Development and Pilot Testing of a Nutrition Attitudes and Knowledge Questionnaire to Measure Changes of Child Nutrition Knowledge related to the Canada's Food Guide

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Complete List of Authors:	Franco-Arellano, Beatriz; Ontario Tech University, Faculty of Health Sciences Brown, Jacqueline M.; Ontario Tech University, Faculty of Health Sciences; The Hospital for Sick Children Froome, Hannah M.; Ontario Tech University, Faculty of Health Sciences LeSage, Ann; Ontario Tech University, Faculty of Education Arcand, JoAnne; Ontario Tech University, Faculty of Health Sciences
Novelty bullets: points that summarize the key findings in the work:	The Nutrition Attitudes and Knowledge (NAK) questionnaire was developed by educators and dietitians, The NAK underwent face and content validity assessments and was pilot tested among children, The NAK questionnaire is a potential tool to detect changes in children's knowledge of the 2019 Canada's Food Guide
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Development and Pilot Testing of a Nutrition Attitudes and Knowledge Questionnaire to Measure Changes of Child Nutrition Knowledge related to the Canada's Food Guide

Beatriz Franco-Arellano¹, Jacqueline M. Brown^{1,2}, Hannah M. Froome¹,
Ann LeSage³, JoAnne Arcand¹

¹Faculty of Health Sciences, Ontario Tech University, Oshawa, Ontario, L1G 0C5, Canada

²The Hospital for Sick Children, Toronto, Ontario, M5G 0A4, Canada

³Faculty of Education, Ontario Tech University, Oshawa, Ontario, L1G 0C5, Canada

Corresponding Author

JoAnne Arcand PhD, RD.

Associate Professor, Faculty of Health Sciences, Ontario Tech University, 2000 Simcoe Street North, Oshawa ON, L1G 0C5 Phone: (647) 296-8426, joanne.arcand@ontariotechu.ca

Beatriz Franco-Arellano: Beatriz.FrancoArellano@ontariotechu.ca

Jacqueline M. Brown: jacqueline.brown1@ontariotechu.net

Hannah Mary Froome: Hannah.Froome@ontariotechu.net

Ann LeSage: Ann.LeSage@ontariotechu.ca

Abstract

Foodbot Factory is a serious game developed to teach children about the 2019 Canada's Food Guide (CFG) healthy eating principles. Because no measurement tools existed to assess changes in children's knowledge of the CFG, the Nutrition Attitudes and Knowledge (NAK) questionnaire was developed for this purpose. The NAK is based on the 2019 CFG nutrition content and aligned with the Foodbot Factory modules (Drinks, Whole Grain foods, Vegetables and Fruit, Protein foods). Seven experts assessed face and content validity of the draft NAK questionnaire. Three sections were deemed valid, while the remaining two required minor revisions. The NAK was pilot tested for changes in nutrition attitudes and knowledge among children 9-10 years-old (n=23), who answered the NAK questionnaire before and after using Foodbot Factory. Significant increases were found in overall nutrition knowledge, and knowledge of Whole Grain foods, Vegetables and Fruit and Protein foods. Knowledge of Drinks and nutrition attitudes remained unchanged. The NAK showed a moderate reliability when tested among a group of children (n=23). While the NAK questionnaire is a promising tool for assessing changes nutrition knowledge related to the 2019 CFG guidelines in children, further research is required to test construct validity of this instrument.

Novelty bullets

- The Nutrition Attitudes and Knowledge (NAK) questionnaire was developed by educators and dietitians.
- The NAK underwent face and content validity assessments and was pilot tested among children.

- The NAK questionnaire is a potential tool to detect changes in children's knowledge of the 2019 Canada's Food Guide.

Keywords

Canada's Food Guide, Children, Nutrition Knowledge, Healthy Eating, Questionnaire, Face and Content Validity

Draft

Introduction

Childhood is a critical period to promote the development of healthy eating principles (Forneris et al. 2010; Craigie et al. 2011). While there are many factors that influence children's food intake (Haines et al. 2019), higher nutrition knowledge, most often measured through questionnaires, has been associated with healthier dietary habits in both children and adults (Kersting et al. 2008; Bonsmann 2014; Spronk et al. 2014; Schultz et al. 2016; Asakura et al. 2017). Nutrition knowledge is also necessary to support behavior change in eating habits (Worsley 2002; de Vlieger et al. 2020). Therefore, improving nutrition knowledge in children has the potential to support long-term health (Health Canada 2016; Clark et al. 2020). The latter is particularly important since many children consume inadequate amounts of vegetables, fruit, and whole grain, while consuming high levels of nutrients of public health concern, such as sodium and sugar (Tugault-Lafleur et al. 2019).

Canadian children learn about healthy eating as part of provincial and territorial elementary and secondary school curricula, largely based on the Canada's Food Guide (CFG) content (Health Canada 2019). Launched in January 2019, the updated CFG currently does not contain child-focused advice or child-friendly educational materials (Health Canada 2019). A serious game (i.e., a game designed for educational purposes) called Foodbot Factory was created to engage children 9 to 11 years-old in learning about CFG (Brown et al. 2020). Foodbot Factory features two 'nutrition scientists' and 'Foodbots' that teach nutrition guidelines across four modules (Drinks, Whole Grain foods, Vegetables and Fruit, Protein foods) and incorporates games and quizzes to engage children (Brown, Savaglio et al. 2020). Although the game underwent extensive testing as part of the iterative development process, including interviews with children to assess their

learning (Brown, Savaglio et al. 2020), no validated questionnaire was available to gain empirical estimates of changes in knowledge.

Quantifying the impact of nutrition education on knowledge requires validated questionnaires (Bradette-Laplane et al. 2017). In Canada, there is only one known validated nutrition knowledge questionnaire based in the CFG (Bradette-Laplane, Carbonneau et al. 2017); however, this questionnaire was designed for the adult French-Canadian population and was developed based on the 2007 CFG. Additionally, psychometric properties (e.g., validity and reliability) of existing knowledge measuring tools have been alarmingly underreported (Newton et al. 2019). To date, there is no known questionnaire that aims to measure changes in nutrition knowledge in children based on the 2019 CFG. Therefore, this study reports the development, face and content validity assessment, pilot testing and internal consistency (reliability) of the Nutrition Attitudes and Knowledge (NAK) questionnaire, a brief questionnaire developed based on the 2019 CFG and aligned with the Foodbot Factory educational content.

Materials and methods

Research ethics

Research ethics approval was received by the Durham Catholic District School Board and Ontario Tech University (File No. 15010). Informed assent and consent were obtained from participant children and their parent/guardians, respectively.

Item development and format of the questionnaire

The NAK questionnaire was developed by a team of educators and dietitians to assess changes in children's knowledge of the 2019 CFG (Health Canada 2019), after using Foodbot

Factory (Brown, Savaglio et al. 2020). Because it is intended for children, the NAK questionnaire is purposefully brief. The first draft of the NAK questionnaire contained 23 items, with one section evaluating nutrition attitudes and four sections assessing nutrition knowledge associated with the different food groups. The nutrition attitudes section contained one open-ended and four 5-point Likert scale questions (e.g., “Eating healthy now can help me be healthy in the future”), with higher scores indicating more positive attitudes about nutrition. Thirteen multiple choice and five true/false questions were developed to reflect knowledge of the CFG food groups: Drinks, Whole Grain foods, Vegetables and Fruit, and Protein foods (both animal and plant-based).

Face and content validity

To determine if each item in the NAK questionnaire was appropriate and relevant for children and if items covered the necessary components of the 2019 CFG, experts in clinical nutrition, nutrition research and education assessed face and content validity (Connell et al. 2018). A sample of 6-10 experts is sufficient based on published guidelines for this type of validation (Rubio et al. 2003). Assessment occurred in February and March 2019, through an online survey where experts answered questions asking for broad feedback on the face validity of the NAK questionnaire overall and on the individual questions (**Supplementary Table S1**). A structured evaluation was also included to assess expert agreement on both the face and content validity of each section (e.g., “This section is readable for children aged 9-11”, “Questions in this section cover the most important concepts regarding child healthy eating attitudes”). Experts answered these structured questions on a 5-point Likert scale. Data on the face and content validity were subsequently used to modify and optimize the NAK questionnaire. Twenty-five items were

included in the revised NAK questionnaire, with five items assessing nutrition attitudes and twenty items assessing nutrition knowledge (**Figure 1**).

Pilot testing and internal consistency (reliability) assessment

Sample: Children at an elementary school

To assess whether the NAK questionnaire was able to measure changes in nutrition knowledge and attitudes, a sample of grade 4 students (ages 9-10) from a single classroom participated in a single arm, pre-post pilot study, conducted in May 2019. Participants (n=25) played with Foodbot Factory on a tablet for 20-30 minutes per day for two days. During gameplay they learned CFG key nutrition concepts in four modules (approximately 15 minutes of playtime per food group module). The NAK questionnaire was administered immediately before participants used Foodbot Factory and on a third day after all modules were completed. Children independently completed the NAK questionnaire on both occasions. Internal consistency (i.e., reliability) of the test was calculated pre-test and post-test.

Statistical Analyses

Face and content validity

Experts' face and content validity ratings (expressed as frequencies and proportions) were calculated individually for each section. A score of 4-5 in the Likert scale questions was considered "valid", while scores of 3 or 1-2 were considered "neutral" or "invalid", respectively. If $\geq 80\%$ of experts deemed a section "valid" then that item was considered appropriate, with sections between 70-79% interpreted as "needing revision", and those sections below 69% were interpreted as

“needing significant revision”. This approach has been used in comparable studies (Zamanzadeh et al. 2015; Heikkilä et al. 2018).

Pilot testing and internal consistency (reliability)

For the school sample, nutrition attitudes and nutrition knowledge scores were calculated and assessed separately. A nutrition attitudes score was calculated by adding the sub-scores of the four 5-point Likert scale questions, for a total of 20 points (1 section, 4 questions with a maximum of 5 points each). An overall composite score was calculated for nutrition knowledge. Each correct answer was assigned 1 point, which combined to a weighted a maximum of 20 points (4 sub-scores, 5 questions per sub-score with a maximum of 1 point each). Paired t-tests analyzed the changes in the nutrition attitudes score, the overall nutrition knowledge score and each of the four nutrition knowledge sub-scores. In analyses of individual NAK questionnaire items, changes in the proportion of correct nutrition knowledge answers were analyzed using chi-square tests. Stratification by gender was not conducted due to the small sample size. The Cronbach's α coefficient, which is a measure of reliability or internal consistency, was calculated for nutrition attitudes and nutrition knowledge separately for results pre-test and post-test. A p -value of 0.05 was considered statistically significant. Analyses were conducted using R Studio.

Results

Face and Content Validity

Seven experts in nutrition ($n= 1$) and education ($n= 6$) assessed the face and content validity of the questionnaire. **Table 1** shows the relevance of each of the five sections of the NAK. Three sections were deemed valid (Nutrition Attitudes, Drink, Protein foods), while the remaining two

(Whole Grain foods, Vegetables and Fruit) required minor revisions. Items that required amendments were reviewed and revised alongside open-ended feedback provided from experts. Revisions included one wording modification, conversion of four questions from True/False question format to multiple choice question format, and the addition of two questions to broaden content coverage (**Figure 1**).

Pilot testing and internal consistency (reliability)

In the school sample, twenty-five (n=25) Grade 4 children participated in the pre/post study at the elementary school (specific age and gender not captured). Data from 2 students were excluded from analyses due to missing pre or post data. The NAK questionnaire took 10 to 15 minutes to complete. **Table 2A** presents the nutrition attitudes and nutrition knowledge scores. There were no significant differences in nutrition attitudes; however, participants had positive nutrition attitudes at baseline. Statistically significant increases in nutrition knowledge were observed in the overall composite score from 11.1 ± 2.6 pre-test to 14.3 ± 2.4 ($p < 0.001$) post-test. Statistically significant increases in nutrition knowledge were also found in the sections of Whole Grain foods, Vegetables and Fruit, and Protein foods. Changes in nutrition knowledge for Drinks were not statistically significant; however, knowledge of drinks was already high at baseline. **Table 2B** shows a detailed assessment of correct answers among participants. Cronbach's α coefficients were 0.98 and 0.98 for nutrition attitudes pre-test and post-test, respectively. The Cronbach's α coefficients for nutrition knowledge were 0.41 pre-test and 0.44 post-test. Detailed information for each individual question is presented in **Supplementary Table S2**.

Discussion

This study presents the development of a questionnaire to empirically evaluate changes in nutrition attitudes and knowledge in children after they learn about the 2019 CFG using Foodbot Factory. The NAK questionnaire was subjected to face and content validity, pilot testing and evaluated for internal consistency (reliability). This study addresses an important gap in research, since few tools exist to appropriately measure changes in nutrition knowledge, particularly for children (Vereecken et al. 2012; Newton, Racey et al. 2019).

Previous questionnaires developed to assess nutrition knowledge have some limitations, such as focusing on limited aspects of food and nutrition (e.g., general knowledge or knowledge of one nutrient), content based on outdated recommendations, lack of tools available for assessing children's knowledge, and/or lack of reporting regarding validity and reliability testing (Spronk, Kullen et al. 2014; Newton, Racey et al. 2019), which are critical factors required to adopt or adapt existing tools (Newton, Racey et al. 2019). Through the feedback provided by nutrition and education experts, adjustments were made to the NAK questionnaire to ensure it was appropriate and relevant for children in the target age group (Bradette-Laplante, Carboneau et al. 2017), including changes to improve readability and understanding for children ages 9-11. Moreover, the pilot testing of the NAK questionnaire determined the NAK was appropriate to detect changes in nutrition knowledge for the target population. The pilot testing showed that the NAK can be used in schools or other community settings, which are places where interventions to educate about the CFG can occur. These results on testing the validity of the NAK questionnaire demonstrate that it can support public health interventions aimed to educate children about the CFG. While our results showed a moderate reliability in the school sample, such results are comparable to studies that

evaluated nutrition knowledge in children in similar settings (Liquori et al. 1998; Saksvig et al. 2005; Rih et al. 2012; Rani et al. 2012; Viggiano et al. 2015).

A limitation of this study was the small participant sample size in the pilot testing. For validation studies, particularly those that include multivariate analyses, a minimum sample size of 100 participants is recommended (Anthoine et al. 2014). While this study provided insights to the validity of the questionnaire and its potential ability to detect changes in nutrition knowledge, replicating this study using a larger sample size (>100 participants) that can provide greater statistical power would be beneficial to strengthen these findings. Another limitation was that there was only one nutrition expert validating the tool. However, the research team did include an experienced senior nutrition researcher that was involved in the development and evaluation of the final questionnaire. The current study did not include other measures of validity such as construct validity and test-retest reproducibility. Construct validity determines if the questions are providing a good measure of the *construct* (Parmenter et al. 2000; Streiner et al. 2014), which in this case is knowledge of the 2019 CFG guidelines. A common method to assess construct validity is to compare the questionnaire between two groups, with one group having a higher scores than the other (Parmenter and Wardle 2000; Bradette-Laplane, Carbonneau et al. 2017). Therefore, the construct validity of the NAK questionnaire could be assessed by comparing the responses of older children/teens or dietetic programs students to those of children 9-11 years-old (i.e., the target population). Test-and retest reproducibility can also be conducted by administering the questionnaire to the same sample of participants under the same conditions within a certain period of time, usually between 2-14 days up to 3 months (Parmenter and Wardle 2000; Bland et al. 2002; Streiner, Norman et al. 2014). Westen and Rosenthal argued that construct validity is a continual process (Westen et al. 2003), meaning that an instrument can be continuously refined, a statement

also supported by other research (Vereecken, De Pauw et al. 2012). Therefore, future research is warranted to update the NAK to better assess changes in nutrition attitudes and knowledge in children.

The NAK questionnaire is among the first tools that have attempted to measure changes in knowledge of 2019 CFG among children; thus, there are several strengths in this study. First, not only was the NAK questionnaire developed almost immediately after the launch of the 2019 CFG, but also it was developed to assess changes in knowledge, a construct often given low priority compared to other constructs such as nutrition intake or adherence to dietary guidelines. It is important to note that a questionnaire for assessing nutrition knowledge of the 2007 CFG was developed previously (Bradette-Laplane, Carbonneau et al. 2017), which could have been used as a baseline questionnaire. However, that questionnaire did not include child-specific questions or language. In addition, the content of the 2019 CFG differs from the 2007 CFG version since nutrition guidelines are not based on specific amounts of servings of certain foods (as in the 2007 version), and the 2019 CFG promotes a more holistic approach by incorporating both healthy food choices and eating behaviours. Second, face and content validity of the NAK occurred through a collaboration with an interdisciplinary expert panel. The results of this study disclosed data from the different phases in the development of the tool, including face and content validity and internal consistency (reliability), as well as results from the pilot test among the target population. These types of data are often omitted in published research (Kirkpatrick et al. 2017; Newton, Racey et al. 2019). Third, while the NAK does not measure changes in dietary behaviours (such as changes in dietary intake), it could be used in conjunction with established methods that assess dietary behaviours, such as food recalls or food frequency questionnaires, as these methods do not assess nutrition knowledge (Newton, Racey et al. 2019).

As interventions aimed to improve healthy eating are implemented to teach about the 2019 CFG, including innovative tools like Foodbot Factory, having instruments that evaluate changes in nutrition knowledge are crucial to determine if such interventions are effective. Educators and health professionals can benefit from the availability of the NAK questionnaire to easily assess and support nutrition education for children in Canada. This questionnaire can be adapted for use in other child-focused learning environments, accelerating the development of similar tools. While the NAK questionnaire may be a promising tool for assessing changes in nutrition knowledge related to the 2019 CFG guidelines, further research will strengthen this tool to support its broad use in assessing changes in nutrition knowledge in children.

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Conflict of Interest: The authors declare there are no competing interests.

Contributors' statement: J.A., J.M.B. and H.M.F contributed to the conceptualization and design of the study; J.M.B. and H.M.F collected data; A.L. assisted with the questionnaire development; B.F.A. analysed the data and drafted the final manuscript; all authors provided critical revisions for intellectual content and read and approved the final version.

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Figure Caption

Figure 1. Nutrition Attitudes and Knowledge Questionnaire

Table 1. Expert assessment of face and content validity of the Nutrition Attitudes and Knowledge (NAK) Questionnaire

Subcomponents	Not relevant (1-2)	Neutral (3)	Relevant (4-5)	Interpretation ^a
<i>Face validity</i>				
Nutrition attitudes items	0 (0)	1 (14.3)	6 (85.7)	Appropriate
Drinks items	0 (0)	0 (0)	7 (100)	Appropriate
Whole Grain food items	0 (0)	1 (14.3)	6 (85.7)	Appropriate
Vegetables and Fruit items	0 (0)	1 (14.3)	6 (85.7)	Appropriate
Protein food items	0 (0)	0 (0)	7 (100)	Appropriate
<i>Content Validity</i>				
Nutrition attitudes items	0 (0)	0 (0)	7 (100)	Appropriate
Drinks items	0 (0)	1 (14.3)	6 (85.7)	Appropriate
Whole Grain food items	0 (0)	2 (28.6)	5 (71.4)	Needs Revision
Vegetables and Fruit items	0 (0)	2 (28.6)	5 (71.4)	Needs Revision
Protein food items	0 (0)	1 (14.3)	6 (85.7)	Appropriate

Note: Data presented as n (%). ^a If the proportion of experts deeming the subcomponents valid was 80% or higher it was interpreted as appropriate, those between 70-79% was interpreted as needing revision, and those below 69% was interpreted as needing significant revision

Table 2. Results of the pre-post testing that assess the NAK among children aged 9-11, elementary school sample (n=23)

		<i>Pre-test</i>	<i>Post-test</i>	
<u>A. Nutrition attitudes and nutrition knowledge score and sub-scores</u>				
	Maximum Score	Mean $\pm$ SD	Mean $\pm$ SD	p-value ^a
Score of nutrition attitudes	20	15.7 $\pm$ 6.5	14.4 $\pm$ 7.9	p=0.278
AQ2. Healthy eating should be an important part of my life	5	3.9 $\pm$ 1.7	3.7 $\pm$ 2.0	p=0.435
AQ3. What I eat can affect my current health	5	3.8 $\pm$ 1.7	3.5 $\pm$ 2.0	p=0.307
AQ4. My family thinks healthy eating is important	5	3.9 $\pm$ 1.7	3.5 $\pm$ 2.0	p=0.187
AQ5. Eating healthy now can help me be healthy in the future	5	4.1 $\pm$ 1.7	3.8 $\pm$ 2.1	p=0.286
Composite score of nutrition knowledge	20	11.1 $\pm$ 2.6	14.3 $\pm$ 2.4	p<0.001
Drinks sub-score	5	3.8 $\pm$ 0.9	4.1 $\pm$ 0.7	p=0.187
Whole Grain Foods sub-score	5	2.6 $\pm$ 1.6	3.4 $\pm$ 1.0	p=0.013
Vegetables and Fruits sub-score	5	2.7 $\pm$ 1.2	3.6 $\pm$ 1.1	p<0.001
Protein Foods sub-score	5	2.1 $\pm$ 1.0	3.2 $\pm$ 1.2	p=0.003
<u>B. Detailed assessment of correct answers</u>				
Drinks		n (%)	n (%)	p-value ^b
KQ1. What is the best thing to drink when you are thirsty?		21 (91)	23 (100)	p=0.470
KQ2. Which drink should only be enjoyed once in a while?		22 (96)	21 (91)	p=1
KQ3. Dairy and unsweetened soy milk are a good source of which nutrients?		10 (43)	13 (57)	p=0.555
KQ4. Why is drinking water regularly important for your health?		18 (78)	20 (87)	p=0.697
KQ5. Fruit juices, like orange and apple juice, are a sugary drink (T/F).		17 (74)	18 (78)	p=1
Whole Grain Foods				
KQ6. Which type of grain foods should you choose most often?		11 (48)	21 (91)	p=0.003
KQ7. Whole grain bread contains all 3 parts of the grain kernel (Bran, Endosperm and the Germ) – all of which play an important role in your health. Examples of whole grains include:		18 (78)	19 (83)	p=1
KQ8. Compared to white bread, whole grain bread is higher in which nutrient?		16 (70)	19 (83)	p=0.489
KQ9. Why is fibre an important nutrient for your health?		6 (26)	7 (30)	p=1
KQ10. When grain foods are refined some parts are removed. What happens to the nutritional content of refined grains food when these parts are removed?		8 (35)	12 (52)	p=0.372

Vegetables and Fruits			
KQ11. Vegetables and fruits are a good source of	15 (65)	15 (65)	p=1
KQ12. Every day you should try to eat vegetables and fruits that are different	16 (70)	21 (91)	p=0.137
KQ13. What nutrient can you find in fruit that is not found in fruit juice?	6 (26)	8 (35)	p=0.749
KQ14. How much of your plate should be vegetables and fruits?	7 (30)	17 (74)	p=0.008
KQ15. When choosing canned or frozen vegetables and fruits, you should try to choose options that do not contain added _____.	17 (24)	22 (96)	p=0.101
Protein Foods			
KQ16. A diet high in which type of fat can cause heart disease?	4 (17)	15 (65)	p=0.003
KQ17. What type of protein food should you eat more often?	12 (52)	10 (43)	p=0.768
KQ18. Which protein food is also a source of fibre?	12 (52)	20 (87)	p=0.025
KQ19. Processed meats, like hot dogs and chicken nuggets, are high in which nutrients?	11 (48)	16 (70)	p=0.231
KQ20. Which animal protein may contain unsaturated fats?	9 (39)	13 (57)	p=0.376

Note: SD – Standard Deviation; AQ – Attitudes Question; KQ – Knowledge Question; T/F – True/False; V&F – Vegetables and Fruit. ^a As determined by paired t-tests. ^b Determined by the chi-square test.

Figure 1. Nutrition Attitudes and Knowledge Questionnaire

Number: _____

AQ1. What does healthy eating mean to you?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
AQ2. Healthy eating should be an important part of my life	1	2	3	4	5
AQ3. What I eat can affect my current health	1	2	3	4	5
AQ4. My family thinks healthy eating is important	1	2	3	4	5
AQ5. Eating healthy now can help me be healthy in the future	1	2	3	4	5

Drinks

KQ1. What is the best thing to drink when you are thirsty?

- a. **Water**
- b. Soft Drinks/pop
- c. Milk
- d. Unsweetened Soy Milk

KQ2. Which drink should only be enjoyed once in a while?

- a. Water
- b. **Soft Drinks/Pop**
- c. Milk
- d. Unsweetened Soy Milk

KQ3. Dairy and unsweetened soy milk are a good source of which nutrients?

- a. Vitamin A & B
- b. **Calcium & Vitamin D***
- c. Fibre & Vitamin C
- d. Sodium & Saturated Fat

KQ4. Why is drinking water regularly important for your health?

- a. Water contains vitamins and minerals that help you grow
- b. **Water keeps your body hydrated**
- c. Water is a good source of energy
- d. Water is a good source of fibre

KQ5. Fruit juices, like orange and apple juice, are a sugary drink.

- a. **True**
- b. False

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KQ6. Which type of grain foods should you choose most often?

- a. Refined grain foods
- b. Millet grain foods
- c. **Whole grain foods**
- d. Wheat grain foods

KQ7. Whole grain bread contains all 3 parts of the grain kernel (Bran, Endosperm and the Germ) – all of which play an important role in your health. Examples of whole grains include:

- a. Quinoa
- b. Whole Grain Bread
- c. Flour Tortillas
- d. **A&B**

KQ8. Compared to white bread, whole grain bread is higher in which nutrient?

- a. Sugar
- b. Sodium
- c. **Fibre**
- d. Saturated fat

KQ9. Why is fibre an important nutrient for your health?

- a. Fibre helps you feel full for longer
- b. Fibre gives you energy
- c. **Fibre keeps your digestive system healthy**
- d. A&C

KQ10. When grain foods are refined some parts are removed. What happens to the nutritional content of refined grains food when these parts are removed?

- a. Fibre is added
- b. **Vitamins, minerals and fibre are removed**
- c. Vitamins and minerals are added
- d. There is no change to the nutritional content

Vegetables and Fruit

KQ11. Vegetables and fruits are a good source of _____.

- a. Toxins
- b. **Vitamins & minerals**
- c. Protein
- d. Fat

KQ12. Every day you should try to eat vegetables and fruits that are different _____.

- a. Shapes
- b. Colours
- c. Textures
- d. **All of the above**

KQ13. What nutrient can you find in fruit that is *not* found in fruit juice?

- a. Iron
- b. Vitamin C
- c. **Fibre**
- d. Calcium

KQ14. How much of your plate should be vegetables and fruits?

- a. $\frac{1}{4}$
- b. $\frac{1}{3}$
- c. $\frac{1}{2}$
- d. $\frac{3}{4}$

KQ15. When choosing canned or frozen vegetables and fruits, you should try to choose options that do not contain added _____.

- a. Fibre & carbohydrates
- b. **Sodium**
- c. Vitamins & minerals
- d. Protein

Protein foods

KQ16. A diet high in which type of fat can cause heart disease?

- a. **Saturated fat**
- b. Unsaturated fat
- c. Omega-3 fatty acids
- d. None of the above

KQ17. What type of protein food should you eat more often?

- a. Pork
- b. Chicken
- c. Beef
- d. **Plant protein foods**

KQ18. Which protein food is also a source of fibre?

- a. Chicken
- b. **Beans**
- c. Beef
- d. Fish

KQ19. Processed meats, like hot dogs and chicken nuggets, are high in which nutrients?

- a. **Sodium & saturated fat**
- b. Fibre & carbohydrates
- c. Sugar & water
- d. Omega-3 fatty acids & unsaturated fat

KQ20. Which animal protein may contain unsaturated fats?

- a. **Steak**
- b. **Fish**
- c. Milk