-9	0.00	0.00	2.00	12.00	34.33	0.00	0.00	48.33
1317-18	5.37	2.08	55.29	70.03	49.83	40.69	0.00	223.29
1321-22	0.00	3.29	0.00	14.58	69.00	0.00	0.00	86.87
1327-28	0.00	6.92	0.00	6.58	45.79	0.00	0.00	59.29
1329-30	0.00	8.67	0.00	0.00	56.66	0.00	0.00	65.33
1336-37	0.00	0.00	4.25	3.50	51.00	0.00	0.00	58.75
1339-40	0.00	0.00	6.58	0.60	0.00	2.75	0.00	9.93
1343-44	20.71	2.66	0.00	76.34	42.75	8.78	57.70	208.94
1352-53	0.00	9.00	0.00	5.25	4.83	0.00	0.00	19.08
1354-55	0.00	15.00	12.00	0.00	0.00	0.00	0.00	27.00

2. In Percentage

Year	Building Repairs	Parts	Horses	Wood	Implements (millstones, nets)	Raw Material	Workers	Total
1292-3	0.00%	0.00%	44.20%	0.00%	55.80%	0.00%	0.00%	100.00%
1295-6	2.74%	8.22%	0.00%	89.04%	0.00%	0.00%	0.00%	100.00%
1308-9	0.00%	0.00%	4.14%	24.83%	71.03%	0.00%	0.00%	100.00%
1317-18	2.40%	0.93%	24.76%	31.36%	22.32%	18.22%	0.00%	100.00%
1321-22	0.00%	3.79%	0.00%	16.78%	79.43%	0.00%	0.00%	100.00%
1327-28	0.00%	11.67%	0.00%	11.10%	77.23%	0.00%	0.00%	100.00%
1329-30	0.00%	13.27%	0.00%	0.00%	86.73%	0.00%	0.00%	100.00%
1336-37	0.00%	0.00%	7.23%	5.96%	86.81%	0.00%	0.00%	100.00%
1339-40	0.00%	0.00%	66.26%	6.04%	0.00%	27.69%	0.00%	100.00%
1343-44	9.91%	1.27%	0.00%	36.54%	20.46%	4.20%	27.62%	100.00%
1352-53	0.00%	47.17%	0.00%	27.52%	25.31%	0.00%	0.00%	100.00%
1354-55	0.00%	55.56%	44.44%	0.00%	0.00%	0.00%	0.00%	100.00%
Average	1.25%	11.82%	15.92%	20.76%	43.76%	4.18%	2.30%	100.00%

Source: DCN 1/5/1-14.

*Table 6.17. The Cellarer's Expenses on the Priory Mill, 1327-1370*1. In Shillings.

Year	Horse	Wheels, spindles	Milling	Mill Stones	Miller's Wages	Sum
1327-28		15.50				15.50
1328-39						0.00
1329-30						0.00
1350-1						0.00
1355-6	92.58	42.00	0.75		9.00	144.33
1359-60		20.16	14.75		8.00	42.91
1368-69		17.16	1.50	146.33		164.99
1369-70	83.00	30.00				113.00

2. In Percentage.

Year	Horse	Wheels, spindles	Milling	Mill Stones	Miller's Wages	Sum
1327-28	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%
1328-39						
1329-30						
1350-1						
1355-6	64.14%	29.10%	0.52%	0.00%	6.24%	100.00%
1359-60	0.00%	46.98%	34.37%	0.00%	18.64%	100.00%
1368-69	0.00%	10.40%	0.91%	88.69%	0.00%	100.00%
1369-70	73.45%	26.55%	0.00%	0.00%	0.00%	100.00%

Source: DCN 1/2/14a-23.

Because of fragmentary presentation and survival of some accounts, there is not enough information to make any definitive conclusion regarding the maintenance of the Priory mill. The surviving rolls, however, reveal the general trends and indicate that we have to differentiate between the pre-1350 period, when the chamberlain was in almost complete charge of the mill and the post-Black Death era, when this department was shared between the two obedientiaries.

Conclusions

The Priory authorities had planned and developed a very convenient strategy for storing and processing the regular supply of the manorial grain. The topological planning of the cluster of five adjacent buildings (granary, brewery, bakery, mill and stables), all located close to the canal leading to the backwater of the Wensum, allowed the most effective cooperation between a dozen of monastic officials. These convenient locations, plus the reliance on horses and water as the power source for the mill, undoubtedly optimized the level of production, on the one hand, and decreased the risk and transportation (or, rather, moving) costs, on the other. Furthermore, no department was confined to a single office. Various rolls indicate that there was a clear overlap in duties between several monastic offices. The monastic granary was shared between the master of the cellarer and the keeper of the granary, while the almoner was in charge of his own granary. The bakery and brewery were taken care of by the master of the cellar, cellarer and sacrist. The mill was looked after by the cellarer and chamberlain. The evidence from the master of the cellar rolls imply that the storing costs must have been low and hence, the granaries were a profitable form of capital and investment.

Chapter 7. Demand and Supply: Monastic Population, Its Requirements and Quantity of Grain Reaching the Priory

The Size of the Priory Population

By the time the Priory was founded, in 1096, there were sixty monks, as the late thirteenth century *Registrum Primum* of the cathedral reports.³⁶⁵ Ever since then and down to the Black Death, this was, more or less, a constant number. This fact is verified in Bishop Goldwell's visitation of the Priory in 1492, where he stated that 'the Lord Andrew Ryngland said that the number of the brethren has not been filled up, since there are ought to be sixty brethren, but there are present just thirty eight'.³⁶⁶ In any event, there is not a single pre-fourteenth century source to shed any further light on the monastic population between 1096 and the early fourteenth century. In his injunctions, following the 1308 visitation of the Priory, Bishop John Salmon mentioned that there were sixty brethren, or over (*sexaginta uel amplius eo*).³⁶⁷ On the very eve of the Black Death, in 1348-9, there were sixty-seven monks, as the communar's roll reveals.³⁶⁸ The bread accounts, treated at full length in the next chapter, reveal that the number of loaves distributed among the brethren remained more or less static over the period between 1281 and 1343 (Table 7.3). This may mean that the monastic population remained largely

³⁶⁵ The relevant part is printed in *The First Register of Norwich Cathedral Priory*, H. W. Saunders (ed.), Norfolk Record Society 11 (1939), p. 30. I have used the original manuscript DCN 40/1

³⁶⁶ 'Dompnus Andreas Ryngland dicit quod numerus confratrum non perimpletur quia deberent esse LX confratres et sunt in praesenti nisi xxxuiij'. *Visitations of the Diocese of Norwich, 1492-1532*, Augustus Jessopp (ed.), Royal Historical Society, Camden 2nd Series 43 (London, 1888), p. 73. This passage is quoted in H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), p. 160.

³⁶⁷ DCN 92/1.

³⁶⁸ DCN 1/12/7.

unchanged between the 1308 visitation and the 1348-9 roll. The Black Death did not spare the monks' lives: during the plague years we find dozens of rolls compiled by several different hands.³⁶⁹ This frequent change of handwriting implies that the officials were dying. The monastic mortality during the plague years is well reflected in other monasteries. In Westminster Abbey, at least half of monks died during the troubled years of 1348-9, as the Westminster accounts reveal.³⁷⁰ Meaux Abbey (Yorkshire) had forty-nine monks in 1348, but lost as many as thirty-two in 1349.³⁷¹ Peterborough Abbey shows similar mortality figures, with only thirty out of sixty-four monks surviving the plague.³⁷² The post-Plague statistics on the monastic population of the Cathedral come from the accounts of St. Leonard's Priory, itself a dependant cell of Norwich Priory.³⁷³ There were just 40 monks in 1353-4, which suggests that at least 40 per cent of the brethren died during the pestilence.³⁷⁴ The following decades show a slow, but sure recovery, and in 1368-9 there were 53 brethren.³⁷⁵ Between then and 1460 there have always been between 45 and 55 monks. From 1460 onwards we witness a sharp decline in the number of the monks. In 1466, there were 36 monks, while by the time of the Dissolution, in 1536, there were just 22 brethren.³⁷⁶ The pre-1390 population is shown on the following graph (Figure 7.1):

³⁶⁹ This fact was noted in H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), p. 186.

³⁷⁰ Barbara Harvey, *Westminster Abbey and its Estates in the Middle Ages* (Oxford: The Clarendon Press, 1977), p. 144. For a comprehensive description of the Westminster accounts, consult Barbara Harvey, *The Obedientiaries of Westminster Abbey and their Financial Records, c.1275-1540* (Woodbridge: The Boydell Press, 2002).

³⁷¹ G.G.Coulton, *Five Centuries of Religion*, Vol. III (Cambridge: Cambridge University Press, 1936), p. 555.

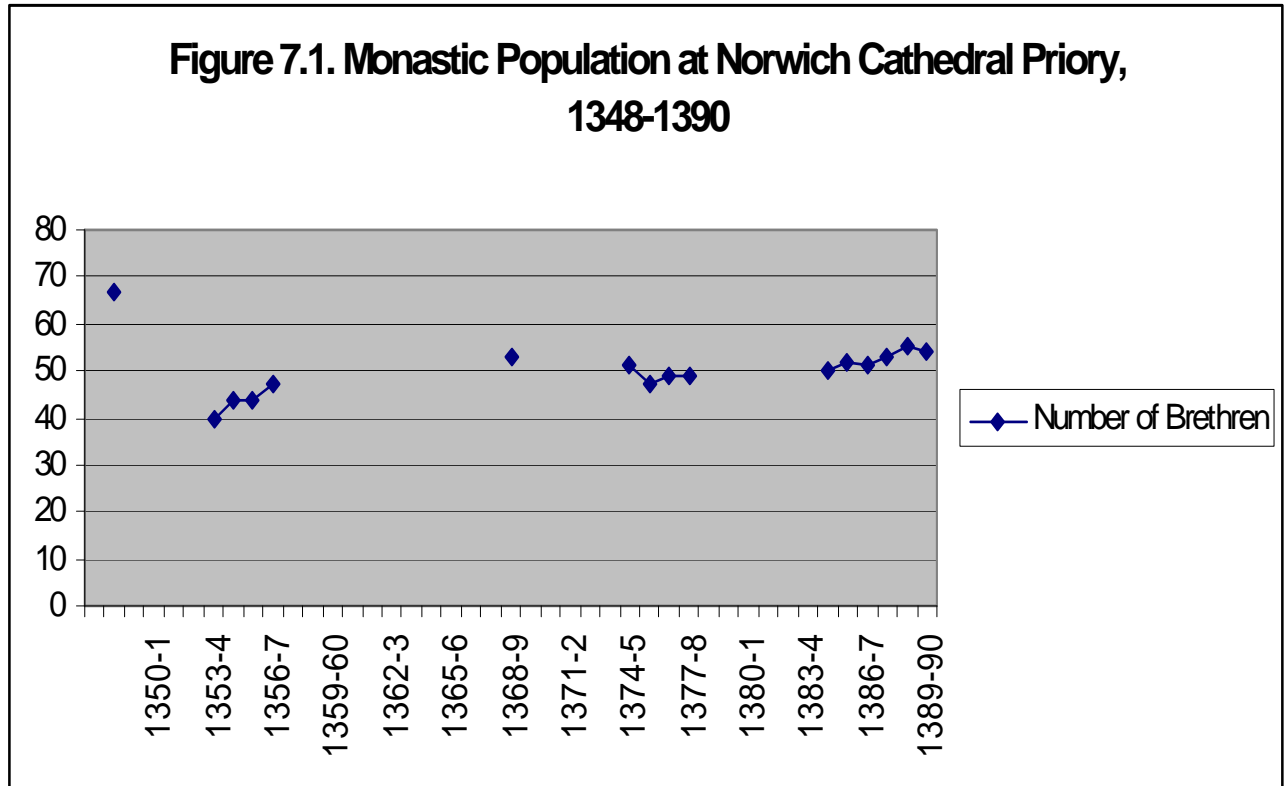
³⁷² *ibid.*, p. 555.

³⁷³ St. Leonards' accounts are deposited at the Norfolk Record Office, and their shelfmark is DCN 2/3.

³⁷⁴ DCN 2/3/2

³⁷⁵ DCN 2/3/6

³⁷⁶ H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), p. 161. On late medieval monastic population in England, see Barbara Harvey, *Living and Dying in England, 1100-*



Source: DCN 92/1, 1/10/7, 2/3/2-10.

The number and population trend of Norwich brethren stood along the line of other Cathedrals and monasteries of the same period. For instance, the size of Canterbury monastic community fluctuated between sixty and seventy persons in the years 1300-1348; then, there were forty-four brethren in 1376, sixty-one in 1381 and eighty in 1391.³⁷⁷ Between 1395 and 1505 their number fluctuated between 75 and 95, in the years

1540. *The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 112-145 and Barbara Harvey and Jim Oepen, 'Patterns of Morbidity in Late Medieval England: A Sample from Westminster Abbey', *Economic History Review* 54:2 (2001), 215-239 (on Westminster); John Hatcher, 'Mortality in the Fifteenth-Century: Some New Evidence,' *Economic History Review* 39 (1986), 19-38 (on Canterbury Priory); John Hatcher, A.J.Piper and David Stone, 'Monastic Mortality: Durham Priory, 1395-1529,' *Economic History Review* 59:4 (2006), 667-687.

³⁷⁷ Barrie Dobson, 'The Monks of Canterbury in the Later Middle Ages, 1220-1540,' in *A History of Canterbury Cathedral*, Patrick Collinson, Nigel Ramsay and Margaret Sparks (eds.) (Oxford: Oxford University Press, 1995), p. 117.

1395-1505,³⁷⁸ with 25 obedientiaries.³⁷⁹ By the end of the thirteenth century Westminster Abbey housed between 50 and 55 monks and this number remained, largely, unchanged between 1375 and 1529.³⁸⁰ The monks of Durham Priory amounted to 90 in 1274, 85 in 1283, 81 in 1343, 73 in 1345 and there was, more or less, a constant number of seventy between 1406 and 1494.³⁸¹ Ely Cathedral was populated by 70 monks in the thirteenth century, while by 1345 their number fell to 49. In 1349 their number fell to 28, while in 1352-3 there were 35 brethren.³⁸² There were over 60 brethren at St. Swithun's Priory, Winchester, in 1325, while between the end of the fourteenth century and its dissolution the Priory housed, more or less constantly, 45 monks.³⁸³ The decline of Rochester community was even more pronounced: there were 35 monks in 1317 and 1333, 23 between 1385 and 1416 and as few as 16 in 1540.³⁸⁴ The monastic communities of Abingdon, Bury-St. Edmunds and Peterborough contained about 80 persons around c.1300.³⁸⁵ Finally, Battle Abbey, a smaller monastic house, had some 60 monks in the thirteenth century and around 30 monks in the last decades of the fourteenth-century.³⁸⁶

³⁷⁸ John Hatcher, 'Mortality in the Fifteenth-Century: Some New Evidence,' *Economic History Review* 39 (1986), p.23.

³⁷⁹ R.A.L. Smith, *Canterbury Cathedral Priory* (Cambridge: Cambridge University Press, 1943), pp. 36-51, esp. 49.

³⁸⁰ Barbara Harvey and Jim Oeppen, 'Patterns of Morbidity in Late Medieval England: A Sample from Westminster Abbey,' *Economic History Review* 54:2 (2001), p. 221; Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 73.

³⁸¹ R.B.Dobson, *Durham Priory, 1400-1450* (Cambridge: Cambridge University Press, 1973), pp. 52-55; John Hatcher, A.J. Piper and David Stone, 'Monastic Mortality: Durham Priory, 1395-1529,' *Economic History Review* 59:4 (2006), p.670.

³⁸² G.G.Coulton, *Five Centuries of Religion*, Vol. III (Cambridge: Cambridge University Press, 1936), p. 558.

³⁸³ Joan Greatrex, 'St. Swithun's Priory in the Later Middle Ages,' in *Winchester Cathedral. Nine Hundred Years*, John Crook (ed.) (Chichester: Phillimore, 1993), pp. 144-5.

³⁸⁴ Anne Oakley, 'Rochester Priory, 1185-1540,' in *Faith and Fabric. A History of Rochester Cathedral, 604-1994*, Nigel Yates and Paul A. Welsby (eds.) (Woodbridge: The Boydell Press, 1996), p. 52.

³⁸⁵ G.G.Coulton, *Five Centuries of Religion*, Vol. III (Cambridge: Cambridge University Press, 1936), p. 558.

³⁸⁶ G.G.Coulton, *Five Centuries of Religion*, Vol. III (Cambridge: Cambridge University Press, 1936), p. 558; *The Cellarers' Rolls of Battle Abbey, 1275-1513*, Eleanor Searle (ed.), Sussex Record Society 65 (1967), p. 15.

Although the *de jure* head of the monastery was the Bishop of Norwich, the *de facto* one was the Prior. The Bishop had his own, separate residence within the Cathedral Close, but in reality he had hardly ever been present there. A considerable amount of time he spent in various itineraries, both within and without his diocese. The Prior, on the other hand, was constantly available to his monks, for help and advice. The monastic community can be roughly divided into two main groups: ordinary monks and obedientiaries, holding special offices and duties.

There were twelve obedientiaries at Norwich Cathedral Priory. Perhaps the most important official was the master of the cellar (*magister cellarii*). He had the largest number of duties, including the provisioning of grain, fuel, raw materials, wool. He was also in charge in building and repairing, as well as commissioning manuscripts.³⁸⁷ The next most important official was the cellarer (*cellerarius*), who, as his title suggests, was responsible for providing the brethren with food, other than grains. He was also in charge of the bakery and brewery, as well as the larder.³⁸⁸ The sacrist (*sacrista*) cared for ecclesiastical matters, such as liturgy, cemetery, altars and shrines of the saints, the most famous and venerated of which was St. William of Norwich, a boy allegedly killed by Jews in 1144. He also looked after the tower clock, first mentioned in 1291.³⁸⁹ The chamberlain (*camerarius*) was responsible mainly for monastic garments, as well as the Priory mill.³⁹⁰ The almoner (*elemosinarius*) was burdened with various charity activities, including distributing alms and food among the poor of the town. The almoner had its

³⁸⁷ On his duties, consult . W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), pp. 76-91.

³⁸⁸ W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), pp. 92-101.

³⁸⁹ H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), pp. 102-113.

³⁹⁰ *ibid*, pp. 114-120.

own, distinctive granary, in which the grain for distribution-in-alms was stored.³⁹¹ As we shall see later, this grain came both from the local market and the manors appropriated to the office of the almoner. The hosteler (*hostilarius*) was attached to the guest hall and provided visitors with comfort. Perhaps the most peculiar duty of this obedientiary was cleaning the latrines of feces with lime.³⁹² The monastic orchard was ran by the gardener (*officium gardinii, de gardinio, gardinarius*).³⁹³ The infirmerer (*infirmarius*) looked after sick brethren and provided them with remedies, dry fruit and spices.³⁹⁴ The precentor (*precentorius*) shared some liturgical duties with the sacrist. His main responsibilities were to train the boys' choir and to arrange festive processions. He was also the keeper of the Priory seal.³⁹⁵ The pitancer (*pitancerius*) and communar (*communarius*), appearing on the same account, were responsible mainly for building materials and stones, as well as supervising masons and carpenters.³⁹⁶ And finally, the refectorer (*refectorarius*), contrary to what his name suggests, supervised the general maintenance of the building, its furniture and utensils.³⁹⁷

Obviously, the monks were not the only inhabitants of the Priory. Three more groups should be added: labourers receiving their annual stipend, servants (*famuli*) and occasional guests. H. Saunders suggested that there were about 270 mouths to be fed each

³⁹¹ *ibid*, pp. 121-127.

³⁹² *ibid*, pp. 128-129.

³⁹³ *ibid*, pp. 130-131. His accounts have now been published by Claire Noble, *Farming and Gardening in Late Medieval Norfolk* (Norwich, 1996).

³⁹⁴ *ibid*, pp. 132-133.

³⁹⁵ *ibid*, pp. 134-136.

³⁹⁶ *ibid*, pp. 137-141. Their accounts have been partially (up to 1329-30) have been transcribed and printed in *Communar Rolls of Norwich Cathedral Priory*, Eric Ferrie and A.B. Whittingham (eds.), Norfolk Record Society 41 (Norwich, 1974).

³⁹⁷ H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), pp. 142-144.

day: 50 monks, 150 workers, twenty *famuli* and 50 visitors.³⁹⁸ This estimation might be too conservative, since it, in fact, ignores some labourers mentioned in the rolls. He also failed to distinguish between ‘domestic workers’ and ‘manual workers’. The first category means persons performing tasks not involving physical labour. The second category included various occupations based on manual work. And most importantly, Saunders did not utilize one source of major importance (perhaps unknown to him). The document in question is a c. 1300 list of annual recipients of candles, distributed by the sacrist. The list constitutes a part of the sacrist’s register, that is, a cartulary containing a vast bulk of earlier charters pertaining to the manors appropriated to this obedientiary.³⁹⁹ This list is vitally important for reconstructing the size of the labourer population of the Priory.

Under the department of the Prior, who also happened to be the Master of the Cellar, the list mentions a seneschal (*senescallus*), sometimes a married person with wife, four esquires (*armigeri*), two clerks, fourteen boys (*garçiones*) and three pages (*pagii*). To these we might also add fifteen *homines de ministerio*,⁴⁰⁰ a steward (*dispensator*), painter, at least one book scribe, the keeper of the Great Granary, Bishop’s herald page, Prior’s attorney (*attornatus Prioris*), ‘purchaser of wheat’ (*emptor frumentii*), pelter (*pelliparius*), a certain *sutor* (a rather problematic term, meaning probably a tailor), at least two cattle herds, a shadowy *custos canum* (a dogs’ keeper), at least two boatmen (*batellarii*) and at least four carters (*carrectarii*). This would make some fifty-eight persons, in total.

³⁹⁸ *ibid.*, pp. 89-91, 162-3.

³⁹⁹ DCN 40/11. fols. 42r-44v

⁴⁰⁰ H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), p. 163.

For the Cellarer, the register gives one servant, one boys (*garcio*), one doorman of the cellar (*janitor porte cellarii*), a subcellarer (*subcellerarius*), one clerk, three master-cooks, a pottager (*potagiarius*), saucerer (*salsamentarius*), pan maker (*frixatorius*), kitchen ward (*custos porte coquina*), water-carrier (curiously called *qui trahit aquam*), *squillarius*, six lads, two pages, the cellarer's carpenter (*carpentarius cellerarii*) and one groom (*stabularius*). The document evidently omitted the keeper of pigs (*custos porcorum*), two boatmen, a barber, laundress, panteler, guest-attendant and several clerks of the Kitchen.⁴⁰¹ The overall figure of the cellarer was probably around thirty-two persons.

The department of Bakery and Brewery consisted of twenty-one workers. These included the master-baker (*magister pistor*) with four assistants, the master of the brewery (*magister bracini*) with four assistants, one winnower, four pages, one lad, one farrier, one miller, the Prior's carter, and keeper of the marsh (*custos bosci*).

The guest-hall, in addition to the hostilar, already counted among the brethren, had the seneschal of the hall, marshall of the hall, one pantler, one butler with several lads, a ward of the great gate with one lad and one page. This makes, roughly, nine persons.

The sacrist's staff included one servant of the church, two masters of altars, one esquire, one carpenter, one plumber, two boys, one page, a washer-woman (*lotrix de uestiario*), and a certain 'keeper of *Belhus*', making eleven persons in total. The document omits a brewer, the Sergeant of the Church, the Clerk of the Altar, the Clerk of the Cross (three clergymen), one butler, seven clerks of the Church, an organist,

⁴⁰¹ H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), p. 163.

established ever since the acquisition of an organ in 1333,⁴⁰² a sub-sacrist and mender of vestments.⁴⁰³ The total number of the sacrist's staff seems to be in the area of twenty-three persons.

According to the sacrist's register, the chamberlain supervised one cleric, two boys, one page, three servants and washerwomen (*lotrix pannorum*). To these we should add a skinner, bleacher, dyer, two cobblers, two grooms, three in the tailor's shop, washerman, mender of vestments, as well as the keeper of the mill (*custos molendinarii*).⁴⁰⁴ This would give approximately twenty-one persons.

The list records five servants of the almoner, although in reality the latter probably had about fifteen workers.⁴⁰⁵ The infirmerer had one clerk and four servants. The refectorer had two servants, excluding a garcifer and sergeant, that is four in total.⁴⁰⁶ The gardener had three servants in his staff.

The register ignores the remaining obedientiaries. Some five workers were attached to the hostiler: three domestic workers (butler and two servants), a pantryman and a cleaner of latrines. The Precentor had one worker only, a washerwoman, while the pitancer and communar had a barber and washerman.⁴⁰⁷ The revised estimation of the workers' population of the Priory is represented in the following table (Table 7.1):

⁴⁰² DCN 1/4/27.

⁴⁰³ H. W. Saunders, *An Introduction to the Rolls of Norwich Cathedral Priory* (Norwich, 1930), p. 112

⁴⁰⁴ *ibid*, p.163

⁴⁰⁵ *Ibid*, pp. 127 and 163

⁴⁰⁶ *Ibid*, pp. 143-44 and 163

⁴⁰⁷ *Ibid*, pp. 128-151 and 163

Table 7.1: Estimated Number of Priory Workers, c.1300

Department	Domestic	Manual	Total
Prior / master of the cellar	46	12	58
Cellarer	17	15	32
Bakery and Brewery	5	16	21
Guest Hall	9	9	9
Sacrist	18	5	23
Chamberlain	12	9	21
Almoner	15	0	15
Refectorer	4	0	4
Hostilar	3	2	5
Precentor	0	1	1
Infirmar	5	0	5
Gardener	3	0	3
Pitancer and Communar	0	2	2
Total Estimation	137	71	208

Sources: DCN 1/1-12; DCN 40/11, fols. 42r-44v.

The table above pertains to regular labourers and officials, working on permanent basis. To these we should add daily wage earners, hired for different periods of time, such as masons, thatchers and diggers. An idea of the size of this group is given in the communar and pitancer's accounts, between the 1320s and 1350s, namely during the period of the building works and expansion of the Cathedral. There were fifteen workers (*operarii*) in 1323-4 and eleven in 1324-5.⁴⁰⁸ The 1326-7 and 1329-30 rolls do not specify the number of the workers. Between 1335 and 1350 their number fluctuated from year to year, between five and ten.

In other words, the overall number of the workers was by no means static. The baker's accounts concerning the annual distribution of bread reveal that the amount of *panis militum*, distributed among the labourers between 1281 and 1343, constantly

⁴⁰⁸ DCN 1/12/14-15; printed in *Communar Rolls of Norwich Cathedral Priory*, Eric C. Fernie and A. B. Whittingham (eds.), Norfolk Record Society 41 (1972), pp. 96 and 100.

fluctuated (Table 7.2). This could indicate also that the population of the labourers was actually fluctuating over the period. If we equate the fluctuation of bread with fluctuation of population, then we might conclude that the number of Priory workers fell, perhaps by about twenty per cent compared to the previous decade, during the 1290s. The two subsequent decades (the 1300s and 1310s) show a pronounced rise in the number of workers, so that the working population *c.* 1320 may have exceeded that of *c.*1300 by almost a half. The proportion of the labourers seems to have remained unchanged during the 1320s. It was in the following decade, however, that it fell again by almost fifty per cent.

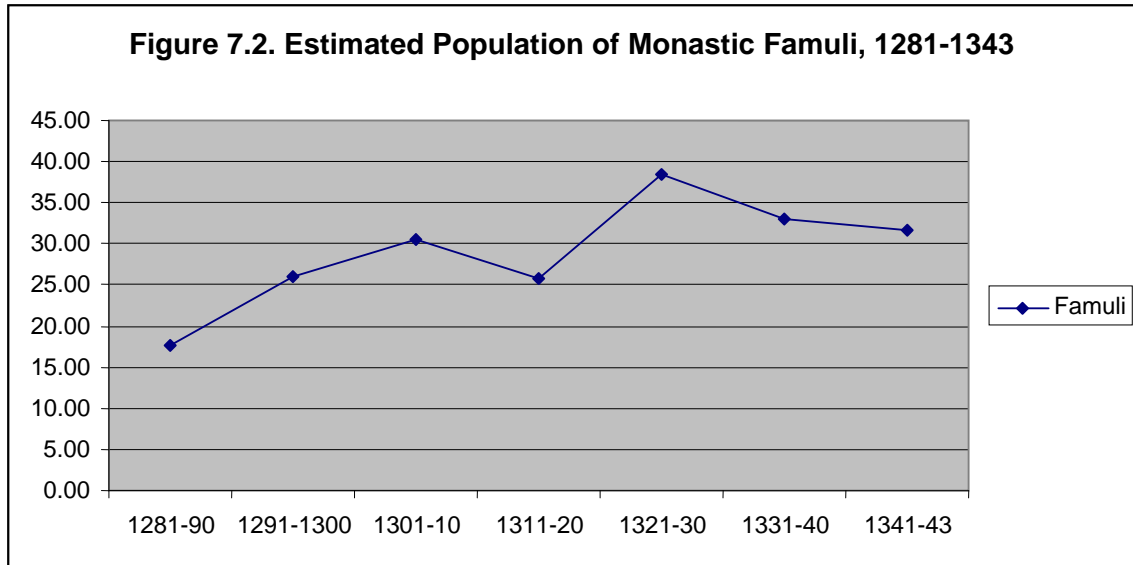
Table 7.2: Annual Amount of Wheat Used in Producing Bread, in Quarters and in Percentage Relative to the Previous Decade

Decade	Brethren	Famuli	Workers	Brethren	Famuli	Workers
1281-1290	218.59	32.69	344.38			
1291-1300	195.09	48.34	268.81	-10.75%	47.90%	-21.94%
1301-1310	200.19	56.67	328.75	2.61%	17.22%	22.30%
1311-1320	182.50	48.13	414.92	-8.84%	-15.07%	26.21%
1321-1330	191.75	71.47	398.50	5.07%	48.51%	-3.96%
1331-1340	188.51	61.45	211.35	-1.69%	-14.02%	-46.96%
1341-1343	187.00	59.19	231.50	-0.80%	-3.68%	9.53%

Sources: DCN 1/1/6-28, 30-37, 39-40

The third group was the local *famuli*, monastic servants living within the precinct. Saunders suggested the figure of twenty, relying mainly on the distribution of bread. This estimation is probably not too far from reality, especially before *c.*1300, when the *famuli* received slightly less than one third of what the brethren did. However, the population of the *famuli* was also by no means static. Like the workers, the number of the *famuli* seems

to have fluctuated from decade to decade, if we rely on the bread accounts (Table 7.3). Unlike the workers, however, the general trend in the *famuli* population was that the rates of growth exceeded those of decline. In the 1280s, 32.69 quarters of grain was allocated for baking their bread. As we shall see later, this amount was capable of rendering approximately 10 million kilocalories of a lighter bread (*panis ponderis minoris*), or nearly 6,400 loaves, distributed among the *famuli*. Assuming that the Priory authorities distributed one loaf per *famulus* each day, one might estimate that these 6,400 loaves would feed about 17.55 servants throughout the year. If the increment of grain allocated to the servants' bread closely corresponds to the growth of the *famuli* population, then it is possible that there were some 26 *famuli* in the 1290s and 30 servants in the 1300s (a rise of 49 and 17 per cent, respectively). During the 1310s the number of the *famuli* seems to have decreased, perhaps by some 15 percent, only to rise again, by almost a half, in the following decade. The bread distribution during the 1330s might reveal a renewed decline (by some 14 per cent), which continued into the 1340s (below 4 per cent, between 1341 and 1343). The estimated number of the Priory *famuli* is shown on the following figure (Figure 7.2):



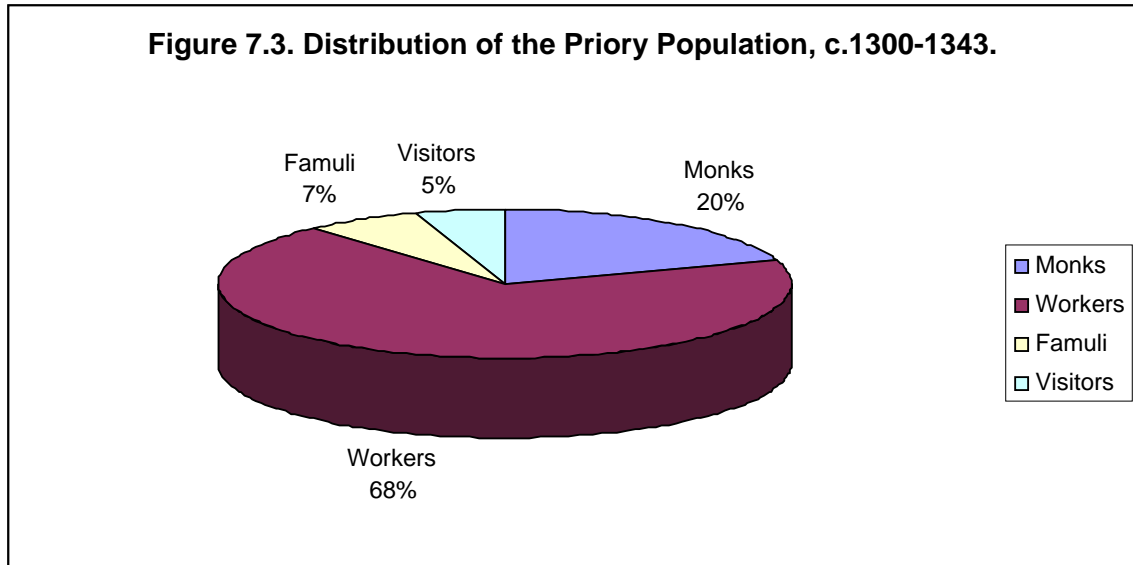
Sources: DCN 1/1/6-28, 30-37, 39-40.

The remaining inmates were occasional guests and day-labourers, namely transient visitors. Saunders counted them as fifty, without a solid justification. The most obvious problem here is that it is impossible to make any approximate estimation, since these were *occasional* inhabitants. Among these were manorial carters, local nobles and their messengers, minstrels and jugglers (*hystriones*) hired for Christmas and Pentecostal plays, as well as young brethren studying theology at Oxford.⁴⁰⁹ These temporary guests, however, never remained at the Priory for a long time and hence it would be problematic to include them among the constant Priory inmates. Certainly, if ten visitors remained at the Priory for two months, for instance, they cannot be counted as *ten persons living at the Priory in a given year*. A better solution would be to equal them to 6.07 persons (that is, 364.25 days divided by 60 guests each staying at the Priory for two months) *living at the Priory during the year the relevant roll was composed*. There is no evidence in our

⁴⁰⁹ On Norwich scholars sent to Oxford, consult Norman Tanner, *The Church in Late Medieval Norwich* (Toronto: Pontifical Institute of Medieval Studies, 1984), pp. 31-32.

rolls that the number of guests was any higher. Even if we accept the too liberal figure of Saunders (fifty), the *real* number of guests living and eating at the Priory *per annum integrum* does not seem to exceed 15. Adding this hypothetical figure to 285 monks, workers and servants mentioned above, we arrive at about three hundred persons living at the Priory each year before the Black Death. An estimated distribution of the Priory population is shown on the following figure (Figure 7.5).

The post-1350 figures, however, could not be the same, not only because of monastic mortality and the scarcity of work, but also because of a lower demand for labour. The post-Black Death rolls reveal that there were indeed fewer staff to pay stipend to, just as there were fewer monks to feed. This point, however, is less crucial to our discussion, since unfortunately no master of the cellar account contains the granary section after 1343. We will still be able to look at separate manorial rolls compiled after that year, but they do not provide any clue to the monastic population. All they reveal is the extent of the grain sent to the Priory and, consequently, the impact of the Black Death on the provisioning patterns.



Source: DCN 1/1, 1/ 2, 1/ 4, 1/5, 1/6, 1/7, 1/8, 1/9, 1/10, 1/11, 1/12.

The estimations above might be criticized as speculative. For example, Marilyn Oliva has shown that the ratio of lay residents to nuns of fifteenth-century Diocese of Norwich varied between 0.25 to 4.4, with an average 2.10 lay residents to one nun.⁴¹⁰ These findings contradict the picture above. It should be noted, however, that Norwich Cathedral Priory was much more than just a monastic house. It was, in fact, the main ecclesiastic establishment of the entire county of Norfolk and the seat of the Bishop. Its precinct embraced a large area, comprising, apart from the cloister and the cathedral, numerous buildings, orchards, gardens, meadow and a canals. But it was also a major centre of economic activities, a sort of pre-modern corporation overseeing and managing vast natural and financial resources. To sustain such establishment would require a large working force. This was certainly the situation in various monastic and canonical

⁴¹⁰ Marilyn Oliva, *The Convent and the Community in Late Medieval England* (Woodbridge: The Boydell Press, 1998), pp. 125-129.

establishments through England. For instance, Bolton Priory, a much smaller house than Norwich Cathedral Priory, had fewer than twenty canons and lay brethren. Yet, the entire establishment must have comprised around two hundred persons and this estimation is based on the quantities of bread and ale consumed there (namely, there were about ten lay residents to one canon/lay brother).⁴¹¹

Calorific Requirements of the Priory Community

What would be annual nutritional requirements of such community? Christopher Dyer estimated that an average late-medieval English male peasant would have consumed about 2,900 kilocalories on a daily basis.⁴¹² This estimation can perhaps be used to calculate the nutritional requirements of the Priory workers and the *famuli*, but not the monks. As a part of the aristocratic society, the brethren adopted some aspects of aristocratic lifestyle, particularly diet. The daily calorific intake of an aristocratic family would have been much higher than that of the rustic one, and it would include much of animal protein, high fat and low fibre content, as well as a meagre intake of vitamins A and C.⁴¹³ A fifteenth-century Provencal nobleman and his household members may have consumed as many as 4,580 kilocalories daily.⁴¹⁴ In her extensive and innovative study of everyday life at Westminster Abbey, Barbara Harvey has shown that an average daily

⁴¹¹ Ian Kershaw, *Bolton Priory. The Economy of a Northern Monastery, 1286-1325* (Oxford: Oxford University Press, 1973), p. 132.

⁴¹² Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), p. 134. This estimation is accepted by Campbell et al., p. 32. It should be noted that Dyer expresses caloric figures in calories, while Campbell et al and Barbara Harvey use kilocalories. I am using the figures in kilocalories throughout the thesis. One food calorie, or 'large calorie' (to be distinguished from heat calorie) is usually referred to as 'kilocalorie' (kcal) = 1,000 'small' calories.

⁴¹³ Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), p. 64.

⁴¹⁴ F. Stouff, *Ravitaillement et alimentation en Provence aux XIVe et XVe siècles* (Paris, 1970), p. 46.

food and drink placed before a monk would have contained an energy value of approximately 6,210 calories. Harvey contended, however, that the monks would have consumed only about 60 per cent of the offered food, leaving about 3,730 kilocalories for the daily intake.⁴¹⁵ Most recently, Philippa Patrick, a monastic archaeologist, argued, on the basis of skeletal analysis of about 300 skeletons from London monasteries, that in reality the monks probably consumed much more than it has been commonly assumed. She suggests about 6,000 kilocalories per regular day and about 4,500 kilocalories per fasting day. As a result of this overeating practice, the monks frequently suffered from Osteoarthritis (a disease representing the failure of the moving joints of the body).⁴¹⁶ Still, much remains to be done, both in the field of paleopathology and economic history, in order to determine whose estimation is the more secure. For now, we should stick to a figure of 4,000 kilocalories, which is a middle ground between the two extremes. Whether this estimation is reasonable, or not, will be seen later in the work.

As we have seen above, the monastic community constituted only twenty per cent of all inhabitants of the Priory, while the remaining eighty were the labourers, *famuli* and occasional visitors and daily wage-earners. Allowing 4,000 kilocalories for the brethren

⁴¹⁵ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 34-71, esp. 69-70.

⁴¹⁶ Philippa Patrick, 'Creaking in the Cloisters: Observations on Prevalence and Distribution of Osteoarthritis in Monks from Medieval London', in *Centre, Region, Periphery. Medieval Europe Basel 2002*, Guido Helmig, Barbara Scholkmann and Matthias Untermann (eds.) (Basel: Folio Verlag Dr. G. Wesselkamp/ Archäologische Bodenforschung Basel-Stadt, 2002), pp. 89-93; eadem, 'An Archaeology of Overindulgence', *Archaeological Review from Cambridge* 20:2 (2005), 98-117; eadem, 'Greed, Gluttony and Intemperance'? *Testing the Stereotype of the 'Obese Medieval Monk'* (PhD Dissertation, University College, London, 2005). On the archaeology of Osteoarthritis, see J. Rogers, 'The Palaeopathology of Joint Disease', in *Human Osteology and Archaeology and Forensic Science*, M. Cox and S. Mays (eds.) (London, 2000), 163-182. On the connection between overeating, obesity and Osteoarthritis, consult T. D. Spector, 'The Fat on the Joint: Osteoarthritis and Obesity', *Journal of Rheumatology* 17 (1990), 357-365. Other archaeological findings on monastic obesity and Osteoarthritis, see T. Waldron, 'DISH at Merton Priory: Evidence for a 'New' Occupational Disease?', *British Medical Journal* 291 (1985), 1762-1763; J. Rogers and T. Waldron, 'DISH and the Monastic Way of Life', *International Journal of Osteoarchaeology* 11 (2001), 357-365.

(twenty per cent) and 2,900 for the others (eighty per cent), we arrive at the figure of about 3,120 kilocalories per an average inhabitant of the Priory. If this is not too far from reality, then we might assume that the annual food requirement of Priory community, consisting of no more than 300 inhabitants, was about 340,938,000 (over 340 million) kilocalories. Campbell and his colleagues assumed that for people of lower social strata, between 60 and 75 per cent of a per caput daily intake derived from grain.⁴¹⁷ As we shall see above, our monks probably derived only about forty per cent of their calorific intake from cereal products.

The Amount of Grain Reaching the Priory from the Manors

Each year, the Priory acquired a certain quantity of grain for further distribution, processing and consumption. The reception came from two main channels: the estates and the market. As we shall see later, the quantity that the manors were capable of sending each year were still not enough to provision some three hundred inhabitants of the Cathedral Close. Hence, an additional supply was required that was purchased in the market. First, let us look at the first channel of the grain, namely the manors.

As far as wheat and malt are concerned, the Priory received the larger part of its annual supply from the manors (about 84 per cent of total annual acquisition). Up to the late 1330s, the manors sent wheat and malt only, while after that we also witness some occasional contributions of rye, oats and peas, for the *famuli* and the livestock. The extent of the manorial contribution was largely dictated by the physical size, resources and grain specialization of each estate. Those specializing in wheat provided larger amounts of

⁴¹⁷ Campbell et al., 1993, p. 34.

wheat than did the rye-biased estates. Similarly, the manors with extensive tithes probably supplied larger quantities of grain than those having no tithes.

The extent of supply varied from decade to decade. This, in turn, was largely determined by price level, local trade and environmental conditions, as well as leasing policies of the Priory authorities. Once a manor was leased out, it stopped supplying the Priory with its grain products.

Let us turn now to the actual numbers and figures (Tables 7.3 - 7.5):

Table 7.3. Quantity of Wheat Reaching the Priory from the Manors, c.1280-1343 (in decennial means)

1. In Quarters

Wheat	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1343
Aldeby				1.08			
Catton						1.88	6.00
Denham	15.00	18.88	7.17	11.50			
Eaton	0.00	0.00	0.00	5.00	1.75	0.00	0.00
Gately	10.84	17.25	13.19	11.56	17.75	11.88	3.63
Gnatingdon	0.00	7.00	4.58	2.83	30.00	8.75	3.00
Hemsby	148.72	194.25	192.92	187.92	173.50	210.88	171.00
Heythe						4.63	2.06
Hindolveston	54.75	48.19	54.25	53.25	46.50	10.00	73.25
Hindringham	116.06	76.13	30.25	43.98	51.00	20.25	50.75
Martham	62.38	60.63	71.48	74.67	83.00	89.25	53.00
Monks G	0.00	0.00	0.00	1.40	2.56	4.53	0.00
Newton	45.03	27.34	38.38	23.25	30.94	58.19	71.69
North Elmham	35.31	12.38	35.85	34.48	53.13	38.78	27.88
Plumstead	28.59	47.88	49.88	44.35	57.94	49.81	24.50
Ravengham				2.81			
Sedgeford	20.75	14.25	0.00	3.42	16.00	15.25	4.50
Taverham	8.31	0.00	0.00	0.00	0.00	4.63	3.88
Thornham	6.25	2.13	0.00	0.00	5.25		
Total	551.99	526.31	497.95	501.50	569.32	528.71	495.14

2. As Percentage

Wheat	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1343
Aldeby	0.00%	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%
Catton	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%	1.21%
Denham	2.72%	3.59%	1.44%	2.29%	0.00%	0.00%	0.00%
Eaton	0.00%	0.00%	0.00%	1.00%	0.31%	0.00%	0.00%
Gately	1.96%	3.28%	2.65%	2.31%	3.12%	2.25%	0.73%
Gnatingdon	0.00%	1.33%	0.92%	0.56%	5.27%	1.65%	0.61%
Hemsby	26.94%	36.91%	38.74%	37.47%	30.47%	39.89%	34.54%
Heythe	0.00%	0.00%	0.00%	0.00%	0.00%	0.88%	0.42%
Hindolveston	9.92%	9.16%	10.89%	10.62%	8.17%	1.89%	14.79%
Hindringham	21.03%	14.46%	6.07%	8.77%	8.96%	3.83%	10.25%
Martham	11.30%	11.52%	14.35%	14.89%	14.58%	16.88%	10.70%
Monks G	0.00%	0.00%	0.00%	0.28%	0.45%	0.86%	0.00%
Newton	8.16%	5.19%	7.71%	4.64%	5.43%	11.01%	14.48%
North Elmham	6.40%	2.35%	7.20%	6.88%	9.33%	7.33%	5.63%
Plumstead	5.18%	9.10%	10.02%	8.84%	10.18%	9.42%	4.95%
Ravengham	0.00%	0.00%	0.00%	0.56%	0.00%	0.00%	0.00%
Sedgeford	3.76%	2.71%	0.00%	0.68%	2.81%	2.88%	0.91%
Taverham	1.51%	0.00%	0.00%	0.00%	0.00%	0.88%	0.78%
Thornham	1.13%	0.40%	0.00%	0.00%	0.92%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Accounts Database.

Table 7.4. Quantity of Malt Reaching the Priory from the Manors, c.1280-1343 (in decennial means)

1. In Quarters.

Malt	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1343
Aldeby				0.00			
Catton						39.06	0.00
Denham	0.00	0.00	0.00	0.00			
Eaton	164.00	127.75	110.67	103.17	37.00	51.97	93.00
Gately	0.00	0.00	0.00	0.00	131.31	0.00	0.00
Gnatingdon	32.00	49.50	41.98	10.00	82.00	17.50	0.00
Hemsby	519.25	602.38	557.21	400.13	363.63	336.25	349.50
Heythe						15.03	18.50
Hindolveston	10.25	19.88	48.58	32.00	29.13	10.00	90.00
Hindringham	116.25	102.63	111.96	24.67	10.00	21.00	106.50
Martham	156.38	183.28	205.38	172.31	130.88	168.63	86.00
Monks G	103.88	136.50	104.50	130.48	139.88	54.88	92.38
Newton	271.13	212.19	248.83	325.34	73.00	317.44	397.63
North Elmham	190.75	88.94	152.79	91.19	7.13	30.13	0.00
Plumstead	102.03	106.00	112.31	95.69	78.25	84.56	127.50
Ravengham				0.00			
Sedgeford	30.38	64.94	40.58	10.33	59.00	44.63	0.00
Taverham	85.88	73.44	74.08	64.92	30.69	44.50	44.75
Thornham	0.00	0.00	0.00	0.00	0.00		
Total	1782.18	1767.43	1808.87	1460.23	1171.90	1235.58	1405.76

2. As Percentage.

Malt	1281- 1290	1291- 1300	1301- 1310	1311- 1320	1321- 1330	1331- 1340	1341- 1343
Aldeby	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Catton	0.00%	0.00%	0.00%	0.00%	0.00%	3.16%	0.00%
Denham	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Eaton	9.20%	7.23%	6.12%	7.07%	3.16%	4.21%	6.62%
Gately	0.00%	0.00%	0.00%	0.00%	11.20%	0.00%	0.00%
Gnatingdon	1.80%	2.80%	2.32%	0.68%	7.00%	1.42%	0.00%
Hemsby	29.14%	34.08%	30.80%	27.40%	31.03%	27.21%	24.86%
Heythe	0.00%	0.00%	0.00%	0.00%	0.00%	1.22%	1.32%
Hindolveston	0.58%	1.12%	2.69%	2.19%	2.49%	0.81%	6.40%
Hindringham	6.52%	5.81%	6.19%	1.69%	0.85%	1.70%	7.58%
Martham	8.77%	10.37%	11.35%	11.80%	11.17%	13.65%	6.12%
Monks G	5.83%	7.72%	5.78%	8.94%	11.94%	4.44%	6.57%
Newton	15.21%	12.01%	13.76%	22.28%	6.23%	25.69%	28.29%
North Elmham	10.70%	5.03%	8.45%	6.24%	0.61%	2.44%	0.00%
Plumstead	5.73%	6.00%	6.21%	6.55%	6.68%	6.84%	9.07%
Ravengham	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sedgeford	1.70%	3.67%	2.24%	0.71%	5.03%	3.61%	0.00%
Taverham	4.82%	4.16%	4.10%	4.45%	2.62%	3.60%	3.18%
Thornham	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Sources: Accounts Database.

Table 7.5. Total Receipt of Wheat and Malt from the Manors, c.1280-1343 (in Quarters and Percentage) (in decennial means)

Decade	Wheat	Malt	Total	Wheat	Malt	Total
1281-1290	552.00	1782.16	2334.16	23.65%	76.35%	100.00%
1291-1300	526.28	1767.41	2293.69	22.94%	77.06%	100.00%
1301-1310	497.94	1808.88	2306.81	21.59%	78.41%	100.00%
1311-1320	501.50	1460.21	1961.71	25.56%	74.44%	100.00%
1321-1330	569.31	1171.88	1741.19	32.70%	67.30%	100.00%
1331-1340	528.69	1235.56	1764.25	29.97%	70.03%	100.00%
1341-1343	492.13	1405.75	1897.88	25.93%	74.07%	100.00%
Average	523.98	1518.83	2042.81	26.05%	73.95%	100.00%

Sources: Accounts Database.

The most generous quantity reached Norwich from Hemsby, as one would expect. To repeat, this was the most productive manor, because of its extensive tithes. Furthermore, this has been one of the most important contributing estates, sending annually well over 80 per cent of its total wheat harvest and close to 100 per cent of its malted barley to the Priory.⁴¹⁸ The only manors whose share in the total wheat contribution accounted for over 10 per cent were Hindolveston (wheat), Hindringham (wheat), Martham (wheat and malt) and Newton (malt). The remaining ones contributed significantly smaller quantities of the grain.

As far as the total receipt of the grain is concerned, the largest part of it was constituted by malt. This is hardly surprising, since malt has considerably higher extraction rates, when converted to ale, than wheat has (when baked). It is estimated, that about 70 per cent of barley content was wasted when brewed (part of which, however, could have been reclaimed as fodder).⁴¹⁹

Unfortunately, our accounts do not contain the granary section after 1342-3. The post-1343 reality is partially illustrated in the manorial rolls. The rolls are particularly important for learning about the post-Black Death era, with all the changes in provisioning patterns. The actual figures are illustrated on the following tables (Tables 7.6-7.8):

⁴¹⁸ See above, Tables 4.1-4.2.

⁴¹⁹ See below, Chapter 9.

Table 7.6. Quantity of Wheat Reaching the Priory from the Manors, 1341-1370, in Quarters and Percentages (in decennial means)

Manor	1341-1350	1351-1360	1361-1370	Manor	1341-1350	1351-1360	1361-1370
Catton	6.00			Catton	1.27%		
Eaton	0.90	0.00	1.83	Eaton	0.19%	0.00%	0.83%
Gateley	4.13			Gateley	0.87%		
Gnatingdon	9.67	0.00	19.13	Gnatingdon	2.04%	0.00%	8.67%
Hemsby	171.00			Hemsby	36.17%		
Heythe	2.06			Heythe	0.44%		
Hindolveston	75.16	19.84	18.50	Hindolveston	15.90%	11.93%	8.38%
Hindringham	44.38	17.31	36.00	Hindringham	9.39%	10.41%	16.31%
Martham	35.33	33.50	67.00	Martham	7.47%	20.15%	30.36%
Monks G	0.00			Monks G	0.00%		
Newton	71.69	40.00	38.50	Newton	15.16%	24.06%	17.44%
North Elmham	23.75	11.75		North Elmham	5.02%	7.07%	
Plumstead	23.17	12.38	11.13	Plumstead	4.90%	7.44%	5.04%
Sedgeford	3.00	19.50	21.88	Sedgeford	0.63%	11.72%	9.91%
Taverham	2.58	0.00	6.75	Taverham	0.55%	0.00%	3.06%
Thornham	0.00	12.00		Thornham	0.00%	7.22%	
Total	472.82	166.28	220.72	Total	100.00%	100.00%	100.00%

Sources: Accounts Database.

Table 7.7. Quantity of Malt Reaching the Priory from the Manors, 1341-1370, in Quarters and Percentages (in decennial means)

Manor	1341-1350	1351-1360	1361-1370	Manor	1341-1350	1351-1360	1361-1370
Catton	0.00			Catton	0.00%		
Eaton	37.20	0.00	31.33	Eaton	2.92%	0.00%	8.10%
Gateley	0.00			Gateley	0.00%		
Gnatingdon	0.00	0.00	33.00	Gnatingdon	0.00%	0.00%	8.53%
Hemsby	349.50			Hemsby	27.39%		
Heythe	18.50			Heythe	1.45%		
Hindolveston	84.00	16.75	35.63	Hindolveston	6.58%	3.69%	9.21%
Hindringham	71.25	0.00	0.00	Hindringham	5.58%	0.00%	0.00%
Martham	57.33	160.00	0.00	Martham	4.49%	35.26%	0.00%
Monks G	92.38			Monks G	7.24%		
Newton	397.63	160.00	162.00	Newton	31.24%	35.26%	41.85%
North	25.33	46.46		North	1.99%	10.24%	
Elmham				Elmham			
Plumstead	97.83	23.55	72.44	Plumstead	7.61%	5.19%	18.72%
Sedgeford	0.00	15.00	22.68	Sedgeford	0.00%	3.31%	5.86%
Taverham	44.38	32.00	29.92	Taverham	3.51%	7.05%	7.73%
Thornham	0.00	12.00		Thornham	0.00%	0.00%	
Total	1275.33	465.76	387.00	Total	100.00%	100.00%	100.00%

Sources: Accounts Database.

Table 7.8. Total Receipt of Wheat and Malt from the Manors, 1341-1370 (in Quarters and Percentage) (in decennial means)

Decade	Wheat	Malt	Total	Wheat	Malt	Total
1341-1350	472.82	1275.33	1748.15	27.05%	72.95%	100.00%
1351-1360	166.28	465.73	632.01	26.31%	73.69%	100.00%
1361-1370	220.72	387.00	607.72	36.32%	63.68%	100.00%
Average	286.61	709.35	995.96	28.78%	71.22%	100.00%

Sources: Accounts Database.

As expected, the 1350s and 1360s show a completely different reality from the pre-Plague years. The amount of carted grain in the 1350s fell by about 64 per cent (65 per

cent for wheat and 66 per cent for barley), compared to the previous decade. The 1360s show some recovery within the wheat sector (47 per cent of the 1340s receipt and 133 per cent of the 1350s receipt), but not in the barley sector (a further fall by 17 per cent compared to the 1350s, constituting just thirty per cent of the 1340s receipt). There were several causes for this decline. First, and most obviously, this reflects the fall in the Priory's population. As we have seen, the monastic population shrank by some 40 per cent (from 67 in 1348 to 40 in 1353) and there are some definitive hints that their fate was shared by the lay workers and *famuli*. Second, the depopulation within the agrarian sector led to a serious scarcity of labour, which, in turn, brought about the conversion from mixed husbandry to pastoral husbandry.⁴²⁰ As a result, the estates could not produce the pre-Plague quantities of grain. And finally, the post-Black Death era marks a gradual decline in direct farming and thus a switch to leasing. During the 1350s and 1360s, the Priory authorities leased out the manors of Gateley, Hemsby, Monks Grange, North Elmham and Thornham. Leasing of Hemsby alone meant a loss of about 30 per cent of total farinaceous products. In other words, there were at least three related causes for the reduced quantities of grain reaching the Priory from the rural estates.

The figures above also suggest that the post-Black Death supply could, by no means, have satisfied the annual demand of the Priory community. The population started growing anew, but agricultural production did not. In order to fit supply to demand, some alternative way of provisioning had to be found. This brings us to another channel of grain acquisition – purchase on the market. As we shall see in the following section, the post-Black Death decades show an increased reliance on local Norfolk markets, to make ends meet.

⁴²⁰ Discussed above, Chapter 4.

Purchases of Wheat (1280-1370)

In this period, purchases accounted for about 23 per cent of total grain acquisition for wheat and just under 6 per cent for malted barley. The highest purchase rates for wheat were in the 1310s (31.91 per cent) and for malt in the 1320s (18.71 per cent). This partially reflects certain difficulties in obtaining sufficient quantities of wheat directly from the estates during the famine years of 1314-17, as well as the disastrous harvest of 1321. As far as malt is concerned, the Priory authorities had to rely on the market more than ever in the 1330s, when two productive manors, Hindolveston and Hindringham were leased out.⁴²¹

The locations of the transactions are specified in some earlier rolls of the master of the cellar. Here the Priory relied on both Norwich market and various local markets outside of the town. The main supplier of wheat was Pullham Market (over 12 per cent of total wheat purchase), Halvergate and Norwich (around 10 per cent each) and Shotesham (about 7 per cent). Smaller quantities of wheat were purchased in other markets, such as Bromholm, Bawdeswell, King's Lynn, Yarmouth and elsewhere. Around 27 per cent of wheat was purchased at unknown places. Malt was supplied largely by Bromholm (over 33 per cent of the total purchase), Plumstead (about 11.50 per cent), Snetisham (about 10 per cent). Smaller quantities were acquired at Norwich (6.72 per cent), North Elmham (5.31 per cent). The remainder (over 33 per cent) was purchased from unknown sellers. Finally, the largest amounts of oats were acquired at Hickling (about 20 per cent). Additional markets included Yarmouth (over 10 per cent), Worstead (9.20 per cent),

⁴²¹ The leases of the manors are discussed in Chapter 2.

Rackheath (almost 7 per cent), Smallburg (6.84 per cent) and others. Over 23 per cent was sold at unspecified locations.

Between 1279 and 1285, the transactions were carried out within the mean radius of 14.45 miles from Norwich, ranging from the Norwich market up to King's Lynn (38.20 miles north-west of Norwich). It should be noted that some grain was evidently purchased from the Priory's tenants, in addition to their annual 'free' supply. For instance, we witness the Priory purchasing 30 quarters of malt from North Elmham and 80 quarters of oats from Hindringham in 1279-80, 10 quarters of malt from Plumstead in 1282-3 and further 33 quarters of wheat from North Elmham and Gateley in 1283-4.⁴²² This fact indicates that the Priory tenants, despite many customary burdens, could still actively participate in local market trade. This evidence might contradict some widespread assumptions regarding the excessive exploitation of late medieval English peasants by the lords, which impeded economic development during the late middle ages.⁴²³

How extensive was the grain-supply area of the Priory? The answer can be obtained by comparing it to other towns. London, whose population was about 80,000 in 1300, seems to have drawn upon grain-supply area of no more than 60 miles (=96.56 km).⁴²⁴ Late fourteenth century Winchester, with a population of about 10,000 persons, was confined to a radius of 12 miles (=19.31 km).⁴²⁵ Exeter, whose population was certainly smaller than that of Winchester was supplying hinterland of about 20 miles

⁴²² DCN 1/1/5-7.

⁴²³ For example, Robert Brenner, 'Agrarian Class Structure and Economic Development in Pre-Industrial Europe,' *Past and Present*, no. 70 (February 1976), 30-74, reprinted in *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*, T. H. Aston and C. H. E. Philpin (eds.) (Cambridge, 1985), pp. 10 - 63

⁴²⁴ Campbell et al., 1993, p. 173.

⁴²⁵ Derek Keene, *Survey of Medieval Winchester*, Winchester Studies 2 (Oxford: Clarendon Press, 1985), pp. 251-5.

(=32.19 km).⁴²⁶ Colchester, smaller than Winchester in its population, was provisioned by a radius of no more than 8 miles (=12.87 km).⁴²⁷ At first it seems that the Priory had drawn on an extraordinarily large grain-supply zone. A close examination, however, might suggest otherwise. It is still true that some transactions took place as far as over 30 miles (=48.28 km) away from Norwich (Gayton, Snetisham and King's Lynn). This does not, however, mean that this was a regular state of affairs. Distant transactions were quite limited. Only about 0.39 and 1.34 per cent of the total purchased grain was acquired on Gayton (31.60 miles [=50.86 km] north-west of Norwich) and King's Lynn (38.20 miles [61.48 km] north-east of Norwich), respectively. Again, the mean distance of all the markets was 14.45 miles (23.26 km), while its median was 13.10 miles (21.08 km). Most purchases were transacted within the range of between 15 and 20 miles (21.14 and 32.29 km) (some 32.16 per cent, with an average rate of 4.59 per cent per each market). The next largest transaction zone would stretch between ten and fifteen miles from Norwich. About 17.68 per cent of all grain was purchased there (with an average 1.77 per cent per each market). About 5.65 per cent of total farinaceous products were bought on the Norwich market. Hence, we can conclude that although the physical range of the grain-transaction zone might be extensive, its *real* zone was far smaller, with most transactions confined to the area of between ten and twenty miles. Nevertheless, the Priory drew on a larger area than the entire towns of Exeter and Colchester had. The most curious paradox here is why the Priory, which had to feed three hundreds persons, at most, did not confine

⁴²⁶ Maryanne Kowaleski, 'The Grain Trade in Fourteenth-Century Exeter', in Edwin DeWindt (ed.), *The Salt of Common Life. Individuality and Choice in Medieval Town, Countryside and Church. Essays Presented to J. Ambrose Raftis on the Occasion of His 70th Birthday* (Kalamazoo: Medieval Institute Press, 1994), pp.27-30. She estimates that the pre-1348 population of Exeter was between 4,000 and 5,000 persons (ibid, p.2).

⁴²⁷ R. H. Britnell, *Growth and Decline in Colchester* (Cambridge: Cambridge University Press, 1986), p. 44.

its annual grain purchases to the Norwich market, especially, since its grain prices were not that different from those of more distant markets.

How often did the transactions take place? Unfortunately, the information on this subject is very limited. In fact, there is only one roll (the 1279-80 roll of the master of the cellar), which specifies precise dates of purchases. Its contents, however, do not allow us to make any generalizations regarding seasonal patterns of sales, prices and consumption. All we can learn from this roll is the state of affairs in that given year. The account reveals that there were four major purchase seasons: around St. Luke's Day (18 October), around the Feast of Epiphany (6 January), the Easter Day (21 April 1280), and St. James' Day (25 July).⁴²⁸ The wheat prices were at their lowest around Easter (7.62 pence per bushel = 5.08 shilling per quarter), while they seem to have reached their annual peak in late July (10.48 pence per bushel = 6.99 shilling per quarter). The prices were almost identical in October 1279 and January 1280 (8.58 pence per bushel = 5.72 shilling per quarter and 8.51 pence per bushel = 5.67 shilling per quarter, respectively). These prices seem to be practically identical to those of London in the same year.⁴²⁹ It is rather surprising here that the Easter prices were actually lower than those in October, since the general rule is that wheat prices rose from November, peaked between March and July and fell again afterwards.⁴³⁰ But then again, a single roll does not necessarily reflect trends.

The demographic and agrarian changes of the post-Black Death era made the Priory rely more and more on local markets. The annual purchases of grain products increased, indeed, in order to make supply meet demand. This was true especially in the

⁴²⁸ DCN 1/1/13 (1297-8 roll).

⁴²⁹ Campbell et al., 1993, p.200.

⁴³⁰ Campbell et al., 1993, p. 96-7.

wheat sector, where about 35.90 per cent of total acquisition came in purchases in the 1350s and about 27.72 per cent in the 1360s (compared with 17.63 per cent of the 1340s). As far as the malt sector is concerned, there is virtually no indication of this switch. It is true that the purchased malt accounted for some 10 per cent in the 1350s (as opposed to 8.53 per cent in the 1340s), but this figure fell to 5.35 per cent in the 1360s (See Table 7.9):

Table 7.9. Grain Acquisition by the Priory (in Quarters and Percentages), 1341-1370.

1. In Quarters.

	Wheat			Surplus from Previous Year	Malt			
	Receipt	Bought	Total		Receipt	Bought	Surplus	Total
1341-1350	472.82	111.34	47.34	631.50	1275.33	142.25	249.32	1666.90
1351-1360	166.28	105.44	22.02	293.74	465.73	62.71	92.94	621.38
1361-1370	220.72	94.42	25.54	340.68	387.00	26.00	72.64	485.64

2. As Percentage.

	Wheat		Surplus from Previous Year	Total	Malt		Surplus	Total
	Receipt	Bought			Receipt	Bought		
1341-1350	74.87%	17.63%	7.50%	100.00%	76.51%	8.53%	14.96%	100.00%
1351-1360	56.61%	35.90%	7.50%	100.00%	74.95%	10.09%	14.96%	100.00%
1361-1370	64.79%	27.72%	7.50%	100.00%	79.69%	5.35%	14.96%	100.00%

Sources: Accounts Database

Notes: The 'surplus' figures are 'remaining' carried over from the previous year, estimated on the basis of the pre-1343 data.

Despite increased purchase rates, the total acquisition of grain was considerably smaller after the Black Death. This undoubtedly points to the fact that the demographic recovery may have been slow. Even though the monastic community seems to have grown during the 1360s, the overall impression is that the lay portion of the Priory

population did not recover at the same pace. In the 1350s the total acquisition of wheat and malt accounted for some 40 per cent of that in the previous decades, while during the following decade, it represented just 36 per cent of the total farinaceous acquisition of the 1340s (Table 7.10):

Table 7.10. Total Post-Black Death Grain Acquisition Represented in Quarters and as Percentage Relative to the 1340s.

	Wheat	Malt	Total	Wheat	Malt	Total
1341-1350	631.50	1666.90	2298.40	100.00%	100.00%	100.00%
1351-1360	293.74	621.38	915.12	46.51%	37.28%	39.82%
1361-1370	340.68	485.64	826.32	53.95%	29.13%	35.95%

Sources: Account Database

The decline in annual supply was felt especially in the malt sector. This might have been a deliberate policy of the Priory authorities to reduce the amount of ale, especially for the workers' and servants' consumption. But even if it is true and much of the servants' ale was substituted with water, then how can one explain that the wheat supply shrank by about 50 per cent?

Missing People, Missing Money or Missing Grain?

Three possible hypotheses can be offered to account for the evidently 'missing' wheat. One is that the Priory was so badly depopulated during the 1350s and 1360s that no more than 50 per cent of the pre-Black Death quantities were required to feed the brethren, labourers and *famuli*. This hypothesis, however, may be true only for early 1350s, but not for the subsequent years. As we have seen above, the monastic population

started recovering by 1354-5 and it grew into the 1360s, reaching its peak in 1368-9.⁴³¹ The growth of the monastic population would probably have meant a renewed recruitment of a sufficient number of lay workers, to satisfy the brethren's needs. Hence, we might dismiss this point as invalid.

We can also assume that the reduction of the wheat supply may have been derived from the financial deficit that the Priory, and the master of the cellar in particular, was facing after the Black Death. The annual income came mainly from selling grain, firewood and wool, tithes paid by appropriated churches and financial receipts from the manors. The 1350s rolls indeed reveal that the Priory experienced a pronounced financial deficit, because there were not enough working hands on the manors to produce and sell enough grain, wool and wood. During this decade, an average receipt of the master of the cellar in the 'charge' section of the account rolls was just about £275 (with over £733 in the 'discharge' section, which resulted in an overwhelming deficit of almost £460). During the 1360s, however, the Priory seems to have partially recovered from its financial crisis, with average receipts of about £400 and with average deficit of slightly over £313. The financial state of the Priory in the 1360s was similar to that of the 1320s and 1340s, with almost identical deficit rates. During these decades, the Priory did not have any trouble purchasing sufficient amounts of wheat. The real troubles did not come until the 1370s, when the annual expenses exceeded the receipts by some 60 per cent (See Table 7.11). Therefore, it is unlikely that these financial reasons stood behind reduced quantities of purchased wheat.

⁴³¹ See above, Figure 7.1.

Table 7.11. Annual Receipt, Expenses and Deficit of the Master of the Cellar's Department (in £ Sterling), 1281-1380 (in decennial means).

Decade	Charge	Discharge	Balance	Charge as % of Discharge	Charge relative to previous decade	Discharge relative to previous decade
1281-1290	478.73	498.40	-19.66	96.05%		
1291-1300	569.33	552.47	16.86	103.05%	118.92%	110.85%
1301-1310	684.33	578.20	106.13	118.35%	120.20%	104.66%
1311-1320	710.87	757.41	-46.54	93.86%	103.88%	130.99%
1321-1330	621.36	1063.88	-442.52	58.40%	87.41%	140.46%
1331-1340	568.65	744.87	-176.22	76.34%	91.52%	70.01%
1341-1350	379.12	676.26	-297.14	56.06%	66.67%	90.79%
1351-1360	274.29	733.87	-459.58	37.38%	72.35%	108.52%
1361-1370	403.23	716.24	-313.01	56.30%	147.01%	97.60%
1371-1380	385.02	951.26	-566.24	40.47%	95.48%	132.81%
Average	507.49	727.29	-219.79	69.78%		

Sources: DCN 1/1/6-58.

Notes: Charge=receipts; discharge=expenditures.

Only one alternative explanation remains: that wheat was replaced with another foodstuff. The best source of information regarding the non-grain diet of the brethren is the Cellarer's rolls. The details about annual purchases and consumption of non-farinaceous products are contained under four main headings: 'larder' (*lardaria*), 'stock' (*staurum*), 'spices' (*species*) and 'kitchen' (*coquina*). After c.1330, the spices were listed under other headings. Calculating the expenses of the three headings together, we obtain an annual figure of over £500 before c.1330 and over £400 during the 1330s (Figure 7.12). The 1350-1 roll reveals that as much as £518 was spent on non-grain products (£262.21 on meat alone, which was an unprecedented record). In the late 1350s we witness a decline in the food expenses (around £350 a year), while by late 1360s the expenses came back to their pre-Black Death level. Between 1369 and 1371, they accounted for over £478, while in 1382-3, they soared to an unprecedented level (over

£580 a year). The *coquina* section alone accounted for over £7 a week, compared to just £3 during the 1330s.⁴³²

Table 7.12. Annual Non-Grain Diet Expenses (in £ Sterling), 1327-1383 (in decennial means).

Year	Lardar	Spices	Stock	Kitchen	Total
1327-8	93.23	13.34	40.33	433.00	579.90
1328-29	93.40	11.73	24.91	400.00	530.04
1329-30	126.64	22.76	34.54	387.65	571.59
1337-38					434.00
1350-51	262.21		14.42	241.63	518.26
1355-56	165.29		13.26	200.00	378.55
1359-60	109.30		43.14	175.00	327.44
1368-69	227.05		19.53	160.00	406.58
1369-70	302.45		28.67	147.69	478.81
1370-71	288.50		30.40	159.41	478.31
1382-83	219.24		10.88	350.00	580.12

Sources: DCN 1/2/14a-25; Saunders, 1930, p.96 (for the 1336-7 account, now lost).

Notes: The figures in red are my estimations.

Certainly, the £478 expenditure of 1370 bought less than the same sum during the 1330s, since prices continued to rise after the Black Death, well until the late 1370s. For instance, the (composite) meat price in the 1370s exceeded that of the 1330s by over 20 per cent; herring price in the 1370s accounted for some 135 per cent of the 1330s price; butter price of the 1370s was higher by about twenty per cent than in the 1330s; cheese, on the other hand, was cheaper by ten per cent in the 1370s.⁴³³ In other words, the purchasing power of money in the 1370s was between fifteen and twenty per cent lower than in the 1330s, as far as non-grain products go. This, however, was nothing compared

⁴³² This fact is noted in H. W. Saunders, *An Introduction to the Obedientary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), p. 96, note 1.

⁴³³ David L. Farmer, 'Prices and Wages, 1350-1500', in Edward Miller (ed.) *Agrarian History of England and Wales*, Vol. III: 1350-1500 (Cambridge, 1988), pp. 431-525. Again, I have used Munro's Index.

to the grain sector, and wheat in particular. Wheat prices rose much faster, before, into and after the Black Death, reaching their peak between 1366 and 1370. By this point they were higher than the 1330 prices by some 37 per cent, both on national level and local (Norwich and Norfolk) level. Can we then assume that it was that asymmetric rise in prices that provoked the Priory authorities to decrease the wheat consumption, on the one hand, and increase the purchases of the non-grain products, on the other? Whatever the real motives were, one thing is clear: after the Black Death, and especially during the 1360s, we witness increased purchases, and consequently consumption of non-farinaceous products, that came to partially replace wheat. This could explain why the quantities of wheat purchases decreased in the post-Black Death decades.

Purchases of Oats and Bran

Along with the human population of the Priory, one should not ignore the equine one. As we have seen above, the monastic horses were used for various purposes, including carting, carrying and milling.⁴³⁴ Each day, such horses would have consumed approximately 10,000 kilocalories each, which were derived from different kinds of fodder, mostly straw, hay, peas, oats and oat bran. In Chapter 5, we have shown that the manorial horses were fed predominately with hay and straw, while oats and peas constituted, as a rule, no more than fifteen per cent of total feed. The situation in the Priory was radically different. Just like the humans, the monastic horses seem to have been valued more than the manorial ones. For instance, the financial price of monastic horses was higher than those from the estates, and, as Saunders put it, ‘there is no doubt

⁴³⁴ See above, Chapters 5 and 6.

that some were very fine beasts'.⁴³⁵ We find several rolls mentioning the proper names of these horses, such as Diggard, Grisel, Bai and Lanteyn.⁴³⁶ Presumably these were riding horses rather than the work-horses on the manors. And most importantly, the Priory horses were certainly fed better than those from the manors. Large amounts of oats and bran, consumed every year by the horses, indicate that the Priory authorities cared to feed their horses with quality fodder, containing as much grain as possible.

Unlike wheat and barley, oats were hardly ever sent from the manors. In these rare cases, the quantities were fairly small, never exceeding twenty five quarters per manor. This is hardly surprising, since Norfolk was strongly a barley-biased county, with modest seeding rates of oats, compared to other counties. Moreover, sending large amounts of oats to the Priory would have left the manorial horses exposed to dearth and diseases, which, in turn, would have led to fall in arable production and, consequently, human famine, so well known in early fourteenth century. Similarly, there is no evidence that the estates ever sent bran to Norwich. Hence, the Priory had to rely chiefly on the market, as far as oat and bran purchases are concerned. The average purchases varied from decade to decade and depended, largely, on the economic and environmental reality. Table 7.13 illustrates annual acquisition of oats and bran, as indicated in the grain accounts on the dorse of the master of the cellar rolls.

Unfortunately, the grain accounts do not cover some years of the 1320s and 1330s, and they stop in 1343. Their advantage, over the master of the cellar accounts proper, is that they distinguish between the quantities purchased, the amounts left unused from a previous year, and quarters received from the estates. This allows us to learn about

⁴³⁵ H. W. Saunders, *An Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), p. 79.

⁴³⁶ Ibid.

the composition and distribution of oat receipt. To fill the gaps, especially the post-1343 ones, I have added an additional table (Table 7.14), calculated on the basis of the 'grain purchase' section of the master of the cellar rolls. Because of some gaps in years, there are some (insignificant) discrepancies in figures:

Table 7.13. Annual Distribution of Horse Feed (Oats and Bran) in Standard Quarters and Percentages, 1281-1343, as Calculated from the Granary Accounts.

1. Oats.

In Quarters

Decade	Manors	Surplus from Previous Year	Bought	Increment*	Total
1281-1290	3.38	72.50	309.13	27.75	412.75
1291-1300	8.88	139.25	374.13	0.00	521.75
1301-1310	2.50	45.83	274.83	0.00	323.17
1311-1320	0.00	25.42	232.31	0.00	257.73
1321-1330	0.00	0.00	111.75	0.00	111.75
1331-1340	22.50	92.19	135.16	0.00	249.84
1341-1343	20.50	138.19	91.88	0.00	250.56
Average	8.25	73.34	218.45	3.96	303.94

As Percentage

1281-1290	0.82%	17.57%	74.89%	6.72%	100.00%
1291-1300	1.70%	26.69%	71.71%	0.00%	100.00%
1301-1310	0.77%	14.18%	85.04%	0.00%	100.00%
1311-1320	0.00%	9.86%	90.14%	0.00%	100.00%
1321-1330	0.00%	0.00%	100.00%	0.00%	100.00%
1331-1340	9.01%	36.90%	54.10%	0.00%	100.00%
1341-1343	8.18%	55.15%	36.67%	0.00%	100.00%
Average	2.71%	24.13%	71.87%	1.30%	100.00%

2. Bran.**In Quarters**

Decade	Manors	Surplus from Previous Year	Bought	Increment	Total
1281-1290	0.00	0.00	0.00	0.00	0.00
1291-1300	0.00	0.00	53.75	0.00	53.75
1301-1310	0.00	0.00	62.00	0.00	62.00
1311-1320	0.00	0.00	80.50	0.00	80.50
1321-1330	0.00	0.00	91.50	0.00	91.50
1331-1340	0.00	0.00	87.25	0.00	87.25
1341-1343	0.00	0.00	134.00	0.00	134.00
Average	0.00	0.00	72.71	0.00	72.71

As Percentage

1281-1290	0.00%	0.00%	0.00%	0.00%	0.00%
1291-1300	0.00%	0.00%	100.00%	0.00%	100.00%
1301-1310	0.00%	0.00%	100.00%	0.00%	100.00%
1311-1320	0.00%	0.00%	100.00%	0.00%	100.00%
1321-1330	0.00%	0.00%	100.00%	0.00%	100.00%
1331-1340	0.00%	0.00%	100.00%	0.00%	100.00%
1341-1343	0.00%	0.00%	100.00%	0.00%	100.00%
Average	0.00%	0.00%	85.71%	0.00%	85.71%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: 'Increment' denotes the difference in volume between 'raw' and ground grain.
This subject will be treated in the next chapter.

Table 7.14. Annual Purchases of Horse Feed (Oats and Bran), 1281-1370, as Calculated from the Master of the Cellar Accounts (in Quarters and £ Sterling).

Decade	Oats Quarters	Value in £	Bran Quarters	Value in £	Total Quarters	Value in £
1281-1290	309.13	22.20	0.00	0.00	309.13	22.20
1291-1300	304.70	25.35	49.40	2.89	354.10	28.23
1301-1310	274.25	21.82	62.00	3.95	336.25	25.76
1311-1320	240.48	23.70	71.86	4.24	312.34	27.93
1321-1330	93.63	11.73	70.88	3.57	164.50	15.29
1331-1340	126.29	10.87	90.52	3.77	216.81	14.64
1341-1350	64.56	5.09	119.50	4.98	184.06	10.07
1351-1360	16.38	3.25	82.80	4.81	99.18	8.06
1361-1370	10.67	1.18	192.60	11.85	203.27	13.02
Average	160.01	13.91	82.17	4.45	242.18	18.36

Sources: DCN 1/1/6-51.

Between 1280 and 1330, the share of oat purchases varied between 70 and 100 per cent. The change came after 1330, when we witness a rise in proportion of manorial receipts, which, nevertheless, did not exceed ten per cent of the total acquisition. About one quarter of the total annual supply remained unused and was stored in the granary for future consumption. During the 1320s, we witness a smaller quantity of oats reaching the Priory stables (111.75 quarters according to the available granary accounts and just 93.63 quarters, if we rely on more numerous master of the cellar accounts). It was a decade of relatively high prices, both for grain and livestock.

Ever since its introduction *c.* 1290, bran was obtained exclusively from the market. Compared to oats, it was first purchased on a small scale. In the course of the decades, however, the quantities of purchased bran grew larger, while, conversely, the amount of oats decreased. The equilibrium between oats and bran was reached around 1335 and ever since the 1340s, and especially in the post-Black Death decades, bran was the

predominant fodder for the horses. The expansion of bran is quite impressive: its ratio to oats grew from marginal 0.16 in the 1290s to overwhelming 18.06 in the 1370s (See Table 7.15):

Table 7.15. Bran-to-Oats Ratio, 1281-1370.

Decade	Oats Quarters	Bran Quarters	Decade	Oats Ratio	Bran Ratio
1281-1290	309.13	0.00	1281-1290	1.00	0.00
1291-1300	304.70	49.40	1291-1300	1.00	0.16
1301-1310	274.25	62.00	1301-1310	1.00	0.23
1311-1320	240.48	71.86	1311-1320	1.00	0.30
1321-1330	93.63	70.88	1321-1330	1.00	0.76
1331-1340	126.29	90.52	1331-1340	1.00	0.72
1341-1350	64.56	119.50	1341-1350	1.00	1.85
1351-1360	16.38	82.80	1351-1360	1.00	5.06
1361-1370	10.67	192.60	1361-1370	1.00	18.06
Average	160.01	82.17	Average	1.00	0.51

Sources: DCN 1/1/6-51.

How can we explain this switch from oats to bran? Again, it is worthwhile looking at local prices (Table 7.16). The comparison between the two sets of prices from Norwich reveal that the rise in purchased quarters of bran correspond, more or less, to the rise in oat prices, on the one hand, and to the fall in bran prices, on the other. From the 1310s onwards, we see a pronounced fall in bran-to-oats price ratio, which reached its lowest point during the 1350s, when the price of bran was just 29 per cent of that of oats. This was because the oat prices soared much higher than the bran ones, during the 1350s. This disproportion between the rise of oat and bran prices was probably the reason behind a gradually increasing preference of bran over oats, as equine feed.

Table 7.16. Oat and Bran Prices, 1271-1370, Represented in d. per Bushel and as Bran-to-Oats Price Ratio.

Decade	Oats d / bushel	Bran d / bushel	Oats Ratio	Bran Ratio
1271-1280	2.79	1.43	1.00	0.51
1281-1290	2.19		1.00	
1291-1300	2.38	1.74	1.00	0.73
1301-1310	2.74	2.01	1.00	0.73
1311-1320	3.00	1.77	1.00	0.59
1321-1330	3.98	1.51	1.00	0.38
1331-1340	2.89	1.27	1.00	0.44
1341-1350	2.99	1.21	1.00	0.40
1351-1360	6.04	1.77	1.00	0.29
1361-1370	3.63	1.87	1.00	0.51
Average	3.27	1.62	1.00	0.51

Sources: Norfolk Grain Price Database, based on the Lord Beveridge Database and the Account Rolls.

What can we conclude about the proportions of these annual purchases of oats and bran? Unfortunately, our accounts do not specify how many horses were at the Priory stable each year. Certainly, the purchase rates of oats and bran do not shed any light on their number. Instead, they imply how many horses *could have been potentially fed with oats and bran only*. As we have seen in Chapter 5, a fourteenth-century horse would have required about 10,000 kilocalories on daily basis. It has been estimated, that one quarter of oats contained c.1300 around 482,688 kilocalories (almost 483 megacalories).⁴³⁷ The estimation of bran calories and weight is a bit trickier. Modern animal scientists have calculated that one kilogram of oat bran contains 4,316 kilocalories of Gross Energy (or,

⁴³⁷ See above, Table 2.10.

1,957.74 kilocalories per pound).⁴³⁸ Campbell estimates that removal of the bran from oats resulted in a loss of 44 per cent per cent for oats (with extraction rates of 56 per cent).⁴³⁹ If a bushel of oats *c.* 1300 contained 36.00 pounds, then it appears that a bushel of oat bran would be equal to about 51.84 pounds (811,912.94 kilocalories, or about 812 megacalories per quarter). The following tables (Tables 7.17-19) illustrate the quantities of oats and bran acquired each year by the Priory, with their (approximate) calorific equivalent and their feeding capacities:

Table 7.17. Annual Acquisition and Consumption of Oats, Their Approximate Calorific Value Per Year and Per Day and Quantities of Horses they were Capable of Feeding (with 10,000 Kilocalories for Each Horse Per Day), 1281-1343.

Decade	Quarters	Calories <i>per annum</i>	Calories <i>per diem</i>	Number of Horses they could feed
1281-1290	340.25	164,234,592.00	450,884.26	45.09
1291-1300	382.50	184,628,160.00	506,872.09	50.69
1301-1310	277.33	133,865,472.00	367,509.88	36.75
1311-1320	232.31	112,134,456.00	307,850.26	30.79
1321-1330	111.75	53,940,384.00	148,086.16	14.81
1331-1340	157.66	76,098,780.00	208,919.09	20.89
1341-1343	112.38	54,242,064.00	148,914.38	14.89

Sources: DCN 1/1/6-28, 30-37, 39-40.

⁴³⁸ J. D. Hahn, T. K. Chung and D. H. Baker, 'Nutritive Value of Oat Flour and Oat Bran', *Journal of Animal Science* 68:12 (1990), 4253-4260. Consult, also, *Oat Bran*, Peter J. Wood (ed.) (St. Paul, Minn.: American Association of Cereal Chemists, 1993)

⁴³⁹ Campbell, 2000, pp. 215, 224. For barley extraction rates, see D. J. Gallant, F. de Monredon, B. Bouchet, P. Tacon and J. Delort-Laval, 'Cytochemical Study of Intact and Processed Barley Grain', in *New Trends in Barley Quality for Malting and Feeding*, J.L. Molina-Cano (ed.) (Zaragoza: CIHEAM-IMAZ, 1991), pp. 31-34 (esp. 34).

Table 7.18. Annual Acquisition and Consumption of Oat Bran, Their Approximate Calorific Value Per Year and Per Day and Quantities of Horses they were Capable of Feeding (with 10,000 Kilocalories for Each Horse Per Day), 1281-1343.

Decade	Quarters	Calories <i>per annum</i>	Calories <i>per diem</i>	Number of Horses they could feed
1281-1290	0.00	0.00	0.00	0.00
1291-1300	53.75	43,640,320.39	119,562.52	11.96
1301-1310	62.00	50,338,602.12	137,913.98	13.79
1311-1320	80.50	65,358,991.47	179,065.73	17.91
1321-1330	91.50	74,290,033.78	203,534.34	20.35
1331-1340	87.25	70,839,403.79	194,080.56	19.41
1341-1343	134.00	108,796,333.62	298,072.15	29.81

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: Unlike oats, the entire supply of bran was consumed by the horses each year.

Table 7.19. Annual Acquisition and Consumption of Oat and Oat Bran Combined, Their Approximate Calorific Value Per Year and Per Day and Quantities of Horses they were Capable of Feeding (with 10,000 Kilocalories for Each Horse Per Day), 1281-1343.

1. Total Quarters of Oats and Oat Bran Available for Consumption, 1281-1343.

Decade	Quarters	Kcals <i>per annum</i>	Kcals <i>per diem</i>	Number of Horses fed
1281-1290	412.75	199,229,472.00	546,958.06	54.70
1291-1300	575.50	295,482,784.39	810,962.56	81.10
1301-1310	385.17	206,327,274.12	566,160.16	56.62
1311-1320	338.23	189,761,767.47	520,597.03	52.06
1321-1330	203.25	128,230,417.78	351,620.50	35.16
1331-1340	337.09	191,435,983.79	525,162.45	52.52
1341-1343	384.56	229,739,845.62	630,106.50	63.01
Average	376.65	205,743,935.02	564,509.61	56.45

2. Number of Quarters of Oats Actually Consumed, According to the Granary Rolls, 1281-1343.

Decade	Quarters	Kcals <i>per annum</i>	Kcals <i>per diem</i>	Number of Horses fed
1281-1290	340.25	164,234,592.00	450,884.26	45.09
1291-1300	436.25	228,268,480.39	626,434.61	62.64
1301-1310	339.33	184,204,074.12	505,423.85	50.54
1311-1320	312.81	177,493,447.47	486,915.99	48.69
1321-1330	203.25	128,230,417.78	351,620.50	35.16
1331-1340	244.91	146,938,183.79	402,999.65	40.30

1341-1343	246.38	163,038,397.62	446,986.53	44.70
Average	303.31	170,343,941.88	467,323.63	46.73

Sources: DCN 1/1/6-28, 30-37, 39-40.

Needless to say, these figures are astonishing. Unlike the manorial counterpart, the Priory horses seem to have been fed exclusively on grain feed, and there is no evidence about feeding them with straw, or hay. These quantities of oats and bran could theoretically have fed more than fifty horses a year and in some decades this was indeed the case. This, of course, does not mean that there were as many horses in the Priory stables. If there were, and there almost certainly were, fewer than 50 horses that the aforesaid amounts of oats and bran could feed, then where did the remaining fodder go to? Three hypotheses can be established here. The first that the feed was partially consumed by some workers of lower ranks, such as temporary wage earners, or the Priory *famuli*. But the bakers' accounts, as we shall see later, prove otherwise, implying that all the human inhabitants of the Priory were fed with wheat bread. The second possibility is that the remaining fodder might have been given to other animals, destined for butchering, such as cattle, swine, rabbits and poultry. And finally, it is also possible that just as the brethren, so were their horses indulged in overeating, and the number of calories they consumed exceeded the amount of calories they actually required. All these hypotheses, however, cannot be proven here, since our sources do not provide any solid evidence for them. What is clear, however, is that the reliance on market, rather than on manors, reflects not only the monastic demands, but also the geography of crops. As we have seen in Chapter 2, the Priory manors were strongly barley-biased, both because of

geological and consumption factors. After all, it was from barley-malt that the monastic ale was brewed, while oats were of secondary importance.

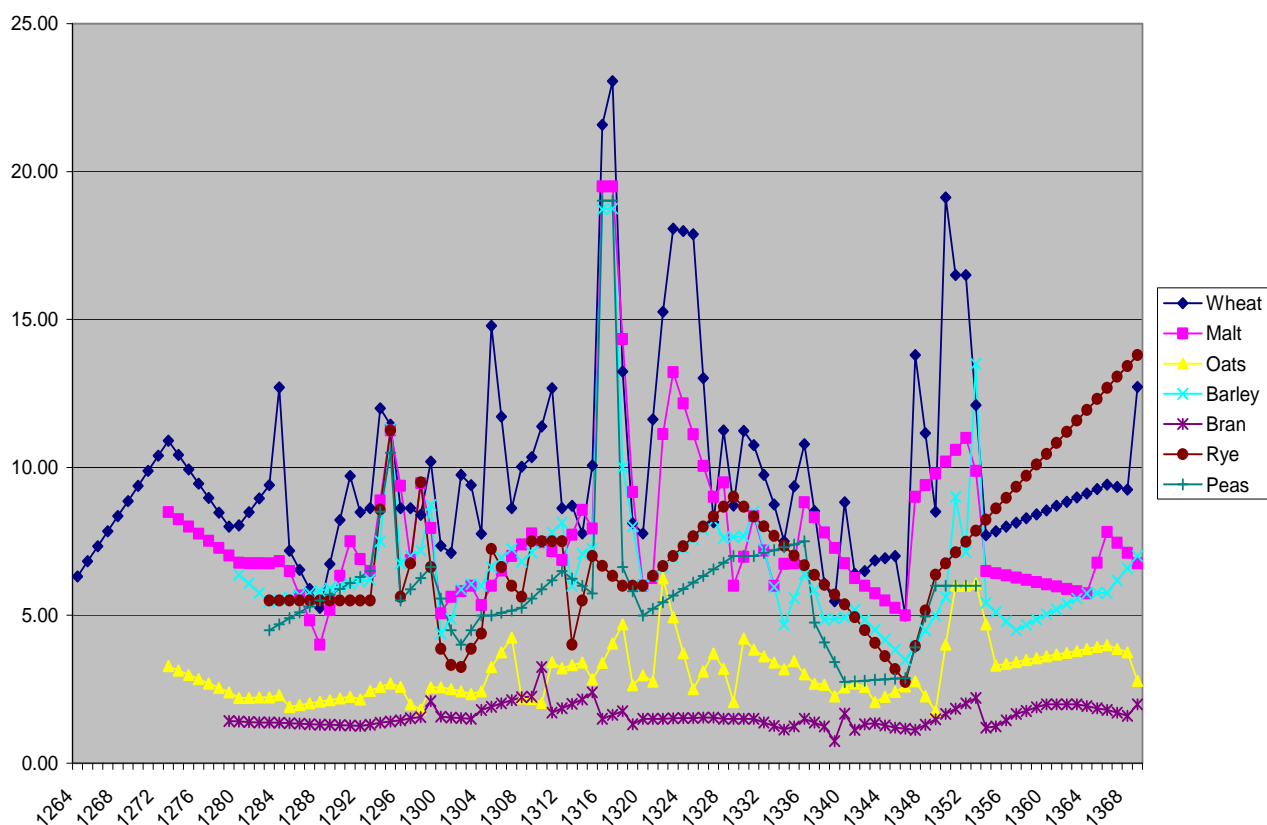
Grain Prices of Norwich, 1263-1380.

In the previous section we have seen that the feeding patterns were, to a great extent, dictated and shaped by the fluctuation of grain prices, on local level. It is absolutely vital to look at the prices of each grain and their fluctuation, both before, during and after the period under our study. As the earliest surviving Priory account recording the grain prices is that of 1263-4, let this year be our starting point. The information on the prices comes from various obedientiary rolls, mainly from these of the master of the cellar, but also from those of the cellar, almoner, sacrist and chamberlain. Each year these officials recorded annual expenses and receipts from sales and purchases of grain. I have calculated the mean price of all the sales and purchases, both in pence per bushel and shilling per quarter. Since the price data derive from so many rolls, we are fortunate to have the prices for virtually each year, after 1290, except 1305-6, 1316-7 (unfortunately), 1323-4, 1325-6, 1331-2, 1343-4, 1347-8, 1355-6, 1357-8, 1358-9, 1360-1, 1364-5, 1366-7 and 1369-70. To fill the gaps of time-series data and estimate the prices in the missing years (except for the abnormal 1316-7), I have used regressions, filling the gaps with a linear interpolation.⁴⁴⁰ As far as the abnormal years are concerned, I have replaced the gaps with the most likely numbers, based on contemporary evidence

⁴⁴⁰ For alternative approaches, see, Kevin F. Ryan and David E. A. Giles, 'Testing for Unit Roots in Economic Time Series with Missing Observations', in *Advances in Econometrics* 13 (1998), Thomas B. Fomby and R. Carter Hill (eds.), pp. 203-242; P.C.B. Phillips, 'Time Series Regression with Unit Roots', *Econometrica* 55 (1987), 277-302; P.C.B. Phillips and P. Perron, 'Testing for a Unit Root in Time Series Regression', *Biometrika* 75 (1988), 335-346.

from other regions and relative to the national prices. The complete picture is represented on Figure 7.3 (year by year) and 7.20 (in quinquennial means):

Figure 7.4. Norwich Grain and Legume Prices, 1264-1370



Source: DCN 1/1-12.

Table 7.20. Norwich Grain Prices, in Quinquennial Means, 1264-1370.

1. In Pence per Bushel.

Year	Wheat	Rye	Peas	Oats	Oat Bran	Barley	Malt
1264-1265	6.57						
1266-1270	8.36						
1271-1275	10.31			3.14			8.25
1276-1280	8.59			2.54	1.42	6.38	7.27
1281-1285	9.35	5.51	4.70	2.17	1.37	5.69	6.72
1286-1290	6.53	5.51	5.50	2.08	1.31	5.84	5.20
1291-1295	10.05	7.27	7.58	2.43	1.32	7.44	8.21

1296-1300	8.64	6.47	5.97	2.30	1.64	6.81	7.75
1301-1305	9.76	4.41	4.60	2.59	1.66	5.89	5.76
1306-1310	10.42	6.65	5.39	2.88	2.38	7.12	7.23
1311-1315	9.57	6.30	6.13	3.24	2.03	7.25	7.65
1316-1320	14.75	6.20	11.10	3.55	1.54	12.30	13.70
1321-1325	16.16	7.00	5.67	4.04	1.52	6.95	10.78
1326-1330	10.47	8.54	6.74	3.26	1.52	7.81	8.30
1331-1335	9.22	7.68	7.20	3.50	1.31	6.39	7.01
1336-1340	7.94	6.03	4.50	2.64	1.31	5.38	7.79
1341-1345	6.74	4.06	2.82	2.40	1.25	4.51	5.75
1346-1350	11.52	5.00	4.75	2.68	1.35	4.52	8.68
1351-1355	12.13	7.86	6.00	5.21	1.70	8.03	8.88
1356-1360	8.27	9.72		3.49	1.76	4.78	6.20
1361-1365	8.98	11.57		3.80	1.96	5.53	6.04
1366-1370	10.19	13.25		3.60	1.78	6.38	7.28
Average	9.75	7.17	5.91	3.08	1.59	6.58	7.72

2. In Shilling per Quarter.

Year	Wheat	Rye	Peas	Oats	Oat Bran	Barley	Malt
1264-1265	4.38						
1266-1270	5.57						
1271-1275	6.87			2.09			5.50
1276-1280	5.72			1.69	0.95	4.25	4.85
1281-1285	6.23	3.67	3.13	1.45	0.92	3.79	4.48
1286-1290	4.35	3.67	3.67	1.39	0.87	3.89	3.47
1291-1295	6.70	4.85	5.05	1.62	0.88	4.96	5.47
1296-1300	5.76	4.32	3.98	1.54	1.09	4.54	5.16
1301-1305	6.51	2.94	3.07	1.73	1.10	3.93	3.84
1306-1310	6.95	4.43	3.59	1.92	1.59	4.74	4.82
1311-1315	6.38	4.20	4.09	2.16	1.35	4.83	5.10
1316-1320	9.84	4.13	7.40	2.37	1.03	8.20	9.13
1321-1325	10.78	4.67	3.78	2.69	1.01	4.63	7.18
1326-1330	6.98	5.69	4.49	2.17	1.01	5.20	5.54
1331-1335	6.15	5.12	4.80	2.33	0.87	4.26	4.67
1336-1340	5.29	4.02	3.00	1.76	0.87	3.59	5.20
1341-1345	4.49	2.71	1.88	1.60	0.84	3.01	3.83
1346-1350	7.68	3.33	3.17	1.79	0.90	3.01	5.79
1351-1355	8.09	5.24	4.00	3.48	1.14	5.36	5.92
1356-1360	5.52	6.48		2.33	1.17	3.18	4.13
1361-1365	5.99	7.72		2.53	1.30	3.69	4.03
1366-1370	6.79	8.83		2.40	1.19	4.26	4.86
Average	6.50	4.78	3.94	2.05	1.06	4.39	5.15

Source: DCN 1/1-12.

Unfortunately, our accounts do not give any data about prices other than wheat in the 1260s, while rye and peas prices do not come into the picture until the 1280s. Before the agrarian crisis of 1314-1317, wheat prices were at their lowest during the early 1260s, as well as between 1286 and 1290, costing about 6.50 pence per bushel. The periods of 1271-1275, 1291-1295 and 1306-1310, on the other hand, saw some high prices, with a bushel of wheat selling for over ten pence. As expected, the prices were abnormally high between 1316 and 1320 (14.75 pence per bushel, on average), because of harvest failures all over the country. But what is perhaps less expected is that in the long run, wheat prices were even higher between 1321 and 1325 (16.16 pence per bushel, on average), than between 1316 and 1320. This requires a closer look at the price fluctuations. The prices were indeed exceedingly high between 1315-1316 and 1317-1318 only, but once the weather showed its clemency in 1317, the prices fell, returning to their pre-1315 level, but not for long.

They soared anew in 1321-1322 (15.26 pence per bushel) and remained at a high level until 1325-1326 (around 18 pence per bushel). This fact implied that besides the crisis of 1314-1317 there was another period of hardship, lasting between 1321-1322 and 1325-1326. Perhaps, the crisis of 1321-1326 was no easier than the harvest failure of 1314-1317, since it lasted twice as long. But how can it be explained? Is it possible that the high prices of early 1320s were connected to widespread cattle murrain – a phenomenon, still underestimated and understudied by economic and environmental historians?⁴⁴¹ The stock accounts of our manors provide an unquestioned proof that the

⁴⁴¹ The epizootics are (briefly) mentioned in Ian Kershaw, 'The Great Famine and Agrarian Crisis in England, 1315-1322', *Past and Present* no. 59 (May 1973), p. 14 (Kershaw limits the murrain to 1319-1321 only). I am thankful to my colleague and friend, Tim Newfield, of University of Montreal, for his helpful suggestions, as well as for presenting me with a copy of his MA Thesis: Tim P. Newfield, *A Great*

epizootics were indeed severe, on most manors, with depopulation rates of over 31 per cent, on average. This is well reflected in Table 7.21, comparing the cattle population on each manor, in the periods of 1317-1320 and 1321-1326:

Table 7.21. Cattle Population on the Priory Manors, 1317-1320 and 1321-1326.

Manor	Cattle Heads 1317-1320	Cattle Heads 1321-1326	Depopulation Rates (during the Plague)
Eaton	57.50	38.20	33.57%
Gateley	68.67	33.60	51.07%
Gnatingdon	62.67	41.40	33.94%
Hemsby	124.50	71.00	42.97%
Hindolveston	73.00	49.00	32.88%
Hindringham	70.00	37.33	46.67%
Martham	91.67	45.40	50.47%
Monks Grange	44.50	25.20	43.37%
North Elmham	13.00	15.00	-15.38%
Plumstead	45.00	33.50	25.56%
Sedgeford	81.00	58.33	27.98%
Taverham	38.50	29.60	23.12%
Thornham	14.33	12.75	11.05%
Average	60.33	37.72	31.33%

Sources: Accounts Database.

The stock accounts imply that the crisis was especially pronounced on the estates with a large cattle population, such as Gateley, Hemsby, Hindringham and Martham, where the depopulation rates accounted for around 50 per cent. On the other hand, the manors of North Elmham and Thornham seem to have overcome the murrain well: while Thornham lost only slightly over ten per cent of its cattle, the bovine population of North

Elmham actually increased a bit. This is not surprising, since the two estates did not specialize in cattle rearing and possessed a small number of bovine animals. Hence, such manors would have experienced much less difficulty in replacing the dead cattle with live ones, through purchase, than those with large bovine population. Furthermore, it is necessary to distinguish between the *murrain rates* and *depopulation rates*. Again, the figures above do not actually reflect the death rates of the cattle, but the ratio between the 1317-1320 and 1321-1326 cattle heads at hand. The *murrain rates*, in fact, were higher than *depopulation rates* and much of the cattle population was reclaimed through annual purchases and inter-manorial transfers. The cattle murrain attacked not only all of England, but also other countries of Western and Central Europe. It is likely that it contributed to bad harvests of 1321, since cattle served both as ploughing animals and fertilizing agents of the soil, via manure folding. The deficit of cattle may have undoubtedly created certain barriers to successful cultivation and plentiful harvests, as well as redoubling the peasant labour.

Is it possible, then, that these hardships commanded higher prices in the grain sector of Norfolk, in the first half of the 1320? The combined evidence on cattle mortality and grain harvests provide a contradictory picture. In fact, the cattle murrain should have had a disastrous effect on harvests. This was, however, not the case. The manorial accounts do not provide any evidence of bad harvests during these years. On the contrary, the manorial fields yielded good harvests, on the demesne, at least. The average wheat harvest was 56.00 quarters in 1318, 70.37 in 1319, 52.16 in 1320 and 50.66 in 1321; the rye harvest amounted 24.13 quarters in 1318, 23.53 in 1319, 34.03 in 1320 and 29.69 in 1321; the oat crop accounted for 32.87 quarters in 1318, 39.50 in 1319, 46.98 in 1320 and

36.82 in 1321; and finally, the fortunes of barley were 217.77 in 1318, 236.74 in 1319, 250.91 in 1320 and 269.00 in 1321.⁴⁴² In other words, with the exception of wheat, the grain harvests of 1320 were higher than those in the preceding years, even on the estates where the cattle mortality was exceedingly high. The epizootic of 1319-20 seems to have had hardly any effect on farming in Norfolk. This was largely because of progressive farming methods, used by Norfolk lords, who succeeded in obtaining high grain yields, without relying much on grazing animals and their manure as sources of nitrogen.⁴⁴³ Instead, a considerable role was played by legumes, serving as fertilizing agents.⁴⁴⁴ But at the same time, it is important to remember that the primary purpose of the legumes was fodder for the animals, who, in turn, produced the manure. In other words, the nitrogen fixing properties of legumes were more indirect (via the animals) than direct. Hence, the cattle murrain of 1319-20, can be dismissed as the cause of the soaring grain prices, at least in case of Norfolk.

This brings us to yet another possibility: heavy rainfall in 1321, which brought disastrous harvests in 1322.⁴⁴⁵ Unfortunately, there is not a single extant manorial account for 1321-2 and hence, there is no way to learn about the harvest of 1322 on the Priory manors. Contemporary evidence, both chronographic and manorial, suggests that

⁴⁴² NRO, DCN 60/8/17-19; 60/13/17-20; 60/14/16-19; 60/15/10-12; 60/18/20-22; 60/20/18-20; 60/23/15-18; 60/16/16-18; 60/10/16-18; 60/29/18-19; 60/33/19-22; 60/35/18-20; 60/37/12-15.

⁴⁴³ On the importance of manure, see Robert S. Shiel, 'Improving Soil Productivity in the Pre-Fertiliser Era,' in M.S. Campbell (ed.) *Before the Black Death: Studies in 'Crisis' of the Early Fourteenth Century* (Manchester and New York: Manchester University Press, 1991), pp. 51 – 77; idem, 'Nutrient Flows in Pre-Modern Agriculture in Europe,' in *Soils and Societies. Perspectives from Environmental History*, J. R. McNeill and Verena Winiwarter (eds.) (Isle of Harris: The White Horse Press, 2006), pp. 216-242.

⁴⁴⁴ Bruce Campbell, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk,' *Economic History Review* 2nd Series 36 (1983), 26-46; idem, 'Arable Productivity in Medieval England: Some Evidence from Norfolk,' *Journal of Economic History* 43 (1983), 379-404.

⁴⁴⁵ Ian Kershaw, 'The Great Famine and Agrarian Crisis in England, 1315-1322,' *Past and Present* no. 59 (May 1973), p.14 and 20.

the 1322 harvest was bad all over East England.⁴⁴⁶ It is equally possible that the Norfolk grain prices reflect general, or, national situation, rather than the local conditions. There is firm evidence of harvest failures in other counties, which undoubtedly contributed to the rise in grain prices between 1321 and 1325 all over England. Whatever was the situation in Norfolk, it is obvious that local landed lords could not have kept their prices significantly below the national level.

Wheat prices fell again in 1326, reaching their pre-1315 level (10. 47d per bushel). From that point until 1346, we witness (with the exception of 1327-8, 1329-1330, 1330-1 and 1335-6) relatively low prices, ranging between 5.50d and 10.00d per bushel. This can be explained by a relative rest on the countryside; between these years, the rural society did not experience any significant hardships, resembling the crises of 1314-1317 and 1321-1325 (except, perhaps, the rainy summer of 1331 and exceptionally hot and dry summer of 1339). In 1346-7, two years before the arrival of the Black Death, wheat prices soared almost twofold, compared to the previous year (1345-6). During the plague years (1349-1352), the prices were abnormally high (ranging between 16.50d and 19.13d pence per bushel). It should be repeated that the prices rose higher than the *real wages* of the labourers and it was not until 1376 that the grain prices fell to such a level that the *real wages* rose.⁴⁴⁷

The high prices of the pestilence years undoubtedly reflect the scarcity of working hands to cultivate the soil and, consequently, reduced harvests. The prices fell anew

⁴⁴⁶ H. E. Hallam, 'The Climate of Eastern England, 1250-1350', *Agricultural History Review* 32 (1984), 124-132.

⁴⁴⁷ A more detailed and contributive study on the post-Plague prices is John Munro, 'Before and After the Black Death: Money, Prices and Wages in Fourteenth-Century England', in Troels Dahlerup and Per Ingesman eds., *Changes and Crises in Late Medieval and Early Modern Europe*, (Copenhagen, 2008, forthcoming).

during the fiscal year of 1353-4, returning, more or less, to their pre-1346 level. It is rather intriguing that the prices started rising a short time *before*, and not *with* the Black Death, as it is tempting to assume. Again, it is unclear what stood behind it. One possible cause may have been the bad weather of 1345, leading to harvest failures of 1346, which was characteristic of the entire country in that year.⁴⁴⁸ Unfortunately, there is no surviving account of 1345-6 to shed light on the situation on our manors and hence this remains a hypothesis. It is possible that the outbreak of the Hundred Years War in 1337 and full-scale military operations of the 1340s might have been responsible for this sudden soar in wheat prices, which commenced in 1346.⁴⁴⁹ But this connection cannot be examined within the present study. It should be noted that the high prices of 1346-1353 asymmetrically corresponded to a fall in mint output of silver coinage of the same years. The total mint output of silver coinage averaged £17,710.47 in 1341-5 and only £7,090.87 in 1346-50.⁴⁵⁰ In other words, we would expect the 1346-50, or at least the pre-Plague (1346-1348) prices to fall, since low coinage output usually coincides (or leads to) price deflation. But it was the opposite in our case.

The fiscal year of 1353-4, when the prices fell to their pre-1346 level, mark the beginning of a new, prolonged period of gradual rise in grain prices. From 7.71d. per bushel in 1353-4, the prices soared to 8.27d. in 1356-60, 8.98d. in 1361-65. In 1369, the price of one bushel of wheat soared from 9.26d. to 12.72. It was not until 1376, the year

⁴⁴⁸ Campbell, 2000, p. 23.

⁴⁴⁹ On the connection between warfare and price movement, consult Munro John H. Munro, 'The 'New Institutional Economics' and the Changing Fortunes of Fairs in Medieval and Early Modern Europe: the Textile Trades, Warfare and Transaction Costs', *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 88:1 (2001), 1-47 and Chris Briggs, 'Taxation, Warfare, and the Early Fourteenth Century 'Crisis' in the North: Cumberland Lay Subsidies, 1332-1348,' *Economic History Review* 58:4 (2005), 639-672.

⁴⁵⁰ Ibid.

of the Good Parliament, that the prices started falling anew, while real wages began to rise.

So far, we have been guided by wheat, which was, undoubtedly, the most valued grain. What was the behaviour of other grains? The trends in their prices were largely dependant on fluctuations in wheat prices and they often coincided with them. Their financial value has already been established on Table 7.20. It will be useful to look at their ratio to wheat prices (Table 7.22):

Table 7.22. Norwich Grain Prices Relative to Wheat, 1264-1369 (Wheat=1.00)

Year	Wheat	Rye	Peas	Oats	Oat Bran	Barley	Malt
1264-1265	1.00						
1266-1270	1.00						
1271-1275	1.00			0.30			0.80
1276-1280	1.00			0.30	0.17	0.74	0.85
1281-1285	1.00	0.59	0.50	0.23	0.15	0.61	0.72
1286-1290	1.00	0.84	0.84	0.32	0.20	0.89	0.80
1291-1295	1.00	0.72	0.75	0.24	0.13	0.74	0.82
1296-1300	1.00	0.75	0.69	0.27	0.19	0.79	0.90
1301-1305	1.00	0.45	0.47	0.27	0.17	0.60	0.59
1306-1310	1.00	0.64	0.52	0.28	0.23	0.68	0.69
1311-1315	1.00	0.66	0.64	0.34	0.21	0.76	0.80
1316-1320	1.00	0.42	0.75	0.24	0.10	0.83	0.93
1321-1325	1.00	0.43	0.35	0.25	0.09	0.43	0.67
1326-1330	1.00	0.81	0.64	0.31	0.14	0.75	0.79
1331-1335	1.00	0.83	0.78	0.38	0.14	0.69	0.76
1336-1340	1.00	0.76	0.57	0.33	0.17	0.68	0.98
1341-1345	1.00	0.60	0.42	0.36	0.19	0.67	0.85
1346-1350	1.00	0.43	0.41	0.23	0.12	0.39	0.75
1351-1355	1.00	0.65	0.49	0.43	0.14	0.66	0.73
1356-1360	1.00	1.17		0.42	0.21	0.58	0.75
1361-1365	1.00	1.29		0.42	0.22	0.62	0.67
1366-1369	1.00	1.30		0.35	0.17	0.63	0.72
Average	1.00	0.74	0.61	0.32	0.16	0.67	0.79

Source: DCN 1/1-12.

As far as rye prices are concerned, they were certainly lower than those of wheat, until 1356-60. Their ratio fluctuated between 0.42:1.00 and 0.84:1.00. They reached their lowest point (0.42:1.00) in 1316-20, 1321-25 and 1346-50, namely when the wheat prices were at their highest, that is during the crisis years. In 1346-7, a bushel of rye was sold for just 2.75d., an unprecedented low price. After the outbreak of the Black Death, however, we see, as in case of wheat, a period of gradual rise. Already in 1353-4, a bushel of rye was selling for as much as 8.24d. (about 1.07 of wheat price). During the 1360s, rye prices were around 130 per cent of the wheat ones. The peas prices did not fluctuate nearly as much as wheat and rye. Between 1281 and 1355 they were, more or less, stable, varying between 0.35:1.00 in 1321-1325 and 0.84:1.00 in 1286-90. Other grains show even smoother behaviour. Oats and oat bran prices remained largely unchanged relative to wheat, over the entire period (0.32:1.00 and 0.16:1.00 respectively). It is interesting to see that bran prices amounted to 50 per cent of the oats, on average (Table 7.23). Just as rye, barley prices were at their lowest in 1321-25 and 1346-50, namely when the wheat prices were exceedingly high (around 0.40:1.00). Unlike rye, however, barley prices did not rise nearly as much after the Black Death (around 0.60:1.00). Malt, as a rule, commanded higher prices than barley. There were numerous instances before the Black Death, when malt prices nearly reached those of wheat (0.90:1.00 in 1296-1300, 0.93:1.00 in 1316-20 and 0.96:1.00 in 1336-40). After the Black Death, however, malt prices fell more than barley prices (0.72:1.00 relative to wheat and just 1.16 relative to barley, on average) (See Table 7.23).

Table 7.23. Norwich Malt Prices Relative to Barley Prices and Oat Bran Prices Relative to Oat Prices, 1276-1369 (Barley and Oats=1.00).

Year	Barley	Malt	Oats	Oat Bran
1276-1280	1.00	1.14	1.00	0.56
1281-1285	1.00	1.18	1.00	0.63
1286-1290	1.00	0.89	1.00	0.63
1291-1295	1.00	1.10	1.00	0.55
1296-1300	1.00	1.14	1.00	0.71
1301-1305	1.00	0.98	1.00	0.64
1306-1310	1.00	1.02	1.00	0.83
1311-1315	1.00	1.06	1.00	0.63
1316-1320	1.00	1.11	1.00	0.43
1321-1325	1.00	1.55	1.00	0.38
1326-1330	1.00	1.06	1.00	0.47
1331-1335	1.00	1.10	1.00	0.37
1336-1340	1.00	1.45	1.00	0.50
1341-1345	1.00	1.27	1.00	0.52
1346-1350	1.00	1.92	1.00	0.50
1351-1355	1.00	1.10	1.00	0.33
1356-1360	1.00	1.30	1.00	0.50
1361-1365	1.00	1.09	1.00	0.51
1366-1369	1.00	1.14	1.00	0.49
Average	1.00	1.19	1.00	0.54

Source: DCN 1/1-12.

Were the levels and trends of Norwich grain prices unusual? A comparison with other regions is required, in order to answer that question. The following table (Table 7.24) has Cambridgeshire-Oxfordshire prices for wheat, rye, peas and malt⁴⁵¹ and

⁴⁵¹ Based on Thorold Rogers' dataset (J. E. Thorold Rogers, *History of Agriculture and Prices in England from 1259 to 1753* (London, 1866-1902)

‘national’ prices for barley⁴⁵² (in pence per bushel) tabulated beside their Norwich counterpart.⁴⁵³

Table 7.24. Grain Prices on Local (Norwich), Cambridgeshire-Oxfordshire (wheat, rye, peas and malt) and National (barley) Level, 1264-1369 (in Pence per Bushel, in Quinquennial Means).

d/b Year	Norwich Wheat	Ox/Cam	Norwich Rye	Ox/Cam	Norwich Barley	National	Norwich Peas	Ox/Cam	Norwich Malt	Ox/Cam
1264-1265	6.57	6.21		4.48		5.18		4.76		3.74
1266-1270	8.36	6.73		6.53		4.93		4.44		5.63
1271-1275	10.31	9.56		8.37		7.16		6.35	8.25	7.14
1276-1280	8.59	7.78		6.53	6.38	6.18		5.36	7.27	6.36
1281-1285	9.35	8.68	5.51	6.88	5.69	5.66	4.70	5.61	6.72	8.30
1286-1290	6.53	6.10	5.51	4.70	5.84	4.62	5.50	3.89	5.20	5.41
1291-1295	10.05	10.44	7.27	8.68	7.44	7.41	7.58	7.44	8.21	8.47
1296-1300	8.64	8.39	6.47	6.26	6.81	6.44	5.97	5.49	7.75	7.47
1301-1305	9.76	7.40	4.41	5.55	5.89	5.28	4.60	4.40	5.76	6.39
1306-1310	10.42	8.73	6.65	7.02	7.12	6.54	5.39	6.43	7.23	7.27
1311-1315	9.57	9.10	6.30	7.35	7.25	6.76	6.13	4.95	7.65	6.82
1316-1320	14.75	14.86	6.20	11.73	12.30	10.20	11.10	10.56	13.70	12.86
1321-1325	16.16	12.57	7.00	10.01	6.95	8.49	5.67	8.86	10.78	9.42
1326-1330	10.47	7.88	8.54	5.91	7.81	5.93	6.74	5.21	8.30	7.18
1331-1335	9.22	8.42	7.68	6.32	6.39	6.86	7.20	5.63	7.01	7.99
1336-1340	7.94	6.87	6.03	4.94	5.38	4.88	4.50	3.73	7.79	5.23
1341-1345	6.74	6.19	4.06	4.92	4.51	4.98	2.82	3.86	5.75	5.30
1346-1350	11.52	8.09	5.00	6.21	4.52	5.71	4.75	4.41	8.68	6.47

⁴⁵² Based on William H. Beveridge’s national price dataset (Archives of the British Library of Political and Economic Science, London School of Economics, classified as *The Beveridge Price and Wage History*).

⁴⁵³ I am indebted to John Munro, who has kindly agreed to provide me with his (yet) unpublished Database on Basket of Prices in England, 1264-1700. In his index, he converted the index numbers tabulated by Phelps Brown-Hopkins (see below) into actual prices (pence sterling). Phelps Brown-Hopkins used prices of wheat, rye and oats from Thorold Rogers, but those of barley from unpublished dataset of Beveridge. Other price indices are tabulated in J. E. Thorold Rogers, *History of Agriculture and Prices in England from 1259 to 1753*, (London, 1866-1902); William. H. Beveridge, *Prices and Wages in England from the Twelfth to the Nineteenth Century* (London, 1939). His vast, unpublished data is kept in the Archives of the British Library of Political and Economic Science, London School of Economics, classified as *The Beveridge Price and Wage History*. E. H. Phelps Brown and Sheila V. Hopkins, ‘Seven Centuries of the Prices of Consumables’, *Economica* 23 (1956), reprinted in *Essays in Economic History*, E.M. Carus-Wilson (ed.) (London, 1954-1962), Vol. II, pp. 179-196. Grain and livestock prices are tabulated also by David L. Farmer, ‘Prices and Wages’, in Joan Thirsk (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), pp. 716-817. Most recently, prices of many commodities were tabulated (in a very *longue durée*) by Gregory Clark, ‘The Price History of English Agriculture, 1209-1914’, *Research in Economic History* 22 (2004), 41-124; idem, ‘The Condition of the Working Class in England, 1209-1914’, *Journal of Political Economy* 113:6 (2005), 1307-1340; idem, ‘The Long March of History: Farm Wages, Population, and Economic Growth, England, 1209-1869,’ *Economic History Review* 60:1 (2007), 97-135.

1351-1355	12.13	10.55	7.86	7.15	8.03	7.82	6.00	6.46	8.88	8.91
1356-1360	8.27	9.08	9.72	6.89	4.78	6.83		5.38	6.20	7.62
1361-1365	8.98	10.54	11.57	7.21	5.53	7.40		6.48	6.04	10.81
1366-1369	10.19	10.50	13.25	8.78	6.38	6.99		5.55	7.28	7.98
Average	9.75	8.85	7.17	6.93	6.58	6.47	5.91	5.69	7.72	7.40

Source: DCN 1/1-12 and Munro's Price Index.

Table 7.25. Norwich Grain Prices Relative to Cambridgeshire-Oxfordshire (wheat, rye, peas and malt) Prices, 1264-1369 (in Quinquennial Means) (Wheat=1.00).

Year	Wheat	Rye	Barley	Peas	Malt	Combined
1264-1265	1.06					
1266-1270	1.24					
1271-1275	1.08				1.15	
1276-1280	1.10		1.03		1.14	1.09
1281-1285	1.08	0.80	1.00	0.84	0.81	0.91
1286-1290	1.07	1.17	1.26	1.41	0.96	1.18
1291-1295	0.96	0.84	1.00	1.02	0.97	0.96
1296-1300	1.03	1.03	1.06	1.09	1.04	1.05
1301-1305	1.32	0.79	1.12	1.05	0.90	1.04
1306-1310	1.19	0.95	1.09	0.84	0.99	1.01
1311-1315	1.05	0.86	1.07	1.24	1.12	1.07
1316-1320	0.99	0.53	1.21	1.05	1.07	0.97
1321-1325	1.29	0.70	0.82	0.64	1.14	0.92
1326-1330	1.33	1.44	1.32	1.29	1.16	1.31
1331-1335	1.10	1.21	0.93	1.28	0.88	1.08
1336-1340	1.15	1.22	1.10	1.20	1.49	1.23
1341-1345	1.09	0.82	0.91	0.73	1.09	0.93
1346-1350	1.42	0.81	0.79	1.08	1.34	1.09
1351-1355	1.15	1.10	1.03	0.93	1.00	1.04
1356-1360	0.91	1.41	0.70		0.81	0.96
1361-1365	0.85	1.60	0.75		0.56	0.94
1366-1369	0.97	1.51	0.91		0.91	1.08
Average	1.10	1.03	1.02	1.04	1.04	1.05

Source: DCN 1/1-12 and Munro's Price Index.

The table reveals some clear variances. Wheat prices in Norwich were, in most cases, high compared to Cambridgeshire-Oxfordshire level and this was the case from

c.1300 until c.1355; only in 1356 did Norwich wheat prices fall below the Cambridgeshire-Oxfordshire level and they remained that way during the 1360s. Rye prices were, as a rule, lower in Norwich, at least until 1326. Between 1326 and 1340, they exceeded the Cambridgeshire-Oxfordshire and national level, only to fall again between 1341 and 1350 below the later. After the Black Death, however, Norwich rye prices soared to an unprecedented level, rising much higher than in other regions. Barley prices show more proximity between the two levels. In 1316-20, the Norwich prices were higher than the 'national' ones; in 1321-25, however, they fell below the 'national' level, only to rise again in 1326-30. Between 1330 and 1345, Norfolk barley prices stood very close to the national level.

Although figures were different, the trends were identical. In both cases, we witness a pronounced rise in grain prices during the Agrarian Crisis of 1314-1317; both instances show high grain prices in 1321-1325, the years of the cattle murrain and bad weather (although the national prices were somewhat lower than those of Norwich); both locally and nationally, the prices soared shortly *before* the Black Death, but not *after*; the prices continued rising after the Black Death, well into the 1350s and 1360s. Perhaps the main difference between the two sets of prices is the fact, that post-Black Death rye prices soared much higher on the Norwich market, than in other regions. In other words, the history of Norwich grain prices represents, to a great extent, a microcosm of national grain prices.

The Grain Supply of Norwich Priory: An Overview.

The monastic community of Norwich relied on two main channels of grain supply: its rural estates and local Norfolk markets. The grains for human consumption, wheat and malt, came mostly, in form of annual dispatches, from the manors, while equine fodder (oats and bran) was purchased on the market. The Priory rolls reveal not only the quantities of the grain purchase, but also its distribution and consumption patterns. About 70 per cent of wheat came in the form of annual receipt from the manors, while the remaining derived from either the market, or the leftovers from a previous year. As much as 80 per cent of malt was carted from the estates; over 14 per cent remained in the granary from a previous year and almost 6 per cent came from the market. Only a marginal percentage of oats (less than 3 per cent) came in form of manorial receipts. Over 70 per cent was purchased and about 25 per cent was left untouched from a previous year. Because of its low and largely unchanging price, all of bran supply was bought on the market. During the 1330s and 1340s we also witness marginal purchases and receipts of rye, maslin, barley and peas. The general impression is that the human inhabitants of the Cathedral Close usually left much less supply unused (about 7.36 per cent for wheat and below fifteen per cent for barley) than did the horses (around 25 per cent of oats). Nonetheless, we have seen that the fodder supply usually exceeded its demand. These supply components are tabulated on the Tables 7.26 – 7.29:

*Table 7.26. Total Wheat Supply and Its Distribution, c.1281-1343.*1. In Quarters.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Total Quarters Available	Surplus towards the Next Year	Total Quarters Used
1281-1290	552.00	31.19	203.91	84.00	2.75	873.84	44.84	829.00
1291-1300	526.28	83.44	159.72	0.00	1.00	770.44	120.34	650.09
1301-1310	497.94	122.44	217.58	0.00	0.00	837.96	104.28	733.68
1311-1320	529.00	30.20	230.35	0.00	0.00	789.55	46.00	743.55
1321-1330	569.31	20.75	133.75	0.00	0.00	723.81	14.75	709.06
1331-1340	528.69	38.31	126.44	0.00	0.00	693.44	68.84	624.59
1341-1343	492.13	58.75	144.19	0.00	0.00	695.06	25.75	669.31
Average	527.91	55.01	173.70	12.00	0.54	769.16	60.69	708.47

2. As Percentage.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Total Quarters Available	Surplus towards the Next Year	Total Quarters Used
1281-1290	63.17%	3.57%	23.33%	9.61%	0.31%	100.00%	5.13%	94.87%
1291-1300	68.31%	10.83%	20.73%	0.00%	0.13%	100.00%	15.62%	84.38%
1301-1310	59.42%	14.61%	25.97%	0.00%	0.00%	100.00%	12.44%	87.56%
1311-1320	67.00%	3.82%	29.17%	0.00%	0.00%	100.00%	5.83%	94.17%
1321-1330	78.65%	2.87%	18.48%	0.00%	0.00%	100.00%	2.04%	97.96%
1331-1340	76.24%	5.53%	18.23%	0.00%	0.00%	100.00%	9.93%	90.07%
1341-1343	70.80%	8.45%	20.74%	0.00%	0.00%	100.00%	3.70%	96.30%
Average	68.63%	7.15%	22.58%	1.56%	0.07%	100.00%	7.89%	92.11%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: 'Increment' denotes the difference in volume between 'raw' and ground grain.

*Table 7.27. Total Malt Supply and Its Distribution, c.1281-1343.*1. In Quarters.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Other	Total Quarters Available	Surplus towards the Next Year	Total Quarters Used
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1281-1290	1782.16	81.16	52.84	32.25	0.00	0.00	1948.41	147.78	1800.63
1291-1300	1767.41	258.50	163.88	0.00	0.00	0.00	2189.78	283.13	1906.66
1301-1310	1808.88	455.17	50.46	0.00	0.00	0.00	2314.50	439.17	1875.33
1311-1320	1460.21	217.83	213.33	0.00	0.83	0.00	1892.21	184.00	1708.21
1321-1330	1171.88	75.00	287.00	0.00	0.00	0.00	1533.88	347.82	1186.06
1331-1340	1235.56	489.53	28.75	0.00	0.00	0.00	1753.85	387.38	1366.47
1341-1343	1405.75	324.38	1.25	0.00	0.00	25.00	1731.38	364.38	1367.00
Average	1518.83	271.65	113.93	4.61	0.12	3.57	1909.14	307.66	1601.48

2. As Percentage.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Other	Total Quarters Available	Surplus towards the Next Year	Total Quarters Used
1281-1290	91.47%	4.17%	2.71%	1.66%	0.00%	0.00%	100.00%	7.58%	92.42%
1291-1300	80.71%	11.80%	7.48%	0.00%	0.00%	0.00%	100.00%	12.93%	87.07%
1301-1310	78.15%	19.67%	2.18%	0.00%	0.00%	0.00%	100.00%	18.97%	81.03%
1311-1320	77.17%	11.51%	11.27%	0.00%	0.04%	0.00%	100.00%	9.72%	90.28%
1321-1330	76.40%	4.89%	18.71%	0.00%	0.00%	0.00%	100.00%	22.68%	77.32%
1331-1340	70.45%	27.91%	1.64%	0.00%	0.00%	0.00%	100.00%	22.09%	77.91%
1341-1343	81.19%	18.74%	0.07%	0.00%	0.00%	1.44%	100.00%	21.05%	78.95%
Average	79.56%	14.23%	5.97%	0.24%	0.01%	0.19%	100.00%	16.12%	83.88%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: 'Increment' denotes the difference in volume between 'raw' and ground grain.

Table 7.28. Total Oat Supply and Its Distribution, c.1281-1343.

1. In Quarters.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Total Quarters Available	Surplus towards the Next Year	Total Quarters Used
1281-1290	3.38	72.50	309.13	27.75	0.00	412.75	72.50	340.25
1291-1300	8.88	139.25	374.13	0.00	0.00	521.75	139.25	382.50
1301-1310	2.50	45.83	274.83	0.00	0.00	323.17	45.83	277.33
1311-1320	0.00	25.42	232.31	0.00	0.00	257.73	25.42	232.31
1321-1330	0.00	0.00	111.75	0.00	0.00	111.75	0.00	111.75
1331-1340	22.50	92.19	135.16	0.00	0.00	249.84	92.19	157.66
1341-1343	20.50	138.19	91.88	0.00	0.00	250.56	138.19	112.38
Average	8.25	73.34	218.45	3.96	0.00	303.94	73.34	230.60

2. As Percentage.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Total Quarters Available	Surplus towards the Next Year	Total Quarters Used
1281-1290	0.82%	17.57%	74.89%	6.72%	0.00%	100.00%	17.57%	82.43%
1291-1300	1.70%	26.69%	71.71%	0.00%	0.00%	100.00%	26.69%	73.31%
1301-1310	0.77%	14.18%	85.04%	0.00%	0.00%	100.00%	14.18%	85.82%
1311-1320	0.00%	9.86%	90.14%	0.00%	0.00%	100.00%	9.86%	90.14%
1321-1330	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	100.00%
1331-1340	9.01%	36.90%	54.10%	0.00%	0.00%	100.00%	36.90%	63.10%
1341-1343	8.18%	55.15%	36.67%	0.00%	0.00%	100.00%	55.15%	44.85%
Average	2.71%	24.13%	71.87%	1.30%	0.00%	100.00%	24.13%	75.87%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: 'Increment' denotes the difference in volume between 'raw' and ground grain.

Table 7.29. Total Oat Bran Supply and Its Distribution, c.1291-1343.

1. In Quarters.

Decade	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Total
1291-1300	0.00	0.00	53.75	0.00	0.00	53.75
1301-1310	0.00	0.00	62.00	0.00	0.00	62.00
1311-1320	0.00	0.00	80.50	0.00	0.00	80.50
1321-1330	0.00	0.00	91.50	0.00	0.00	91.50
1331-1340	0.00	0.00	87.25	0.00	0.00	87.25
1341-1343	0.00	0.00	134.00	0.00	0.00	134.00
Average	0.00	0.00	84.83	0.00	0.00	84.83

2. As Percentage.

Years	Receipt	Surplus from the Previous Year	Bought	Increment	Gifts	Total
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1291-1300	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
1301-1310	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
1311-1320	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
1321-1330	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
1331-1340	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
1341-1343	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
Average	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: Since no bran was bought during the 1280s, I did not include this decade in the table. 'Increment' denotes the difference in volume between 'raw' and ground grain.

Between 1280 and 1343, there were, on average, 3,000 quarters of grain stored in the Great Granary of the Priory. Each grain constituted a different share of the total grain resources. The distribution is represented on the following tables:

Table 7.30. Total Grain Supply Distribution, 1281-1343.

1. In Quarters.

Decade	Wheat	Malt	Oats	Bran	Rye	Maslin	Barley	Peas	Total
1281-1290	829.00	1800.63	340.25	0	0	0	0	0	2969.88
1291-1300	650.09	1906.66	382.50	53.75	0	0	0	0	2993.00
1301-1310	733.68	1875.33	277.33	62	0	0	0	0	2948.35
1311-1320	743.55	1708.21	232.31	80.5	0	0	0	0	2764.58
1321-1330	709.06	1186.06	111.75	91.5	0	0	0	0	2098.37
1331-1340	624.59	1366.47	157.66	87.25	2	0.5	0.75	0.75	2239.97
1341-1343	669.31	1367.00	112.38	134	3	0	2.25	2.25	2290.19
Average	708.47	1601.48	230.60	72.71	0.71	0.07	0.43	0.43	2614.90

2. As Percentage.

Decade	Wheat	Malt	Oats	Bran	Rye	Maslin	Barley	Peas	Total
1281-1290	27.91%	60.63%	11.46%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
1291-1300	21.72%	63.70%	12.78%	1.80%	0.00%	0.00%	0.00%	0.00%	100.00%

1301-1310	24.88%	63.61%	9.41%	2.10%	0.00%	0.00%	0.00%	0.00%	100.00%
1311-1320	26.90%	61.79%	8.40%	2.91%	0.00%	0.00%	0.00%	0.00%	100.00%
1321-1330	33.79%	56.52%	5.33%	4.36%	0.00%	0.00%	0.00%	0.00%	100.00%
1331-1340	27.88%	61.00%	7.04%	3.90%	0.09%	0.02%	0.03%	0.03%	100.00%
1341-1343	29.23%	59.69%	4.91%	5.85%	0.13%	0.00%	0.10%	0.10%	100.00%
Average	27.09%	61.24%	8.82%	2.78%	0.03%	0.00%	0.02%	0.02%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

The largest proportion was constituted by malt (over 60 per cent of total grain). This reflects two facts: (1) the nature of the Norwich hinterland as strongly barley-biased agricultural region; (2) a high demand for barley as a brewing grain. Again, barley was the most prominent grain for ale-brewing, preferred by anyone who could afford it. The Norwich brethren could certainly afford it and hence acquired it in large quantities. Malt could not be substituted by either water or wine. Water was considered to be both the drinking substance of the lowest ranks of the society,⁴⁵⁴ and unsafe for health (because of poor hygiene and frequent and omnipresent contamination of water resources), while wine was acquired in modest quantities, and mostly for liturgical uses. Wheat constituted about one quarter of the grain supply kept in the granary. It was destined to be turned into bread, which was, although important, not the only staple of the monastic community. Unlike malt, wheat was easily substituted with other dishes, such as dairy products, poultry, meat and fish. Oats and bran (over twelve per cent combined) may have been given mostly to the Priory horses.

⁴⁵⁴ On water consumption, see Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), pp. 154, 159 and 209.

Generally speaking, only about twenty per cent of total grain supply came from the market, while the majority (eighty per cent) was acquired either from the estates, or from the granary, as a leftover from a previous year (Table 7.31):

Table 7.31. Distribution of 'Purchased' and 'Non-purchased' Grain Supply, 1281-1343.

	In Quarters			As Percentage		
	Non-purchased	Purchased	Total	Non-purchased	Purchased	Total
1281-1290	2404.00	565.88	2969.88	80.95%	19.05%	100.00%
1291-1300	2241.53	751.47	2993.00	74.89%	25.11%	100.00%
1301-1310	2343.47	604.88	2948.35	79.48%	20.52%	100.00%
1311-1320	1983.60	780.98	2764.58	71.75%	28.25%	100.00%
1321-1330	1474.37	624	2098.37	70.26%	29.74%	100.00%
1331-1340	1861.13	378.84	2239.97	83.09%	16.91%	100.00%
1341-1343	1918.38	371.81	2290.19	83.77%	16.23%	100.00%
Average	2032.35	582.55	2614.90	77.72%	22.28%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Finally, we have to convert the grain into its financial equivalent, in order to appreciate the extent of the profit deriving from the distribution of grain supply. Table 7.32, converting the quarters into pounds sterling, shows that the financial profit deriving from annual grain receipt was indeed astonishing. As much as 83 per cent of the financial equivalent of total grain supply came from the manors, while only the remaining accounted for the purchases.

Table 7.32. Financial Equivalent of the Grain Supply (in Pounds Sterling and as Percentage)

Decade	In Pounds			As Percentage		
	Non-purchased	Purchased	Total	Non-purchased	Purchased	Total
1281-1290	544.33	92.12	636.46	85.53%	14.47%	100.00%
1291-1300	599.43	123.53	722.96	82.91%	17.09%	100.00%
1301-1310	581.76	116.64	698.40	83.30%	16.70%	100.00%
1311-1320	716.08	205.61	921.69	77.69%	22.31%	100.00%
1321-1330	561.51	176.16	737.68	76.12%	23.88%	100.00%
1331-1340	434.02	57.38	491.40	88.32%	11.68%	100.00%
1341-1343	392.18	45.43	437.61	89.62%	10.38%	100.00%
Average	547.05	116.70	663.74	83.36%	16.64%	100.00%

Chapter 8. Bread and Ale Consumption⁴⁵⁵

Annual Baking Patterns

Each year the chief baker received a certain amount of wheat, to be cleansed, milled, sieved, turned into dough and ultimately baked. On average, 98 per cent of total grain supply kept at the Great Granary was processed and consumed by the Priory community. The remaining averages of 2 per cent, or so, were given away to various people and departments. The former included the king, bishop, almoner and cellarer; sometimes, meagre amounts of grain were sent back to the manors. The annual disposal of wheat supply is illustrated on Table 8.1:

Table 8.1. Annual Disposal of Wheat Supply (in Standard Quarters), 1281-1343.

Decade	Bakery	Other	Total	Bakery	Other	Total
1281-1290	869.56	9.34	878.91	98.94%	1.06%	100.00%
1291-1300	783.25	13.19	796.44	98.34%	1.66%	100.00%
1301-1310	866.67	30.33	897.00	96.62%	3.38%	100.00%
1311-1320	930.33	24.17	954.50	97.47%	2.53%	100.00%
1321-1330	808.00	13.50	821.50	98.36%	1.64%	100.00%
1331-1340	757.00	14.51	771.51	98.12%	1.88%	100.00%
1341-1343	783.75	14.50	798.25	98.18%	1.82%	100.00%
Average	828.37	17.08	845.44	97.98%	2.02%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: The figures are calculated after the 'first increment' (by grinding), which increased the total volume of grain.

⁴⁵⁵ Different parts of this chapter were presented at the annual meeting of Medieval Academy of America, University of Toronto, 14 April 2007 and at the Forty-Second International Congress on Medieval Studies at the University of Western Michigan, at the session entitled 'Cerevisia Sancta: Monastic Breweries in the Middle Ages', organized by the Medieval Brewing Guild, Kalamazoo, May 2007. I am especially indebted to my colleague and friend, Prof. Max Nelson, Department of Classics, University of Windsor for sharing his extensive knowledge on medieval brewing and beer.

As a rule, the *compotus pistoris*, the baker's account, was included within the *compotus granarii*. From 1332 onwards, however, we have separate accounts recorded on the dorse of each roll. The actual amount of the grain reaching the bakery was, in reality, larger than that recorded by the bailiff and master of the cellar, in the manorial and granary accounts, respectively. This should be ascribed to the difference between the two measures, known as *incrementum*, increment, which amounted between 13 and 37 per cent of the total grain supply.

We have to distinguish between two increments. The first increment concerns the milling of the grain and represents the increase in the volume of grain when milled. On average, the grinding expanded the volume to 119 per cent of volume of the original 'raw' grain. This agrees with John Langdon's findings and calculations of grinding of grain in purveyance accounts.⁴⁵⁶ The second kind of increment seems to have accounted for the increase in volume when baking the bread. The following tables (Tables 8.2 and 8.3) show an average increment over the time:

Table 8.2. The 'First' Increment of Grain Supply, as Reckoned by the Master of the Cellar (1281-1343) (in Decennial Means)

1. In Quarters

Decade	Before Milling	1 st Increment	After Milling
1281-1290	873.84	49.91	923.75
1291-1300	770.44	146.34	916.78
1301-1310	837.96	163.32	1001.28
1311-1320	812.29	183.04	995.33
1321-1330	725.44	110.81	836.25
1331-1340	684.09	141.44	825.53
1341-1343	695.50	128.50	824.00

⁴⁵⁶ John Langdon, *Mills in the Medieval Economy: England, 1300-1540* (Oxford: Oxford University Press, 2004), Table 4.5 (p. 153). I am grateful to Prof. Langdon for his most valuable comments regarding the 'increment' problem.

Average	771.37	131.91	903.27
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2. In Percentages

Decade	Before Milling	1 st Increment	Ratio of Raw-to-Milled Grain
1281-1290	100.00%	5.71%	105.71%
1291-1300	100.00%	18.99%	118.99%
1301-1310	100.00%	19.49%	119.49%
1311-1320	100.00%	22.53%	122.53%
1321-1330	100.00%	15.28%	115.28%
1331-1340	100.00%	20.68%	120.68%
1341-1343	100.00%	18.48%	118.48%
Average	100.00%	17.10%	117.10%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.3. The 'Second' Increment of Grain Supply, as Reckoned By the Baker, c.1281-1343 (in Decennial Means)

1. In Quarters

Decade	Before Baking	2 nd Increment	After Baking
1281-1290	869.56	121.57	999.63
1291-1300	778.25	178.84	970.34
1301-1310	866.67	146.06	1012.73
1311-1320	930.33	123.65	1053.98
1321-1330	808.00	266.37	1097.25
1331-1340	748.20	286.91	1060.01
1341-1343	783.75	281.50	1091.50
Average	826.39	200.70	1040.78

2. In Percentages

Decade	Before Baking	2 nd Increment	After Baking
1281-1290	100.00%	13.98%	114.96%
1291-1300	100.00%	22.98%	124.68%
1301-1310	100.00%	16.85%	116.85%
1311-1320	100.00%	13.29%	113.29%
1321-1330	100.00%	32.97%	135.80%
1331-1340	100.00%	38.35%	141.67%
1341-1343	100.00%	35.92%	139.27%

Average	100.00%	24.29%	125.94%
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Sources: DCN 1/1/6-28, 30-37, 39-40.

The annual grain supply was divided threeways: roughly speaking, half of the grain was converted into *panis militum*, namely the servants' bread; the two remaining quarters were turned, in a more or less equal way, into *panis monachorum* and *panis ponderis minoris*, namely into the loaves intended for the monks and the *famuli* (Table 8.4):

Table 8.4. Annual Baking Patterns, 1281-1343 (in Decennial Means)

1. Distribution of Wheat for Baking Bread (in Quarters)

Decade	<i>Monachorum</i>	<i>Ponderis Minoris</i>	<i>Militum</i>	Total
1281-1290	258.41	267.97	473.25	999.63
1291-1300	256.00	248.97	465.38	970.34
1301-1310	260.54	295.06	457.13	1012.73
1311-1320	243.75	261.98	548.25	1053.98
1321-1330	241.78	279.34	576.13	1097.25
1331-1340	233.49	248.89	577.64	1060.01
1341-1343	232.91	253.66	604.94	1091.50
Average	246.70	265.12	528.96	1040.78

2. Distribution of Wheat for Baking Bread (in Percentages)

Decade	<i>Monachorum</i>	<i>Ponderis Minoris</i>	<i>Militis</i>	Total
1281-1290	25.85%	26.81%	47.34%	100.00%
1291-1300	26.38%	25.66%	47.96%	100.00%
1301-1310	25.73%	29.14%	45.14%	100.00%
1311-1320	23.13%	24.86%	52.02%	100.00%
1321-1330	22.04%	25.46%	52.51%	100.00%
1331-1340	22.03%	23.48%	54.49%	100.00%
1341-1343	21.34%	23.24%	55.42%	100.00%
Average	23.70%	25.47%	50.82%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

The tabulation above shows a rather generous allowance of bread, compared to some other monastic houses. For instance, Bolton Priory (Yorkshire), comprising approximately 190 persons (twenty canons and lay brethren and 170 servants), consumed only 488 quarters of bread and pottage combined, between 1297 and 1319.⁴⁵⁷ The conventual loafs constituted some 55 per cent, while gruel bread, made of wheat and oatmeal mixture, and oat pottage represented 28 and 17 per cent, respectively.⁴⁵⁸ This, undoubtedly, reflects the climatic advantage of Norfolk lords over their Yorkshire fellows, for both the climate and soil types of most of Yorkshire create unfavourable conditions for growing wheat. In thirteenth-century Ramsey Abbey (Huntingdonshire), three quarters of fine flour (that is, from six quarters of grain) were used for baking bread for some eighty monks and even more servants, on a weekly basis.⁴⁵⁹ In other words, each year, some 312 quarters of wheat were converted into bread: approximately three times less than in Norwich Priory.

Three Kinds of Bread

The grain accounts specify three distinctive kinds of bread, baked from wheat: the monks' bread (*panis monachorum*), bread of a lesser weight (*panis ponderis minoris*) and the knights' bread (*panis militum*). These terms appear in various documents from other monastic houses and some attempts have been made to identify these kinds of bread,

⁴⁵⁷ Ian Kershaw, *Bolton Priory. The Economy of a Northern Monastery, 1286-1325* (Oxford: Oxford University Press, 1973), pp. 132-3 and 145

⁴⁵⁸ Calculated from idem, Table XIX (p. 145)

⁴⁵⁹ *Cartularium Monasterii de Rameseia*, William Henry Hart (ed.), Rolls Series (London, 1893), Vol. 3, pp. 230-234; for the number of the monks, see idem, Vol. 2, p. 219.

although no positive conclusion has been reached so far.⁴⁶⁰ In their attempts to identify the varieties of bread, scholars have used, largely, legal documents, such as *Assisa Panis et Cervisie* (*Assize of Bread and Ale*, around 1256) and late medieval urban customaries.⁴⁶¹ These sources, however, might not be necessarily revealing, since they deal with kinds of bread consumed by burgesses, not monks. Perhaps, it might be more secure to rely on monastic sources, such as customaries (*libri consuetudinum*) and deeds. Let us deal with each and every kind of bread separately.

Panis Monachorum / Panis Monachalis

The *panis monachorum* / *panis monachalis* was undoubtedly the bread consumed by the brethren. The nature of this bread is suggested in a final concord between the Priory and Julian, widow of Edmund de Thorp of Sedgeford, from 1281. According to the document, Julian was to receive each week fourteen loaves of white bread and seven

⁴⁶⁰ W. Hudson, 'The Camera Roll of the Prior of Norwich in 1283, Compiled by Bartholomew de Cotton', *Norfolk Archaeology* 19 (1917), pp. 305-306; H. W. Saunders, *An Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), pp. 88-91.

⁴⁶¹ The Assize in printed and discussed in *The Statutes of the Realm: Printed by Command of His Majesty King George the Third, in Pursuance of an Address of the House of Commons of Great Britain*, 11 Vols., (London: Record Commission, 1810-1828), Vol. I, pp. 199-200; Robert Chambers, *Book of Days* (London, 1864), Vol. I, pp. 119-120; Mary Bateson, 'Some Legal Texts in the Leicester Vellum Book', *English Historical Review* 14:55 (1899), 502-506; Sidney and Beatrice Webb, 'The Assize of Bread', *Economic Journal* 14 (1904), 190-218; *The Oak Book of Southampton*, P. Studer (ed.), Southampton Record Society 11, (Southampton: Cox & Sharland, 1910-11), pp. xxiv-xxvi; *Mediaeval Archives of the University of Oxford*, H. E. Salter (ed.), Oxford Historical Society 73 (Oxford: 1921), Vol. II, pp. 130-138; W. Ashley, *The Bread of Our Forefathers* (Oxford, 1928), pp. 149-153; Alan S. C. Ross, 'The Assize of Bread', *Economic History Review* 9 (1956), 332-342; *The Commonplace Book of Robert Reynes of Acle, An Edition of Tanner MS 407*, Cameron Louis (ed.) (New York and London: Garland Publishing, 1980), pp. 121-124; James Davis, 'Baking for the Common Good: A Reassessment of the Assize of Bread in Medieval England', *Economic History Review* 57:3 (2004), 465-502, esp. p. 471; Gwen Seabourne, 'Assize Matters: Regulation of the Price of Bread in Medieval London', *Journal of Legal History* 27:1 (2006), 29-52.

loaves of the bread called ‘*panis militum*’.⁴⁶² The fact that the ‘white bread’ (*panis albus*) was, in fact, the same as the monks’ bread (*panis monachorum*) is supported by another monastic deed, from the Abbey of Selby (1272). According to it, the Abbot of Selby concedes a perpetual corrody to Adam de Flexburg and his wife Emma, of ‘two white monastic loaves’ (*duos albos panes monachales*), distinguished from the brown bread (*unum panem biscum*).⁴⁶³ The identification of the *panis monachorum* with the *panis albus*, or white bread, can be strengthened further by a passage from the Customary of Norwich Priory, compiled c. 1258-1265.⁴⁶⁴ According to it, on Nativity, Easter and Pentecost Vigils, the monks do not eat [*panis*] *albus*.⁴⁶⁵ The three passages establish that the *panis monachorum* was indeed *panis albus*.

According to various contemporary sources, *panis albus* has numerous names. The most common synonyms of it were *panis conventualis*, found in several monastic customaries and in the account book of Beaulieu Abbey from 1269-70⁴⁶⁶ and *wastel*, which is mentioned in the *Assisa Panis*. According to the assize, this was one of the best and most expensive breads. The statute describes *wastellus* as [*panis*] *albus et bene*

⁴⁶² ‘dicta Juliana toto tempore vite sue singulis septimanis percipiet et habebit de domo eorum sancte Trinitatis apud Norwycum quatuordecim panes videlicet septem panes de illis panibus eorum qui vocantur albi panes et septem panes de illis panibus eorum qui vocantur panes militum et etiam quinque lagenas cervisie de illa cervisia eorum que vocatur cervisia aule’. *The Charters of Norwich Cathedral Priory*, Part 2, Barbara Dodwell (ed.) (London, 1985), no. 43.

⁴⁶³ ‘reddent singulis annis eidem Adae et Emmae tota vita utriusque ipsorum Adae et Emmae duo corrodia monachorum sc[ilicet] duos albos panes monacales et duas lagenas cervisie monacalis duo fercula et duas pitancias ita sc[ilicet] quod quando carnes comeduntur praedicta fercula percipient carnalia ter in ebdomada Et praeter corrodia praedicta qualibet die unum panem bisum qualem carucatores ejusdem Abbatiae percipiunt et quod dabunt eisdem Adae et Emmae singulis diebus tota vita utriusque ipsorum Adae et Emmae corrodium unius garcionis sc[ilicet] unum pa[nem] armigeri unum ferculum et unam lagenam secundae cervisie’. Printed in *The Coucher Book of Selby*, Vol. II, J.T. Fowler (ed.), The Yorkshire Archaeological and Topographical Association, Record Series 13 (1893), no. 1286. Expansions mine.

⁴⁶⁴ *The Customary of the Cathedral Priory Church of Norwich*, J. B. L. Tolhurst (ed.), Henry Bradshaw Society 82 (London, 1948).

⁴⁶⁵ Idem, p. 218.

⁴⁶⁶ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 290-291.

coctus.⁴⁶⁷ Similarly, later fifteenth-century records from Southampton always identify the *wastel* with the *panis albus*.⁴⁶⁸ The Customary of Saint Augustine of Canterbury, compiled between 1320 and 1330, refers to the same bread as *panis fratrum* (the brethren's bread), interchangeable with *choyns* and *gastellum* (namely, *wastel*).⁴⁶⁹ According to the same Customary, this bread *sit bene albus et racionaliter fermentatus et boni saporis* (should be white and leavened well and possess a good taste).⁴⁷⁰ The customary of Westminster, written between 1260 and 1280, provides a further clue: the *wastel* bread is also called *miches* (*gastella, quae vulgo miches vocitantur*).⁴⁷¹ The term *miche* / *michie* appears in various monastic deeds. For instance, a 1259 deed from Osney Abbey (Oxford) speaks about *duas albas michias* (two white *miches*).⁴⁷² Another charter from the same abbey (1288), distinguishes between *iiii parvas michas conventuales* (four small monastic *miche*, buns) and *iii grossos panes* (three large loaves).⁴⁷³ Similarly, a 1259 deed from Cirencester Abbey (Gloucestershire), has *septem michas canonicales* (seven canonical *miches*), as opposed to *unum panem servientum* (a servants' loaf).⁴⁷⁴

On the basis of the evidence above, we can conclude that the terms *panis monachorum* / *monachalis* / *conventualis*, *panis albus*, *wastellum* / *gastellum*, *panis fratrum*, *choyns* and *micha* / *michia* all refer to high quality white or wheat bread.

⁴⁶⁷ It should be noted that the bread was weighed by the Troy, not Tower, pounds. See, R. D. Connor, *Weights and Measures of England* (London: HMSO, 1987), pp. 123-130, 197, 204.

⁴⁶⁸ Alan S. C. Ross, 'The Assize of Bread', *Economic History Review* 9 (1956), p. 333.

⁴⁶⁹ *Customary of the Benedictine Monasteries of Saint Augustine, Canterbury and Saint Peter, Westminster*, Edward Maunde Thompson (ed.), Henry Bradshaw Society 23 (London, 1902), pp. 160, 170, 396.

⁴⁷⁰ *Customary of the Benedictine Monasteries of Saint Augustine, Canterbury and Saint Peter, Westminster*, Edward Maunde Thompson (ed.), Henry Bradshaw Society 23 (London, 1902), p. 135.

⁴⁷¹ *Customary of the Benedictine Monasteries of Saint Augustine, Canterbury and Saint Peter, Westminster*, Edward Maunde Thompson (ed.), Henry Bradshaw Society 23 (London, 1902), p. 98.

⁴⁷² *Cartulary of Osney Abbey*, H. E. Salter (ed.), Vol. I (Oxford, Clarendon Press, 1929), p. 183 (no. 192)

⁴⁷³ *Cartulary of Osney Abbey*, H. E. Salter (ed.), Vol. I (Oxford, Clarendon Press, 1929), pp. 369-370 (no. 948).

⁴⁷⁴ *The Cartulary of Cirencester Abbey, Gloucestershire*, Mary Devine (ed.), Vol. III (Oxford: Oxford University Press, 1977), p. 933 (no. 549).

There is a fifteenth-century illustrated manuscript of the *Assisa Panis*, which depicts each and every kind of bread described in the statute. Wastel is portrayed here as a small (as expected) and round bread with a hole in the middle, resembling a doughnut or bagel (Figure 8.1).



Figure 8.1. Five different kinds of bread baked in fifteenth-century London. The second from the left is wastel.

Source: Bodleian Library, Oxford, MS Douce Charters a.1, no.62 (table for calculating prices of bread, c.1450). Reproduced in Hammond, Peter W., *Food and Feast in Medieval England* (Phoenix Mill: Alan Sutton, 1993), p. 53.

It is possible that it was the *panis monachorum* / *wastel* that was memorialized in two late fourteenth century stone carvings of Norwich Cathedral Priory. The one depicts the Wedding at Cana, while the other one portrays Abraham's angel (Figures 8.2 and 8.3):



Figure 8.2. The wedding at Cana. Roof Carving, Norwich Cathedral Priory (NC 17). Note the round loaf at the right grainer of the table, which might be modelled after wastel.

Source: Martial Rose and Julia Hedgecoe, *Stories in Stone. The Medieval Roof Carvings of Norwich Cathedral* (London: Herbert Press, 1997), p. 93



Figure 8.3. Abraham's Angel. Roof Carving, Norwich Cathedral Priory (NC 11). Note the second bread from right, which might be modelled after wastel.

Source: Martial Rose and Julia Hedgecoe, *Stories in Stone. The Medieval Roof Carvings of Norwich Cathedral* (London: Herbert Press, 1997), p. 53

The *Assisa Panis* states that if a quarter of wheat is sold for 12d. (an unrealistically low figure for our period), then a farthing loaf of wastel bread ought to have weighed 6.50 lb troy (=5.33 lb avoirdupois). This is the second lightest bread after *simnel*, twice baked bread consumed by the highest ranks of the society (its farthing loaf would weigh 2 shillings less than that of wastel). Wastel would also weigh two or five shillings less than a *cocket* bread (second quality bread, otherwise known as *panis levatus*), depending on the latter's quality; about 3.625 shillings less than whole-wheat bread (*panis integer*); twice as little as a *treyt* bread (whole grain bread, usually fed to household) and as much

as 7.25 shillings less than all common grain bread (*panis de toto blado*, containing various grains).⁴⁷⁵ In other words, our *panis monachorum* was one of the finest breads, second only to *simnel* bread. It is worth noting that some monastic communities, such as that of Westminster Abbey, actually consumed *simnel*.⁴⁷⁶ Contemporary evidence also suggests that the Norwich monks were well aware of the existence of the *Assisa Panis* and had an easy access to its text. It is included in the *Historia Anglicana* of Bartholomew Cotton, a Priory monk and master of the cellar between 1282 and 1285.⁴⁷⁷

Furthermore, the weight of wastel was dynamic, depending on price fluctuations. This is well reflected in various manuscripts and editions of the assize.⁴⁷⁸ Similarly, the weight of *panis monachorum* differed from house to house. For instance, its (baked) loaf weighed 3.25 lb troy (=2.66 lb avoirdupois) in Evesham,⁴⁷⁹ 3 lb troy (=2.46 lb avoirdupois) in Winchcomb (until 1306),⁴⁸⁰ and 2.50 lb troy (=2.05 lb avoirdupois) in Fécamp (Normandy),⁴⁸¹ Beaulieu Abbey (Hampshire),⁴⁸² Bolton Priory (Yorkshire)⁴⁸³ and Westminster Abbey.⁴⁸⁴ For the purpose of estimating the overall number of loaves and their calorific value, I shall allow 2.05 lb avoirdupois per loaf, for two reasons. First,

⁴⁷⁵ *The Statutes of the Realm: Printed by Command of His Majesty King George the Third, in Pursuance of an Address of the House of Commons of Great Britain*, 11 Vols., (London: Record Commission, 1810-1828), Vol. I, pp. 199-200

⁴⁷⁶ *Customary of the Benedictine Monasteries of Saint Augustine, Canterbury and Saint Peter, Westminster*, Edward Maunde Thompson (ed.), Henry Bradshaw Society 23 (London, 1902), p. 98.

⁴⁷⁷ *Bartholomaei de Cotton Monachi Norwicensis Historia Anglicana*, Henry R. Luard (ed.) (London: Longman, 1859), pp. 93-94. Cotton, following Matthew Paris, mistakenly dates the Assize to 1202.

⁴⁷⁸ In addition to different printed editions of the Assize, based on various manuscripts, I have consulted an early fourteenth-century compilation of statutes, deposited at the Thomas Fisher Rare Books Library, MS. 1053, University of Toronto. The Assize of Bread is copied on fols. 138r-139r.

⁴⁷⁹ William Dugdale, *Monasticon Anglicanum* (London, 1846), Vol. II, p. 30.

⁴⁸⁰ *Landboc sive Registrum de Winchelcumba*, David Royce (ed.) (Exeter, 1892), Vol. I, pp. 262-3.

⁴⁸¹ *The Ordinal of the Abbey of the Holy Trinity, Fécamp (Fécamp, Musée de la Bénédictine, MS 186*, David Chadd (ed.) Henry Bradshaw Society 111-112 (London, 1996-2002), p. 706.

⁴⁸² *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 290-291.

⁴⁸³ Ian Kershaw, *Bolton Priory. The Economy of a Northern Monastery, 1286-1325* (Oxford: Oxford University Press), pp. 132-3.

⁴⁸⁴ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 59.

that was the weight in most monastic houses. Second, the customary of Norwich Cathedral Priory was largely based on that of Fécamp and hence, it appears that the former may have adopted many usages and customs of the latter. Third, the Beaulieu book distinguishes between *magnum panis conventualis* weighing 2.50 lb troy (=2.05 lb avoirdupois) and *parvum panis conventualis* weighing 1.70 lb troy (=1.39 lb avoirdupois) each. As we shall see later, the latter must have corresponded to our *panis ponderis minoris*.

As we have seen, a bushel of wheat c. 1300 weighed 53 lb avoirdupois. Grain was converted into fine flour (*simula*), destined for monastic loaves, through threshing, removal of germ and bran (leaving endosperm only), milling and sieving. This conversion would result in loss of about fifty per cent of grain contents and of its calorific value (extraction rate of fifty per cent), as the Beaulieu account book suggests. According to it, a quarter of wheat, cleaned, milled and sieved yielded four bushels of either *simula* or *grutum* (second-rate flour).⁴⁸⁵ In other words, each bushel of *simula* should have weighed some 26.50 lb avoirdupois. It should be noted that medieval loaves may have been composed about 22 per cent by water and 78 per cent by flour (as opposed to modern bread, consisting 35-40 per cent by water and 60-65 per cent by flour).⁴⁸⁶ This would increase the weight of baked bread from 26.50 lb to approximately 33.97 lb avoirdupois per bushel. Assuming that each loaf weighed 2.05 lb avoirdupois, we arrive at the conclusion that one bushel of fine flour must have produced around 16.57 loaves, while one quarter of the same would have made 132.56 loaves of *panis monachorum*.

⁴⁸⁵ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 290-291.

⁴⁸⁶ Campbell et al., 1993, pp. 191-192

As far as the calorific value of *panis monachorum* is concerned, it can also be approximately calculated, without too much speculation. Each bushel of wheat, weighing 53 lb c. 1300, would render 80,560 kilocalories;⁴⁸⁷ hence, one bushel of fine flour and consequently of *panis monachorum* would have rendered around 40,280 kilocalories. One quarter of the same would render approximately 322,240 kilocalories. Given the fact that each quarter, rendering about 322,240 kilocalories, would have produced about 132.56 loaves, we arrive at the estimation that each loaf rendered around 2,430 calories. The weight and calorific value of *panis monachorum* and of the two other kinds of bread are represented on Tables 8.5 and 8.6 (other breads' weights and calorific values will be discussed in the following sections).

Table 8.5. Bread Relative to Flour and Grain (in lb avoirdupois)

Kind of Bread	Lb in bushel of grain	Extraction Rates	Lb in bushel of flour	Lb of bread	Lb in loaf	Loaves per bus flour	Loaves per q flour
<i>Panis Monachorum</i>	53.00	0.50	26.50	33.97	2.05	16.57	132.58
<i>Ponderis Minoris</i>	53.00	0.50	26.50	33.97	1.39	24.44	195.54
<i>Panis Militum</i>	53.00	0.85	45.05	57.76	2.05	28.17	225.39
Average	53.00	0.62	32.68	41.90	1.83	23.06	184.50

Sources: DCN 1/1/6-28, 30-37, 39-40.

⁴⁸⁷ Campbell et al., 1993, pp. 191-192

Table 8.6. Calorific Value of the Three Kinds of Bread

Kind of Bread	Kcal in bus of wheat	Kcal in q. of wheat	Kcal in bus of flour	Kcal in q. of flour	Kcal per loaf
<i>Panis Monachorum</i>	80,560.00	644,480.00	40,280.00	322,240.00	2,430.48
<i>Ponderis Minoris</i>	80,560.00	644,480.00	40,280.00	322,240.00	1,647.98
<i>Panis Militum</i>	80,560.00	644,480.00	68,476.00	547,808.00	2,430.48
<i>Average</i>	80,560.00	644,480.00	49,678.67	397,429.33	2,169.65

Sources: DCN 1/1/6-28, 30-37, 39-40.

The *panis monachorum ponderis majoris* was intended mostly for the brethren's consumption. Indeed, about 79 per cent of its production was given to the monks, as their daily bread. The remaining 20 per cent or so was unevenly distributed among various departments and persons, both within and without the Priory. About 7 per cent was destined to be consumed in the guest hall, presumably by various visitors of high standing. The cooks working in the Priory kitchen consumed another 7 per cent of bread. It is hardly surprising that the people responsible for producing fine food were presented with the finest kind of bread. Another 2 per cent was allowed for the almoner, who must have distributed the loaves among the poor. Another 4 per cent was allocated to the 'expenses of the Prior' (*expensis Prioris*) and distributed among the manorial tenants, as a token of appreciation for hard work and as a charity. Finally, a small part of the total (usually, less than one per cent) was given as livery to the *famuli*, in addition to regular supply of *panis ponderis minoris*, discussed below. The overall distribution of the bread, in quarters of grain and loaves, is shown on Tables 8.7 and 8.8.

Table 8.7. Annual Distribution of Panis Monachorum (in Grain Quarters) (in decennial means).

1. In Quarters

Decade	Monks	Aula (Hall)	Prior's expenses toward manors	Kitchen	Almoner	Livery servants)	(to	Sum
1281-1290	218.59	8.25	10.94	20.38	0.25		0.00	258.40
1291-1300	195.09	21.78	10.00	24.00	3.19		1.94	256.00
1301-1310	200.19	24.48	5.85	19.58	5.25		5.17	260.52
1311-1320	182.50	24.50	9.40	15.13	5.58		8.31	245.42
1321-1330	191.75	15.53	9.34	19.03	6.00		0.13	241.78
1331-1340	188.51	14.15	7.95	16.38	6.50		0.00	233.49
1341-1343	187.00	13.06	10.03	15.72	6.50		0.59	232.91
Average	194.80	17.39	9.07	18.60	4.75		2.31	246.93

2. In Percentage

Decade	Monks	Aula (Hall)	Prior's expenses toward manors	Kitchen	Almoner	Livery famuli)	(to	Sum
1281-1290	84.59%	3.19%	4.23%	7.88%	0.10%		0.00%	100.00%
1291-1300	76.21%	8.51%	3.91%	9.38%	1.25%		0.76%	100.00%
1301-1310	76.84%	9.40%	2.25%	7.52%	2.02%		1.98%	100.00%
1311-1320	74.36%	9.98%	3.83%	6.16%	2.28%		3.39%	100.00%
1321-1330	79.31%	6.42%	3.86%	7.87%	2.48%		0.05%	100.00%
1331-1340	80.74%	6.06%	3.40%	7.01%	2.78%		0.00%	100.00%
1341-1343	80.29%	5.61%	4.31%	6.75%	2.79%		0.25%	100.00%
Average	78.91%	7.02%	3.68%	7.51%	1.96%		0.92%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.8. Annual Allocation of Panis Monachorum Loaves, 1281-1343 (in decennial means).

Decade	Monks	Cooks	Guests	Prior's Expenses	Almoner	Famuli	Total Loaves
1281-1290	28981.79	2701.38	1093.81	1450.13	33.15	0.00	34260.24
1291-1300	25866.09	3181.99	2887.65	1325.83	422.61	256.88	33941.05
1301-1310	26541.43	2596.41	3245.63	775.94	696.06	685.01	34540.49
1311-1320	24196.37	2005.32	3248.28	1245.73	740.25	1102.10	32538.04
1321-1330	25422.76	2523.22	2059.01	1238.82	795.50	16.57	32055.88
1331-1340	24993.53	2171.04	1876.05	1054.03	861.79	0.00	30956.44
1341-1343	24793.00	2084.04	1731.53	1329.97	861.79	78.72	30879.05

Average	25827.85	2466.20	2305.99	1202.92	630.16	305.61	32738.74
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Sources: DCN 1/1/6-28, 30-37, 39-40.

Panis Ponderis Minoris

Hudson and Saunders identify this kind of bread with the *panis levatus* of the London *Liber Albus* and with *cocket* of the *Assize of Bread and Ale*, without actually justifying their identification.⁴⁸⁸ This term indeed occurs in the *Liber Albus* and it has, in fact, to do with price fluctuation of wheat. According to the *Liber*, ‘it should be noted that when a quarter of wheat becomes expensive, then you shall have more loaves from one quarter, being of lighter weight. While when [a quarter of wheat] becomes cheap, then you shall have fewer loaves, being of greater weight’ (*Et nota, quod quando quarterium frumenti carum fuerit, tunc habebitis plures panes de uno quarterio, et minoris ponderis. Quando vero vile fuerit, tunc habebitis panes pauciores, sed majoris ponderis*).⁴⁸⁹ This passage is dealing with the *panis albus*, not with the *panis levatus*, as Hudson and Saunders had assumed. The heading *De Pane Levi*, which follows *De Pane Albo*, has, in fact, nothing to do with the *panis ponderis minoris* and hence, Hudson’s and Saunder’s identification seems to be incorrect.

It appears that the term *panis ponderis majoris* denotes not a type of bread, but its weight. Contemporary sources indicate that this kind of bread must have been identical to the *panis monachorum*, only of a lighter weight. This fact is supported by several granary

⁴⁸⁸ W. Hudson, ‘The Camera Roll of the Prior of Norwich in 1283, Compiled by Bartholomew de Cotton’, *Norfolk Archaeology* 19 (1917), pp. 305-306; H. W. Saunders, *An Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), pp. 88-91.

⁴⁸⁹ *Monumenta Gildhallae Londoniensis: Liber Albus, Liber Custumarum et Liber Horn*, Henry Thomas Riley (ed.), Rolls Series 12, Vol. I (London, 1859), p. 352. The translation is mine.

rolls from the 1280s, which speak about *panis monachalis maioris et maioris ponderis*.⁴⁹⁰

The fact that the *panis monachorum* and *panis minoris ponderis* were the one and the same type is attested in several other monastic sources. For example, a passage from *Landboc* of Winchcomb Priory (Gloucestershire), which speaks about *unum panem monachalem de antiquo pondere et alium panem minorem de eodem pastu* (a monastic loaf of the ancient weight and another smaller loaf, made of the same dough).⁴⁹¹ The *de antiquo pondere* must have been understood as a regulated weight, before the wheat prices soared toward the end of the thirteenth century. Similarly, the Beaulieu book mentions *parvum* and *magnum panis conventualis* made from the same flour.⁴⁹² A 1289 deed from Little Dunmow Priory (Essex), speaks of *duos panes albos minoris de pastu conventus*,⁴⁹³ while a 1263-4 charter from Eynsham Abbey (Oxfordshire) mentions *panem album minoris ponderis* kept at the monastery cellar (*de celario nostro*).⁴⁹⁴ In other words, both kinds of bread were made of the same dough.

The account book of Beaulieu shows that a loaf of *panis minoris ponderis* should have been lighter than that of *panis monachorum* by some 70 per cent. Its weight was 1.70 lb troy (=1.39 lb avoirdupois) and one bushel of wheat was expected to produce thirty loaves (hence, 240 loaves per quarter).⁴⁹⁵ Since *panis ponderis minoris* was made from the same flour and dough that the regular *panis monachorum* was, it may have had the identical extraction rate (of fifty per cent). Again, one bushel of grain would have

⁴⁹⁰ DCN 1/16-8.

⁴⁹¹ *Landboc sive Registrum de Winchelcumba*, David Royce (ed.) (Exeter, 1892), Vol. I, pp.262-3.

⁴⁹² *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 290-291.

⁴⁹³ *The Cartulary of Little Dunmowe Priory*, Richard E. Levy (ed.), Unpublished MA Dissertation (Charlottesville: University of Virginia, 1971), no. 46.

⁴⁹⁴ *Eynsham Cartulary*, H. E. Salter (ed.), Vol. I (Oxford: Clarendon Press, 1907), pp. 231-232 (no. 335)

⁴⁹⁵ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 290-291. On different figures, consult Peter W. Hammond, *Food and Feast in Medieval England* (Phoenix Mill: Alan Sutton, 1993), pp. 63-79.

produced 26.50 lb avoirdupois of fine flour, converted into about 33.97 lb avoirdupois of bread. If each loaf weighed 1.39 lb avoirdupois, then a bushel of flour would be expected to produce about 24.44 loaves of *panis ponderis minoris* (=195.51 loaves per quarter). As we have seen, one quarter of flour rendered approximately 322,240 kilocalories and produced some 195.51 loaves (Table 8.6). Hence, calorific value of each loaf, weighing 1.39 lb avoirdupois, may have been around 1,648 kilocalories.

To conclude: the *panis minoris ponderis* may have been identical to the *panis monachorum* in everything except weight. The (mis)identification of Hudson and Saunders can thus be dismissed. This kind of bread had two main destinations: to the guest-hall, presumably, for entertainment of the guests (about sixty per cent) and to the servants living within the Cathedral precinct (*servientibus in curia*), namely the *famuli* (about twenty per cent). The remaining eleven per cent went to the cellar, and was occasionally distributed among the labourers (especially from c. 1330 onwards) and manorial tenants.

Table 8.9. Annual Distribution of Panis Ponderis Minoris, 1281-1343 (in decennial means).

1. In Quarters

Decade	Cellar	Aula	Famuli	Labourers	Prior's expenses towards manors	Total
1281-1290	11.44	223.35	32.69	0.00	0.50	267.97
1291-1300	43.34	142.47	48.34	0.00	14.81	248.97
1301-1310	41.69	189.08	56.67	1.00	6.63	295.06
1311-1320	18.42	185.58	48.13	0.00	9.85	261.98
1321-1330	30.69	162.81	71.47	0.00	14.38	279.34
1331-1340	37.15	110.18	61.45	28.30	11.81	248.89
1341-1343	28.19	107.56	59.19	45.13	13.59	253.66
Average	30.13	160.15	53.99	10.63	10.22	265.12

2. In Percentages

Decade	Cellar	Aula	Famuli	Labourers	Prior's expenses towards manors	Total
1281-1290	4.27%	83.35%	12.20%	0.00%	0.19%	100.00%
1291-1300	17.41%	57.22%	19.42%	0.00%	5.95%	100.00%
1301-1310	14.13%	64.08%	19.20%	0.34%	2.25%	100.00%
1311-1320	7.03%	70.84%	18.37%	0.00%	3.76%	100.00%
1321-1330	10.99%	58.28%	25.58%	0.00%	5.15%	100.00%
1331-1340	14.93%	44.27%	24.69%	11.37%	4.75%	100.00%
1341-1343	11.11%	42.40%	23.33%	17.79%	5.36%	100.00%
Average	11.36%	60.40%	20.36%	4.01%	3.86%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.10. Annual Allocation of Panis Ponderis Minoris Loaves, 1281-1343 (in decennial means).

Decade	Famuli	Guests	Cellar	Prior's Expenses	Workers	Total Loaves
1281-1290	6,391.58	43,671.96	2,236.44	97.77	0.00	52,397.75
1291-1300	9,452.94	27,857.75	8,475.26	2,896.38	0.00	48,682.32
1301-1310	11,080.37	36,972.58	8,151.40	1,295.43	195.54	57,695.31
1311-1320	9,410.16	36,288.20	3,601.12	1,926.84	0.00	51,226.33
1321-1330	13,974.70	31,835.69	6,000.51	2,810.83	0.00	54,621.73
1331-1340	12,015.68	21,543.17	7,264.16	2,309.77	5,533.67	48,666.44
1341-1343	11,573.28	21,032.33	5,511.67	2,658.07	8,823.56	49,598.90
Average	10,556.96	31,314.52	5,891.51	1,999.30	2,078.97	51,841.25

Sources: DCN 1/1/6-28, 30-37, 39-40.

Panis Militum

Hudson and Saunders have, however, correctly suggested that *panis militum* may have derived from the Norman misinterpretation of the Old English term 'servant'. In their view, the French speaking élite understood the term *kniht* / *cniht* as *miles* (that is,

knight), while its true meaning was ‘servant’. I could not find any pre-1066 occurrence of the word-combination *cnihtes (knihtes) hlaf* (sgl.) / *cnihta (knihta) hlaf* (pl.). However, there are several post-Conquest witnesses to this term. Some cellarer’s accounts of Westminster Abbey mention *knytelof*, evidently a later corruption of *knihtahlaf*.⁴⁹⁶ In addition, a 1198 deed from Stoke-by-Clare Priory (Norfolk) speaks about a bread called *sweinesloves*.⁴⁹⁷ Clearly, the term derived from the Old English *-swan* (servant, a synonym to *kniht*) and *-hlaf* (bread, loaf). The two terms (*sweinesloves* and *knytelof*) are clearly corrupted Old English parallels of the Latin *panis militum*.

Curiously enough, this term has a continental counterpart, which goes back to the Carolingian times. The term in question is *panis vasallorum*, which one encounters, *inter alia*, in the constitutions of Corbie Abbey, as recorded by the abbot Adalhard. The constitutions prescribe the distribution of one loaf of *panis vasallorum* among two paupers.⁴⁹⁸

Different monastic institutions referred to the servant’s bread by different names. For instance, late-medieval accounts of Durham Priory mention *panis militaris* distinguishing it from *panis dominicus*;⁴⁹⁹ a 1269-70 account book from Beaulieu Abbey talks about *panis familie*,⁵⁰⁰ while a fourteenth-century cartulary of Ramsey Abbey

⁴⁹⁶ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 171

⁴⁹⁷ *Stoke-by-Clare Cartulary, BL Cotton Appx. Xxi*, Christopher Harper-Bill and Richard Mortimer (eds.), Vol. I (Woodbridge: Boydell and Brewer for the Suffolk Record Society, 1982), pp. 14-15 (no. 20).

⁴⁹⁸ Adalhard, *Statuta antiqua abbatis Sancti Petri Corbeiensis* 1.3 (7), Kassius Hallinger (ed.), in *Corpus Consuetudinum Monasticarum*, Vol. I, (Sieburg: F. Schmitt, 1963), pp. 369.32-370.3 = *Patrologia Latina* (=PL) 105, cols. 537B-C.

⁴⁹⁹ *Extracts from the Account Rolls of the Abbey of Durham from the Original MSS*, Joseph Thomas Fowler (ed.) (Durham: Published for the Society for Andrews & Co. 1898-1901), pp. 123 and 575.

⁵⁰⁰ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 290-291.

(Huntingdonshire), distinguishes between *panes monachorum* and *panes villarum*.⁵⁰¹ It should be noted, however, that some monastic documents use the term *panis servientum*, instead of *panis militum*, which reveals a better understanding of the original Old English term.⁵⁰²

Because our accounts provide no clue about the nature of *panis militum*, we have to seek the answer elsewhere. Contemporary Latin documents make a strong distinction between *panes albi* and *panes militum / servientum*. For example, a 1281 final concord between Norwich Priory and Julian, widow of Edmund de Thorp of Sedgeford, established a weekly corrody of *septem panis de illis panibus eorum qui vocatur albi panes et septem panes de illis panibus eorum qui vocantur panes militum* (seven loaves of those breads called ‘white breads’ and seven loaves of those called ‘knights’ breads’).⁵⁰³ In other words, the ‘knights’, or ‘servants’ bread may have been of a darker, non-white colour. Some Westminster accounts refer to the servants’ loaves as *panes nigri*, which were perhaps very dark, but not actually black. The Westminster *panis niger* was baked from a mixture of inferior wheat and rye flour.⁵⁰⁴ The Norwich loaves, however, may have been somewhat different, since it was mostly wheat flour that was used for baking. After 1329, however, we witness some minor additions of rye and legumes to the bread; these, however, were always marginal components.

Converting raw grain into flour of inferior quality (*farina*), suitable for making servants’ bread, commanded an extraction rate of about 85 per cent. Hence, a bushel of

⁵⁰¹ *Cartularium Monasterii de Rameseia*, William Henry Hart (ed.), Rolls Series (London, 1893), Vol. 3, pp. 230-234

⁵⁰² For instance, see *Cartularium Monasterii de Rameseia*, William Henry Hart (ed.), Rolls Series (London, 1893), Vol. 1, no. 141

⁵⁰³ *The Charters of Norwich Cathedral Priory*, Part 2, Barbara Dodwell (ed.) (London, 1985), no. 43.

⁵⁰⁴ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 171

wheat containing 53 lb avoirdupois would have produced around 45.05 lb avoirdupois of inferior wheat. Since that flour constituted only 78 per cent of each loaf, we arrive at 57.76 lb avoirdupois of bread. Determining the weight of each loaf is a more problematic task. The Beaulieu Book distinguishes between *parvum* and *magnum* loaves for servants, each weighing 4 lb troy (=3.28 lb avoirdupois) and 2.5 lb troy (=2.05 avoirdupois). Our accounts, on the other hand, do not provide any clue regarding either the size or weight of *panis militum*. D. J. Stone suggested that loaves baked for workers and peasants were bigger and heavier than those consumed by the lords.⁵⁰⁵ However, to assume that our *panis militum* corresponds to the *magnum panis servientum* of Beaulieu might be rather problematic, for two reasons. First, if that were true, then each loaf would have rendered around 3,889 kilocalories, if we assume that the extraction rates were about 85 per cent.⁵⁰⁶ This would have been an abnormally high figure for a fourteenth-century worker, especially given the fact that bread constituted only part of his daily diet, though a large part. As Christopher Dyer suggested, an average late-medieval English male peasant would normally have consumed around 2,900 calories on daily basis, and this estimation has been accepted by other scholars.⁵⁰⁷ Second, if each loaf weighed 3.28 lb avoirdupois, then the bakery would have produced too few loaves, certainly not enough to feed all the Priory workers. For example, during the 1310s, 185.59 quarters of grain were allocated for feeding the workers with bread. This would have produced about 72 loaves each day,

⁵⁰⁵ D. J. Stone, 'The Consumption of Field Crops in Late Medieval England,' in *Food in Medieval England: Diet and Nutrition*, C. M. Woolgar, D. Serjeantson and T. Waldron (eds.) (Oxford: Oxford University Press, 2006), p. 14, citing the examples of harvest workers at Wisbech (=2.88 lb each) and plowmen of Hinderclay (=3.58 lb each), both cases from the early fourteenth century.

⁵⁰⁶ Campbell et al., 1993, pp. 191. Stone (2006), on the other hand suggests 80 per cent ('The Consumption of Field Crops', p. 21).

⁵⁰⁷ Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England, c.1200-1520* (Cambridge: Cambridge University Press, 1989), p. 134. This figure is accepted by Campbell et al., 1993, p. 32.

while the total number of workers was well over a hundred and perhaps as many as two hundred, as we have seen above. Hence, it would be safer to go with the lower extreme, namely with the estimation that each loaf of servants' bread weighed approximately 2.05 lb. avoirdupois. In the 1310s, this would have produced, on average, about 115 loaves, each rendering approximately 2,430 kilocalories. One quarter of *farina* would have rendered, then, around 547,808 kilocalories.

Panis militum was baked mostly for the workers of the Priory. In addition, certain amounts of it were distributed as corrodies among the town's anchorites and as charity among the poor and prisoners incarcerated in the Castle prison (jail). The bread accounted for about one half of total bread produced at the Priory bakery.

Table 8.11. Annual Distribution of Panis Militum, 1281-1343 (in decennial means).

1. In Quarters of Wheat

Decade	A	B	C	D	E	F	G	H	I	J
1281-1290	59.50	344.38	43.75	8.00	2.00	0.81	2.25	4.78	10.28	475.75
1291-1300	54.59	268.81	46.56	6.25	2.38	5.56	28.75	8.00	44.47	465.38
1301-1310	24.85	328.75	28.83	5.81	2.50	9.75	0.00	8.71	47.92	457.13
1311-1320	18.13	414.92	46.96	24.79	1.25	8.25	0.00	2.25	31.71	548.25
1321-1330	19.44	398.50	52.06	10.63	0.00	8.75	0.00	30.44	56.31	576.13
1331-1340	249.03	211.35	52.10	10.71	0.00	6.60	0.00	33.20	14.65	577.64
1341-1343	227.84	231.50	62.72	8.56	0.00	10.00	0.00	37.38	26.94	604.94
Average	93.34	314.03	47.57	10.68	1.16	7.10	4.43	17.82	33.18	529.31

2. In Percentage

Decade	A	B	C	D	E	F	G	H	I	J
1281-1290	12.51%	72.39%	9.20%	1.68%	0.42%	0.17%	0.47%	1.00%	2.16%	100.00%
1291-1300	11.73%	57.76%	10.01%	1.34%	0.51%	1.20%	6.18%	1.72%	9.56%	100.00%
1301-1310	5.44%	71.92%	6.31%	1.27%	0.55%	2.13%	0.00%	1.91%	10.48%	100.00%
1311-1320	3.31%	75.68%	8.57%	4.52%	0.23%	1.50%	0.00%	0.41%	5.78%	100.00%
1321-1330	3.37%	69.17%	9.04%	1.84%	0.00%	1.52%	0.00%	5.28%	9.77%	100.00%
1331-1340	43.11%	36.59%	9.02%	1.85%	0.00%	1.14%	0.00%	5.75%	2.54%	100.00%

1341-1343	37.66%	38.27%	10.37%	1.42%	0.00%	1.65%	0.00%	6.18%	4.45%	100.00%
Average	17.63%	59.33%	8.99%	2.02%	0.22%	1.34%	0.84%	3.37%	6.27%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: Allocation to: a=cellar (probably for later consumption); b=guest-hall (for the labourers); c=prior's expenses; d=prisoners incarcerated in the castle prison; e= town's anchorites; f= poor in Maundy Thursday; g=extra alms; h=horses; i=additional liveries; j=total

Bread Consumers: Brethren

Before the 1320s, the bread accounts distinguish between the two departments responsible for keeping and distributing the loafs among the brethren: refectory (*versus refectorium*) and the cellar (*versus celarium*). From c.1320 onwards, however, the entire amount of bread given to the monks was stored in the cellar only. On average, the brethren consumed about 194.80 quarters of wheat on an annual basis. If one bushel of wheat contained 80,560 kilocalories, then 194.80 quarters of the grain would make over 125 million kilocalories. Allowing for 50 per cent extraction rates, we may estimate that this would make around 97.50 quarters of fine flour, containing about 63 million kilocalories, which were consumed yearly by some sixty monks. Each monk, then, would consume slightly over a million kilocalories every year and some 2,872.30 kilocalories, on a daily basis, which derived from bread only (Table 8.12). In reality, however, the overall amount of kilocalories consumed each day may have been higher, since bread represented only about 40 per cent of daily diet. I shall return to this issue later in this chapter.

Table 8.12. Calorific Values Deriving from Bread Intake of Norwich Monks , 1281-1343 (in decennial means).

Decade	Grain quarters)	(in Flour quarters)	(in Calorific Value of Total Grain	Calorific Value of Flour	Annual Intake of a Monk	Daily Intake of a Monk
1281-1290	218.59	109.30	140,879,300.00	70,439,650.00	1,173,994.17	3,223.05
1291-1300	195.09	97.55	125,734,020.00	62,867,010.00	1,047,783.50	2,876.55
1301-1310	200.19	100.09	129,016,840.00	64,508,420.00	1,075,140.33	2,951.65
1311-1320	182.50	91.25	117,617,600.00	58,808,800.00	980,146.67	2,690.86
1321-1330	191.75	95.88	123,579,040.00	61,789,520.00	1,029,825.33	2,827.25
1331-1340	188.51	94.26	121,492,536.00	60,746,268.00	1,012,437.80	2,779.51
1341-1343	187.00	93.50	120,517,760.00	60,258,880.00	1,004,314.67	2,757.21
Average	194.81	97.40	125,548,156.57	62,774,078.29	1,046,234.64	2,872.30

Sources: DCN 1/1/6-28, 30-37, 39-40.

In addition, it is essential to establish the overall number of loaves. One bushel contained 53 lb. of wheat and hence, 194.80 quarters accounted for 82,597 lb. Deducting fifty per cent for extraction rates, we arrive at nearly 41,300 lb of fine flour, ready to be converted into bread. As we have seen, bread was composed 78 per cent by weight of flour; hence, the overall amount of baked bread would have weighed nearly 53,000 lb. If each loaf weighed 2.05 lb. avoirdupois, then 52,947 lb would have made about 25,828 loaves. It appears, then, that each monk would have given around 430 loaves each year (1.18 loaves each day). Each loaf would render around 2,430 kilocalories. In other words, each quarter of wheat appears to have produced about 132.58 loaves of bread, each weighing around 2.50 lb troy (2.05 pounds avoirdupois).

Table 8.13. Weight and Amount of Bread Consumed by Norwich Monks, 1281-1343 (in decennial means).

Decade	Grain (in lb)	Flour (in lb)	Bread (in lb)	Loaves 2.05 lb)	(if Monk Loaves)	Annual Intake of a (in Loaves)	Daily Intake of a Monk (in Loaves)	Kcals per Loaf
1281-1290	92,683.75	46,341.88	59,412.66	28,981.79		483.03	1.33	2,430.48
1291-1300	82,719.75	41,359.88	53,025.48	25,866.09		431.10	1.18	2,430.48
1301-1310	84,879.50	42,439.75	54,409.94	26,541.43		442.36	1.21	2,430.48
1311-1320	77,380.00	38,690.00	49,602.56	24,196.37		403.27	1.11	2,430.48
1321-1330	81,302.00	40,651.00	52,116.67	25,422.76		423.71	1.16	2,430.48
1331-1340	79,929.30	39,964.65	51,236.73	24,993.53		416.56	1.14	2,430.48
1341-1343	79,288.00	39,644.00	50,825.64	24,793.00		413.22	1.13	2,430.48
Average	82,597.47	41,298.74	52,947.10	25,827.85		430.46	1.18	2,430.48

Sources: DCN 1/1/6-28, 30-37, 39-40.

Bread Consumers: Famuli

Roughly speaking, the Priory *famuli* received some twenty per cent of total *panis ponderis minoris*. The estimations below will be based on the assumption that each loaf weighed about 1.39 lb avoirdupois (=1.70 lb troy) and that the *famuli* population was fluctuating from decade to decade, as we have seen above.⁵⁰⁸

⁵⁰⁸ See above, Figure 7.2.

Table 8.14. Calorific Values Deriving from Bread Intake of Norwich Famuli , 1281-1343 (in decennial means).

Decade	Grain (in quarters)	Flour (in quarters)	Calorific Value of Grain	Calorific Value of Flour	Annual intake of a <i>famulus</i> (in kcals)	Daily Intake of a <i>Famulus</i> (in kcals)	Estimated no. of <i>famuli</i>
1281-1290	32.69	16.34	21,066,440.00	10,533,220.00	600,183.48	1,647.72	17.55
1291-1300	48.34	24.17	31,156,580.00	15,578,290.00	600,319.46	1,648.10	25.95
1301-1310	56.67	28.33	36,520,533.33	18,260,266.67	600,271.75	1,647.97	30.42
1311-1320	48.13	24.06	31,015,600.00	15,507,800.00	600,379.40	1,648.26	25.83
1321-1330	71.47	35.73	46,060,180.00	23,030,090.00	600,210.84	1,647.80	38.37
1331-1340	61.45	30.73	39,603,296.00	19,801,648.00	600,231.83	1,647.86	32.99
1341-1343	59.19	29.59	38,145,160.00	19,072,580.00	600,333.02	1,648.13	31.77
Average	53.99	26.99	34,795,398.48	17,397,699.24	600,275.51	1,647.98	28.98

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.15. Weight and Amount of Bread Consumed by Norwich Famuli, 1281-1343 (in decennial means).

Decade	Grain (in lb)	Flour (in lb)	Bread (in lb)	Loaves (if 1.39 lb)	Annual Intake of a <i>Famulus</i> (in Loaves)	Daily Intake of a <i>Famulus</i> (in Loaves)	Kcals per Loaf
1281-1290	13,859.50	6,929.75	8,884.29	6,391.58	364.19	1.00	1,647.98
1291-1300	20,497.75	10,248.88	13,139.58	9,452.94	364.28	1.00	1,647.98
1301-1310	24,026.67	12,013.33	15,401.71	11,080.37	364.25	1.00	1,647.98
1311-1320	20,405.00	10,202.50	13,080.13	9,410.16	364.31	1.00	1,647.98
1321-1330	30,302.75	15,151.38	19,424.84	13,974.70	364.21	1.00	1,647.98
1331-1340	26,054.80	13,027.40	16,701.79	12,015.68	364.22	1.00	1,647.98
1341-1343	25,095.50	12,547.75	16,086.86	11,573.28	364.28	1.00	1,647.98
Average	22,891.71	11,445.85	14,674.17	10,556.96	364.25	1.00	1,647.98

Sources: DCN 1/1/6-28, 30-37, 39-40.

It appears that the *famuli* were allowed a much smaller intake of bread than were the brethren (Tables 8.13-8.14). The loaves of *panis ponderis minoris* were smaller both in size and calorific input than the regular monastic bread. Each loaf seems to have rendered approximately 1,650 calories, namely some two thirds of calorific value of *panis*

monachorum. There is no doubt that the servants consumed many fewer calories than their masters and hence, they were less likely to suffer from obesity than the latter. The fact that the *famuli* were allowed bread of superior quality shows that they were undoubtedly valued more highly than the workers, who received mostly *panis militum*, namely bread made of inferior flour. It also demonstrates that the *famuli* were regarded as an integral part of the Priory community.

Bread Consumers: Priory Guests

A much larger proportion of *panis ponderis minoris* was allocated to the entertainment of guests (some sixty per cent). The accounts refer to this allocation as *versus aulam* (for the [guest]-hall). The amount of grain, and consequently of loaves, fluctuated from decade to decade. In the 1280s as much as 223.35 quarters of wheat, producing about 43,672 loaves annually (about 120 loaves daily), was spent on the guests. In the 1330s, on the other hand, only 110 quarters of grain, rendering 21,543 loaves a year (slightly fewer than 60 a day), were allocated to the guests' entertainment (Table 8.16). In other words, the guests received about three times more than the *famuli*. It is unclear, though, if the number of loaves, distributed annually and daily, is actually identical to the number of guests. It appears unlikely that during the 1280s the Prior had to entertain as many as 120 transient guests in the guest-hall each day. It could be that there were some 'low' and 'high seasons' of guests, throughout a year. For instance, it appears that around Christmas and Pentecost, the guest-hall would have hosted more guests and entertainers than in other periods. Furthermore, it is possible that each guest

would have received more than one loaf *per caput*. Therefore, it is unlikely that the number of loaves equals the number of guests.

Table 8.16. Weight and Amount of Panis Ponderis Minoris Consumed by Guests, 1281-1343 (in decennial means).

Decade	Grain (in quarters)	Flour (in quarters)	Calorific Value of Grain (kcal)	Calorific Value of Flour (kcal)
1281-1290	223.35	111.67	143,941,385.60	71,970,692.80
1291-1300	142.47	71.23	91,818,260.00	45,909,130.00
1301-1310	189.08	94.54	121,860,426.67	60,930,213.33
1311-1320	185.58	92.79	119,604,746.67	59,802,373.33
1321-1330	162.81	81.41	104,929,400.00	52,464,700.00
1331-1340	110.18	55.09	71,005,584.00	35,502,792.00
1341-1343	107.56	53.78	69,321,880.00	34,660,940.00
Average	160.15	80.07	103,211,668.99	51,605,834.50

Sources: DCN 1/1/6-28, 30-37, 39-40.

Bread Consumers: Labourers

Priory labourers (*operatores*), hired by the Priory authorities for various works and tasks, were yet another significant group of bread consumers. Their allowance was both in *panis ponderis minoris* and *panis militum*. The latter represented the majority of their bread diet (100 per cent before c. 1330) and about 75 per cent between 1331 and 1343. As in case of the guests, the annual grain allocation varied from decade to decade (Table 8.17). In the 1280s, the annual amount of grain converted into the two kinds of bread intended for the labourers' consumption reached its peak, with 223.25 quarters converted to *panis militum*. In the following decade, however, the amount of bread was decreased by 36 per cent. On average, the annual allocation was around 170 quarters. From c. 1330 onwards, the Priory authorities added certain amounts of *ponderis minoris*

bread to the workers' diet. This tendency corresponds to the period of intensive renovation, expansion and building activities undertaken by the Prior. It is quite possible that the latter realized the importance of maintaining good terms with the hired workers, by supplying them with better food.

Table 8.17. Annual Grain Allocation (in Quarters) for Workers' Bread (in decennial means)

Decade	<i>Ponderis Minoris</i>	<i>Militum</i>	Total
1281-1290	0.00	223.35	223.35
1291-1300	0.00	142.47	142.47
1301-1310	1.00	189.08	190.08
1311-1320	0.00	185.58	185.58
1321-1330	0.00	162.81	162.81
1331-1340	28.30	110.18	138.48
1341-1343	45.13	107.56	152.69
Average	10.63	160.15	170.78

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.18 Combined Calorific Value of Panis Ponderis Minoris and Panis Monachorum Annually Distributed among the Labourers, 1281-1343 (in decennial means).

Decade	Grain (in q)	Flour (in q)	Calorific Value of Grain (kcal)	Calorific Value of Flour (kcal)
1281-1290	223.35	111.67	143,941,385.60	71,970,692.80
1291-1300	142.47	71.23	91,818,260.00	45,909,130.00
1301-1310	190.08	95.04	122,504,906.67	61,252,453.33
1311-1320	185.58	92.79	119,604,746.67	59,802,373.33
1321-1330	162.81	81.41	104,929,400.00	52,464,700.00
1331-1340	138.48	69.24	89,244,368.00	44,622,184.00
1341-1343	152.69	76.34	98,404,040.00	49,202,020.00
Average	170.78	85.39	110,063,872.42	55,031,936.21

Sources: DCN 1/1/6-28, 30-37, 39-40.

Tables 8.17 and 8.18 estimate annual calorific, weight and number patterns. The fluctuation of amounts of grain and hence, of loaves probably reflects the number of workers to be fed. It appears that the number of loaves may have been lower than the number of labourers working at the Priory, if we allow one loaf per labourer. As we have seen, there must have been slightly above 200 regular workers and some ten daily wage earners. Our accounts clearly state that these loaves were distributed among *operatores*, which stands for manual workers. Hence, it becomes apparent that domestic workers, who were regarded socially superior to manual labourers, could have received *panis ponderis minoris*, alongside guests and *famuli*; while *panis militum* was destined specifically to workers performing physical tasks. As we have seen above, our accounts reveal that there were approximately seventy regular manual labourers and some ten wage earners, hired for different periods of time. This estimation stands not far from the number of loaves distributed during the 1290s and between 1331-1343. It is possible that the overall number of manual workers was higher in other periods, as the number of loaves indicates.

Bread Consumers: Priory Cooks

Another group of bread consumers were the Priory cooks. The average 18.60 quarters of grain allocated for *panis monachorum*, to be distributed among the cooks in the kitchen (some 7.50 per cent of the total), would make about 2,466 loaves, capable of feeding, on average, 6.77 persons throughout the year (on the assumption that each cook received one loaf every day). This agrees with the evidence from the Cellarer's rolls,

indicating that there were three or four cooks with at least two assistants.⁵⁰⁹ The fact that the cooks were fed with the finest kind of bread reveals that they were undoubtedly valued higher than any other workers. After all, it was in the brethren's best interest to please the cooks with delicate food, so that the latter would, in turn, please the monks with their culinary creations. As Saunders stated 'apart from the fact that it is always well to nurse those preparing food, these cooks were people of importance and apparently on an equal footing with the monks'.⁵¹⁰ The overall patterns of the consumption are represented on Tables 8.19 and 8.20.

Table 8.19. Calorific Values Deriving from Bread Intake of Priory Cooks , 1281-1343 (in decennial means).

Decade	Grain quarters)	(in Flour quarters)	(in Calorific of Total (in kcals)	Value of Grain of Flour (in kcals)
1281-1290	20.38	10.19	13,131,280.00	6,565,640.00
1291-1300	24.00	12.00	15,467,520.00	7,733,760.00
1301-1310	19.58	9.79	12,621,066.67	6,310,533.33
1311-1320	15.13	7.56	9,747,760.00	4,873,880.00
1321-1330	19.03	9.52	12,265,260.00	6,132,630.00
1331-1340	16.38	8.19	10,553,360.00	5,276,680.00
1341-1343	15.72	7.86	10,130,420.00	5,065,210.00
Average	18.60	9.30	11,988,095.24	5,994,047.62

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.20. Annual Distribution of Loaves among the Priory Cooks, 1281-1343 (in decennial means)

Decade	Grain (in lb)	Flour (in lb)	Bread (in lb)	Number of Loaves Distributed Annually	Number of Loaves Distributed Daily
1281-1290	8,639.00	4,319.50	5,537.82	2,701.38	7.42
1291-1300	10,176.00	5,088.00	6,523.08	3,181.99	8.74
1301-1310	8,303.33	4,151.67	5,322.65	2,596.41	7.13

⁵⁰⁹ See above, p. 181.

⁵¹⁰ H. W. Saunders, *An Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), p. 91.

1311-1320	6,413.00	3,206.50	4,110.90	2,005.32	5.51
1321-1330	8,069.25	4,034.63	5,172.60	2,523.22	6.93
1331-1340	6,943.00	3,471.50	4,450.64	2,171.04	5.96
1341-1343	6,664.75	3,332.38	4,272.28	2,084.04	5.72
Average	7,886.90	3,943.45	5,055.71	2,466.20	6.77

Sources: DCN 1/1/6-28, 30-37, 39-40.

Bread Consumers: Horses

It is rather surprising to find Priory horses among the regular daily recipients of bread. We have already seen the exceptional treatment of the horses by their masters: for instance, they were fed mostly on oats as opposed to the manorial horses, which lived on hay and straw, for the most part.⁵¹¹ But provisioning the animals with processed food is even more striking, taking into account the time of baking and loss of weight and calorific value, after the extraction of chaff and bran. This was certainly an exceptional situation for late-medieval England, where feeding the horses with processed wheat, let alone with loaves, was by no means a commonplace.⁵¹² There were cases, however, where horses were fed with a special horse-bread (*panis equinus*), made of beans, peas, bran and other coarse materials. Such practice was common, for instance, at late-medieval Durham Priory.⁵¹³ Our accounts indicate that before the 1320s, the horses used to receive meagre amounts of wheat loaves and no bread was fed to them between 1314 and 1321, i.e., during the troublesome years of the Agrarian Crisis.⁵¹⁴ From the later 1320s onwards, however, we witness a sharp increase in the amount of bread allocated to

⁵¹¹ The feeding of horses is discussed above, Chapter 5 (esp. Tables 5.12-5.15).

⁵¹² Campbell (2000) sites two fourteenth-century examples of using wheat as fodder. Both examples are from Norfolk (see, Campbell, 2000, p. 218, no. 89).

⁵¹³ *Extracts from the Account Rolls of the Abbey of Durham from the Original MSS*, Joseph Thomas Fowler (ed.) (Durham : Published for the Society fo Andrews & Co. 1898-1901), pp. 147, 160, 234, 252, 256, 527, 569, 577, 641, 722-4.

⁵¹⁴ DCN 1/1/6-28.

the horses. This amount was capable of producing about twenty loaves each day, on average. It is clear, however, that these amounts were far from sufficient for meeting calorific requirements of the animals. As we have seen, an average horse probably consumed about 10,000 kilocalories each day, *c.* 1300.⁵¹⁵ It turns out, then, that the loaves were given as an addition to regular daily oat fodder. Furthermore, it is evident that not every horse was fed with a loaf every day. For instance, during the 1280s, about 1,077 loaves were produced from 4.78 quarters of wheat, enough to feed about three horses each day. It is certain that the overall number of the horses in the Priory stables was considerably higher than three.⁵¹⁶ The overall patterns of feeding the horses with *panis militum* are shown on the following tables (Table 8.21 and 8.22):

Table 8.21. Calorific Values Deriving from Bread Intake of Priory Cooks , 1281-1343 (in decennial means).

Decade	Quarters	Flour (in quarters)	Calorific Value of Grain (kcal)	Calorific Value of Flour (kcal)
1281-1290	4.78	4.06	3,081,420.00	2,619,207.00
1291-1300	8.00	6.80	5,155,840.00	4,382,464.00
1301-1310	8.71	7.40	5,612,346.67	4,770,494.67
1311-1320	2.25	1.91	1,450,080.00	1,232,568.00
1321-1330	30.44	25.87	19,616,360.00	16,673,906.00
1331-1340	33.20	28.22	21,396,736.00	18,187,225.60
1341-1343	37.38	31.77	24,087,440.00	20,474,324.00
Average	17.82	15.15	11,485,746.10	9,762,884.18

Sources: DCN 1/1/6-28, 30-37, 39-40.

⁵¹⁵ See above, Table 5.13.

⁵¹⁶ See above, Chapter 7, pp. 240-249.

Table 8.22. Annual Distribution of Loaves among the Priory Cooks, 1281-1343 (in decennial means)

Decade	Grain (in quarters)	Grain (in lb)	Flour (in lb)	Bread (in lb)	Loaves (if 2.05 lb)	No. of Loaves distributed Daily
1281-1290	4.78	2,027.25	1,723.16	2,209.18	1,077.65	2.96
1291-1300	8.00	3,392.00	2,883.20	3,696.41	1,803.13	4.95
1301-1310	8.71	3,692.33	3,138.48	4,023.70	1,962.78	5.39
1311-1320	2.25	954.00	810.90	1,039.62	507.13	1.39
1321-1330	30.44	12,905.50	10,969.68	14,063.69	6,860.33	18.83
1331-1340	33.20	14,076.80	11,965.28	15,340.10	7,482.98	20.54
1341-1343	37.38	15,847.00	13,469.95	17,269.17	8,423.98	23.13
Average	17.82	7,556.41	6,422.95	8,234.55	4,016.85	11.03

Sources: DCN 1/1/6-28, 30-37, 39-40.

Ironically, the situation at Norwich Cathedral Priory was completely contrary to what is described in Norfolk play *Mankind*, mentioned above.⁵¹⁷ In the dialogue between Mischief and Mercy, the former explains to Mercy that *Grain seruit bredibus, chaffe horsibus, straw fyrybusque* ('Grain serves for [the making of] loaves, chaff for [feeding the] horses, and straw for [kindling] fire').⁵¹⁸

In addition to the aforementioned groups of bread consumers, receiving their allowance on the daily basis, there was an additional group enjoying the products of the Priory bakery: corrodians. These included three main groups: paupers begging outside the gates of the Cathedral, prisoners incarcerated in the Castle jail and town anchorites secluded in their cells. Their fate, however, will be discussed in the following chapter, for three main reasons. First, the distribution of bread among the needy has to be seen in a

⁵¹⁷ See above, p. 56.

⁵¹⁸ *Mankind* (Morality Play), in *The Macro Plays*, Mark Eccles (ed.), Early English Text Society (Oxford: Oxford University Press, 1969), lines 36-63. This is apparently a linguistic game, with Latin words and forms entering Middle English lexicon.

wider context of late medieval charity, which cannot be treated here. Second, the corrodians were neither dwellers, nor workers within the Cathedral precinct. Third, although the master of the cellar was partially responsible for distributing the loaves among the corrodians, the dominant figure in this department was the almoner. As we have seen above, the latter had his own granary and received annual revenue from manors appropriated specifically to him. This fact, in turn, requires a lengthy treatment that cannot be undertaken fully within the current chapter.

Kinds of Ale

As with bread, there were several kinds of ale, destined for different social groups of consumers.⁵¹⁹ Unfortunately, there are too few passages shedding light on the nature of ale varieties. The 1281 final concord between the Priory and Julian of Sedgford, mentioned above, establishes a weekly corrody of *quinque lagenas cervisie de illa cervisia eorum que vocatur cervisia aule* (five gallons of ale from that ale called the ‘Hall’s Ale’).⁵²⁰ The 1283-4 granary roll has a memorandum note saying ‘*Memorandum quod isto anno partantur versus aulam cxui tunell(os) preter magnam lagenam de secunda cervisea quam quaerunt quolibet die*’ (Memorandum that in this year 136 tuns of the secondary ale were distributed to the hall, in addition to a large gallon of the

⁵¹⁹ On varieties of ale / beer, its history and on brewing process in the middle ages, see Max Nelson, *The Barbarian’s Beverage. A History of Beer in Ancient Europe* (London and New York: Routledge, 2005); Judith M. Bennet, *Ale, Beer, and Brewsters in England. Women’s Work in a Changing World, 1300-1600* (Oxford: Oxford University Press, 1996) and Richard W. Unger, *Beer in the Middle Ages and the Renaissance* (Philadelphia: University of Pennsylvania Press), 2004. The brewing process is described, in a great detail, in J. Brown, ‘The Malting Industry,’ in *The Agrarian History of England and Wales, Vol. 6, 1750-1850* (Cambridge: Cambridge University Press), pp. 501-519; Hieronymus, Stan, *Brew Like a Monk : Trappist, Abbey and Strong Belgian Ales and How to Brew Them* (Boulder: All Brewers Publications, 2005)

⁵²⁰ *The Charters of Norwich Cathedral Priory*, Part 2, Barbara Dodwell (ed.) (London, 1985), no. 43.

secondary ale, which they request on any day).⁵²¹ The annual allowance of loaves, ale and pancakes on major feast days, mentioned in the Sacrists' register, distinguishes between *cervisia bona* and *cervisia secunda*.⁵²² In other words, at least two sorts of ale were brewed at the Priory: *cervisia bona*, monastic ale of a superior quality and *cervisia aule / secunda*, interchangeable terms, signifying ale of secondary quality, drunk in the guest-hall.

It is unclear if only the two kinds of ale were actually brewed at the Priory, but the distinction between the *bona cervisia / cervisia fratrum* and *secunda cervisia* was known since the early middle ages. For example, the first synod of Aachen of 816 decreed that where there was no wine, the monks could drink a double measure of *cervisa bona*.⁵²³ Similarly, Adalhard of Corbie, in his ancient statutes of the abbey, spoke about *cervisa fratrum*, to be distributed among the poor on certain days.⁵²⁴ There are numerous examples from contemporary monastic sources distinguishing between *cervisia aule / secunda* and *cervisia conventualis / bona*.⁵²⁵ Some sources also speak about *melior servisia* and *posterior servisia*,⁵²⁶ which probably corresponded to our *cervisia bona* and *cervisia aule*. There were as many as four kinds of ale in Beaulieu Abbey: *bona /*

⁵²¹ DCN 1/1/7. The 'C' stands for a long hundred here (=120).

⁵²² DCN 40/11/ fols. 45r-45v.

⁵²³ *Legislatio Aquisgranensis* 20, Kassius Hallinger (ed.), in *Corpus Consuetudinum Monasticarum*, Vol. I, (Sieburg: F. Schmitt, 1963), pp. 462-463; noted in Max Nelson, 'On a Beautiful Girl and Some Good Barley Beer,' *Études Celtiques* 35 (2003), p. 258.

⁵²⁴ Adalhard, *Statuta antiqua abbatae Sancti Petri Corbeiensis* 1.3 (7), Kassius Hallinger (ed.), in *Corpus Consuetudinum Monasticarum*, Vol. I, (Sieburg: F. Schmitt, 1963), pp. 369.32-370.3 = *Patrologia Latina* (=PL) 105, cols. 537B-C.

⁵²⁵ For instance, *Registrum Prioratus Beate Marie Wigorniensis*, William Hale (ed.) (London, 1865), p. 130b; *Cartulary of Oseney Abbey*, H. E. Salter (ed.), Vol. III (Oxford, Clarendon Press, 1931), p. 82; *Landboc sive Registrum de Winchelcumba*, David Royce (ed.) (Exeter, 1892), Vol. I, pp. 298, 337, 340 and 348.

⁵²⁶ Just to name a few: *The Cartulary of Cirencester Abbey, Gloucestershire*, Mary Devine (ed.), Vol. III (Oxford: Oxford University Press, 1977), p. 933 (no. 402); *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 230-3; *The Cartulary of Shrewsbury Abbey*, Una Rees (ed.) (Aberystwyth: The National Library of Wales, 1975), Vol. 2, pp. 373-4 (no. 402b).

conventualis, *mixta* (mixture of *conventualis* and *secunda*), *secunda* (known as *lag*) and *tercia* (=third-rate ale, also known as *Wilkin le Naket*). Interestingly enough, *bona cervisia* was intended for the monks, aristocratic guests and master-masons; *mixta* was distributed among the *conversi*, the lay brethren, and *famuli*, while the two inferior kinds evidently went to workers of inferior status.⁵²⁷ Similarly, Dunstable Priory (Bedfordshire) brewed three kinds of ale: *dominica cervisia* (=lord's ale), *secunda cervisia* and *tercia cervisia*, otherwise known as *cervisia servientium vel caretтарiorum* (servants' or carters' ale).⁵²⁸ The three kinds of ale are also known to have been brewed in Worcester Priory and Oseney Abbey (Oxfordshire).⁵²⁹ The Norwich sources do not contain any similar information, and all we can say, with a full confidence, is that there were at least two varieties of ale: one brewed for the brethren in the refectory and the other one for the *famuli* and workers in the guest-hall.

It is unclear what was the main difference between ale enjoyed by the brethren and that drunk by the servants and labourers. The customary of the Benedictine Abbey of Eynsham in Oxfordshire (from after 1228/9) states that the brethren receive a fresh beer.⁵³⁰ According to Canterbury Cathedral Customal, '*sit bene defecata, boni coloris, clara, bene granata et boni saporis*' (it should be well cleansed,

⁵²⁷ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 230-3.

⁵²⁸ *A Digest of the Charters Preserved in the Cartulary of the Priory of Dunstable*, G. Herbert Fowler (ed.), Bedfordshire Historical Record Society 10 (1926), nos. 225, 227, 297, 299, 307, 332, 333, 467, 468, 469, 693, 906, 907, 908. The three kinds of ale brewed at Dunstable are noted in H. E. Hallam, 'The Life of the People,' in H. E. Hallam (ed.) *Agrarian History of England and Wales*, Vol. II: 1042-1350 (Cambridge, 1988), p. 827 and D. J. Stone, 'The Consumption of Field Crops in Late Medieval England,' in *Food in Medieval England: Diet and Nutrition*, C. M. Woolgar, D. Serjeantson and T. Waldron (eds.) (Oxford: Oxford University Press, 2006), p. 16.

⁵²⁹ *Registrum Prioratus Beate Marie Wigorniensis*, William Hale Hale (ed.) (London, 1865), p. 130b; *Cartulary of Oseney Abbey*, H. E. Salter (ed.), Vol. III (Oxford, Clarendon Press, 1931), p. 82.

⁵³⁰ *The Customary of the Benedictine Abbey of Eynsham in Oxfordshire*, Antonia Graden (ed.), in *Corpus Consuetudinum Monasticarum*, Vol. II (Siegburg: F. Schmitt, 1963), pp. 187.2-3 and 17

have a good colour, be clear, possess grainy flavour and good taste).⁵³¹ The use of the expression *bene granata* might suggest that the monks' ale had higher proportion of grain and lower proportion of water compared to *cervisia secunda* and, consequently, could have been stronger than the latter. The possibility that the *cervisia secunda* was weaker than the *cervisia bona* is supported by a thirteenth-century continental source, the *Chronica Andrensis* of William of Andres (1177-after 1234). According to the 1198 entry, workers who built an infirmary for an abbey were paid not in money but in weak beer.⁵³² This continental source, however, might not necessarily reflect the situation in England.

It is equally possible that the difference between the two kinds actually derived from the difference in malt from which they were brewed. Medieval English sources distinguish between *braseum capitale* and *braseum cursale / commune*, first and second-grade of malt, respectively.⁵³³ For instance, such distinction was made in some *compotus* rolls of Worcester Cathedral Priory.⁵³⁴ The *braseum cursale / commune* was a dark-brown, defected malt, heated too severely to produce fine ale. If all the difference between the two varieties of ale was in quality only, it is possible, then, that the two kinds of ale were actually of more or less the same strength. In any event, any attempt to estimate the exact alcohol strength and, consequently, calorific value of medieval monastic ale, could be speculative, and misleading.

⁵³¹ *Customary of the Benedictine Monasteries of Saint Augustine, Canterbury and Saint Peter, Westminster*, Edward Maunde Thompson (ed.), Henry Bradshaw Society 23 (London, 1902), p. 135.

⁵³² *Willelmi Chronica Andrensis*, I. Heller (ed.), *Monumenta Germaniae Historica Scriptores* (=MGH S), Vol. XXIV (Hanover, 1879), p. 724. 37-50. I owe this reference to Max Nelson, of University of Windsor.

⁵³³ For example, this distinction is made in *Forma Compoti* (a 1298 guide to compiling annual bailiffs' accounts), printed in *Legal and Manorial Formularies in Memory of J. P. Gilson*, S. C. Ratcliff et al. (eds.) (Oxford, 1933), pp. 38-9 and in the 1296-7 minister's account of the Earldom of Grainwall, edited in *Ministers' Accounts of the Earldom of Grainwall*, L. Margaret Migdley (ed.) Vol. I, p. 13.

⁵³⁴ *Compotus Rolls of Priory of Worcester*, Sidney Graves Hamilton (ed.) (Oxford, 1910), p. 73.

Our only piece of information regarding late-medieval brewing technique in England comes from Walter of Bibbesworth's *Treatise (Le Tretiz)*, composed in the mid-thirteenth century.⁵³⁵ Dealing with the Norman French language as spoken in England, the treatise has one section on ale brewing, which reveals that late-medieval malting, with the exception of mechanical processing equipment, was largely identical to the modern one.⁵³⁶ Obviously, the treatise, despite its significance, cannot shed any light on either the alcohol content, or energy value of late medieval ale. Some modern practical experiments show that late medieval ales may have had a higher food value higher than reported in modern scholarly estimates. The reason is based on the mash temperature profile created by the addition of hot water using ladles.

During the early phases of mashing the temperatures are lower and therefore favor the creation of fermentable sugars. According to some experiments, such mashing technique would have resulted in less alcohol and more sugar after fermentation.⁵³⁷ On the other hand, this technique could have achieved the opposite: more alcohol and less sugar. Hence, this issue is rather too complicated and enigmatic to be resolved here. All we can say with a high degree of assurance is that late medieval monastic ale was weaker, and consequently had less energy than most modern beers.

⁵³⁵ Walter of Bibbesworth, *Le Traité de Walter de Bibbesworth sur la langue française*, Annie Owen (ed.) (Paris, 1929); *Walter de Bibbesworth: Le Tretiz*, William Rothwell (ed.), Anglo-Norman Text Society Plain Texts Series 6 (London: The Anglo-Norman Text Society 1990).

⁵³⁶ *Walter de Bibbesworth: Le Tretiz*, William Rothwell (ed.), Anglo-Norman Text Society Plain Texts Series 6 (London: The Anglo-Norman Text Society 1990), lines 459-512.

⁵³⁷ I am grateful to Henry Davis, Chief Operating Officer of Applied Plasmonics and an experimental brewer for being kind to share some most valuable and profound knowledge of brewing techniques. In particular, Mr. Davis has been experimenting with the recreation of the famous 'Domesday Ale' for ten years now.

Annual Brewing Patterns

Annual brewing patterns were somewhat similar to the baking ones. The vast majority of malt was given to the brewer to be converted into drink; some meagre proportions were granted to different people, the bishop and the king among them (Table 8.24). As in the case of bread, the real amount of malt received from the manors was actually somewhat higher than that declared in the master of the cellar's rolls. Again, the increment in volume arose from the grinding of malt. This difference is shown on Table 8.23:

Table 8.23. The Increment of Malt Supply (in Quarters), as Reckoned by the Master of the Cellar (1281-1343) (in decennial means)

Decade	1st Total	Increment	2nd Total	2 nd Total Relative to 1st Total
1281-1290	1,900.67	0.00	1,900.67	1.00
1291-1300	2,094.73	154.18	2,248.90	1.07
1301-1310	2,313.58	89.53	2,403.10	1.04
1311-1320	1,912.38	90.96	2,003.34	1.05
1321-1330	1,826.50	63.50	1,890.00	1.03
1331-1340	1,832.43	43.88	1,916.70	1.05
1341-1343	1,677.08	37.17	1,714.25	1.02
Average	1,936.76	68.46	2,011.00	1.04

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.24. Annual Disposal of Malt Supply, 1281-1343 (in decennial means).

Decade	Brewer	Other	Total	Brewer	Other	Total
1281-1290	1,833.33	1.00	1,834.33	99.95%	0.05%	100.00%
1291-1300	1,972.00	3.00	1,975.00	99.85%	0.15%	100.00%
1301-1310	1,908.00	6.50	1,914.50	99.66%	0.34%	100.00%
1311-1320	1,726.67	1.67	1,728.34	99.90%	0.10%	100.00%
1321-1330	1,650.00	2.50	1,652.50	99.85%	0.15%	100.00%
1331-1340	1,430.45	0.30	1,430.75	99.98%	0.02%	100.00%
1341-1343	1,403.33	0.33	1,403.66	99.98%	0.02%	100.00%
Average	1,703.40	2.19	1,705.58	99.87%	0.13%	100.00%

Sources: DCN 1/1/6-28, 30-37, 39-40.

The total amount of malt used for brewing varied from year to year. For example, as many as 2,260 quarters of malt were brewed in 1299-1300, while in 1335-6 only 1,320 quarters were converted into ale. Generally speaking, from c.1300 onwards, we witness a gradual decrease in the amount of malt allocated for brewing. The causes of this decline will be discussed below.

As a rule, no more than one quarter of malt was given as a gift to different recipients. There were, however, some exceptions. In 1299-1300, 1309-10 and 1313-4, the prior granted to John Salmon, Bishop of Norwich (1299-1325) twelve, ten and five quarters of malt, respectively.⁵³⁸ In 1309-10, the Priory provided Edward II with twenty quarters of malt, possibly in exchange for an exemption from military service, required from all lords in his writ from 18 June 1310.⁵³⁹ According to Edward's *Vita*, many ecclesiastical magnates received the exemption having paid the King large sums of

⁵³⁸ DCN 1/1/15, 21, 23.

⁵³⁹ DCN 1/1/21.

money.⁵⁴⁰ It is equally possible, however, that the twenty quarters of malt were contributed for provisioning of Edward's garrisons on their way to Scotland.

Turning Malt into Ale: Gallons and Calories

Malting increases the volume of barley by 14 per cent and lowers its density, reducing its weight by 25 per cent.⁵⁴¹ As Bruce Campbell and his colleagues have estimated, a bushel of malted barley, containing 58,747 kilocalories (14 per cent more than a bushel of raw barley), would have produced about 50 pints of strong or 95.61 pints of weak ale. Each pint of ale contained 320 or 160 kilocalories, depending on its strength.⁵⁴² Hence, one bushel of malt produced between 15,297 and 21,000 kilocalories, which is approximately thirty per cent of the original calorific value of barley. Again, as stated above, these estimations are somewhat speculative, but they should not be too removed from reality, since they accord with some late-medieval evidence.⁵⁴³ It should be noted that medieval ale was usually measured in larger quantities than the pint, with eight pints making one gallon (*galo, lagena*); 32 gallons make one barrel (*barrillum*). The largest capacity, however, was the tun, or cask (*tunnelum, doleum*), containing 240 gallons in the late thirteenth century and 252 gallons in the early modern period.⁵⁴⁴

Apart from the quantity of malt allocated to brewing, our sources do not directly specify the number of gallons daily distributed among the brethren and servants. Our

⁵⁴⁰ *Vita Edwardi Secundi*, Wendy R. Childs (ed. and trsl.) (Oxford: Clarendon Press, 2005), pp. 20-21.

⁵⁴¹ Campbell et al., 1993, p. 34, note 59.

⁵⁴² *ibid.*

⁵⁴³ D. J. Stone, 'The Consumption of Field Crops in Late Medieval England,' in *Food in Medieval England: Diet and Nutrition*, C. M. Woolgar, D. Serjeantson and T. Waldron (eds.) (Oxford: Oxford University Press, 2006), p. 16.

⁵⁴⁴ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), p. 229 (for late thirteenth-century); *Weights and Measures of England*, R. D. Connor (ed.), (London: HMSO, 1987), pp. 21-22 (for Early Modern Period).

single piece of information comes from the marginal memorandum entries in the 1282-3 and 1283-4 accounts, which state that the recipients of *cervisia secunda*, namely the vast majority of the Priory population, received a gallon of ale each day. It is only reasonable to interpret it that a gallon of ale was allowed for *each person*, not for the whole lay community. This was a common practice in various monastic houses, including Beaulieu Bolton and Dunstable Priors, as well as St. Paul's Cathedral.⁵⁴⁵ The 1282-3 and 1283-4 rolls also specify that in addition to a gallon of ale distributed every day, the workers were allowed 122 and 136 tuns of ale, respectively, throughout the year.⁵⁴⁶

This, in turn, sheds light on the nature of ale produced at the Priory. In 1282, the Priory brewer received 1,860 quarters of malt, capable of yielding about either 93,000 gallons (=387.50 tuns) of strong or 177,834.60 gallons (=740.98 tuns) of weak ale. A daily allowance of a gallon per person suggests that an average servant or labourer drank about 1.52 tuns of ale every year (that is, 364.25 days divided by 240 gallons in one tun). Assuming that there were some 240 recipients of *cervisia secunda* (that is, the *famuli*, most workers and occasional guests), we arrive at 364.25 tuns consumed over the year. To this amount we should add another 122 tuns, mentioned in the roll, which were allowed in addition to a daily gallon. This would make some 486.25 tuns in total. This amount, which does not include the ale drunk by the brethren and highly valued guests, already exceeds the possible limit of strong ale, which could not have yielded more than

⁵⁴⁵ *Account Book of Beaulieu Abbey*, S. F. Hockey (ed.), Camden Fourth Series 16 (London: Royal Historical Society, 1975), pp. 230-3; Ian Kershaw, *Bolton Priory. The Economy of a Northern Monastery, 1286-1325* (Oxford: Oxford University Press), pp. 132-3 (Oxford: Oxford University Press, 1973); *The Bolton Priory Compotus, 1286-1325*, Ian M. Kershaw and David M. Smith (eds.), Printed for Yorkshire Archaeological Society 154 (1999-2000) (Woodbridge: The Boydell Press, 2000), pp. 163, 473, 492; *A Digest of the Charters Preserved in the Cartulary of the Priory of Dunstable*, G. Herbert Fowler (ed.), Bedfordshire Historical Record Society 10 (1926), nos. 225, 227, 297, 299, 307, 332, 333, 467, 468, 469, 693, 906, 907, 908; *The Domesday of St. Paul's of the Year MCXXII*, William Hale Hale (ed.), Printed for the Camden Society (London, 1858), pp. 165-175.

⁵⁴⁶ DCN 1/1/6-7

387.50 tuns in a given year. Hence, it must have been weak ale that was produced at the Priory brewery. 486.25 tuns of weak ale, made of approximately 1,220.50 quarters of grain, would have constituted about 66 per cent of total ale brewed in the same year (that is, out of about 740.98 tuns).

The remaining malt was converted into *cervisia bona*, or monastic ale. Assuming that the two kinds of ale were of the same strength and a quarter of malt yielded the same number of gallons in both cases, we arrive at around 254.73 tuns (=61,135.20 gallons) of ale, brewed from 640 quarters of malt. If a monk drank one gallon of ale each day, then it becomes evident that the quantity of *cervisia bona* actually exceeded daily requirements of a monk by some 280 per cent (it would have taken around 91.20 tuns of ale each year to meet the requirements of about sixty brethren).

Two possibilities remain. First, that the brethren actually consumed more than a gallon a day. Even allowing as much as two gallons per monk, we still remain with a definite surplus. Moreover, it is highly unlikely that the monks consumed more than a gallon a day: as we shall see below, one gallon yielding some 1,280 kilocalories, represented, approximately, the twenty per cent of total energy intake of a monk, on a regular, non-fasting day (See Table 8.27). Drinking two gallons a day, in addition to all other meals, would have meant a daily reception of equivalent of about 7,400 kilocalories: an exceedingly high figure, even by monastic and aristocratic standards of the same time.

This brings us to the second possibility: that the brethren were not the only consumers of *cervisia bona*. It is possible that occasional guests were entertained with the fine ale, upon their sojourn at the Priory. What is obvious, though, is that the Priory

workers were allowed, communally, meagre amounts of *bona cervisia* on major feasts. According to the sacrist's register, they received (communally) four gallons on Christmas, Easter (including the Octaves), Pentecost, Circumcision, Epiphany, Purification of BMV, Day of Ascension, Holy Trinity, Nativity of St. John, Dedication of the Church, All Saints, Michaelmas and Anniversary of Bishop Herbert Losinga (23 July). They were given the same amount also during annual synods at Easter and Michaelmas. Furthermore, two gallons of monastic ale were distributed among the labourers twice a year, during a *lectio divina* said by the cellarer. In addition, they were given one gallon of fine ale each day within the two-week period before Christmas (*contra Natale per quindenam*), the three-week period before Easter, and the two-week period before the Nativity of St. John. Finally, the sacrist's carpenter received a gallon of *bona cervisia* each day, which underlines his importance in the eyes of the Priory authorities.⁵⁴⁷ All this would have meant an additional 505 gallons, or some 2.10 tuns of first-grade ale distributed among the workers on feast days. Annual brewing and overall distribution patterns are represented on Tables 8.25-8.26:

⁵⁴⁷ DCN 40/11/fols. 45r-45v.

Table 8.25. Estimated Amount of Ale (in Pints, Gallons and Tuns) and the Number of Consumers it was Capable of Satisfying (a Gallon of Ale per Person) (in decennial means)

Decade	Quarters of Malt	Malt (kcal)	Calories	Pints	Gallons	Tuns	Kcals	Potential Consumers
1281-1290	1,833.33	861,621,100.08		1,402,277.45	175,284.68	730.35	224,364,392.06	480.50
1291-1300	1,972.00	926,792,672.00		1,508,343.36	188,542.92	785.60	241,334,937.60	516.84
1301-1310	1,908.00	896,714,208.00		1,459,391.04	182,423.88	760.10	233,502,566.40	500.07
1311-1320	1,726.67	811,493,459.92		1,320,695.35	165,086.92	687.86	211,311,255.94	452.54
1321-1330	1,650.00	775,460,400.00		1,262,052.00	157,756.50	657.32	201,928,320.00	432.45
1331-1340	1,430.45	672,277,169.20		1,094,122.60	136,765.32	569.86	175,059,615.36	374.90
1341-1343	1,403.33	659,531,420.08		1,073,379.05	134,172.38	559.05	171,740,648.06	367.80
Average	1,703.40	800,555,775.61		1,302,894.41	162,861.80	678.59	208,463,105.06	446.44

Sources: DCN 1/1/6-28, 30-37, 39-40.

Table 8.26. Annual Brewing Patterns, as Sampled from the 1282-3 and 1283-4 Rolls.

Year	Quarters of Malt	Malt (kcal)	Calories	Estimated Gallons	Estimated Tuns	<i>Bona Cervisia</i>	<i>Secunda Cervisia</i>
1282-3	1,860.00	874,155,360.00		177,834.60	740.98	486.25	254.73
1283-4	1,770.00	831,857,520.00		169,229.70	705.12	500.25	204.87
Average	1,815.00	853,006,440.00		173,532.15	723.05	493.25	229.80

Sources: DCN 1/1/6-7.

Thus, the amount of malt allocated for brewing gradually declined from c.1300 onwards and reached unprecedentedly low levels during the 1340s (about thirty per cent of the 1290 levels). This phenomenon will be discussed in the next section.

The proportions of ale drunk on a daily basis might appear a bit surprising to a modern drinker. It should be remembered, however, that ale produced at Norwich Priory was considerably weaker than modern beer. Its alcoholic strength must have been no more than two percent, and probably even less than that, compared with around five per

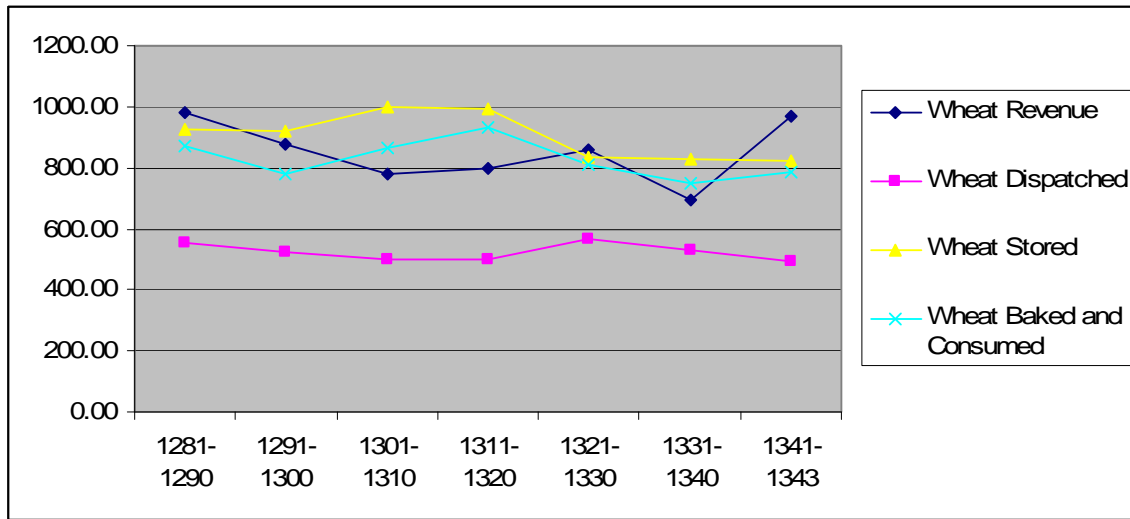
cent for modern beer. Hence, drinking eight pints of the weaker ale would not have intoxicated a late-medieval drinker as much as the same quantity of modern beer would. On the other hand, in *Piers Ploughman* a glutton collapses after drinking a gallon of ale.⁵⁴⁸ The historical validity of this allegoric description, however, lies outside the scope of the present work.

Relationships between Production, Dispatching, Storing and Consumption Levels

In the cases of both bread and ale, the level of annual consumption fluctuated from decade to decade, as we have seen above. From c. 1320, we witness a gradual decline in the levels of bread consumption, while the decline in malt consumption began some twenty years earlier, from c. 1300. Between 1341-3, the bread consumption amounted to some 84 per cent of the 1310s level, while the level of ale consumption was about 30 per cent lower than it was in the 1290s. This phenomenon requires an explanation. Does this decline have something to do with the extent and success of agrarian technique, namely annual seeding rates and harvest yields? In order to avoid confusion and get as clear picture as possible, it is necessary to establish a correlation between four variables: (raw) grain revenue in harvest and tithes combined; amount of grain / malt *sent* to the Priory from the manors; amount of grain / malt *stored* at the Priory granary; and amount of grain / malt converted into bread / ale and, consequently, consumed by the community (Figures 8.27 and 8.28).

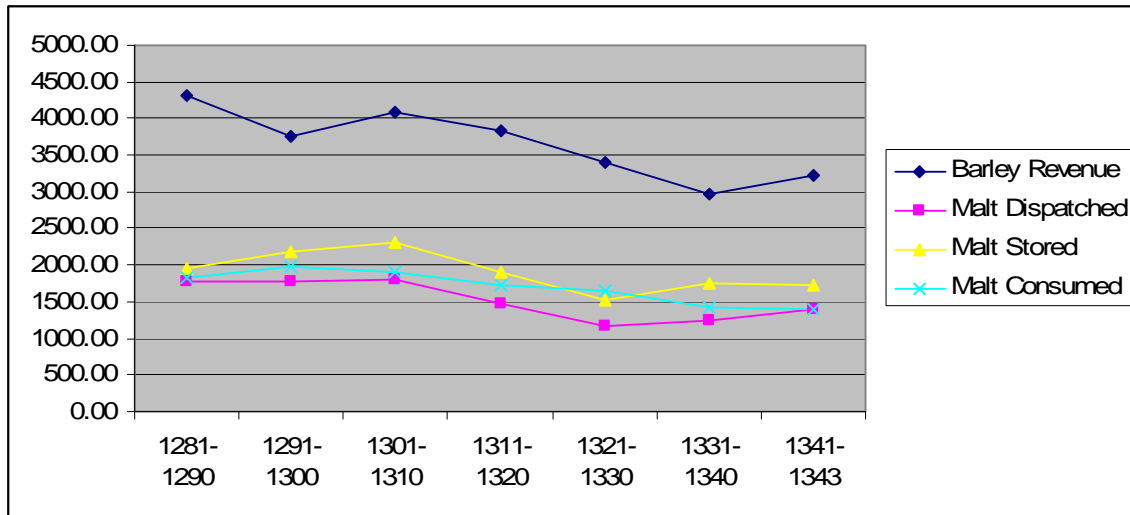
⁵⁴⁸ William Langland, *Piers Plowman*, A.V.C. Schmidt (ed.) (Oxford: Oxford University Press, 1992), pp. 53-54.

Figure 8.4. Relationships between Wheat Production, Dispatching, Storing and Consumption, 1281-1343 (in Quarters) (in Decennial Means)



Sources: Accounts Database; DCN 1/1/6-28, 30-37, 39-40.

Figure 8.5. Relationships between Barley Production, Malt Dispatching, Storing and Consumption, 1281-1343 (in Quarters) (in Decennial Means)



Sources: Accounts Database; DCN 1/1/6-28, 30-37, 39-40.

In both instances, there is a clear correlation between levels of grain production and dispatching. The pre-1310 period was a period of intensive seeding and harvesting, with

high seeding, yield and, consequently, harvest rates. The Great Famine of 1314-1317 certainly had an impact on the barley harvest: during the 1310s, the combined amount of barley reaped on the Priory manors was just 3,413 quarters (compared to 4,086 during the 1300s).⁵⁴⁹ The amount of harvested wheat and barley decreased further in the 1330s, when three manors, Hindringham, Hindolveston and Thornham were leased out. Hence, the amount of wheat and malt dispatched to Norwich decreased, too. Accordingly, the Priory authorities increased the level of purchases on local markets, apparently to ensure that sufficient amounts of grain were stored at the Great Granary.⁵⁵⁰

Having established a direct connection between the levels of production and dispatching, we must now look to see if there was any similar connection between the levels of dispatching and storing. Surprisingly, the two curves show opposite behaviour in case of wheat and similar oscillations in case of malt. In other words, the less wheat the Priory received, the more it relied on markets, to compensate for deficit and maintain sufficient supply of the grain. In the case of malt, however, there was a clear correlation between the levels of dispatching and storing levels, both declining in more or less the same pace. Finally, let us look at the relation between the storing and consumption levels. In both instances, the general trends were similar: the higher the amounts of stored grains were, the more quarters were converted into bread and ale. The gap between the two curves, which varies from decade to decade and represents the extent of annual (unused) surplus, is, perhaps, worth attention (Table 8.27):

⁵⁴⁹ See above, Chapter Four, Table 4.13.

⁵⁵⁰ See above, Chapter Seven, Table 7.30.

Table 8.27. Consumption-to-Storing Ratio of Wheat and Malt, 1281-1343 (in decennial means).

Decade	Wheat Stored	Consumed	Malt Stored	Consumed	Wheat Consumed:Stored	Malt Consumed:Stored
1281-1290	923.75	869.56	1,900.67	1,833.33	0.94	0.96
1291-1300	916.78	778.25	2,248.90	1,972.00	0.85	0.88
1301-1310	1,001.28	866.67	2,403.10	1,908.00	0.87	0.79
1311-1320	995.33	930.33	2,003.34	1,726.67	0.93	0.86
1321-1330	836.25	808.00	1,890.00	1,650.00	0.97	0.87
1331-1340	825.53	748.20	1,916.70	1,430.45	0.91	0.75
1341-1343	824.00	783.75	1,714.25	1,403.33	0.95	0.82
Average	903.27	826.39	2,010.99	1,703.40	0.92	0.85

Source: DCN 1/1/6-28, 30-37, 39-40.

Both wheat and malt show similar chronological behaviour: the consumption-to-storing ratio was at its highest in the 1290s (0.94 for wheat and 0.96 for barley), to fall in the 1300s (0.85 and 0.88 respectively). During the 1300s, the wheat ratio rose slightly (0.87), while that of malt fell (0.79). There was a pronounced rise during the troublesome decade of the 1310s (0.93 and 0.86, respectively). The following decade saw a rise in wheat ratio (0.97), while that of malt remained, more or less, the same (0.87). The fall came in the 1330s, with 0.91 for wheat and 0.75 for malt. The first years of the 1340s show a renewed rise (0.95 and 0.82).

It is unclear what stood behind these gaps between the storing and consumption levels, and it is possible that they reflect fluctuations in the Priory population: after all, the movement in wheat and malt sector was very similar (with the exception of the 1320s). It is equally puzzling why the Priory authorities preferred storing the surplus, rather than selling it. Is it possible that it reflects the fact that the Priory authorities were

aware of potential risk deriving from natural causes and saved the surplus for a rainy day?

Fuel Requirements for Bread and Ale

How much fuel did it take to produce the said (estimated) amounts of loaves and gallons? Unfortunately, the obedientiary accounts do not reveal how many faggots were used in baking and brewing. The most important burning material used at Norwich Priory for baking, brewing, cooking and heating purposes were faggots. Faggots were bundles of cut wood, rods and sticks tied together. It has been estimated that one quarter of firewood *c.* 1300 contained some 27.75 faggots.⁵⁵¹ There are occasional references to purchases of faggots and peat, which come mostly from the master of the cellar's and the almoner's accounts, as we have seen above. These references, however, are of little use, since they may have been used for cooking in the Priory kitchen, not baking and brewing. In order to establish annual fuel requirements of the bakery and brewery, we have to seek relevant references outside Norwich Cathedral. Contemporary cellarer's accounts from Westminster Abbey provide such information. According to a 1353-4 roll, it took 13.7 faggots to bake bread from one quarter of wheat and 10.5 faggots to brew 100 gallons of ale (namely, 0.105 faggots per gallon).⁵⁵² Using the Westminster figures as our

⁵⁵¹ James A. Galloway, Derek Keene and Margaret Murphy, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400', *Economic History Review* 49:3 (1996), p. 449.

⁵⁵² Galloway, James A., Keene Derek and Murphy, Margaret, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400', *Economic History Review* 49:3 (1996), pp. 469-470. The ratio of faggots to loaves is also mentioned in Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 59, notes 76 and 78.

guidelines, we might now attempt to estimate the required number of faggots to be supplied annually for baking and brewing (Table 8.28):

Table 8.28. Estimated Annual Fuel Requirements (for Baking and Brewing) of Norwich Cathedral Priory, 1281-1343 (in decennial means).

Decade	Wheat Quarters	Faggots	Ale Gallons	Faggots	Total Faggots	Faggots (in Quarters)
1281-1290	1,002.12	13,729.08	175,284.68	18,404.89	32,133.97	1,157.98
1291-1300	970.34	13,293.66	188,542.92	19,797.01	33,090.66	1,192.46
1301-1310	1,012.71	13,874.12	182,423.88	19,154.51	33,028.62	1,190.22
1311-1320	1,055.65	14,462.35	165,086.92	17,334.13	31,796.47	1,145.82
1321-1330	1,097.25	15,032.33	157,756.50	16,564.43	31,596.76	1,138.62
1331-1340	1,060.01	14,522.14	136,765.32	14,360.36	28,882.50	1,040.81
1341-1343	1,091.50	14,953.55	134,172.38	14,088.10	29,041.65	1,046.55
Average	1,041.37	14,266.74	162,861.80	17,100.49	31,367.23	1,130.35

Sources: DCN 1/1/6-28, 30-37, 39-40; Galloway, James A., Keene Derek and Murphy, Margaret, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400', *Economic History Review* 49:3 (1996), pp. 469-470.

On average, it would have required as many as 30,000 faggots annually to turn the grain into finalized products. These were considerably higher figures than the number of faggots purchased by the Priory, as specified in the almoner's and master of the cellar's rolls. As the latter reveal, the quantity of firewood purchased by the master of the cellar never exceeded 5,760 faggots.⁵⁵³ It should be noted, however, that no firewood was purchased before the Black Death and hence, we might conclude that the pre-1350 firewood came from outside the market. Various manorial accounts are furnished with details regarding their woods and sales of timber on local markets. The revenue from the

⁵⁵³ See above, p. 192.

sales went directly to the master of the cellar's department. Roughly speaking, there were seven main manors serving also as timber markets and fuel suppliers: Hindolveston (elms, beeches and willows); Thorpe (wood and bark); Plumstead (white poplars); Newton (alders); Taverham (alders); Gateley (beech) and Eaton (bark).⁵⁵⁴ Were these woods enough to supply the Priory with wood and fuel?

To produce about 31,367 faggots required for baking and brewing would have taken about 618 tons of wood, with one ton of wood producing around 50.79 faggots.⁵⁵⁵ Late thirteenth-century evidence suggests that one acre of coppiced underwood would produce two tons of wood (about 101.58 faggots), or more.⁵⁵⁶ In other words, it would have taken about 308.79 acres (=124.97 hectares) of coppiced underwood to meet the Priory requirements (Table 8.29):

Table 8.29. Estimated Amounts of Faggots, Woods (in Tons) and Coppiced Underwood Area Required for Annual Baking and Brewing at Norwich Cathedral Priory, 1281-1343 (in decennial means).

Decade	Faggots	Tons of Wood	Acres of Coppiced Underwood	Ha of Coppiced Underwood
1281-1290	32,133.97	632.68	316.34	128.02
1291-1300	33,090.66	651.52	325.76	131.83
1301-1310	33,028.62	650.30	325.15	131.59
1311-1320	31,796.47	626.04	313.02	126.68

⁵⁵⁴ H. Beevor, 'Address [to the Members of the Norfolk and Norwich Naturalists' Society]: Norfolk Woodlands, from the Evidence of Contemporary Chronicles', *Transactions of the Norfolk and Norwich Naturalists' Society* 11 (1919-20 and 1923-4), 487-508; H. W. Saunders, *An Introduction to the Obedientary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), p. 77. On ancient and medieval Norfolk woodland, consult also H. Beevor, 'Norfolk Woodlands from the Evidence of Contemporary Chronicles', *Quarterly Journal of Forestry* 19 (1925), 87-110; H.C. Darby, 'Domesday Woodland in East Anglia', *Antiquity* 8 (1934), 211-215; idem, *The Domesday Geography of Eastern England* (Cambridge: Cambridge University Press, 1952), pp. 124-129; David Percy Dymond, *The Norfolk Landscape* (London: Hodder and Stoughton, 1985); G. Barnes, *Woodlands in Norfolk: A Landscape History*, Unpublished PhD Thesis (Norwich: University of East Anglia, 2003).

⁵⁵⁵ Galloway, James A., Keene Derek and Murphy, Margaret, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400', *Economic History Review* 49:3 (1996), pp. 469-470.

⁵⁵⁶ Oliver Rackham, *Ancient Woodland: Its History, Vegetation and Uses in England* (Dalbeattie: Castlepoint Press, 2003), p. 140.

1321-1330	31,596.76	622.11	311.05	125.88
1331-1340	28,882.50	568.67	284.33	115.07
1341-1343	29,041.65	571.80	285.90	115.70
Average	31,367.23	617.59	308.79	124.97

Sources: DCN 1/1/6-28, 30-37, 39-40; Galloway, James A., Keene Derek and Murphy, Margaret, 'Fuelling the City: Production and Distribution of Firewood and Fuel in London's Region, 1290-1400', *Economic History Review* 49:3 (1996), pp. 469-470; Oliver Rackham, *Ancient Woodland: Its History, Vegetation and Uses in England* (Dalbeattie: Castlepoint Press, 2003), p. 142.

Norfolk was, as we have seen, one of the most densely populated and, conversely, one of the least wooded counties of late medieval England. According to the *Domesday Book*, its total woodland area comprised around 158,000 acres, in 1086.⁵⁵⁷ The total woodland area represented just over eight per cent of the total acreage (compared to 26 per cent in Derbyshire, 27 per cent in Cheshire, 32 per cent in Staffordshire and as much as 40 per cent in Worcestershire).⁵⁵⁸ Late medieval references to the woodland areas of the manors are fragmented and ambiguous, as far as their interpretation goes. It is unclear if the entries refer to the entire area of woodland, or just the portion of woodland that was allocated for coppicing on an annual basis.

Coppicing is a wood-management operation of cutting young tree stems to a lower level, leaving a tree as a stump. Shortly after, new shoots emerge from the stool and thus, the tree crops are regenerated. Coppicing cycles can vary from two to forty years. In late-medieval England, moderately exploited woodlands were commonly coppiced every seven years.⁵⁵⁹ Our sources do not specify the acreage of the Priory's

⁵⁵⁷ G. Barnes, *Woodlands in Norfolk: A Landscape History*, Unpublished PhD Thesis (Norwich: University of East Anglia, 2003), p. 111. Barnes contends that this must have been an underestimated figure.

⁵⁵⁸ Oliver Rackham, *Ancient Woodland: Its History, Vegetation and Uses in England* (Dalbeattie: Castlepoint Press, 2003), p. 114.

⁵⁵⁹ On coppicing of medieval English woodlands, consult Oliver Rackham, *Ancient Woodland: Its History, Vegetation and Uses in England* (Dalbeattie: Castlepoint Press, 2003), p. 141; G. Barnes, *Woodlands in*

woodland, with the exception of two manors: Hindolveston and Thorpe. Hindolveston woodland had 298 acres,⁵⁶⁰ while Thorpe contained 175 acres 1 rod and thirteen perches apart from ‘many acres within the close of St. Leonard’s Priory’ (dependant of the Cathedral Priory).⁵⁶¹ The total number of acres within Thorpe wood may have been around 600, or slightly less.⁵⁶² The remaining information regarding the supplying manors comes from the *Domesday Book*. It appears that in 1086 Taverham, Plumstead and Eaton had quite small woods (thirty-four, fourteen and six acres, respectively), while the Newton woodland is not mentioned at all.⁵⁶³ It is unclear if the size of the woodland was considerably smaller c. 1300, given their already small size in 1086, compared to the woodland of Hindolveston and Thorpe. The total estimated acreage of the Priory’s woodland and the number of faggots it was capable of producing is represented on Table 8.30:

Table 8.30. Estimated Woodland Acreages of the Priory and the Amount of Faggots It Was Capable of Producing (c. 1300)

Manor	Pigs	Wood Acreage	Faggots (in tons)	Faggots (in number)
Hindolveston	300.00	298.00	596.00	30,270.84
Thorpe	600.00	600.00	1,200.00	60,948.00
Plumstead	6.00	6.00	12.00	609.48
Newton	unknown	Unknown	unknown	Unknown

Norfolk: A Landscape History, Unpublished PhD Thesis (Norwich: University of East Anglia, 2003), pp. 151-166; Bruce M. S. Campbell and Ken Bartley, *England on the Eve of the Black Death. An Atlas of Lay Lordship and Wealth, 1300-1349* (Manchester: Manchester University Press, 2006), p. 152.

⁵⁶⁰ The cultivation of Hindolveston woodland is mentioned in various bailiff’s accounts of this manor. Its structure, cultivations and profits from are discussed and analyzed in Oliver Rackham, *Ancient Woodland: Its History, Vegetation and Uses in England* (Dalbeattie: Castlepoint Press, 2003), pp. 157-159 and G. Barnes, *Woodlands in Norfolk: A Landscape History*, Unpublished PhD Thesis (Norwich: University of East Anglia, 2003), pp. 163-164.

⁵⁶¹ H. W. Saunders, *An Introduction to the Obedientary and Manor Rolls of Norwich Cathedral Priory* (Norwich: Jarrold and Sons Ltd., 1930), p. 7. The cultivation of Thorpe wood is discussed in Oliver Rackham, *Trees and Woodland in the British Landscape* (London: Dent, 1990), pp. 144-145.

⁵⁶² There was area for 600 pigs in 1086, according to the *Domesday Book*. Allowing a conservative estimate of one pig per acre, we arrive at about 600 acres. For the equation of one pig to 1-1.5 acres, consult Oliver Rackham, *Ancient Woodland: Its History, Vegetation and Uses in England* (Dalbeattie: Castlepoint Press, 2003), pp. 119-120.

⁵⁶³ (Little) *Domesday Book*, fols. 114v, 147v, 196r, 201v and 229r (Taverham); fols. 123r and 199r (Plustead); fol. 135r (Eaton).

Taverham	34.00	34.00	68.00	3,453.72
Gateley	80.00	80.00	160.00	8,126.40
Eaton	6.00	6.00	12.00	609.48
Total	1,026.00	1,024.00	2,048.00	104,017.92

As the table reveals, the producing capacity of the manorial woodland exceeded the fuel requirements of the Priory by at least 332 per cent. As we have seen, it would have taken, on average, some 308.79 acres, or 31,367 faggots to produce the annual supply of bread and ale. Keeping this fact in mind, we might conclude that most (if not all) of the faggot supply came from the manors. The remaining profit of the woodland was either sold on the market, or retained by the tenants for domestic heating and cooking. This is, however, a different subject, which cannot be treated within the scope of the present work.

In addition, the tenants of Eaton were obliged to reap the heather of Gyddyngeheyth, used for fuel, and to cart 21 cartloads of heather to Norwich.⁵⁶⁴ This would, certainly, have increased the total amount of fuel received and burnt by the Priory. It is unclear, however, how much heather these 21 cartloads carried, as much as it is unclear how much this heather would have contributed to baking and brewing.

Bread and Ale Consumption in a Wider Perspective

Cereal products, namely bread and ale, constituted only a part of the daily monastic diet. Despite the omnipresent threat of the eternal damnation that Gluttony could earn a sinner, and contrary to the mandate of St. Benedict's *Rule*, calling for

⁵⁶⁴ *Benedicti Regula, Editio Altera Emendata*, Rudolph Hanslik (ed.), Corpus Scriptorum Ecclesiasticorum Latinorum 75 (Vienne: Hoelder-Pichler-Tempsky, 1977), Cap. 40.

abstention from excessive eating, Norwich monks consumed food of heroic proportions. The overall calorific intake exceeded by far normal requirements of an adult male, let alone the non-working one. Our main information on non-cereal food consumed by the monks comes from larder's accounts, sometimes called kitchen accounts (*compoti de coquina*) incorporated into cellarer's accounts. Unfortunately, there are only three extant larder's accounts that predate 1343, the year of the last granary account. Furthermore, the larder's accounts specify only the amount of purchased food, and they omit hens and eggs rendered by the manors. The biggest challenge, however, is in converting carcasses of animals and lasts of fishes into numbers and their calorific equivalent. Skeletal analyses of medieval animal remains suggest that medieval domestic animals and fishes differed in size from their modern descendants.⁵⁶⁵ Using Harvey's figures as our guideline, we may attempt to undertake this difficult task.

Let us begin with meat. Between 1327 and 1330, the Priory purchased, on average, 122 carcasses of veal and 141.33 carcasses of mutton.⁵⁶⁶ Allowing 37.6 lb per edible meat per carcass of veal and 24.18 lb per edible part per carcass of mutton, we arrive at approximately 10,209,180 calories a year.⁵⁶⁷ If the entire amount of veal and mutton was offered to the brethren, then it appears that a monk received, on average, an equivalent of some 467.13 kilocalories derived from beef and mutton, on daily basis. To

⁵⁶⁵ M. L. Ryder, 'The Animal Remains found at Kirkstall Abbey,' *Agricultural History Review* 7 (1959), 1-5; idem, 'Livestock Remains from Four Medieval Sites in Yorkshire,' *Agricultural History Review* 9 (1961), 105-110; idem, 'The Animal Remains from Petergate, York, 1957-1958,' *Yorkshire Archaeological Journal* 42:4 (1971), 418-428; Michael Prestwich, 'Victualling Estimates for English Garrisons in Scotland during the Early Fourteenth Century,' *English Historical Review* 82 (1967), 536-543; Ian Kershaw, *Bolton Priory. The Economy of a Northern Monastery, 1286-1325* (Oxford: Oxford University Press), pp. 157-158; F. Stoff, *Ravitaillement et alimentation en Provence aux XIVe et XVe siècles* (Paris, 1970), pp. 186-189 and 301-315; A. J. S. Gibson, 'The Size and Weight of Cattle and Sheep in Early Modern Scotland,' *Agricultural History Review* 36 (1988), 162-171; Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 226-230.

⁵⁶⁶ DCN 1/2/14a-16.

⁵⁶⁷ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 228.

these we should add small numbers of poultry, hens and eggs, rendered by the estates. On average, the manors sent 190 hens and 1,080 eggs, which would have added approximately 20 and 3.71 kilocalories, on a daily basis.⁵⁶⁸

Fish, mostly herring, was yet another important staple of the monks. Between 1327 and 1330, the Priory acquired, on average, over 16.80 lasts of herring. With each last containing 10,000 fishes,⁵⁶⁹ the total number of herrings may have been around 168,800. Archaeological findings show that an average size of medieval fish was larger than that of the modern one,⁵⁷⁰ and that the edible part of a herring weighed about 0.28 lb per fish.⁵⁷¹ This would render about 50 million kilocalories a year and hence, every monk could have potentially received an equivalent of about 2,300 kilocalories deriving from about 7.75 fishes, on a daily basis. If we rely on our sources and allow one loaf of monastic bread, yielding about 2,340 kilocalories and one gallon of monastic ale, rendering about 1,280 kilocalories, then we can add another 3,620 kilocalories. These estimations, as crude as they are, reveal that, on average, a Norwich monk was offered daily food plates worth perhaps as much as *c.* 6,500 kilocalories. Clearly, the amount of food and calories consumed varied from period to period and from day to day. The monks were forbidden to eat meat during the Advent (two weeks before Christmas) and

⁵⁶⁸ Calculated on basis of DCN 60/18/9-41 and DCN 60/20/7-30.

⁵⁶⁹ 31st Edward I (1302), printed in *The Statutes of the Realm: Printed by Command of His Majesty King George the Third, in Pursuance of an Address of the House of Commons of Great Britain*, 11 Vols., (London: Record Commission, 1810-1828), Vol. I.

⁵⁷⁰ A. Wheeler, 'Fish Bone,' in *Excavations in King's Lynn, 1963-1970*, H. Clarke and A. Carter (eds.) (Society for Medieval Archaeology, Monograph Series, vii, 1977), 403-408; A. Wheeler and A. Jones, 'Fish Remains,' in *Excavations on Fuller's Hill, Great Yarmouth, East Anglian Archaeology*, Report no. 2: Norfolk, A. Rogerson (ed.) (Norfolk Archaeological Unit, 1976), 208-226. On late medieval fishes and fishing, consult Richard Hoffmann, 'Environmental change and the culture of common carp in medieval Europe,' *Guelph Ichthyology Reviews* 3 (1995), 57-85; idem, 'Economic Development and Aquatic Ecosystems in Medieval Europe,' *American Historical Review* 101 (1996), 631-669, idem, 'Frontier Foods for Late Medieval Consumers: Culture, Economy, Ecology,' *Environment and History* 7 (2001), 131-167.

⁵⁷¹ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), p. 226.

the ‘Long Lent’ periods (seven weeks before Easter Sunday). In addition, they were required to ‘fast’ three days a week (Wednesday, Friday and Saturday), i.e., to live on fish and cereal products only.⁵⁷² Hence, they could eat meat only 118.25 days a year, outside the Advent, Lent and the weekly fasting periods. Table 8.31 summarizes the structure of daily monastic diet, over the three periods:

Table 8.31. Estimated Calorific Values Allowed to an Average Norwich Monk on Daily Basis, 1327-1330.

Article	Advent	Lent	Regular	Advent	Lent	Regular
Bread	2,430.00	2,430.00	2,430.00	40.43%	40.46%	36.50%
Ale	1,280.00	1,280.00	1,280.00	21.30%	21.31%	19.23%
Fish	2,296.54	2,296.54	2,296.54	38.21%	38.23%	34.49%
Meat/poultry	0.00	0.00	646.99	0.00%	0.00%	9.72%
Eggs	4.19	0.00	4.19	0.07%	0.00%	0.06%
Total	6,010.73	6,006.54	6,657.72	100.00%	100.00%	100.00%

Sources: DCN 1/2/14a-16

These surprisingly large proportions seem to have been a norm for a medieval monastic community in late medieval England. Diet accounts from late fifteenth century Westminster Abbey show similar trends: bread accounted for 41.50 (Advent), 45.00 (Lent) and 35.00 per cent (on a regular day); ale and wine constituted 30.00, 32.50 and 25.00 per cent, respectively; fish represented 17.00, 18.00 and 6.00 per cent; meat, when allowed, accounted for 17.00 per cent; and finally, eggs contributed around five per cent to the energy value of the diet of the monks. Outside Advent and Lent, an average

⁵⁷² Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 38-41.

Westminster monk received an equivalent of as much as *c.* 6,210 kilocalories, while on a day when flesh-meat was allowed, his daily allowance was as high as *c.* 7,375 kilocalories. During Lent, the average value was around *c.* 4,870 a day.⁵⁷³ The main difference between Westminster and Norwich, it seems, was not as much in proportions, as in components. While the latter relied heavily on fish, which contributed around 36 per cent to the energy value of the monks, the former consumed fish in much smaller quantities and replaced it, to a great degree, with meat. From that point, the Norwich brethren observed St. Benedict's commandment to abstain from meat more closely than their fellow-monks from Westminster.

So far we have discussed daily allowances of food. But how much of it did the Norwich monks actually consume? 6,500 kilocalories is certainly an astonishing figure, which by far exceeds a recommended calorific intake for male consumers: around 3,000 kilocalories a day (this given the fact that a consumer is neither performing an excessive physical labour, nor suffering from disabling diseases). Consuming such high amounts by the monks, leading a passive and contemplative way of life, would, in fact, cause not only obesity, but also some lethal symptoms, such as adipose. In other words, the daily intake of over 6,500 kilocalories could have led, most likely, to very high mortality rates of the brethren.

But did they really consume the entire amount of their daily food placed before them? There was a widespread late-medieval monastic practice to pass leftovers to servants and paupers. This is well illustrated in late fifteenth-century evidence from Westminster Abbey, that Barbara Harvey has studied. The Westminster sources indicate

⁵⁷³ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 34-71.

that a monk would consume only about 55 to 60 per cent of his allowance. The remainder was left to the servants, workers and paupers.⁵⁷⁴ These estimations left a Westminster monk with around 3,730 kilocalories, on an average day. Subtracting forty per cent from the allowance of *c.* 6,500 kilocalories, we arrive at some 3,900 kilocalories, which accords with Harvey's estimation. This energy intake, though not as quite deadly as 6,500 kilocalories, is still large for passive male consumers, since it exceeds the suggested 3,000 kilocalories recommended for active men. Recent archaeopathological studies suggests that medieval English monks certainly tended towards obesity. Philippa Patrick's work suggests that omnipresent signs of the Osteoarthritis detected on skeletons of medieval London monks reveal that the latter could well have consumed over 4,500 kilocalories on regular, non-fasting days.⁵⁷⁵ The archaeological data accords well with the written sources from both Westminster and Norwich. A more profound, full-scale study on monastic obesity is yet to be undertaken.

Conclusions

Cereal products, bread and ale, were central components in the daily diet of the monks of Norwich. They contributed, on average, between 55 and 60 per cent, depending on period, to total calorific intake of the monastic community. As far as bread is concerned, the Priory baked three kinds of loaves, intended for different groups living

⁵⁷⁴ Ibid, pp. 67-70.

⁵⁷⁵ Philippa Patrick, 'Creaking in the Cloisters: Observations on Prevalence and Distribution of Osteoarthritis in Monks from Medieval London,' in *Centre, Region, Periphery. Medieval Europe Basel 2002*, Guido Helmig, Barbara Scholkmann and Matthias Untermann (eds.) (Basel: Folio Verlag Dr. G. Wesselkamp/ Archäologische Bodenforschung Basel-Stadt, 2002), pp. 89-93; eadem, 'An Archaeology of Overindulgence', *Archaeological Review from Cambridge* 20:2 (2005), 98-117; eadem, 'Greed, Gluttony and Intemperance'? *Testing the Stereotype of the 'Obese Medieval Monk'* (PhD Dissertation, University College, London, 2005).

within the Cathedral precinct. The loaves also differed in their quality, appearance, calorific value and weight. Similarly, there were two varieties of ale, one intended for the brethren and valuable guests and the other one to be distributed among the workers and *famuli*. Using medieval evidence and modern guides to composition of foods, I have attempted to calculate approximate numbers of loaves and gallons produced at the Priory. The calculations, as gross as they are, indicate that the amount of cereal products, baked and brewed, exceeded normal requirements of the Cathedral community. In other words, supply exceeded demand. Yet, there is no evidence of large-scale sales of the surplus. Instead, there are many hints about monastic obesity. Joining bread and ale accounts with contemporary larder's accounts, we arrive at astonishing figures, as far as calorific values are concerned. It is possible that an average Norwich monk could have consumed as much as 4,000 kilocalories, on an average day, contrary both to medieval concept of Gluttony (*gula*) as (sometimes the major) deadly sin and the *Rule* of St. Benedict. The Norwich brethren, however, were certainly not *avites rarae*, as complementary evidence from Westminster suggests. Perhaps this reminds one of the most famous obese friar of the Middle Ages: Thomas Aquinas (1225-1274). The latter was nicknamed *bos mutus* (mute ox) and devoted considerable attention to the sin of Gluttony in his theological treatises.⁵⁷⁶

⁵⁷⁶ For instance, *Summa Theologiae* II, Quaestio CXLVIII, articuli I-VI.

Chapter 9. Economy and Charity: Grain Alms.

Apart from catering food products for their own community, Norwich Priory authorities distributed limited amounts of grain to non-resident recipients, in form of annual alms. This was a common practice in western monasticism throughout all the Middle Ages.⁵⁷⁷ As far as Norwich Cathedral Priory is concerned, we can speak about three distinctive groups of alm recipients. The first and the largest group were the town's paupers, receiving grain on the anniversary of Herbert Losinga and Maundy Thursday. The urban hermits and anchorites secluded in their cells constituted the second group. The third group contained prisoners incarcerated in the Castle prison, located within a walking distance from the Cathedral. Alms were profitable for both parties: on the one hand, they provided the needy with food, while on the other hand, they helped the monks to fulfill the Benedictine ideal of charity.

Hermits and Anchorites

It is impossible to establish the hermitic population of Norwich town between 1280 and 1343. The information, which derives from non-monastic sources, is scarce and problematic. First, some hermits appear only in a single document and as a result, we are unable to determine the chronology of their lives in the town. In other words, if a hermit appears in a document from 1300, we cannot be certain that he was still alive, or practiced eremitism, say, five years later. Second, we are ignorant about the total number of hermits and anchorites. For instance, if a certain source mentions four hermits at the

⁵⁷⁷ On Westminster corrodies and alms, consult Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 179-209 and 238-251.

same time, it does not mean that there were *only* four hermits present at Norwich in the given year. The surviving evidence, imperfect as it might be, suggests that there was *at least* one anchorite in 1244, four in 1247 and 1250, two or three in 1287-8, two in 1304-5 and 1312-3.⁵⁷⁸ A will from 1313 mentions four recluses.⁵⁷⁹ The last non-Cathedral document to mention anchorites was a will of Catherine, an anchorite of St. Margaret Newbridge, dated on 22 February 1315. Catherine left her Norwich messuage to be sold and ordered its revenue to be distributed 'for her soul' (*pro mea anima*), presumably among the poor.⁵⁸⁰ There are also a number of undated deeds and wills from the thirteenth-century mentioning recluses of Norwich.⁵⁸¹ Between 1315 and 1393/4, the year when Julian of Norwich first appears in the records,⁵⁸² no document mentions a single recluse living in the town. The hermits are also attested in our bread accounts recorded on the dorse of the cellarer's rolls. Each year they recorded a certain number of loaves of *panis militum* distributed among the 'anchorites / anchors / recluses within the town' (*anachoritis / reclusis in villa*). Interestingly enough, the recluses disappear from the bread accounts around roughly the same time that they disappeared from other contemporary sources. The last roll to mention the distribution of bread among them was

⁵⁷⁸ *A Short Calendar of the Deeds Relating to Norwich Enrolled in the Court Rolls of the City, 1285-1306*, Walter Rye (ed.) (Norwich, 1903), pp. 100 and 103; Rotha Mary Clay, *The Hermits and Anchorites of England* (London: Methuen and Co., 1914), pp. 232-237; Norman P. Tanner, *The Church in Late Medieval Norwich* (Toronto: Pontifical Institute of Medieval Studies, 1984), p. 58; Roberta Gilchrist and Marilyn Oliva, *Religious Women in Medieval East Anglia* (Norwich: University of East Anglia Press, 1993), pp. 97-99.

⁵⁷⁹ British Library, *Add. Ch.* 15527

⁵⁸⁰ NRO, *NCR* Case 1/7 m. 9

⁵⁸¹ NRO, *PHI* 249/3, 577x3; Rotha Mary Clay, *The Hermits and Anchorites of England* (London: Methuen and Co., 1914), p. 235.

⁵⁸² NRO, *Norwich Consistory Court, Register Harsyk*, fol. 194 v. The document in question is a will of Roger Reed, rector of St. Michael's Coslany in Norwich, dated 20 March 1393 or 1394. The will is mentioned in *A Book of Showings to the anchoress Julian of Norwich*, Edmund Colledge and James Walsh (eds.) (Toronto: Pontifical Institute of Mediaeval Studies, 1978), p. 33 and in *The Writings of Julian of Norwich*, Nicholas Watson and Jacqueline Jenkins (eds.) (University Park: The Pennsylvania State University Press, 2006), p. 431.

that of 1315-6. From the next surviving roll (1318-9) onwards, no anchorites are mentioned in the accounts. This might suggest their temporary disappearance from the town: at least until *c.* 1394. The reasons for their disappearance are unclear and perhaps they have something to do with the severe famine of 1314-1317, which may have weakened the townsfolk badly.

Some rolls also specify that the recluses used to receive their loaves as custom (*de constuetudine*).⁵⁸³ From this we might conclude that the Priory may have had a long tradition of giving bread to the anchorites and hermits. Before *c.* 1291-2, the customary amount of grain turned into the loaves for recluses was two quarters. From *c.* 1294-5 onwards, the Priory allocated two and a half quarters of wheat grain to be turned into *panis militum* for the anchorites and hermits. Unfortunately, the accounts do not specify whether the loaves were given once a year on specific day, or throughout the year. Two quarters and two and half quarters of grain would have produced around 383 and 479 loaves of *panis militum*, respectively, if we assume that a quarter of flour, at the extraction rates of 85 per cent, would have made around 225 loaves.⁵⁸⁴ Keeping in mind the fact that the recluses used to consume many fewer calories than their non-hermitic counterparts, we might speculate that these amounts of loaves could have sustained two hermits throughout the entire year. After all, the hermits lived on vegetarian foods, chiefly cereal products, vegetables, fruits and milk. Some recluses had only bread and water on certain days. Normally, they took only one meal day, around the noon outside Lent and not until Vespers (six o'clock PM).⁵⁸⁵ 479 loaves would render around 3,196

⁵⁸³ DCN 1/1/6-8.

⁵⁸⁴ For conversion of raw grain into loaves, see above, Chapter 8.

⁵⁸⁵ Rotha Mary Clay, *The Hermits and Anchorites of England* (London: Methuen and Co., 1914), pp. 101-105

calories on daily basis and it is rather unlikely that a frequently fasting person would have consumed this calorific amount. On the other hand, 1,598 calories a day, that is half a loaf per day, would not have been extravagant.

Grain alms given to the hermits by monastic authorities seem to have been a widespread practice in late medieval England.⁵⁸⁶ For instance, Westminster Abbey established the perpetual corrody (=monastic allowance) of bread, ale, mead and wine for three anchorites of Kilburn, somewhere between 1127 and 1134.⁵⁸⁷ Around 1235, a similar corrody was established at St. Alban's Abbey, to feed a local anchorite.⁵⁸⁸ Towards the end of Henry III's reign, the authorities of Blyth Priory granted annual liveries (*liberations*) of one conventual loaf, gallon of conventual wine and some food from kitchen to be granted on daily basis to Joanna the anchoress.⁵⁸⁹ Sometime before 1285 the livery of two loaves of white bread (*liberation albi panis*) and two flagons (*juste*) of ale was granted to recluses of Worcester, presumably two in number.⁵⁹⁰

Prisoners in the Castle Jail

Distributing bread among the incarcerated in the castle prison was yet another aspect of 'food charity' practised by the Priory authorities. Before looking at actual numbers of loaves distributed each year, we have to say a few words about the penal

⁵⁸⁶ Ann K. Warren, *Anchorites and Their Patrons in Medieval England* (Berkeley: University of California Press, 1985), pp. 45-50.

⁵⁸⁷ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 239-240.

⁵⁸⁸ *Gesta Abbatum Monasterii Sancti Albani*, Henry Thomas Riley (ed.), Rolls Series 28:4, Vol. 1 (London, 1867), p. 305.

⁵⁸⁹ *The Cartulary of Blyth Priory*, R. T. Timson (ed.) (London: Her Majesty's Stationary Office, 1973), p. 508.

⁵⁹⁰ *Registrum Prioratus Beate Marie Wigorniensis*, William Hale Hale (ed.) (London, 1865), pp. 120b and 124b.

system of late medieval England. Four main characteristics distinguish late-medieval prisons from their modern counterparts in the western world. First, the prisons were exclusively an urban institution. Second, each major town had at least three kinds of prisons: the castle prison, administered by the king's justices according to the common law; the town prison, ran by semi-autonomous town authorities; and the bishop's prison, intended for the clergy. Third, prison deliveries occurred several times a year. A statute of 1299 established the practice of holding delivery at least once a year, but no more than three times.⁵⁹¹ In 1330, another statute was issued commanding at least three deliveries a year.⁵⁹² In other words, circuit justices travelled through different counties, visiting prisons and trying felons incarcerated there. Finally, unlike modern prisons, medieval prisons did not form an institution for long-term seclusion and isolation. As a rule, felons would spend no more than a year in a prison, before either indictment or acquittal would be pronounced by the jury.⁵⁹³

⁵⁹¹ *The Statutes of the Realm: Printed by Command of His Majesty King George the Third, in Pursuance of an Address of the House of Commons of Great Britain*, 11 Vols., (London: Record Commission, 1810-1828), Vol. I, pp. 129-130.

⁵⁹² *The Statutes of the Realm: Printed by Command of His Majesty King George the Third, in Pursuance of an Address of the House of Commons of Great Britain*, 11 Vols., (London: Record Commission, 1810-1828), Vol. I, p. 261.

⁵⁹³ On crime, jail delivery, imprisonment and penal system of late medieval England, consult M. Gollancz, *The System of Gaol delivery as Illustrated in the Extant Gaol Delivery Rolls of the Fifteenth Century*, Unpublished MA Dissertation (London University, 1936); Ralph B. Pugh, 'The King's Prisons before 1250,' *Transactions of the Royal Historical Society* 5th Series, 5 (1955), 1-22; idem, *Imprisonment in Medieval England* (Cambridge: Cambridge University Press, 1968); idem, 'Some Reflections of a Medieval Criminologist,' *Proceedings of the British Academy* 59 (for 1973) (1975), 83-104; H. M. Walton, 'England's Medieval Prisons,' *Journal of the Society of Archivists* 3:10 (1969), 583-584; B. H. Westman [Hanawalt], *A Study of Crime in Norfolk, Yorkshire and Northamptonshire 1300-1348*, Unpublished Ph. D. Dissertation, University of Michigan (Ann Arbor: University of Michigan, 1970); Barbara A. Hanawalt, 'Economic Influences on the Pattern of Crime in England, 1300-1348,' *American Journal of Legal History* 18:4 (1974), 281-297; eadem, 'The Female Felon in Fourteenth-Century England,' *Viator* 5 (1974), 253-268; eadem, 'The Peasant Family and Crime in Fourteenth-Century England,' *Journal of British Studies* 13 (1974), 1-18; eadem, *Crime and Conflict in English Communities, 1300-1348* (Cambridge Massachusetts: Harvard University Press, 1979); John Bellamy, *Crime and Public Order in England in the Later Middle Ages* (London: Routledge and Kegan Paul, 1978); Ted Robert Gurr, 'Historical Trends in Violent Crime: A Critical Review of the Evidence,' *Crime and Justice. An Annual Review of Research* 3 (1981), 295-353; Richard W. Ireland, 'Theory and Practice within the Medieval English Prison,' *American Journal of Legal*

The amount of grain allocated to be converted into *panis militum* for the prisoners varied from year to year. For instance, the roll of 1298-9 allocates only three quarters, while that of 1315-6 indicates that as much as 33.25 quarters were turned into bread for the incarcerated.⁵⁹⁴ There were also years when no bread was given to the prisoners at all.⁵⁹⁵ These, however, may have been rare instances and the general rule appears to be that the brethren took care of the felons awaiting their trial. On average, the Priory allocated eight quarters of wheat (=around 1,533 loaves) in the 1280s; 6.25 quarters (=around 1,197 loaves) in the 1290s; 5.81 quarters (=around 1,114 loaves) in the 1300s; as much as 24.79 quarters (=around 4,750 loaves) in the 1310s; 10.63 quarters (=around 2,036 loaves) in the 1320s; 10.71 quarters (=around 2,052 loaves) in the 1330s and 8.56 quarters (=around 1,640 loaves) between 1341 and 1343 (Table 9.1). Generally speaking, with the exception of the 1310s, the prisoners' bread amounted to between one and two per cent of total *panis militum* baked at the Priory bakery.

History 31:1 (1987), 56-67; Andrew Saunders, 'Administrative Buildings and Prisons in the Earldom of Grainwall,' in *Warriors and Churchmen in the High Middle Ages: Essays Presented to Karl Leyser*, Timothy Reuter (ed.) (London: Hambledon, 1992), 179-194; Daniel Klerman, *Private Prosecution of Crime in Thirteenth-Century England*, Unpublished PhD Dissertation (University of Chicago, 1998); idem, *Settlement and Decline of Private-Prosecution in Thirteenth-Century England*, Independent Institute Working Paper #19 (Oakland, California, 2000); idem, 'Settlement and Decline of Private-Prosecution in Thirteenth-Century England,' *Law and History Review* 19:1 (2001), 1-66; Eisner, Manuel, 'Long-Term Historical Trends in Violent Crime', *Crime and Justice. A Review of Research* 30 (2003), 83-242; Anthony Musson, 'A Reappraisal of the 'Four Knights' System,' in *English Government in the Thirteenth-Century*, Adrian Jobson (ed.) (Woodbridge: Boydell and Brewer, 2004), pp.97-110. On internal conditions of prisons and prison life (in *trecento* Italy), see Guy Geltner, *Medieval Prisons: Marginality at the City Center, 1250-1400*, Unpublished PhD Dissertation (Princeton University, 2006); idem, 'Medieval Prisons: Between Myth and Reality, Hell and Purgatory,' *History Compass* 4:2 (2006), 261-274.

⁵⁹⁴ DCN 1/1/14 and 1/1/25.

⁵⁹⁵ DCN 1/1/12 (1294-5) and 1/1/19 (1308-9).

Table 9.1. Amount of Grain Allocated to the Distribution of Panis Militum among the Prison Prisoners, 1281-1343.

Decade	Quarters of Wheat	Estimated Amount of Loaves	As a Percentage of All <i>Panis militum</i>
1281-1290	8.00	1,532.64	1.68%
1291-1300	6.25	1,197.38	1.34%
1301-1310	5.81	1,113.56	1.27%
1311-1320	24.79	4,749.59	4.52%
1321-1330	10.63	2,035.54	1.84%
1331-1340	10.71	2,052.30	1.85%
1341-1343	8.56	1,640.40	1.42%
Average	10.68	2,045.91	2.02%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Were these amounts enough to feed the felons? In order to answer this question, we have to juxtapose the quantity of bread to the number of inmates held at the castle prison. Here I am going to examine closely the period between 1308 and 1316 to determine numbers of prisoners. Our information regarding the number of the prisoners and their penal conditions derive from two sources: jail delivery rolls⁵⁹⁶ and the king's rolls, close, patent and fine, commissioning to determine cases.⁵⁹⁷ Determining the number of the prison

⁵⁹⁶ Norfolk Jail Delivery Rolls are printed in *Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316*, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976) (the edition of *National Archives*, (=NA) JUST 3/48). Other relevant Norfolk Delivery Rolls are: NA, JUST 3/47/1 (1294-5), JUST 3/47/2 (1295), JUST 3/47/3 (1299-1302), JUST 3/49/1 (1313, 1316-1324), JUST 3/49/2 (1332-4), JUST 3/49/3 (1333), JUST 3/50/1 (1332-3), JUST 3/50/2 (1335-39).

⁵⁹⁷ The relevant commissions regarding Norwich Castle Prison appear in the **fine rolls**: *Calendar of the Fine Rolls* (=CFR) Vol. I, Edward I, AD 1272-1307 (London: HMSO, 1911), pp. 116, 157, 165, 264, 326 and 501; CFR Vol. II, Edward II, AD 1307-1319 (London: HMSO, 1912), pp. 141 and 259; in the **close rolls**: *Calendar of the Close Rolls* (=CCR), Edward I, Vol. II, AD 1279-1288 (London:HMSO, 1902), pp. 73, 151, 215, 311, 323, 334, 446 and 509; CCR, Edward I, Vol. III, AD 1288-1296 (London:HMSO, 1904), pp. 12, 17, 70, 75, 174, 222, 373, and 414; CCR, Edward I, Vol. IV, AD 1296-1302 (London:HMSO, 1906), pp. 458, 523, 533, 548; CCR, Edward I, Vol. IV, AD 1302-1307 (London:HMSO, 1908), pp.24, 49, 57, 117, 136, 148, 151, 163, 187 and 385; CCR, Edward II, Vol. I, AD 1307-1313 (London:HMSO, 1892), pp. 190, 191, 208 and 510; CCR, Edward II, Vol. II, AD 1313-1318 (London:HMSO, 1893), pp. 34, 35, 55, 251, 284, 555 and 556; CCR, Edward II, Vol. III, AD 1318-1323 (London:HMSO, 1895), pp. 6, 224, 386 and 388; CCR, Edward II, Vol. IV, AD 1323-1327 (London:HMSO, 1898), p. 114; CCR, Edward III, Vol. I, AD 1327-1330 (London:HMSO, 1896), pp. 11, 282, 299, 300, 455 and 456; CCR, Edward III, Vol. II, AD 1330-1333 (London:HMSO, 1898), pp. 106, 313 and 375; CCR, Edward III, Vol. III, AD 1333-1337 (London:HMSO, 1898), pp. 2, 26, 37, 62 and 390; CCR, Edward III, Vol. V, AD 1339-1341 (London:HMSO, 1901), pp. 355 and 369; and in the **patent rolls**: *Calendar of the Patent Rolls* (=CPR),

inmates is rather a problematic task. The jail delivery rolls tell us about the amount of prisoners held in the castle only at the time of the circuit justices' visits. The rolls indicate that there were 'high' and 'low' incarceration seasons. For example, there was only one inmate on 21 January 1314; while during the delivery on 7 June 1316 there were as many as 189 prisoners incarcerated in the prison. The contrast between seasons is illustrated on Table 9.2 showing the number of felons kept at Norwich Castle prison, during the justices' visits. As we have seen above, the latter made several deliveries each year, three as a rule, in order to try the prisoners, either for indictment or acquittal. After each delivery, the castle prison was 'purged', partially or completely, of felons. Taking into account 'high seasons' only, it appears that, on average, about thirty per cent of total (suspected) felons returned to the prison for either further investigations, or for the king's pardon; about one half of the prisoners were acquitted; some 13 per cent were indicted and consequently executed by hanging; around 3 per cent were released on bail or manucaption; a further 3 per cent were handed over to the Bishop, because of their clerical status; those who managed to get away by either paying a fine or breaking from the prison constituted a marginal percentage, usually under one per cent (Table 9.3). In other words, the number of inmates drastically fell after the delivery was carried out and

Edward I, Vol. I, AD 1272-1281 (London: HMSO, 1901), pp. 141, 338, 339, 341 and 344; *CPR, Edward I, Vol. II, AD 1281-1292* (London: HMSO, 1893), pp. 23, 88, 254, 260, 284, 288, 332 and 336; *CPR, Edward I, Vol. III, AD 1292-1301* (London: HMSO, 1895), pp. 11, 20, 25, 54, 82, 110, 112, 113, 116, 141, 159, 160, 165, 191, 192, 215, 218, 238, 254, 257, 258, 319, 374, 375, 379, 381 and 440; *CPR, Edward I, Vol. IV, AD 1301-1307* (London: HMSO, 1898), pp. 8, 54, 379, 445, 491 and 510; *CPR, Edward II, Vol. I, AD 1307-1313* (London: HMSO, 1894), pp. 144, 194, 211, 227, 341 and 381; *CPR, Edward II, Vol. II, AD 1313-1317* (London: HMSO, 1898), pp. 153, 218, 246, 452, 493 and 503; *CPR, Edward II, Vol. III, AD 1317-1321* (London: HMSO, 1903), pp. 467, 489, 512, 539, 677 and 701; *CPR, Edward II, Vol. IV, AD 1321-1324* (London: HMSO, 1904), p. 248; *CPR, Edward II, Vol. V, AD 1324-1327* (London: HMSO, 1904), pp. 154 and 158; *CPR, Edward III, AD 1327-1330* (London: HMSO, 1891), pp. 182, 272, 388 and 551.

felons were either released, or hanged. However, we know nothing about the frequency of incarceration, namely how many felons would be thrown into the prison on, say, a weekly or monthly basis. Hence, we are ignorant, in most cases, about the length of incarceration of most felons; we only know when they were released, or executed. As a result, we cannot calculate the number of inmates on daily basis. All we can do is estimate the average number of prisoners on an annual basis. Since the bread accounts cover each year from Michaelmas to Michaelmas, I have adjusted each prison year to the fiscal year reckoned by the Priory authorities, by calculating the average number of prisoners between the two Michaelmases (namely, between the delivery closest to Michaelmas of the previous year and that closest to Michaelmas of the following year) (Table 9.4).

Table 9.2. Number of Prisoners Kept at Norwich Castle Prison, 1308-1316

Date	Men	Women	Total Number of Prisoners	Men as %	Women as %	Total
7.8.1308	50	9	59	84.75%	15.25%	100.00%
10.1.1309	35	17	52	67.31%	32.69%	100.00%
29.5.1309	19	5	24	79.17%	20.83%	100.00%
2.10.1309	19	6	25	76.00%	24.00%	100.00%
8.1.1310	54	7	61	88.52%	11.48%	100.00%
9.4.1310	11	0	11	100.00%	0.00%	100.00%
27.7.1310	47	16	63	74.60%	25.40%	100.00%
1.3.1311	45	9	54	83.33%	16.67%	100.00%
28.7.1312	36	7	43	83.72%	16.28%	100.00%
25.9.1312	7	1	8	87.50%	12.50%	100.00%
19.1.1313	28	4	32	87.50%	12.50%	100.00%
30.8.1313	49	3	52	94.23%	5.77%	100.00%
21.1.1314	1	0	1	100.00%	0.00%	100.00%
4.7.1314	27	1	28	96.43%	3.57%	100.00%
23.7.1314	8	0	8	100.00%	0.00%	100.00%
8.10.1314	6	0	6	100.00%	0.00%	100.00%
25.2.1315	5	0	5	100.00%	0.00%	100.00%
19.6.1315	72	20	92	78.26%	21.74%	100.00%
26.11.1315	64	26	90	71.11%	28.89%	100.00%
15.3.1316	96	42	138	69.57%	30.43%	100.00%
7.6.1316	146	43	189	77.25%	22.75%	100.00%

Average 85.68% 14.32% 100.00%

Source: Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976).

Table 9.3. Fate of Prisoners Kept at Norwich Castle Prison in 'High Seasons', 1308-1316

1. In Numbers.

Date	Return to prison	Acquittal	Indictment	Released on Bail	To Bishop	Fine	Escape	Sum
7.8.1308	26	25	7	1	0	0	0	59
10.1.1309	4	42	3	1	2	0	0	52
29.5.1309	6	15	2	0	0	1	0	24
2.10.1309	15	6	4	0	0	0	0	25
8.1.1310	4	46	7	1	2	0	1	61
27.7.1310	21	37	3	2	0	0	0	63
1.3.1311	17	15	8	13	1	0	0	54
28.7.1312	3	34	4	1	1	0	0	43
19.1.1313	15	14	2	0	1	0	0	32
30.8.1313	6	35	7	1	3	0	0	52
4.7.1314	9	14	5	0	0	0	0	28
19.6.1315	29	37	13	1	9	3	0	92
26.11.1315	40	34	10	0	6	0	0	90
15.3.1316	40	63	24	2	8	1	0	138
7.6.1316	37	80	58	8	6	0	0	189
Average	18.13	33.13	10.47	2.07	2.60	0.33	0.07	66.80

2. As Percentage

Date	Return to prison	Acquittal	Indictment	Released on Bail	To Bishop	Fine	Escape	Sum
7.8.1308	44.07%	42.37%	11.86%	1.69%	0.00%	0.00%	0.00%	100.00%
10.1.1309	7.69%	80.77%	5.77%	1.92%	3.85%	0.00%	0.00%	100.00%
29.5.1309	25.00%	62.50%	8.33%	0.00%	0.00%	4.17%	0.00%	100.00%
2.10.1309	60.00%	24.00%	16.00%	0.00%	0.00%	0.00%	0.00%	100.00%
8.1.1310	6.56%	75.41%	11.48%	1.64%	3.28%	0.00%	1.64%	100.00%
27.7.1310	33.33%	58.73%	4.76%	3.17%	0.00%	0.00%	0.00%	100.00%
1.3.1311	31.48%	27.78%	14.81%	24.07%	1.85%	0.00%	0.00%	100.00%
28.7.1312	6.98%	79.07%	9.30%	2.33%	2.33%	0.00%	0.00%	100.00%
19.1.1313	46.88%	43.75%	6.25%	0.00%	3.13%	0.00%	0.00%	100.00%
30.8.1313	11.54%	67.31%	13.46%	1.92%	5.77%	0.00%	0.00%	100.00%
4.7.1314	32.14%	50.00%	17.86%	0.00%	0.00%	0.00%	0.00%	100.00%
19.6.1315	31.52%	40.22%	14.13%	1.09%	9.78%	3.26%	0.00%	100.00%

26.11.1315	44.44%	37.78%	11.11%	0.00%	6.67%	0.00%	0.00%	100.00%
15.3.1316	28.99%	45.65%	17.39%	1.45%	5.80%	0.72%	0.00%	100.00%
7.6.1316	19.58%	42.33%	30.69%	4.23%	3.17%	0.00%	0.00%	100.00%
Average	28.68%	51.84%	12.88%	2.90%	3.04%	0.54%	0.11%	100.00%

Source: Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976).

Table 9.4. Correlation between the Amount of Bread and Number of Inmates, 1308-1316.

Year	Prisoners	Quarters of Wheat	Estimated Amount of Loaves	Loaves per Inmate (on Annual Basis)	Loaves per Inmate (on Daily Basis)
1308-9	45.00	0.00	0.00	0.00	0.00
1309-10	40.00	5.00	975.90	24.40	0.07
1310-11	54.00	8.00	1532.64	28.38	0.08
1311-12	43.00				
1312-13	30.67				
1313-14	12.33	26.00	4981.08	403.87	1.11
1314-15	34.33	21.25	4071.08	118.58	0.33
1315-16	139.00	33.25	6370.04	45.83	0.13

Source: Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976); DNC 1/1/19-25.

As Table 9.4 indicates, the amount of bread sent to the castle was far from sufficient to feed each inmate on a daily basis. The only exception was 1313-14, when the number of felons in the prison was low and it is quite possible that the Priory authorities could have provided each and every prisoner with his daily bread. During the troublesome year of 1315-16, when the number of inmates reached an unprecedented peak, the Priory allocated an exceptionally large amount of bread to be distributed among them. Nevertheless, the distributed loaves were insufficient to feed every mouth and

many prisoners undoubtedly starved, because of the widespread famine. The high number of felons kept in the prison during 1315-16 reflects, undoubtedly, the exceptionally high volume of crime that took over all England and most Europe during the Famine years.⁵⁹⁸ During the crisis years, we find more and more felons accused of plundering barns and granaries and stealing supplies of grain, chiefly wheat and malt. Between 26 November 1315 and 15 March 1316, fourteen robbers of grain were taken to the Castle prison (10.14 per cent of total felons incarcerated there), while between 15 March and 7 June 1316, as many as 41 suspects of stealing grain and malt were imprisoned (an astonishing 21.69 per cent of all felons).⁵⁹⁹ These are certainly high figures, compared to previous years, when grain robbers constituted between zero and six per cent of total felons incarcerated in the prison.⁶⁰⁰ Indeed, some entries in the delivery rolls specify that it was hunger and want (*fames et inopia*) that prompted the felons to plunder barns and steal cereals. The Great Famine must have inflicted exceptionally hard suffering upon the incarcerated. As John of Trokelowe, a contemporary Suffolk chronicler reports, there were cases of cannibalism among prison inmates.⁶⁰¹

It should be noted, however, that some entries clearly indicate the inmates' hardships during 'normal' years. There are numerous examples when the prisoners became victims of arbitrary rule of the prison guards and the King's justices. For

⁵⁹⁸ On the connection between crime rates and chaotic times in fourteenth-century, see Barbara A. Hanawalt, 'Economic Influences on the Pattern of Crime in England, 1300-1348,' *American Journal of Legal History* 18:4 (1974), 281-297; eadem, 'The Peasant Family and Crime in Fourteenth-Century England', *Journal of British Studies* 13 (1974), 1-18; eadem, *Crime and Conflict in English Communities, 1300-1348* (Cambridge Massachusetts: Harvard University Press, 1979), pp. 238-260; Ted Robert Gurr, 'Historical Trends in Violent Crime: A Critical Review of the Evidence', *Crime and Justice. An Annual Review of Research* 3 (1981), 295-353.

⁵⁹⁹ Figure calculated from *Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316*, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976), pp. 79-116.

⁶⁰⁰ Calculated from *ibid*, pp. 23-76.

⁶⁰¹ *Johannis de Trokelowe Monachi Annales*, Henry Thomas Riley (ed.), Rolls Series 28C (London: Longmans, 1866), p. 95.

instance, a certain Richard of Sapling, who was accused of abjuration of the realm, and spent at least eight years in the prison, served part of his sentence in the castle tower. The tower was exposed to pouring rain, which destroyed the charter of pardon granted by Edward I to Richard. The justices failed to test the authenticity of the charter and ordered the chancellor of the king to search for a transcript of the document and send it over to the castle. As a result, Richard became a victim of the royal bureaucratism and ended up suffering a long-term imprisonment.⁶⁰² A certain Welshman, Rhys ap Rhys ap Mereduk, presumably a war prisoner, or traitor, appears to have spent about thirty years in the prison (between c.1305 and 1335) and it is likely that he ended his life there.⁶⁰³ Another felon, John Bonde, indicted as burglar and sentenced to be hanged, complained that the constable of the castle forced him to act as approver under various tortures inflicted in the lowest room of the prison.⁶⁰⁴ Some prisoners, like John of St. Olav and James Syffe, did not even live to hear their sentence.⁶⁰⁵ Some prisoners, who refused to accept a jury trial, were returned to the prison and put on special severe diet and sojourn conditions, to force them to plead. Two particular conditions are mentioned in the rolls: *ad dietam* (torture by penal starvation) and *peine forte et dure* (torture by putting a board on a prisoner's body and piling weights on it until he/she consented to answer to the charge). Several pregnant

⁶⁰² The case of Richard of Sapling appears in *Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316*, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976), pp. 28, 29 and 64. Richard claimed to have the charter of pardon issued by Edward I on 16 January 1307; however, he was still found among the imprisoned felons on 4 July 1314 and it is unclear what was his fate afterwards.

⁶⁰³ *CCR, Edward II, Vol. I, AD 1307-1313* (London:HMSO, 1892), p. 191; *CCR, Edward II, Vol. IV, AD 1323-1327* (London:HMSO, 1898), p. 114; *CCR, Edward III, Vol. I, AD 1327-1330* (London:HMSO, 1896), pp. 11, 282, 299, 300, 455 and 456; *CCR, Edward III, Vol. II, AD 1330-1333* (London:HMSO, 1898), p. 106 and 375; *CCR, Edward III, Vol. III, AD 1333-1337* (London:HMSO, 1898), pp. 2, 26, 37 and 390.

⁶⁰⁴ *Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316*, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976), pp. 39-40.

⁶⁰⁵ *Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316*, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976), pp. 81-82 and 91.

women sentenced to death by hanging were returned to their cells to await the execution, which was to occur shortly after they would deliver their babies.⁶⁰⁶ Unlike modern prisons, medieval prisons did not distinguish between sexes or ages. Men, women, young and old were kept at the same cells. Unfortunately, our delivery accounts do not, as rule, specify the age of the convicted. There are some exceptions to this rule, however. For example, a certain William Junior of Walesby could not be indicted because he appeared to have been less than ten years old.⁶⁰⁷ Similarly, the castle authorities did not distinguish between laymen and clergy. Thus, our rolls are full of clerks, suspected of and indicted for various felonies, varying from harbouring criminals to homicide. Out of 92 felons tried on 19 June 1315, 9 were clerks (namely, almost ten per cent).⁶⁰⁸ Unlike the laymen, however, the clerks could refuse to acknowledge their sentence and demand to be judged at the Bishop's court.

These are but few examples of hardships experienced by the castle prison inmates. The Priory authorities were undoubtedly aware of harsh conditions of the prisoners and attempted to ease their suffering by providing them with their most basic necessity: bread. The distribution of loaves among the felons must be considered a charity activity *par excellence*, prescribed by the Rule of St. Benedict. The care for the imprisoned played an important part in shaping of medieval Christian concept of six corporal works of Mercy: feed the hungry and give drink to the thirsty; welcome the stranger; clothe the naked; visit the sick; visit the prisoner and bury the dead. This concept derived from the description of the Last Judgement (Matthew 25:31-46). In

⁶⁰⁶ *Crime in East Anglia in the Fourteenth Century. Norfolk Gaol Delivery Rolls, 1307-1316*, Barbara Hannawalt (ed.) Norfolk Record Society 44 (Norwich, 1976), pp. 25, 71, 92 and 93.

⁶⁰⁷ *ibid.*, p. 108.

⁶⁰⁸ *ibid.*, pp. 69-76.

accordance with the Book of Matthew, medieval theologians tended to ignore the criminal character of the prisoners and perceived them as people in need, belonging to the same group with the hungry, thirsty, poor, naked, captives, sick. For example, Beatus of Liébana (died 798), stated that whoever does not fast, pray, distribute his property among the poor, visit the sick and imprisoned, dress the naked, wash the guests' feet cannot see the majesty of God.⁶⁰⁹ The association of the incarcerated with other people in need is also found in Rather of Verona's (c. 890-974) *Praeloquia*.⁶¹⁰ John Beleth (died c. 1182) distinguished between six charity activities (*sex opera misericordie*): feeding the hungry, letting the thirsty drink, visiting the sick, dressing the naked, hosting the poor and pilgrims and attending the incarcerated (*pascere esurientes, potare sitientes, uisitare infirmos, uestire nudos, peregrinos et pauperes hospitari, incarceratos uisitare*).⁶¹¹ A short time after Beleth's death, we find this perception in a sermon of Gerard Iterius, abbot of Grandmont (1188-1198).⁶¹² Beleth and Gerard were followed by Guillaume Durand (1237-1296) and Ramon Llull (1232/3-1315/6), two influential theologians of their age.⁶¹³ Unlike Beleth and Durand, Llull added another charity work, burial of the dead (*mortuos sepelire*). For Llull, the seven charity activities corresponded to the seven sacraments and seven gifts of the Holy Spirit (*sapientia, scientia, intellectus, consilium,*

⁶⁰⁹ *Beati Liebanensis et Eterii Oxomensis Adversus Elipandum Libri Duo*, Bengt Löfstedt (ed.), Corpus Christianorum Continuatio Mediaevalis 59 (Turnhout, 1984), p. 72.

⁶¹⁰ *Ratherii Veronensis Praeloquiorum Libri VI*, Bernard Bischoff (ed.), Corpus Christianorum Continuatio Mediaevalis 41A (Turnhout, 1984), p. 130.

⁶¹¹ *Johannis Beleth Summa de Ecclesiasticis Officiis*, Herbert Douteil (ed.), Corpus Christianorum Continuatio Mediaevalis 41A (Turnhout, 1976), p. 142.

⁶¹² *Scriptores Ordinis Grandimontensis*, Jean Becquet (ed.), Corpus Christianorum Continuatio Mediaevalis 8 (Turnhout, 1968), p. 399.

⁶¹³ *Guillelmi Duranti Rationale Divinorum Officiorum V-VI*, A. Davril and T. M. Thibodeau (eds.), Corpus Christianorum Continuatio Mediaevalis 140A (Turnhout, 1998), p. 215; *Raimundi Lulli Opera Latina. Summa Sermonum in Civitate Maioricensi Annis MCCCXII-MCCCXIII Composita*, Fernando Domínguez Reboiras and Abraham Soria Flores (eds.), Corpus Christianorum Continuatio Mediaevalis 76 (Turnhout, 1987), pp. 468-469; *Raimundi Lulli Opera Latina. Summa Sermonum in Civitate Maioricensi Anno MCCCXIII Composita*, Abraham Soria Flores, Fernando Domínguez Reboiras and Michel Senellart (eds.), Corpus Christianorum Continuatio Mediaevalis 80 (Turnhout, 1991), p. 143.

fortitudo, pietas and *timor*).⁶¹⁴ This concept is found in the Western liturgy, having originated in a private Carolingian prayer, composed c. 850, which has been, for a long time, ascribed, to Alcuin of York. The prayer in question implores God to appear favourable to ‘widows, orphans, captives, penitents, sick, suffering, sailours, pilgrims, imprisoned and to those placed in whatever necessities and miseries’.⁶¹⁵

The reluctance of the clergy to keep up with this mandate and visit the prisoners is reflected in a sermon of Thomas of Chobham (died c. 1233/6). Chobham complained that no preachers of his day preached to the prisoners, who needed consolation and spiritual guidance.⁶¹⁶

Apart from the manifestation of charity, the distribution of bread among the prisoners can also be interpreted as an aspect of *imitatio Christi*. First, it alludes to the Miracle of Bread and Fishes, with Jesus feeding four thousand men with seven loaves (Matthew 15:30-38). Second, it alludes to Jesus’ attachment to and activities among sinners and criminals. In Matthew 9:9-10 Jesus ate together with ‘sinners and publicans’; in Matthew 11:19 he was called ‘a friend of publicans and sinners’ (*publicanorum et peccatorum amicus*); in Matthew 22:31-32, he promises that the publicans and harlots,

⁶¹⁴ *Raimundi Lulli Opera Latina. Summa Sermonum in Civitate Maioricensi Anno MCCCXIII Composita*, Abraham Soria Flores, Fernando Domínguez Reboiras and Michel Senellart (eds.), Corpus Christianorum Continuatio Mediaevalis 80 (Turnhout, 1991), p. 143.

⁶¹⁵ ‘Propitiare...viduis, orphanis, captives, poenitentibus, infirmis, afflictis, navigantibus, itinerantibus, incarceratis, et in quibuscunque necessitatibus atque miseriis constitutis.’ *B. Flacci Albini seu Alcuini Opera*, Patrologia Latina (=PL) 101, col. 488C. The prayer constitutes a part of a larger liturgical work of Pseudo-Alcuin, known as *De Usu Psalmorum*. The authorship of the work is discussed in André Wilmart, ‘Le manuel de prières de saint Jean Gualbert’, *Revue bénédictine* 48 (1936), 263-265; Jonathan Black, ‘Psalm Uses in Carolingian Prayerbooks : Alcuin and the Preface to *De Psalmorum Usu*’, *Medieval Studies* 64 (2002), 1-60.

⁶¹⁶ ‘Est iterum alius defectus magnus in predicatoribus, quod numquam predicant incarceratis, cum sepe multi carceres pleni sint captiuis qui maxime indigent consolatione et magno consilio animarum, et in articulo tante necessitatis non habent predicatorem qui eos instruat, cum multi forte inter eos sint in odio fraterno, parati congregari in duello cum fratribus, parati etiam periurare pro peccatis super quibus accusantur’. *Thomas de Chobham, Summa de Arte Praedicandi*, Franco Morenzoni (ed.), Corpus Christianorum Continuatio Mediaevalis 82 (Turnhout, 1988), p. 88.

who believed in him, would go into the kingdom of God before the priests of the Temple; finally, he was crucified with felons (*latrones*).

During the 1270s and 1280s, the distribution of bread among the prisoners seems to have carried yet another aspect: the mandate of love and forgiveness prescribed by Jesus to his disciples. After the Riot of 1272, when the citizens sacked the Cathedral and killed some monks, the castle prison became filled with attackers of the church. Apart from those sentenced to death and those pardoned, there was another group of offenders who spent a long-term imprisonment in the prison. For example, a close roll from 26 March 1287, namely almost fifteen years after the riot, mentions seven citizens of Norwich still kept in the prison, on the account of their participation in the attack.⁶¹⁷

Master of the Cellar's Alms: Norwich Paupers (I)

The town paupers received their bread charity from two channels: the master of the cellar and the almoner. The distribution of loaves by the first represented purely a symbolic, liturgical act, occurring once a year, on Maundy Thursday. This act is described in a detail in the *Customary* of the Priory. Around the Nones (around 3 PM), the community began celebrating the Great Mass (*majoris missa*), or the Mass of the Chrism. After the Bishop blessed the chrism and deposited the consecrated host, the brethren proceeded to strip and wash the altars. The stripping of altars was followed by the washing of feet, and it was then that the poor came into the picture. The paupers were led into the guest-hall, where the brethren washed their feet. Once the ceremony was over, the monks washed their hands and entered the refectory to celebrate the *cena*

⁶¹⁷ *CCR, Edward I, Vol. II, AD 1279-1288* (London:HMSO, 1902), p. 446.

domini with the bishop. The cellarer called the paupers to join the supper. The latter were seated in the refectory and given a quarter loaf (*quadrans panis*) each. In addition, the cellarer distributed a handful of coins among the poor, kissing their hands. The brethren, on the other hand, left the tables and approached the poor chanting *Miserere mei* (Psalm 51 [50]).⁶¹⁸ The *Customary*, composed between 1258 and 1265, also specifies the number of the poor fed by the Priory: eighty.⁶¹⁹ There is no evidence, however, that it was a constant, customary number. The fact that the amount of bread given to the poor at the Lord's Supper was different each year points to the possibility that also the number of the poor varied from year to year (Table 9.5)

Table 9.5. Annual Distribution of Bread among the Poor on Maundy Thursday, 1281-1343.

Decade	Quarters of Wheat	Estimated Amount of Loaves	As a Percentage of All <i>Panis militum</i>
1281-1290	0.00	0.00	0.00%
1291-1300	5.10	977.06	1.06%
1301-1310	9.70	1,858.33	2.07%
1311-1320	8.25	1,580.54	1.61%
1321-1330	5.00	957.90	0.85%
1331-1340	7.70	1,475.17	1.34%
1341-1343	10.67	2,043.52	1.76%
Average All Years	6.63	1,270.36	1.26%
Average Normal Years	8.50	1,628.43	1.62%

Sources: DCN 1/1/6-28, 30-37, 39-40.

Notes: By 'normal years', I mean years when bread was distributed.

The 1280s saw no distribution of the loaves among the poor. It is possible that it had something to do with the grievance of the Priory community towards the townsfolk, who

⁶¹⁸ *The Customary of the Cathedral Priory Church of Norwich*, J. B. L. Tolhurst (ed.), Henry Bradshaw Society 82 (London, 1948), pp. 79-86.

⁶¹⁹ *Ibid.*, pp. 80-81.

ravaged and burned the Cathedral in 1272. The charitable activities resumed in the 1290s and expanded in the 1300s. There were some years when the Priory did not distribute any bread at all (1329-30, 1338-9), but that appears to be a clear exception. The amount of bread given to the poor indicates that the number of the recipients was much higher than eighty, as stated in the *Customary*. As Table 9.5 shows, the amounts of grain allocated to the poor in 'normal years', were capable of producing well over a thousand loaves. If the estimation above is not far from reality, then each Maundy Thursday (excluding those years, when no bread was distributed), the Priory authorities could have fed between one and two thousand hungry mouths. The actual number, however, could have been even higher, since the *Customary* indicates that each poor received quarter a loaf (*quadrans panis*).

How can we settle the contradiction between the evidence of the *Customary* and that of the rolls? It is likely that we are dealing here with two separate groups of paupers. According to the *Customary*, after the stripping and washing of the altars, the Cellarer and the Almoner chose eighty paupers to participate in the ritual of the washing of feet and the *cena domini*.⁶²⁰ To host all the town paupers in the refectory would have been impossible and hence the Priory authorities could have divided those seeking bread into two groups: those receiving their loaves in the guest-hall, and those waiting for their turn outside it. It appears that the distribution of bread among thousands paupers occurred in two places, with eighty 'chosen' in the refectory and the rest elsewhere, possibly by the entrance to the Cathedral precinct.

⁶²⁰ 'Post hoc celerarius et elemosinarius elegant quatuor viginti paupers.' *The Customary of the Cathedral Priory Church of Norwich*, J. B. L. Tolhurst (ed.), Henry Bradshaw Society 82 (London, 1948), pp. 80-81.

Almoner's Charity: Norwich Paupers (II)

Apart from the Master of the Cellarer's distribution of bread on Maundy Thursday, the poor also enjoyed free grain on a number of other occasions. The main figure in providing the poor with grain on various days outside Maundy Thursday was the almoner. In the 1280s, and perhaps also in the 1290s and 1300s,⁶²¹ the almoner made extensive purchases of grain, to be distributed among the paupers. On average, nearly 450 quarters of various grains were allocated to the poor every year (Table 9.6). The 1280s accounts state that the poor used to receive their grain allowance from different kinds of grain (*de omni blado*); unfortunately, they do not specify the composition of the cereals. The later accounts, which will be discussed shortly, however, clearly demonstrate that the main component of the paupers' allowance were rye, as a bread grain, and barley, as a drinking cereal.

The 1280 accounts also specify the periods of the distribution. The charity activities began in the Spring, in the beginning of Lent, on Ash Wednesday and continued well into the Summer, down to the Anniversary of Bishop Herbert Losinga (23 July), Feast of Mary Magdalene (22 July), or *Ad Vincula* (1 August). On average, the charity period would a little less than 150 days (Table 9.6).

The total monetary value spent on the grain varied from year to year, depending on both the grain prices and the amounts of cereals purchased. On average, however, the purchase of grain for the distribution among the poor amounted to some 55.57 per cent of total annual income and some 50.85 per cent of total annual expenditure of the almoner (Table 9.6).

⁶²¹ Unfortunately, no Almoner's account survives from the 1290s or 1300s.

Table 9.6. The Almoner's Distribution of Grain among the Poor in the 1280s.

Year	Quarters	Grain Value (in £)	Total Almoner's Income	Total Almoner's Expenses	Grain Value as % of Total Income	Grain Value as % of Total Expenses	Period (days)
1282-83	516.00	109.05	159.04	181.21	68.57%	60.18%	151.00
1284-5	420.00	60.00	163.65	174.26	36.66%	34.43%	161.00
1285-6	486.38	97.58	133.20	143.96	73.26%	67.78%	141.00
1287-88	354.00	41.01	93.65	100.04	43.79%	40.99%	137.00
Average	444.09	76.91	137.39	149.87	55.57%	50.85%	147.50

Source: DCN 1/6/5-8.

In other words, we might conclude that in the late thirteenth century, the department of the almoner was strongly devoted to the care for the poor, mainly for providing them with their daily food. The situation seems to have changed in the early fourteenth century. From at least *c.* 1310, the almoner ceased relying on his financial income as the source of acquiring grain for the needy. Instead, he started drawing upon his landed property for supplying the paupers with food. Between 1280 and 1370, the almoner had twelve appropriated estates and tithe-paying churches providing his department with grain, kept at the almoner's granary. Unfortunately, the almoner's rolls, as a rule, did not include granary accounts on their dorse and there are only four rolls mentioning the return and disposal of cereals received from the manors and as churches (the accounts for 1310-1, 1339-40, 1345-6 and 1353-4).⁶²² Consequently, and as opposed to the master of the cellar's rolls, we cannot establish any firm statistical analysis regarding the almoner's granary, let alone reconstruct seeding and harvesting patterns practiced on the almoner's

⁶²² DCN 1/6/9, 12, 13 and 17.

Worstead	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Purchase	5.50	2.00	81.00	21.50	21.50	22.50	154.00
Remaining from Previous Year	23.56	16.63	0.00	0.00	0.00	65.00	105.19
Increment	2.88	9.44	10.88	0.00	0.00	9.50	32.69
Great Granary	5.00	0.00	0.00	0.00	0.00	0.00	5.00
Total	63.56	69.31	116.31	33.38	21.50	375.69	679.75

(3.) 1345-6.

Source	Wheat	Rye	Peas	Oats	Barley	Malt	Total
Attlebridge	3.00	25.50	5.50	2.00	64.50	0.00	100.50
Beckham	0.00	0.00	0.00	8.25	12.00	0.00	20.25
Catton	0.00	6.38	0.00	2.00	14.50	0.00	22.88
Field Dalling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lakeham	0.00	0.00	0.00	0.00	0.63	0.00	0.63
Monks Grange	0.88	6.13	2.25	1.50	18.50	0.00	29.25
Riston	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strumpshaw	0.00	0.00	1.38	0.00	39.25	0.00	40.63
Trowse/Erlham	12.75	11.63	6.00	3.63	70.63	27.50	104.63
Wicklewood	39.00	19.63	13.50	0.00	80.50	0.00	152.63
Wichingham	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worstead	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Purchase	7.50	3.38	50.88	20.00	0.00	0.00	81.75
Remaining from Previous Year	3.50	20.63	39.00	0.00	13.50	0.00	76.63
Increment	3.38	4.63	14.00	0.00	18.00	2.13	40.00
Great Granary	5.00	0.00	0.00	0.00	0.00	0.00	5.00
Total	75.00	97.88	132.50	37.38	332.00	29.63	674.75

(4). 1353-4

Source	Wheat	Rye	Peas	Oats	Barley	Total
Attlebridge	0.00	7.00	0.00	0.00	15.00	22.00
Beckham	0.00	0.00	0.00	0.00	0.00	0.00
Catton	1.13	3.00	0.00	0.00	7.25	11.38
Field Dalling	0.00	0.00	0.00	0.00	0.00	0.00
Lakeham	0.00	0.00	0.00	0.00	0.00	0.00
Monks Grange	0.00	6.50	0.00	0.00	8.25	14.75
Riston	0.00	0.00	0.00	0.00	0.00	0.00
Strumpshaw	0.00	0.00	0.00	2.13	18.00	20.13
Trowse/Erlham	3.88	4.25	0.00	2.00	15.75	25.88
Wicklewood	8.00	9.25	0.00	0.00	15.00	32.25
Wichingham	0.00	0.00	0.00	0.00	5.00	5.00

Worstead	0.00	0.00	0.00	0.00	0.00	0.00
Purchase	0.00	0.00	0.00	0.00	0.00	0.00
Remaining from Previous Year	0.00	0.00	0.00	0.00	0.00	0.00
Increment	0.00	0.00	0.00	0.00	0.00	0.00
Great Granary	0.00	0.00	0.00	0.00	0.00	0.00
Total	13.00	30.00	0.00	4.13	84.25	131.38

Note: Since malt was processed from barley, I have not included it calculating the total amount of the grain.

Source: DCN 1/6/9, 12, 13 and 17.

As far as wheat and rye are concerned, the almoner's estates and churches used to contribute small amounts of cereals to the granary and left large proportions of yields to themselves, for domestic consumption. The two exceptions were the appropriated churches of Attlebridge (Central Norfolk) and Wicklewood (East Norfolk). The former sent substantial amounts of rye, while the latter supplied generous sums of wheat. In the barley sector, on the other hand, the almoner was able to rely on manorial supply, since most estates were able to send twenty quarters of grain and more to Norwich. The largest portion of peas, oats and bran, however, came from direct purchase. For instance, in 1310-1, the almoner purchased 68.50 quarters of oats (out of total of 88.75 quarters) and 42 quarters of bran (out of total 42). Excluding the disastrous year of 1353-4, which saw a very bad harvest resulting both from demographic and climatic factors, the share of the purchased grain amounted for 6.34 per cent for wheat, 22.21 per cent for rye, 48 per cent for peas, 65 per cent for oats, 100 per cent for bran and 6.56 per cent for barley. But then again, these figures might well not reflect the reality, as they derive from three rolls only. What is clear, however, is the fact that the Black Death had a strong impact on the amount of grain supply stored at the almoner's granary. Not only did no purchases of cereals occur in that year, but also the manors could send only meagre quantities of grain.

These quantities amounted to only 15.96 per cent of an average grain receipt in the pre-Black Death years (that is, an average of the 1310-1, 1339-40 and 1345-6 receipts).

The disposal of the grain supply reflects mainly two tendencies: to feed domestic animals of the Priory (horses and swine) and to distribute the grain among the poor. In addition, some amounts were sold, baked, brewed and given as livery to the *famuli*. In addition, tiny quantities were invested in seeding, presumably on the same manors the grain came from (Table 9.8):

Table 9.8. Grain Disposal of Almoner's Granary in 1310-1, 1339-40, 1345-6 and 1353-4 (in Quarters)

(1). 1310-1

Grain	Sown	Given to Poor	Given as Livery	Sold	Fed to Horses	Baked	Total
Wheat	0.00	18.25	0.25	19.75	0.00	10.25	48.50
Rye	0.00	163.31	0.00	0.00	0.00	0.00	163.31
Peas	0.00	37.13	0.00	0.00	0.00	0.00	37.13
Oats	2.00	0.00	1.75	12.00	68.00	0.00	83.75
Bran	0.00	0.00	0.00	0.00	42.00	0.00	42.00
Barley	3.00	169.00	0.00	91.69	0.50	20.88	285.06
Total	5.00	387.69	2.00	123.44	110.50	31.13	659.75

(2). 1339-40

Grain	Sown	Given to Poor	Given as Livery	Sold	Fed to Horses	Fed to Swine	Baked	Total
Wheat	1.63	27.00	0.00	3.00	0.00	0.00	19.75	51.38
Rye	1.94	66.63	0.00	0.25	0.00	0.00	0.00	68.81
Peas	1.81	92.75	0.00	0.00	5.00	1.38	0.00	100.94
Oats	3.63	0.00	0.00	0.00	29.75	0.00	0.00	33.38
Bran	0.00	0.00	0.00	0.00	21.50	0.00	0.00	21.50
Barley	26.00	209.31	7.38	112.00	0.00	0.00	17.00	371.69
Total	35.00	395.69	7.38	115.25	56.25	1.38	36.75	647.69

(3). 1345-6

Grain	Sown	Given to Poor	Given as Livery	Sold	Fed to Horses	Fed to Swine	Baked	Malted	Total
Wheat	1.50	27.50	2.00	10.00	0.00	0.00	25.50	0.00	66.50
Rye	1.38	82.50	0.00	0.00	0.00	0.00	0.00	0.00	83.88
Peas	2.13	92.00	0.38	0.00	3.00	4.00	0.00	0.00	101.50
Oats	3.00	0.00	0.00	0.00	34.38	0.00	0.00	0.00	37.38
Barley	26.50	166.00	14.50	7.50	0.00	0.00	22.50	27.00	264.00
Malt		0.00	11.00	18.63	0.00	0.00	0.00	0.00	29.63
Total	34.50	368.00	27.88	36.13	37.38	4.00	48.00	27.00	582.88

(4). 1353-4

Grain	Sown	Given to Poor	Sold	Fed to Horses	Baked	Total
Wheat	0.00	0.00	4.50	0.00	4.25	8.75
Rye	0.00	16.25	0.00	2.00	0.00	18.25
Peas	0.00	0.00	0.00	0.00	0.00	0.00
Oats	0.00	0.00	0.00	4.13	0.00	4.13
Barley	0.00	20.00	57.00	4.00	0.00	81.00
Total	0.00	36.25	61.50	10.13	4.25	112.13

Note: Since malt was processed from barley, I have not included it calculating the total amount of the grain.

Source: DCN 1/6/9, 12, 13 and 17.

Although the fragmentary nature of evidence does not allow us to reconstruct the full picture of the supply of and disposal within the almoner's granary, one thing is clear: its structure and function were different from that of both the Great Granary and the granary of the master of the cellar. The grain supplies stored in the almoner's granary were not intended for domestic consumption of the Cathedral community. Since wheat was the grain of higher echelons of the society, it is hardly surprising that the almoner's granary, specializing in grain distribution among the poor, was strongly rye-biased, as

opposed to the wheat-biased Great Granary. Furthermore, the almoner's granary stored much smaller quantities of cereals than did the monastic granary.

Now let us look more closely at the amounts of grain distributed among the poor. The surviving granary accounts of the almoner distinguish between wheat, given annually on Bishop Herbert de Losinga's anniversary (23 July), and other grains and legumes (rye, peas and barley), distributed throughout the year (Table 9.9).

Table 9.9. Annual Distribution of Grain among the Paupers, 1310-1, 1339-40, 1345-6 and 1353-4.

(1). In Quarters of Grain

Grain	1310-1	1339-40	1345-6	1353-4
Wheat	18.25	27.00	27.50	0.00
Rye	163.31	66.63	82.50	16.25
Peas	37.13	92.75	92.00	0.00
Barley	169.00	209.31	166.00	20.00
Total	387.69	395.69	368.00	36.25

(2). As a Percentage of Total Grain in the Almoner's Granary

Grain	1310-1	1339-40	1345-6	1353-4
Wheat	36.05%	42.48%	36.67%	0.00%
Rye	94.13%	96.12%	84.29%	54.17%
Peas	78.47%	79.74%	69.43%	0.00%
Barley	55.58%	55.71%	50.00%	23.74%
Total	67.36%	63.32%	57.74%	28.49%

(3). Percentage Composition of All Grains Given to the Poor

Grain	1310-1	1339-40	1345-6	1353-4
Wheat	4.71%	6.82%	7.47%	0.00%
Rye	42.12%	16.84%	22.42%	44.83%
Peas	9.58%	23.44%	25.00%	0.00%
Barley	43.59%	52.90%	45.11%	55.17%
Total	100.00%	100.00%	100.00%	100.00%

Source: DCN 1/6/9, 12, 13 and 17.

The distribution trends show that the Priory authorities clearly preferred to provide the paupers with rye, as the principal bread grain, and barley, as a drinking cereal. Wheat, on the other hand, did not seem to have exceeded ten per cent of the total distributed grain and it was given only on Herbert Losinga's anniversary. We might argue, to a certain degree, that the consumption of wheat bread carried a festive connotation for the poor, for they could enjoy this usually unaffordable staple on two feasts only: Herbert's anniversary and Maundy Thursday. The distribution and consumption of rye bread, on the other hand, was an everyday reality. Peas, presumably turned into pottage, represented nearly ten per cent in 1310-1 and about a quarter of all grains and legumes in 1339-40 and 1345-6. Neither wheat nor peas were given to the poor during the hard year of 1353-4. In estimating the calorific equivalent of quarters and bushels, we learn that Norwich Priory was generous in its charity activities among the town's paupers. For instance, 18.25 quarters of wheat were allocated to the poor in 1310-1. This amount would have produced around 3,500 loaves (if we assume that these were *panes militum*), producing around 8.50 million kilocalories. In 1339-40 and 1345-6,

27.00 and 27.50 quarters of wheat, respectively, were spent on the poor. These amounts were capable of feeding over 5,000 persons with a loaf of *panis militum* each (Table 9.10). According to the almoner's roll, the entire amount was distributed on a single day, the anniversary of Herbert. These are certainly high figures, given the fact that the estimated population of Norwich c. 1310-1 would have been around 15,000 persons, while by c. 1339-40 it would have been as high as 25,000 and perhaps a bit higher.⁶²³ In other words, the amount of wheat allocated to the poor was capable of feeding between some twenty to twenty-five per cent of (estimated) total population of the town. This does not, however, mean that about a quarter of the townsfolk ran to Ethelbert Gate to receive the loaves on Herbert's anniversary. It is highly unlikely that as much as a quarter of the population were paupers, living on alms. According to various taxations and assessments, Norwich was one of the wealthiest towns in fourteenth-century England.⁶²⁴ It is possible that the poor in question were, in fact, tenants from surrounding villages, or perhaps the Priory manors, who knew about the charity activities of their lords and, hence, made their way to the town.

It should be noted that distributing bread and ale on major feasts and anniversaries was a commonplace in various monasteries of late medieval England. For instance, the monks of Battle Abbey used to entertain the town's poor with wine on the anniversary of

⁶²³ Elizabeth Rutledge, 'Immigration and Population Growth in Early Fourteenth-Century Norwich: Evidence from the Tithing Roll', *Urban History Yearbook* 1988, 15-30; eadem, 'Economic Life [in Medieval Norwich]', in *Medieval Norwich*, Carole Rawcliffe and Richard Wilson (eds.) (Hambledon and London, 2004), pp. 157-8. Norwich had approximately 25,000 persons by 1333 and it is likely that the town continued expanding into the 1340s, until the Black Death. Hollingsworth suggested that there might have been as many as 41,000 inhabitants by 1348; however, his dubious methodology makes this figure a rather suspicious and somewhat exaggerated (T. H. Hollingsworth, *Historical Demography* (London and Southampton, 1969), pp. 363-4). It is unlikely that the town's population was any higher than, say, 32,000 people by 1348.

⁶²⁴ Alan Dyer, 'Appendix. Ranking Lists of English Medieval Towns,' in *The Cambridge Urban History of Britain*, D. M. Palliser (ed.), pp. 754-5.

Master Hugh de Mortimer.⁶²⁵ Similarly, the brethren of Evesham Priory distributed loaves on the Commemoration of All Persons, on Maundy Thursday, as well as on any funeral day.⁶²⁶ The monks of Durham Priory commemorated the persons of William de Gyseburn and William of Durham (d.1249), a reputed founder of Durham Hall (now University College, Oxford) and rector of Wearmouth. In addition, they fed the paupers with loaves on nine feasts between All Saints (31 October) and the Nativity of St. John the Baptist.⁶²⁷ A similar situation was at late medieval Peterborough Abbey, where the brethren supported the local poor with food and clothes.⁶²⁸

Table 9.10. Distribution of Wheat among the Poor on Herbert Losinga's Anniversary, Its Financial Equivalent and Estimated Numbers of Loaves it Was Capable of Producing.

Year	Quarters	Value (in £ Sterling)	Loaves
1310-1	18.25	7.71	3,496.34
1339-40	27.00	11.41	5,172.66
1345-6	27.50	11.62	5,268.45
1353-4	0.00	0.00	0.00
Average (without 1353-4)	24.25	10.25	4,645.82

Source: DCN 1/6/9, 12, 13 and 17.

The remaining grains and legumes, turned into loaves, ale and pottages were evidently distributed throughout the year. In 1310-1, 163.31 quarters of rye, producing over 30,000

⁶²⁵ This is stated in a 1278-9 cellarer's account (printed in *The Cellarers' Rolls of Battle Abbey, 1275-1513*, Eleanor Searle (ed.), Sussex Record Society 65 (1967), p. 44).

⁶²⁶ Dugdale, William, *Monasticon Anglicanum* (London, 1846), Vol. II, p. 29.

⁶²⁷ *Extracts from the Account Rolls of the Abbey of Durham from the Original MSS*, Joseph Thomas Fowler (ed.) (Durham : Published for the Society for Andrews & Co. 1898-1901), pp. 484 and 531.

⁶²⁸ *Account Rolls of the Obedientiaries of Peterborough*, Joan Greatrex (ed.) (Northampton : Northamptonshire Record Society, 1984), p. 14.

loaves, were allocated to the poor. In the later years, however, the Priory authorities spent smaller amounts of rye on feeding the paupers: 66.63 quarters (=approximately 12,282 loaves) in 1339-40 and 82.50 quarters (=approximately 15,209 loaves) in 1345-46. During the disastrous year 1353-54, they could afford only 16.25 quarters of rye to be converted into bread for the poor, which would have made just under 3,000 loaves. As far as the peas are concerned, their amount seems to have fluctuated over the period. For example, only 37.13 quarters of peas were distributed among the poor in 1310-1, while in the 1340s, the amount increased by almost 150 per cent (92.75 quarters in 1339-40 and 92.00 quarters in 1345-46). The available evidence suggests that over this period the supply of peas grew proportionally to the shrinkage of rye loaves. It is unclear how many pottages these amounts would have produced, but one can estimate that 37.13 and 92 quarters of (dry) peas would have rendered over 20 and 50 million kilocalories, respectively. Finally, barley, once malted and brewed, made a significant contribution to the consumption of the poor. In 1310-11, the amount was 169 quarters of raw barley, capable of yielding some 16,158 gallons of weak ale. A similar amount was allocated in 1345-46 (166 quarters), while in 1339-40, the almoner spent 209.31 quarters on feeding the poor (=around 20,012 gallons of ale). The post-Black Death crisis was visible also in this sector, since only 20 quarters of barley were contributed to the poor.

Assuming that the amounts above were distributed over the entire year, can we estimate how many paupers could be fed, on daily basis, outside Herbert Losinga's anniversary? The average combined amount of rye, peas and barley distributed among the poor in 1310-1, 1339-40 and 1345-6 would have rendered around 110 million kilocalories (around 114,318,169 in 1310-1; 106,591,561 in 1339-40; and 107,990,479 in

1345-6). Allowing 2,000 kilocalories per pauper, we arrive at the estimated figure of around 150 paupers a day (Table 9.11).

Table 9.11. Estimated Calorific and Financial Equivalent of Distributed Grain and Hypothetical Amount of Paupers it Was Capable of Feeding Each Day (with 2,000 kilocalories per pauper)

(1). 1310-1

Grain	Quarters	Value (in £ Sterling)	Loaves/gallons	Kcals	Paupers
Rye	163.31	40.83	30,106.20	73,172,513.33	100.44
Peas	37.13	7.65		20,463,300.00	28.09
Barley	169.00	43.94	16,158.09	20,682,355.20	28.39
Total	369.44	92.42		114,318,168.53	156.92

(2). 1339-40

Grain	Quarters	Value (in £ Sterling)	Loaves/gallons	Kcals	Paupers
Rye	66.63	11.93	12,282.32	29,851,930.08	40.98
Peas	92.75	8.49		51,123,800.00	70.18
Barley	209.31	34.43	20,012.37	25,615,831.20	35.16
Total	368.69	54.84		106,591,561.28	146.32

(3). 1345-6

Grain	Quarters	Value (in £ Sterling)	Loaves/gallons	Kcals	Paupers
Rye	82.50	7.55	15,208.88	36,964,866.51	50.74
Peas	92.00	8.83		50,710,400.00	69.61
Barley	166.00	19.34	15,871.26	20,315,212.80	27.89
Total	340.50	35.72		107,990,479.31	148.24

(4). 1353-4

Grain	Quarters	Value (in £ Sterling)	Loaves/gallons	Kcals	Paupers
Rye	16.25	4.26	2,995.69	7,280,958.56	9.99
Peas	0.00	0.00		0.00	0.00
Barley	20.00	9.00	1,912.20	2,447,616.00	3.36
Total	36.25	13.26		9,728,574.56	13.35

Source: DCN 1/6/9, 12, 13 and 17.

Obviously, these are hypothetical figures, which, however, might not be too far removed from reality. It is unlikely that the number of the poor was much smaller than that, since it is highly unlikely that the almoner provided every pauper with a loaf of bread, a gallon of barley and plate of pottage. As the *Customary* suggests, each pauper received a quarter loaf on Maundy Thursday and hence we could estimate that the number of loaves could have been actually smaller than the number of the poor begging outside St. Ethelbert gate. On the other hand, the actual number of poor recipients might have been higher, if we take into account the possibility that the periodical patterns of the 1280s persisted into the fourteenth century. As we have seen above, the charitable activities of grain distribution continued, on average, for 150 days, from early spring to the mid-summer (that is, for less than half a year). If the patterns of the 1280s indeed persisted into the later period,⁶²⁹ then the Priory might have fed as many as some 265 paupers each day – a high number, by all standards. It should be noted, however, that the calculations of Table 9.12 do not attempt to estimate the number of the poor fed every

⁶²⁹ For the patterns of the 1280s, see above, pp. 369-70.

day; instead, they seek to establish the number of the paupers that the Priory *was potentially capable* of supporting each day.

Grain Alms in a Wider Context

In order to appreciate the significance and the extent of the grain alms established by the Priory authorities, we need to consider a more general context of urban charity and piety in fourteenth-century Norwich, in particular, and England, in general. Unfortunately, because of the nature and extent of available documentation, scholars have tended to deal with later periods, chiefly the fifteenth and sixteenth centuries.⁶³⁰ The major sources for their studies are late-medieval and early-modern private wills probated in urban consistory courts. Although appearing in late Anglo-Saxon period, the wills become truly plentiful only in the decades following the Black Death and it is only from then that a quantitative analysis based on a solid statistical data is possible. This holds true also for fourteenth-century Norwich: between c. 1314 and 1339, only some sixty wills have survived, all copied and enrolled into what became later known as ‘City Court Rolls’ and there are a few more, deposited elsewhere in their original form.⁶³¹ There is a sudden gap between 1340 and 1370, because not a single will from that period has come down to us, either in its original, or copied/enrolled form. The earliest comprehensive register of enrolled wills, probated at Norwich Consistory Court and known as ‘Heydon’s

⁶³⁰ W. K. Jordan, *Philanthropy in England, 1480-1660* (London, 1959); idem, *The Charities of London* (London, 1960); J. A. F. Thomson, ‘Piety and Charity in Late Medieval London,’ *Journal of Ecclesiastical History* 16 (1965), 178-195; Sylvia L. Thrupp, *The Merchant Class of Medieval London, 1300-1500* (Ann Arbor: The University of Michigan Press, 1962), pp. 174-180; Norman P. Tanner, *The Church in Late Medieval Norwich* (Toronto: Pontifical Institute of Medieval Studies, 1984); Marjorie K. McIntosh, ‘Local Responses to the Poor in Late Medieval and Tudor England,’ *Continuity and Change* 3 (1988), 209-245; Ben R. McRee, ‘Charity and Gild Solidarity in Late Medieval England,’ *Journal of British Studies* 32 (1993), 195-225.

⁶³¹ NRO, NCR Cases 1/1-1/13.

Register', contains over six-hundred wills compiled between 1370 and 1383.⁶³² The two registers will serve as our guidelines to understanding the phenomenon of charity in fourteenth-century Norfolk.

There are obvious traps in using these sources. First, there is the thirty-year gap. Second, because of its fragmentary nature, the 1314-1339 register might not reflect the entire picture. Third, Heydon's register was compiled some thirty years after the last granary roll and after the shock of the plague. Hence, it might reflect a reality that was completely different from that of the pre-Black Death era. Nevertheless, these are the only available sources for 'measuring' the piety of Norwich citizens in the fourteenth century. Because of the voluminous nature of Heydon's register, I have chosen to concentrate on a four-year span, between 1370 and 1373 inclusive.

Only fourteen testators (eleven men and three women), out of total sixty (23.33 per cent), left alms to the poor, between 1314 and 1339. In most cases, the testators stipulated that part of their property be sold and distributed among the paupers. Heydon's register shows higher proportions of testators bequeathing charity. There were six testators, out of total sixteen, in 1370 (=37.50 per cent); sixteen, out of total 33, in 1371 (=48.48 per cent); six, out of total 23, in 1372 (=26.09 per cent) and thirteen, out of total 33, in 1373 (=39.39 per cent).⁶³³ Most testators bequeathed alms in form of money, but some also left certain amounts of grain to be distributed among the paupers. For example, William de Inthburgh, rector of Salle, bequeathed three quarters of wheat, five quarters of malt and six quarters of oats.⁶³⁴ Similarly, John Palmere de Benham left seven bushels of

⁶³² NRO, *PRCC, Register Heydon (1370-83)*.

⁶³³ NRO, *PRCC, Register Heydon (1370-83)*, fols. 1r-41r.

⁶³⁴ NRO, *PRCC, Register Heydon (1370-83)*, fol. 12r

‘whatever kind of grain’ (*de aliquo genere bladi*).⁶³⁵ A certain parson William Ely commanded that one quarter of wheat be baked into bread and distributed among the poor (*unum quarterium frumenti ut fiat in panem*).⁶³⁶ Only one testator, John de Reppes, left alms to the prisoners in Norwich castle prison, in form of five shillings.⁶³⁷ The number of bequests to prisoners, however, increased during the fifteenth and into the sixteenth century, as Norman Tanner has shown in his study of Norwich piety in the fifteenth and sixteenth centuries. For instance, between 1490 and 1517, as much as 22 per cent of lay and 27 per cent of clerical testators left bequests to the prisoners in the castle prison and the Guild Hall.⁶³⁸ J.A.F. Thompson gives similar figures for late-medieval London.⁶³⁹ The evidence from late-medieval Yorkshire shows even higher figures: as much as 60.70 per cent of total bequests left between 1389 and 1398 were in form of charity.⁶⁴⁰ Similar figures are reported in late-medieval Hull.⁶⁴¹ As far as late-medieval English aristocracy is concerned, about one in three wills left money for alms.⁶⁴²

It was in this context that the almoner of Norwich Cathedral Priory practised his extensive charity activities. The problem of the poor was widely recognized in late-medieval English society. Helping the paupers, by giving either money or food, was considered a moral duty of every able Christian and one of the most recognizable forms

⁶³⁵ NRO, *PRCC, Register Heydon (1370-83)*, fol.32r

⁶³⁶ NRO, *PRCC, Register Heydon (1370-83)*, fol. 33v

⁶³⁷ NRO, *PRCC, Register Heydon (1370-83)*, fol.32r

⁶³⁸ Norman P. Tanner, *The Church in Late Medieval Norwich* (Toronto: Pontifical Institute of Medieval Studies, 1984), pp. 222-223.

⁶³⁹ J. A. F. Thomson, ‘Piety and Charity in Late Medieval London,’ *Journal of Ecclesiastical History* 16 (1965), p. 185.

⁶⁴⁰ P. H. Cullum, ‘“And Hir Name was Charite”: Charitable Giving by and for Women in Late Medieval Yorkshire,’ in *Women in Medieval English Society*, P.J.P. Goldberg (ed.) (Phoenix Mill: Sutton Publishing, 1997), pp. 182-221, esp. p. 184. Between 1440 and 1459, however, the figure fell to 40.60 per cent (*ibid.*, p. 184).

⁶⁴¹ Peter Heath, ‘Urban Piety in the Later Middle Ages: the Evidence of Hull Wills,’ in *Church, Politics and Patronage*, Barrie Dobson (ed.) (Gloucester: Alan Sutton, 1984), p. 224.

⁶⁴² Joel T. Rosenthal, *The Purchase of Paradise. Gift Giving and the Aristocracy, 1307-1485* (London: Rutledge and Kegan Paul, 1972), p. 103.

of piety. The distribution of grain among the anchorites, prisoners and poor by the Priory authorities, embodies, to a great extent, the care for the needy, so typical of late medieval society. After all, Norwich Cathedral Priory was both a religious institution and wealthy temporal lord, and as such, it could not have been indifferent towards the people in need. And above all, the brethren could not evade the fulfillment of their moral obligation, which supposedly earned them entrance to Heaven.

Conclusions

The provisioning of grain was not limited to the Priory Cathedral only. Although the primary concern of the Priory authorities was to feed their own community, they did not ignore the needy people of their town: the hermits and anchorites, prisoners incarcerated in the prison and paupers. The anchorites disappear from the granary rolls by 1316-18, as they disappear from other town records around the same time. Perhaps, their sudden disappearance can be explained by their physical extinction after the troublesome years of 1314-1317. Examining the jail delivery rolls of Norwich Castle, we learn about bad conditions of the prisoners, who, at times, were subject to the arbitrary rule and abuse of their guards. The brethren must have been aware of their hardships and did what they could to support them until their sentence was proclaimed. This was especially true during the 1315-6 season, when the prison was unusually full of felons, when the crime rates rose during the anarchy created by the Great Famine and sheep epizootics.

The largest amount of charity-grain, however, was allocated to the paupers. Here we can distinguish between two types of distribution. The one carried a ritual, or liturgical character and was made on Maundy Thursday, in accordance with Jesus'

mandate to his apostles. The other one had a daily aspect, when the almoner, apparently assisted by other brethren and *famuli*, distributed hundreds of loaves and pints every day. Theologically speaking, the paupers and prisoners were considered to be a part of the same group of 'people in need' and helping them constituted two out of 'six (according to some seven) works of charity'. Finally, the grain distribution by the brethren should be seen in a wider context of late-medieval charity. To that end, we have examined the surviving wills from fourteenth-century Norfolk, and compared them to analogous data from other parts of the country. The analysis of the bequests revealed that caring for paupers and prisoners was a dominant phenomenon in late medieval England and distribution of grain among them was one of its forms. It was regarded as a moral obligation of an able Christian, which earned him a 'passport to Paradise'.

Epilogue. Grain Provisioning in the Era of Agrarian and Economic Transition (c.1280-1370)

The present study looks at the process by which a medieval monastic community within an urban setting was fed by its rural estates in this period of economic, agrarian and environmental change: 1280-1370. These changes were result of a large number of factors, which can all be placed under one umbrella: the crisis of the fourteenth-century. Many aspects of the changing reality of fourteenth-century England have brought forth many scholarly studies and provoked a large number of important debates. It is appropriate to place the current thesis into the context of these studies and too see how it contributes to these debates.

One aspect that has caught a considerable amount of attention was the contraction of arable acreage. Using the *Nonarum Inquisitiones* of 1340-1 as his guide, Alan Baker has shown that there is clear evidence of contracting arable land in Bedfordshire, Buckinghamshire and Cambridgeshire in the early fourteenth century.⁶⁴³ This contraction was, evidently, the result of adverse weather, famine, sea inundation and cattle plagues.⁶⁴⁴ There is similar evidence from the North-East, where the agrarian economy was depressed by a combination of bad weather and Scottish raids in the 1310s. The subsequent decades showed very few signs of recovery.⁶⁴⁵

In Suffolk, on the other hand, the situation was less pessimistic. Although the recuperation from the crisis of 1314-22 was slow, the arable production returned to its

⁶⁴³ Alan Baker, "Evidence in the 'Nonarum Inquisitiones' of Contracting Arable Lands in England during the Early Fourteenth Century," *Economic History Review* 19:3 (1966), 518-532.

⁶⁴⁴ Campbell, 2000, p.380

⁶⁴⁵ Chris Briggs, 'Taxation, Warfare, and the Early Fourteenth Century 'Crisis' in the North: Cumberland Lay Subsidies, 1332-1348,' *Economic History Review* 58:4 (2005), 639-672; Ben Dodds, *Peasants and Production in the Medieval North-East: The Evidence from Tithes, 1270-1536* (Woodbridge: Boydell and Brewer, 2007), pp. 66-70.

pre-famine level by c. 1340.⁶⁴⁶ Our accounts show no signs of such contraction until the Black Death and it seems that Norfolk escaped the crisis better than many other parts of England. As we have seen, the arable portion of the Priory estate during the 1320s and 1340s (at least until 1349) consisted of nearly 3,000 acres, which matched the pre-1315 years. The reduction of the arable during the 1330s (to about 2,500 acres) is, however, to be ascribed to the temporary leasing of three manors. This indicates that arable contraction was a regional phenomenon.

Formerly, some historians had argued that the Black Death, and the subsequent depopulation, immediately brought about yet another prolonged period of contraction of the arable sector of the demesne. But such views are no longer widely held. Indeed, A.R. Bridbury has characterized the period between 1351 and 1376 as the ‘Indian Summer’ of demesne farming.⁶⁴⁷ Subsequently, when the grain prices finally collapsed and *real wages* rose, as a result of exceptionally good harvests from 1375, many lords did begin a retreat from direct demesne farming, in leasing manors or portions of their demesnes to able tenants. By 1450, nearly all demesnes throughout England have been leased out, with a few notable exceptions.⁶⁴⁸

In the Norwich Priory estates, however, this process had in fact begun much earlier than in many other parts of England. Vacaries, dairy-houses and poultry of some demesnes were leased out as early as c. 1310. Shortly after 1318, Denham was leased out,

⁶⁴⁶ Mark Bailey, *Medieval Suffolk: An Economic and Social History, 1200-1500* (Woodbridge: Boydell and Brewer, 2007), pp. 86-90.

⁶⁴⁷ A.R. Bridbury, “The Black Death,” *Economic History Review* 26:4 (1973), p. 584; idem, *The English Economy from Bede to the Reformation* (Woodbridge: Boydell & Brewer, 1992), pp. 208-9. Most recently, David Stone, *Decision-Making in Medieval Agriculture* (Oxford: Oxford University Press, 2005), pp. 81-120.

⁶⁴⁸ The most curious exception was a Sussex demesne of Alciston, belonging to Battle Abbey, which was at hand up until 1492.

never to be taken back. In the 1330s, three demesnes, Hindolveston, Hindringham and Thornham were leased out, for the first time. After the Black Death Gateley, Hemsby, Monks Granges and North Elmham were leased, Sedgeford, the last directly cultivated demesne, was yielded in 1431. In other words, the situation in Norfolk was similar to that in other counties, with the significant exception that it had begun earlier.

This fact poses the question: Why would manorial lords chose to lease and regain demesnes in different times and different regions? German scholars, studying the agrarian developments of their *patria* in the late Middle Ages and early modern period, provided an analytic tool which they called ‘the switch from *Gutsherrschaft* to *Grundsherrschaft*’.⁶⁴⁹ Basically, *Gutsherrschaft* model is strongly based on market-oriented use of the demesne lands and on a steady and sufficient supply of relatively cheap labour, either servile or (semi)-free. The *Grundsherrschaft* model, on the other hand, is based on rents from peasant tenancies, whether free or unfree. The leasing of the demesne sector, in turn, increases the productive and commercial opportunities of the tenants. In essence, the gradual leasing of the Norwich Cathedral Priory demesnes reflect this transition from the *Gutsherrschaft* to the *Grundsherrschaft*. The economic behaviour of the Priory authorities was dictated, to a large degree, by the issue of relative costs and prices of marketable commodities. If marketable commodity prices were declining, while costs of production / labour / management were not, then it was more profitable to lease sections of the demesne to the tenants, on the basis of fixed rental contracts. These leasehold contracts could vary from one year up to as much as 25 years and they ensured that rented values remain stable, and indeed that their real values rose with deflation (i.e.,

⁶⁴⁹ For example, William Hagen, “How Mighty the Junkers? Peasant Rents and Seigneurial Profits in Sixteenth-Century Brandenburg,” *Past and Present* no. 108 (August 1985), 80-116.

falling prices). In addition, the lords did not surrender their property rights over their demesne.

If, however, the prices were rising, over a period, then it was only natural for the lords to take back the demesne lands. This logic is reflected in Norfolk reality of the fourteenth-century. In the 1330s, when grain prices declined, the Priory authorities leased three productive demesnes, Hindolveston, Hindringham and Thornham. When the prices began to rise in the 1340s, the Priory took the estates back. The earlier price behaviour – i.e. falling prices – was similar in the later 1370s and 1380s and it was then that the Priory renewed the leasing policy. After the 1370s, the manorial accounts do not contain the farming and livestock portions and, as a result, our knowledge of demesne agriculture in the late fourteenth- and fifteenth-centuries is, unfortunately, very limited. For the same reason, such a lack of documents prevented any analysis of Norwich Cathedral Priory's demesne economy after the 1370s.

The leasing of the demesne sector continued well into the late fifteenth century, when it came to be replaced with the Tudor-Stuart Enclosure movement. According to the Beresford-Blanchard thesis, the enclosure movement was caused (and not *causing*, as some would suggest), by long-term demographic decline and stagnation and, consequently, a large number of vacated parcels of land, formerly constituting the demesne.⁶⁵⁰ Is it possible that the enclosure movement was, in fact, the return to the *Gutsherrschaft* model?

It may be somewhat puzzling, however, to comprehend why the Priory authorities leased four demesnes in the 1350s, when this was an era of a continuous rise in grain

⁶⁵⁰ M.W. Beresford, *The Lost Villages of England* (England, 1954); Ian Blanchard, "Population Change, Enclosure and the Early Tudor Economy," *Economic History Review* 23 (1970), 427-445.

prices. Perhaps, this can be explained by the depopulation brought about by the Black Death.⁶⁵¹ In the era of labour scarcity, many arable acres lay uncultivated; this, in turn, would not have allowed the lord to maximize his commercial profits from the arable available to him. Leasing demesne would have been the only immediate alternative, despite rising prices in the grain sector. This reality contradicts the well-known demographic model proposed by David Ricardo (1772-1823).⁶⁵² In his *Principles of Political Economy and Taxation* (first published in 1817), Ricardo contended, *inter alia*, that depopulation would inevitably lead to falling grain prices and rents, on the one hand, and rising *real* wages, on the other hand. Obviously, the Ricardian model does not hold in the case of post-Black Death England, not until after the late 1370s.⁶⁵³

The changing geography of crops is yet another aspect of these fundamental changes. Ambrose Raftis, in his study on Huntingdonshire and Cambridgeshire estates of Ramsey Abbey, showed that the post-Black Death era was marked by a pronounced reduction of wheat acreage, which fell by almost half, at the expense of barley. At the same time, there was an augmentation of legume acreage.⁶⁵⁴ Similarly, Bruce Campbell has also shown that wheat, rye and oat acreage declined in favour of barley and legumes, at least in Norfolk and the ten FTC (=Feeding the City [London]) counties. In addition, he found that the decline of rye and oat acreage was considerably greater than that of

⁶⁵¹ For post-1348 demographic developments in England, see Edward Miller and John Hatcher, *Medieval England: Rural Society and Economic Change, 1086-1348* (London, 1978), pp. 27-63; John Hatcher, *Plague, Population and the English Economy, 1348-1530* (London, 1977), pp. 11-73; John Hatcher, A.J. Piper and David Stone, "Monastic Mortality: Durham Priory, 1395-1539," *The Economic History Review* 59:4 (2006), 667-687; John Hatcher, "England in the Aftermath of the Black Death," *Past and Present* no. 144 (August 1994), pp. 3-35; John Hatcher and Mark Bailey, *Modeling the Middle Ages: The History and Theory of England's Economic Development* (Oxford: Oxford University Press).

⁶⁵² David Ricardo, *Principles of Political Economy and Taxation* (London, 1817; 3rd ed. 1821)

⁶⁵³ Holmes, G.A. *The Estates of the Higher Nobility in Fourteenth-Century England* (Cambridge, 1957)

⁶⁵⁴ J. Ambrose Raftis, *The Estates of Ramsey Abbey. A Study in Economic Growth and Organization* (Toronto: Pontifical Institute for Mediaeval Studies, 1957), pp.159-190.

wheat, the premier bread grain.⁶⁵⁵ The relative shift to barley was in response to the increasing per capita demand and consumption of ale, which reflects the rise in living standards, though only from the 1370s. These developments are not reflected in our accounts. Instead, we have witnessed a gradual expansion of wheat at the expense of rye, a reduction of the legume acreage and more or less equilibrium between the oat and barley sectors. This reveals, once more, the regional uniqueness of Norfolk as a strongly barley-biased country. If there has been a growing demand for barley and ale in the post-plague era, it did not change the proportion of barley acreage, since it was already large enough to intoxicate the local population. In other words, the demesnes of Norwich Priory do not reflect more general trends in the composition of production, both before and after the Black Death. This, in turn, stresses the importance of regional variances in agricultural production.

In an era of commercial instability, marketing the majority of annual harvests might have been too risky. Instead, the lords chose to retain large proportions of their grain products on the demesne for domestic consumption. As Bruce Campbell has shown, about 40 per cent of total grain receipt was sold in the period between 1288 and 1315,⁶⁵⁶ and about 36 per cent between 1375 and 1450.⁶⁵⁷ Between 1290 and 1360, around 40 per cent of the total receipt on an Oxfordshire demesne of Cuxham was sold.⁶⁵⁸ In this department, the Priory authorities were even less daring than their colleagues in other parts of England: for over the entire period, they did not sell more than 20 per cent of

⁶⁵⁵ Bruce Campbell, 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History* 57: 4 (1997), pp. 832-9.

⁶⁵⁶ Campbell et al., 1993, pp. 153-155; Bruce Campbell, 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History* 57: 4 (1997), 827-58 (esp. p. 846)

⁶⁵⁷ *ibid.*, p. 846.

⁶⁵⁸ Calculated from *Manorial Records of Cuxham, Oxfordshire circa 1200-1359*, P.D.A. Harvey (ed.) (London, 1976).

their total farinaceous products. Similarly, their dependence on the local market was very limited: on average, 80 per cent of grain and malt reaching the Priory came from the estates, while the remaining 20 per cent was purchased either in or around Norwich. This could be ascribed to a continual commercial contraction of the Norwich hinterland, between c.1315 and 1350, as Pamela Nightingale has found.⁶⁵⁹

Did the Great Famine of 1314-22, caused by the disastrous weather of 1314-17, have any impact on arable farming? Very few, if any, would doubt that. Very low yields brought starvation to many in England, as well as in other parts of Northern Europe. It is important to differentiate here between the manorial tenants, on the one hand, and the Priory community, on the other. As tithe accounts from Eaton and Sedgeford indicate, these were indeed hard years for the peasants, because their production fell to a very low level, insufficient to sustain themselves. Surprisingly enough, the provisioning of the Priory seems not to have been affected by the agrarian crisis. The brethren received 1,974 and 1,814 quarters of grain in 1314-5 and 1315-6 respectively, while in 1313-4 and 1317-8 the total amount was 1,998 and 1,471 quarters, respectively.⁶⁶⁰ This contradicts the notion that the Famine ravaged both the wealthy and poor.⁶⁶¹ It is unclear how the Priory escaped the famine and managed to feed itself as well as in the normal years. As I have suggested above, it is possible that the Priory authorities simply decreased the grain proportion available for sale and increased the amount sent for consumption by the monastic community. Unfortunately, this hypothesis cannot be proved, because of the

⁶⁵⁹ Pamela Nightingale, 'Norwich, London, and the Regional Integration of Norfolk's Economy in the First Half of the Fourteenth Century', in *Trade, Urban Hinterlands and Market Integration c.1300-1600*, James A. Galloway (ed.), Centre for Metropolitan History, Working Papers Series, No. 3 (London: 2000), pp. 83-101

⁶⁶⁰ See above, pp. 127-134.

⁶⁶¹ Henry S. Lucas, 'The Great European Famine of 1315-7', *Speculum* 5:4 (1930), p. 355; William Chester Jordan, *The Great Famine: Northern Europe in the Early Fourteenth Century* (Princeton: Princeton University Press, 1996), pp. 78-79.

lack of manorial evidence from the famine years, since no manorial accounts for 1315-6 and 1316-7 survive. It is clear, however, that Norwich Priory was undoubtedly luckier than some other monastic houses, such as Bolton Priory, whose provisioning was indeed affected by the famine.⁶⁶²

The present dissertation is equally concerned with the food provisioning and consumption during the 'normal', non-crisis years. The years under study were also the period of change in diet structure, which went hand-in-hand with the rise of living standards in the 1370s, on the one hand, and the conversion to pastoral husbandry, on the other. Before the Black Death, meat and poultry contributed about 10 per cent of the brethren's diet, while fish accounted for about 36 per cent.⁶⁶³ In post-plague decades non-farinaceous products, such as fish, meat and poultry became increasingly important components of the monastic diet.⁶⁶⁴ Because of the lack of bread and ale accounts after 1343, we cannot estimate the shares of farinaceous and non-farinaceous products, but it is likely that the share of meat and fish increased, at the expense of grain consumption. Quite different was the situation in Westminster Abbey, where meat and poultry constituted about 17 per cent, while fish contributed only 6 per cent of the monastic diet, on a regular day.⁶⁶⁵ The augmentation of the meat component in the monastic diet is also found in the cellarer's account of Battle Abbey, but these, unfortunately, do not specify the exact proportion of meat and fish products consumed by the brethren.⁶⁶⁶ Because there are too few studies and sources available in print, we are still unable to determine

⁶⁶² Ian Kershaw, *Bolton Priory. The Economy of a Northern Monastery, 1286-1325* (Oxford: Oxford University Press, 1973), pp. 144-8.

⁶⁶³ See above, pp. 333-4.

⁶⁶⁴ See above, pp. 237-9.

⁶⁶⁵ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 34-71.

⁶⁶⁶ *The Cellarers' Rolls of Battle Abbey, 1275-1513*, Eleanor Searle (ed.), Sussex Record Society 65 (1967), pp. 41-82.

whether the case of Norwich Cathedral Priory was unusual or commonplace. But in all likelihood, increasing purchases and consumption of meat products by Norwich brethren reflects a general change in the diet structure in late medieval England.

The diet accounts also reveal an excessive calorific intake by the monks. Crude estimations indicate that on a regular, non-fasting day, a monk was offered a plate worth over 6,600 kilocalories, at least 60 per cent of which was consumed and the remaining left for the servants. This accords well with the estimations of Barbara Harvey and archaeopathological findings of Philippa Patrick,⁶⁶⁷ and hints that late-medieval monks indulged in over-eating and consequently suffered from obesity. This is, however, still a nascent field and much more should be studied here, given the abundance of available archival material.

To conclude. The present dissertation on grain provisioning of Norwich Cathedral Priory is more than just a regional study. It provides an analytical microcosm of the late-medieval English economy and society in the period of endogenous and exogenous shocks and crises and it reflects, to a large degree, many general aspects and dynamics of the period, the challenges the people had to face and decisions they had to make.

⁶⁶⁷ Barbara Harvey, *Living and Dying in England, 1100-1540. The Monastic Experience* (Oxford: The Clarendon Press, 1993), pp. 34-71; Philippa Patrick, 'Creaking in the Cloisters: Observations on Prevalence and Distribution of Osteoarthritis in Monks from Medieval London,' in *Centre, Region, Periphery. Medieval Europe Basel 2002*, Guido Helmig, Barbara Scholkmann and Matthias Untermann (eds.) (Basel: Folio Verlag Dr. G. Wesselkamp/ Archäologische Bodenforschung Basel-Stadt, 2002), pp. 89-93; eadem, 'An Archaeology of Overindulgence', *Archaeological Review from Cambridge* 20:2 (2005), 98-117; eadem, 'Greed, Gluttony and Intemperance'? *Testing the Stereotype of the 'Obese Medieval Monk'* (PhD Dissertation, University College, London, 2005).

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