Development and Validation of a 10-item Questionnaire Assessing Vegetable and Fruit Consumption Behaviors in Low-Income 9-11 Year Olds

THESIS

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ABSTRACT

Underserved groups eat fewer vegetables and fruits compared to families who are not low-income; thus, a target message of low-income nutrition education programs is to increase vegetable and fruit consumption. Validated instruments for measuring behavioral outcomes are important for determining and documenting the effectiveness of these programs, yet many of the questionnaires used to gather behavioral outcome information in children have not been validated.

The specific aims of the study were to: 1) develop a questionnaire measuring behavior changes in vegetable and fruit consumption for low-income 9-11 year olds, 2) assess the questionnaire for content validity via judgment of an expert panel and, 3) assess the questionnaire for face validity via focus groups with 9-11 year olds.

A comprehensive review of child nutrition questionnaires was performed using a search on relevant databases (such as MEDLINE, ERIC, and WORLDCAT) as well as electronic sources through relevant journals and other documents. Forty-two questions were chosen based on the target audience, to measure behavior change, and relate to vegetable and fruit consumption. The research team in response to recommendations in the Dietary Guidelines for Americans 2010 also developed twelve questions. A total of 54 questions were assessed.

An expert panel (n=95) was recruited through purposive sampling to evaluate the questions for content validity using 3 constructs: 1) students will understand the question, 2) students can answer the question, and 3) the question
will assess behavior change. After the results of the expert panel were analyzed with
$\alpha=0.1$, questions that received 75% or greater agreement among the constructs and
a power $\geq 0.5$ were considered to have content validity and were then assessed for
face validity. Seven focus groups (FG) were performed with low-income 9-11 year
olds and four major themes were identified.

The results are 10 content and face validated questions assessing behavior
changes in vegetable and fruit consumption in low-income 9-11 year olds.
To my mother, who taught me to always have faith and to never give up, and my father, who always believed that I could achieve anything.
ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

The percentage of overweight and obese people in the US population has increased significantly in the last few decades (1). In the early 1970’s, obesity was not as prevalent in the young US population. Only 5% of 2-5 year olds, 4% of 6-11 year olds, and 6% of 12-19 year olds were obese (2). According to 2007-2008 data, 10% of 2-5 year olds, 10% of 6-11 year olds, and 18% of 12-19 year olds were obese (2). One of the ways that the US government plans to reduce the rate of obesity in the population is through nutrition education programs (3).

The Education segment of the Supplemental Nutrition Assistance Program (SNAP-Ed) is an initiative of the United States Department of Agriculture (USDA) Food and Nutrition Service to help low-income families participating in the Supplemental Nutrition Assistance Program (SNAP, formerly food stamp program) to develop skills to improve their diets (4). SNAP-Ed targets two primary groups: youth and adults (4). The goal of SNAP-Ed is to teach its participants how to make healthy food choices consistent with the current Dietary Guidelines for Americans, Dietary Guidelines 2010, (DG 2010) while staying within a limited budget (4).

Currently, more than 44.6 million individuals in the US are participating in SNAP, impacting approximately 1 in every 7 people (6). Most participants are
children or elderly persons (7). According to a USDA report to Congress, “the Nation’s investment in nutrition education is important to further improve diets and promote health among low-income Americans” (8).

SNAP-Ed programs targeting youth are charged with providing evidence-based information and education to children and adolescents in a variety of settings such as after-school programs, summer camps, or in the classroom (4). Science-based nutrition education is provided through direct education (classroom, face-to-face), indirect education (e.g. brochures), and social marketing (e.g. posters) (3).

In the classroom, the program “target messages” are implemented through a series of lessons, each lesson at least 30 minutes in length (4). Prospective outcomes of SNAP-Ed programs are for participants to: 1) increase consumption of vegetables and fruits, whole grains, and fat-free or low-fat dairy products every day, 2) be physically active every day as part of a healthy lifestyle, and 3) balance caloric intake from food and beverages with energy expended (4).

DG 2010 focuses on two main concepts: 1) maintain calorie balance over time to achieve and sustain a healthy weight, and 2) consume nutrient dense foods and beverages (5). DG 2010 encourages people to increase their vegetable and fruit intake (5) and to meet nutrient needs primarily through foods. Further, DG 2010 recommends eating a variety of vegetables, especially dark green and red and orange vegetables, beans, and peas (5).

A key recommendation of DG 2010 is to “increase vegetable and fruit intake” (5). DG 2010 emphasizes increasing vegetable and fruit intake for several reasons. First, most vegetables and fruits are good sources of under-consumed nutrients
such as folate, magnesium, potassium, dietary fiber, and Vitamins A, C, and K (5, 9). Further, diets high in vegetables and fruits have been associated with reduced risk of chronic diseases, such as cardiovascular diseases and certain types of cancer (5, 10, 11). Fruit consumption in childhood may also have a long-term protective impact against cancer in adulthood (10). Finally, vegetables and fruits are relatively low in calories when consumed without added fats or sugars (5). Including more vegetables and fruits in the diet can help people achieve and/or maintain a healthy weight. DG 2010 advise individuals to eat a variety of vegetables, especially dark green and red and orange vegetables and beans (5).

Population groups with the lowest income levels and formal education have the lowest quality diets (12) and highest incidence of diet-related health problems (1). Specifically, underserved groups eat fewer vegetables and fruits compared to families who are not low-income (13). Further, it has been shown that eating habits developed as a child continue into adulthood (14), thus demonstrating the importance of developing healthy eating habits at a young age. Improving vegetable and fruit intake among low-income populations will likely have significant health impacts. Therefore, increasing participants’ vegetable and fruit intake is an outcome that SNAP-Ed youth programming prioritizes (4).

Outcome evaluation of SNAP-Ed youth programs is critical to measure its effectiveness as well as to secure additional federal and private funding (16, 17). Validated and reliable assessment tools that measure behavior change are of high importance for reporting accurate program outcomes. Many questionnaires that community nutrition programs use to gather behavioral outcome information do
not have face validity or content validity. In addition, DG 2010 includes new recommendations for which questions have not been developed or validated. Previous research has focused primarily on assessing changes in food and nutrition knowledge following general school-based nutrition education programs (15); however, little is known about changes in behavior related to food intake following SNAP-Ed (15).

The specific aims of this study were to:

1) Develop a questionnaire that measures behavior changes in vegetable and fruit consumption for low-income 9-11 year olds, which include questions from current publications, previously reported nutrition education questionnaires, and questions developed for DG 2010 recommendations.

2) Assess the questionnaire for content validity via judgment of an expert panel.

3) Assess the questionnaire for face validity using focus groups with 9-11 year old SNAP-Ed eligible children.
CHAPTER 2

REVIEW OF LITERATURE

Childhood Overweight and Obesity

Overweight is defined as “having excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors”, while obesity is defined as "having excess body fat" (1). Overweight and obesity are due to “caloric imbalance” – more calories are consumed than are expended – and is attributed to several factors including genetic, behavioral, and environmental influences (1). Childhood overweight and obesity is determined using Body Mass Index (BMI). It is determined using the child’s weight and height (BMI = weight in kilograms/height in meters$^2$). Because children’s body compositions vary as they age and vary by sex, child BMI is determined using age and sex specific percentiles (1). For children and adolescents, overweight is defined as a BMI at or above the 85th percentile but lower than the 95th percentile for children of the same age and sex, while obesity is defined as a BMI above the 95th percentile for children of the same age and sex (1). Although BMI does not measure body fat directly, it is considered an appropriate indicator of body fatness for most children and adolescents (1). Childhood overweight and obesity have both immediate and long-term consequences.
Childhood obesity has several immediate consequences. Obese children are more likely to have high blood pressure and high cholesterol, which are both risk factors for cardiovascular disease (17). In one study, 70% of obese children had at least one cardiovascular disease risk factor and 39% of obese children had two or more risk factors (17). It has been suggested that obese children are also more likely to have an increased risk of impaired glucose tolerance, insulin resistance, and type 2 diabetes (18). Breathing problems, such as sleep apnea, and asthma are also more prevalent among obese children (20, 21). Further, obese children are at increased risk for joint problems and musculoskeletal discomfort (21, 22) as well as fatty liver disease, gallstones, and gastro-esophageal reflux (19, 21). Finally, it has been suggested that obese children and adolescents have a greater risk of social and psychological problems, such as poor self-esteem and discrimination, which can persist into adulthood (19, 23, 24).

Childhood overweight and obesity have several long-term consequences. Several studies have found that obese children are more likely to become obese adults (25, 26, 27). Further, adult obesity is associated with serious conditions such as cardiovascular disease, diabetes, and some cancers (27). Additionally, if children are overweight, obesity in adulthood is likely to be more severe (17).

**Childhood Obesity in Ohio**

Ohio is ranked the 13th most obese state in the US and it is in the highest quarter of states for childhood obesity (28). In 2011, the Ohio Department of Health (ODH) released the 2004-2010 Third Grade BMI Report (29). The report includes a comprehensive account of state and county level overweight and obesity prevalence.
among 3rd graders in Ohio (30). The purpose of the report is to help address the “most vulnerable communities in Ohio” as well as to make thorough comparisons with the overweight and obesity rates with the rest of the United States (30). Approximately 15,000 children from 350 Ohio public schools had their BMI and several behaviors assessed. The report emphasized several points. First, non-Hispanic black and Hispanic children were significantly more overweight and/or obese compared to other children of the same age. Second, low-income children, as defined by eligibility in the National School Lunch Program, were significantly more likely to be obese compared to other children of the same age. Further, the prevalence of overweight and obesity increased with increased TV viewing. Finally, children who drank the most sugar-sweetened beverages per day in Ohio included low-income children living in Appalachian counties and who were non-Hispanic black or Hispanic (30). Between 2004 and 2010, 18% of Ohio 3rd graders were obese and more than one-third Ohio 3rd graders were overweight or obese (30). An objective for Healthy People 2010 was to reduce the proportion of children and adolescents who are overweight or obese from 11% to 5% from 1994-2010. Ohio fell below the 5% target that was set for 6 to 11 year olds. Even though the overall rates of obesity did not increase since previous reports, the rates have not decreased either (31).

In 2009-2010, there was a significant difference in the rates of overweight and obesity between Ohio 3rd graders who participated in the National School Lunch Program (NSLP) and children who did not participate. (Eligibility for NSLP = Free if <130% of the federal poverty line; Reduced if <185% of the federal poverty line).
Children who were enrolled in the program were significantly more likely to be obese than children who were not enrolled (30).

**Costs of Childhood Obesity**

Childhood overweight and obesity is estimated to cost an additional $14 billion annually in healthcare compared with children who maintain a healthy weight (30). The annual cost of treating obesity related illness in adults is $147 billion (32). Additionally, Ohio obese kids are 4.6-fold more likely to have diabetes, 2.0-fold more likely to have poor health status, 1.8-fold more likely to have asthma, and 1.6-fold more likely to have poor mental health (31).

**Supplemental Nutrition Assistance Program (SNAP)**

In 2012, all fifty states had approved SNAP-Ed budgets and programs (6). The Supplemental Nutrition Assistance Program and its Supplemental Nutrition Assistance Program Education play an important role in improving nutrition among low-income individuals and families in the United States. Since 1992, federal funds approved for SNAP-Ed increased from $661,000 to $375 million in 2011(4). During the first year of SNAP-Ed (formerly Food Stamp Nutrition Education), seven states had nutrition education plans approved by the Food and Nutrition Service (FNS). During FY2011, an average 44.7 million people living in 21 million households across the nation received SNAP benefits. Of these recipients, nearly 75% of them were families with children (4).

SNAP provides guidance to states for using the most effective nutrition education tools and strategies available in developing their state plans (4). The guidance encourages states to focus on the following behavioral outcomes while
assessing nutrition education needs, developing SNAP-Ed objectives, and evaluation outcomes (4):

1) Eat vegetables and fruits, wholes grains, and fat-free/low-fat dairy products every day

2) Be physically active every day as part of a healthy lifestyle

3) Balance caloric intake from food and beverage with calories expended

**Supplemental Nutrition Assistance Program-Education (SNAP-Ed)**

The Education segment of the Supplemental Nutrition Assistance Program (SNAP-Ed) is an initiative of the United States Department of Agriculture (USDA) Food and Nutrition Service to help low-income families participating in the Supplemental Nutrition Assistance Program (SNAP, formerly food stamp program) to develop skills to improve their diets (4). SNAP-Ed targets two primary groups: youth and adults (4). The goal of SNAP-Ed is to teach its participants how to make healthy food choices consistent with the current Dietary Guidelines for Americans, Dietary Guidelines 2010, (DG 2010) while staying within a limited budget (4).

DG 2010 focuses on two main concepts: 1) maintain calorie balance over time to achieve and sustain a healthy weight, and 2) consume nutrient dense foods and beverages (5). DG 2010 encourages people to increase their vegetable and fruit intake (5) and to meet nutrient needs primarily through foods. Further, DG 2010 recommends eating a variety of vegetables, especially dark green and red and orange vegetables, beans, and peas (5).

Currently, more than 44.6 million individuals in the US participate in SNAP, impacting approximately 1 in every 7 people (6). Most participants are children or
elderly persons (7). According to a USDA report to Congress, “the Nation’s investment in nutrition education is important to further improve diets and promote health among low-income populations” (8).

Youth SNAP-Ed offers research-based information and education to children and adolescents in a variety of settings such as after-school programs, summer camps, or in the classroom (4). Science-based nutrition education is provided through direct education (classroom, face-to-face), indirect education (brochures), and social marketing (posters) (3).

In the classroom, the program “target messages” are implemented through a series of lessons, each lesson at least 30 minutes in length (4). Prospective outcomes of SNAP-Ed programs are for participants to: 1) increase consumption of vegetables and fruits, whole grains, and fat-free or low-fat dairy products every day, 2) be physically active every day as part of a healthy lifestyle, and 3) balance caloric intake from food and beverages with energy expended (4).

**Healthy People 2020**

The national objectives for Healthy People 2020 have been established (33). Three of the objectives are: 1) Decrease the proportion of 6-11 year olds who are obese (NWS-2.2); 2) Increase the contribution of fruits to the diets of the population aged 2 years and older (NWS-14); and 3) Increase the variety and contribution of vegetables to the diets of the population aged 2 years and older (NWS-15). The National Nutrition Policy’s goal is to achieve these objectives by 2020 (33).
**Dietary Guidelines for Americans, 2010**

The USDA provides food patterns that identify and suggest the consumption of nutrient dense foods from the five major food groups and sub-groups (5). The USDA food patterns recommend amounts and limits of foods for 12-calorie levels (from 1000 to 3200 calories). DG 2010 Call to Action has 3 guiding principles: 1) Ensure that all people in the United States have access to nutritious foods and opportunities for physical activity; 2) Facilitate individual behavior change through environmental strategies; and 3) Set the stage for lifelong healthy eating, physical activity, and weight management behaviors (5).

**Vegetable and Fruit Consumption**

The USDA urges the US population to increase their consumption of vegetables and fruits according to DG2010 (5). Using evidence based research and practice, DG2010 makes this recommendation for several reasons. First, most vegetables and fruits are good sources of under-consumed nutrients such as folate, magnesium, potassium, dietary fiber, and Vitamins A, C, and K (5, 9). Second, vegetables and fruits are relatively low in calories when consumed without added fats or sugars (5). Third, diets high in vegetables and fruits have been associated with reduced risk of chronic diseases, such as cardiovascular diseases and certain types of cancers (5, 10, 11). Finally, consuming fruit as a child may have long-term protective impact against cancer in adulthood (10). DG2010 advises the US population to eat a variety of vegetables, especially dark green and red and orange vegetables and beans (5) in order to achieve and/or maintain a healthy weight.
**Low-Income Populations**

The highest incidence of diet-related health problems has been shown in population groups with the lowest income levels and formal education (12). This group also has the lowest quality diets (13). Compared to other groups, low-income populations eat fewer vegetables and fruits (13). Because eating habits develop as a child continues into adulthood, it is important for children to develop healthy eating habits at a young age (14). It has been shown that 1 in 7 low-income preschool-aged children are obese (34). Therefore, it is important to intervene early in life.

**Need for Behavior Change Questionnaire**

SNAP-Ed is an optional component of SNAP benefits. Even though states do conduct evaluation activities, policy and program officials lack the data needed to draw accurate conclusions determining effectiveness about the program overall or about the different educational approaches that have been implemented by various states (5). SNAP funding allows states and localities to tailor programs to local interests and needs, therefore complicating the evaluation process even more (35). While developing and validating outcome measures, the ultimate goal is a tool that is “valid, reliable, sensitive to change, and practical for use” (35). In order for a measure to be credible, it must meet the generally accepted standards for validity, reliability, sensitivity, and internal consistency (15,16,36). The content should reflect the target messages set forth by SNAP-Ed and they should be consistent with DG2010. Content and face validity are done in the initial stage 1, and are considered essential components of the process (35).
Outcome evaluation of SNAP-Ed youth programs is critical to measure its effectiveness as well as to secure additional federal and private funding (16, 17). Validated and reliable assessment tools are of high importance for reporting accurate program outcomes. Many questionnaires that community nutrition programs use to gather behavioral outcome information do not have face or content validity. In addition, DG 2010 includes new recommendations for which questions have not been developed or validated. Previous research has focused primarily on assessing changes in food and nutrition knowledge following general school-based nutrition education programs (15); however, little is known about changes in behavior related to food intake following SNAP-Ed (15). Validated instruments are important for determining the most efficient practices for reducing childhood obesity (32, 36).

**Types of Validity**

When an instrument is shown to be valid, it is valid only for a specific purpose with a specific group of people (38). Validity is “specific to the appropriateness of the interpretations we wish to make with the scores” (38).

**Content Validity**

Content validity is done during the initial stage of tool development. Experts are used for domain selection. The purpose of the initial stage is to first identify the subject matter (also known as content domains) related to diet quality that have content validity, as judged by experts (35). The content domains should be consistent with SNAP-Ed goals based on DG2010. Townsend suggests starting with an extensive and thorough review of relevant nutrition science and medical
literature (35). The product should be the selection of content domains or areas for the evaluation measure. A draft of the individual items and their response options should be generated (35).

Content validity is present when the instrument covers the skills, behaviors, and/or knowledge that the instrument is intended to measure (38, 39). The main method to assess content validity is through expert judgment. A panel of experts subjectively judges content validity.

*Face Validity*

Once content validity is established, the next step is face validity. Face validity is considered “pre-testing” (41). The purpose of face validity is to review the wording of each item with members of the audience. Using individual interviews or focus groups with standardized protocols, each participant is asked what the item means to him/her using their own words (41). Researchers should also clarify the meaning of key words. The item pool should contain many more items than desired for the final measure (41). Townsend suggests that twice as many items are needed for this stage so that inadequate items can be eliminated (41).

Face validity (also known as content-related evidence) is assessing how well the operationalization seems like a good translation of the construct “on its face” (42). If an instrument has face validity, it implies that the instrument is relevant, practical, and pertinent to its purpose and the target audience (43). To do so, individuals representing the target population are asked to assess the appropriateness of the items on the instrument (44).
Child Nutrition Questionnaires

Several child questionnaires have been developed to measure child nutrition knowledge and behavior change. Many of the questionnaires have been developed to evaluate outcomes for specific nutrition education programs.

The Coordinated Approach to Child Health (CATCH) program is based on the Center for Disease Control (CDC) coordinated school health model (45). The goal of CATCH is to positively impact children’s health behaviors (45). It is a multi-component intervention designed to promote healthy eating habits and increase physical activity. It was designed for children in grades 3 through 5 and it has shown to be successful in promoting health and wellness. The CATCH questionnaire asks children about foods that they may have consumed yesterday (i.e. Yesterday, did you eat fruit?) (45). The questionnaire has not yet been tested with low-income children.

Gimme 5 is a school based dietary intervention. It is a social cognitive theory based multi-component intervention. Baranowski et. al implemented the program amongst 3rd graders and continued for 3 years with intentions to improve the children’s fruit, juice, and vegetable (FJV) consumption (46). The intervention aimed to do so by impacting psychosocial variables such as self-efficacy, outcome expectations, and social norms associated with FJV intake. The program was implemented in 32 schools (16 intervention and 16 control) across the country. Results were observed for consumption of FJV combined, FJV consumed at weekday lunch, eating FJV self-efficacy, social norms, and knowledge (46). The outcome
evaluation tool has not been tested for validity or reliability (46). The questionnaire has not yet been tested with low-income children.

The Pro Children project is an international study that aims to assess vegetable and fruit consumption among children in 9 European countries (47). The Pro Children questionnaire aims to measure 14 constructs including knowledge, attitudes, liking, general self-efficacy, intention, habit, preferences, perceived behaviors, modeling, active potential encouragement, family rules related to demands and allowances, and availability at home, in regards to vegetable and fruit intake (47). The questionnaire has been used in 8 publications to date (48). According to the authors, test-retest reliability has been shown to be good to very good. Cronbach's alpha values were moderate to high (0.52 to 0.89) (49). The questionnaire has not yet been tested with low-income children.

Wilson and Magarey developed a child nutrition questionnaire to assess dietary patterns associated with positive energy balance and food behaviors, attitudes, and environment in Australian children ages 10-12 years (50). The tool was tested for reliability and relative validity against a 7-day food record designed to reflect the questionnaire. The developed questionnaire was administered twice. The 1st administration obtained at baseline measures for the evaluation of a community-based obesity prevention project (50). The records were designed to specifically reflect the food intake content of the questionnaires. For each day in the record, the individual foods and behaviors were listed and the child had to “tick” each time he/she consumed an item or did a behavior (50). The records were meant to measure frequency of consumption, not quantity of foods (50). It has been
suggested that children have difficulty measuring portion size (51). According to the authors, the questionnaire demonstrated reasonable relative validity (Spearman correlations ranged from 0.34 to 0.48 with p < 0.01) and good test-retest reliability (Cronbach’s alpha ranged from 0.5 to 0.8) (50). The instrument has not yet been tested with low-income child nutrition programs.

Townsend et al. evaluated the California Youth Expanded Food and Nutrition Education Programs (EFNEP) using an intervention design among 9-12 year olds (35). Group leaders were trained to use curriculum components of the education intervention and then pre and post survey results and impact indicators were compared. Results from the intervention post-test scores in the treatment group showed significantly higher gains than their control counterparts. The researchers validated the USDA impact indicator method by reporting the percentage of youth making changes for each of the four impact indicators. The USDA impact indicator was shown to have content validity, face validity, and test-retest reliability (35).

Branscum and Kaye determined the construct validity and internal consistencies of the Food Behavior Checklist modified for children (FBC-MC) with low-income youth EFNEP-eligible children (52). The instrument demonstrated adequate reliability for the fruit and vegetable consumption sub-scale, but not for the milk consumption sub-scale or the healthful eating behaviors subscale (52). According to the authors, construct validity was shown to be satisfactory but the reliability needs to be improved (52).

The elementary-level School Based Nutrition Monitoring (SBNM) Questionnaire is used as a screening tool with an emphasis on nutrition and physical
activity (38). The instrument is meant to represent group dietary patterns rather than an individual’s intake (38). It asks questions about “yesterdays” food intake (38). According to the authors, it showed good to excellent reproducibility (Spearman correlations ranging from 0.47 to 0.86) for nutrition behavior questions that assessed food and meal choice “yesterday” behaviors, physical activity, weight behaviors, and food selection skills; however, nutrition knowledge and nutrition attitudes demonstrated low reproducibility (Spearman correlations ranging from 0.14 to 0.57) (38).

In the current study, the primary aim is to develop a questionnaire that measures behavior changes in vegetable and fruit consumption for low-income 9-11 year olds and then assess the developed questionnaire for face and content validities.
CHAPTER 3

A VALIDATION STUDY: CHILD VEGETABLE AND FRUIT CONSUMPTION

Abstract

Underserved groups eat fewer vegetables and fruits compared to families who are not low-income; thus, a target message of low-income nutrition education programs is to increase vegetable and fruit consumption. Validated instruments for measuring behavioral outcomes are important for determining and documenting the effectiveness of these programs, yet many of the questionnaires used to gather behavioral outcome information in children have not been validated.

The specific aims of the study were to: 1) develop a questionnaire measuring behavior changes in vegetable and fruit consumption for low-income 9-11 year olds, 2) assess the questionnaire for content validity via judgment of an expert panel and, 3) assess the questionnaire for face validity via focus groups with 9-11 year olds.

A comprehensive review of child nutrition questionnaires was performed using a search on relevant databases (such as MEDLINE, ERIC, and WORLDCAT) as well as electronic sources through relevant journals and other documents. Forty-two questions were chosen based on the target audience, to measure behavior change, and relate to vegetable and fruit consumption. The research team in response to recommendations in DG 2010 also developed twelve questions. A total of 54 questions were assessed.
An expert panel (n=95) was recruited through purposive sampling to evaluate the questions for content validity using 3 constructs: 1) students will understand the question, 2) students can answer the question, and 3) the question will assess behavior change. After the results of the expert panel were analyzed with α=0.1, questions that received 75% or greater agreement among the constructs and a power ≥0.5 were considered to have content validity and were then assessed for face validity. Seven focus groups (FG) were performed with low-income 9-11 year olds and four major themes were identified.

The results are 10 content and face validated questions assessing behavior changes in vegetable and fruit consumption in low-income 9-11 year olds.
**Introduction**

Overweight and obesity has become a major health concern during the recent decades (34). Nutrition education programs have the potential to be effective interventions to help alleviate the prevalence of the overweight and obesity among youth; however, there is a lack of validated tools available to assess the effectiveness of the programs (15).

When an instrument is shown to be valid, it is valid only for a specific purpose with a specific group of people (38). Validity is “specific to the appropriateness of the interpretations we wish to make with the scores” (38).

*Content Validity*

Content validity is present when the instrument covers the skills, behaviors, and/or knowledge that the instrument is intended to measure (38, 39). The main method to assess content validity is through expert judgment. A panel of experts subjectively judges content validity.

The expert panel method is used to assess the selected questions for content validity. The purpose of an expert panel is to determine the extent to which experts agree about a given issue (40). An advantage of using an expert panel is that one individual cannot dominate the discussion (53). When choosing experts to participate on the panel, each participant must be “justifiable” as an expert on the subject under discussion (54). “Agreement” among the expert panelists has two dimensions: 1) the extent to which each respondent agrees with the issue being considered, and 2) the extent to which respondents agree with each other (54).
**Face Validity**

Face validity (also known as content-related evidence) is assessing how well the operationalization seems like a good translation of the construct “on its face” (42). If an instrument has face validity, it implies that the instrument is relevant, practical, and pertinent to its purpose and the target audience (43). To do so, individuals representing the target population are asked to assess the appropriateness of the items on the instrument (44).

Developing questionnaires for children has proven difficulty in many areas of research because childhood is a time of development. Age, cognitive abilities, and assessment techniques must be considered while developing an instrument to assess dietary intake (43).

Qualitative research with children can be a challenge (54) therefore the methodology used should be appropriate and well researched. Focus group methodology is a well-known qualitative approach to understanding feelings, attitudes, and opinions (54). The researchers have chosen to use FGs to assess the questions for face validity. An advantage of FGs with children is that it can produce data from the interaction among the participants (54). Kennedy et al., suggest that FGs can “offer a rich, interactive developmentally effective approach to planning, content, and evaluation in research with children” (55). The authors also advise that FGs with children can capture their perspectives, original ideas, and insights (54). Further, several studies have used the focus group method with children (55). Kennedy et al. recommend several modifications to FGs with children as compared to adults. Such suggestions include using relatively homogenous groups, smaller
group sizes (4-6 participants), shorter duration, a warm and welcoming environment that is well-known to participants, and the moderator should use developmentally appropriate language with the participants (58). It has been shown that groups of 4-6 children can produce lively discussion and manageable activity (59). Previous studies have shown that both single and mixed gender groups can be used successfully; however, the ages of participants should be confined to a difference of only 1-2 years (60).

Methods

A comprehensive review of child nutrition questionnaires was performed using a search on relevant databases (such as MEDLINE, ERIC, and WORLDCAT) as well as electronic sources through relevant journals and other documents. Questions were chosen based on the target audience (developed for 9-11 year olds), measured behavior change as opposed to other constructs (such as knowledge), and related to vegetable and fruit consumption.

Question Revisions and New Questions

Every five years the USDA and the United States Department of Health and Human Services update the Dietary Guidelines for Americans. In January 2011, DG 2010 was released. The new guidelines contain several updates such as changing dietary measurements of vegetables and fruits from "servings" to "cups". Questions that were not up-to-date with the DG 2010 were modified (i.e. "servings" were changed to "cups"). Duplicate questions from different sources were also removed. The new guidelines also encourage individuals to "eat a variety of vegetables,
especially dark-greens and red and orange vegetables and beans and peas” (39).

Because of the new updates, the research team developed 12 questions to reflect the most recent recommendations. Six questions addressed eating vegetables and fruits daily, 2 questions addressed eating vegetables and fruits with different meals throughout the day, 2 questions addressed trying new vegetables and fruits, 1 question addressed consuming red and orange vegetables, and 1 question addressed consuming dark, green vegetables.

Fifty-four questions measuring behavior changes in vegetable and fruit consumption were selected from those reported in the literature and from those developed by the research team in response to recommendations in DG 2010. Approval from the Behavioral and Social Sciences Institutional Review Board, from The Ohio State University, was obtained for all aspects of the study.

**Expert Panel Recruitment and Consent**

To assess for content validity, an expert panel was consulted. Participants for the expert panel were chosen through purposive sampling. Purposive sampling occurs when the research team selects participants based on their potential contribution (55). Potential participants were selected based on their expertise in the field of nutrition, their experience with tool development and validation, their contact with 9-11 year olds, and/or their experience with low-income nutrition education programs. Potential participants were chosen because they are knowledgeable in one or more of these areas. The expert panel consisted of 4 categories of experts: SNAP-Ed/EFNEP state or county coordinators, Nutrition faculty from colleges and universities, 3rd and 4th grade school teachers and
elementary school nurses, and child psychologists. The expert panel consisted of 312 potential participants identified by the research team. SNAP-Ed/EFNEP state or county coordinators were contacted through list-servs. The 3rd and 4th grade school teachers and elementary school nurses taught at elementary schools in Franklin county, Ohio. The nutrition faculty from colleges and universities were from The Ohio State University as well as from several other colleges/universities in the US who are familiar with the SNAP program. The child psychologists were from The Ohio State University. The research team contacted experts in the seven USDA FNS Regions, thus representing all 50 states in the study.

The potential expert panel participants were contacted via email by the co-investigator explaining the study, the role as a member of the expert panel, an invitation to participate in the study, and a link to the survey. By responding to the survey, the participants were implying consent.

*Expert Panel Survey*

The expert panel survey was created using Survey Gizmo and it took approximately 30 minutes for each participant to complete. The survey consisted of 5 demographic questions about the participant followed by questions about the 54 selected questions. The demographic questions gathered information such as: what USDA Food and Nutrition Service (FNS) region of the US they work in, does their work relate to 9-11 year olds children and how so, what is their occupation, and what was their experience in creating/validating child nutrition questionnaires. The expert panel evaluated the questions for content validity using 3 constructs: students will understand the question, students can answer the question, and the
question will assess behavior change. The expert panel also had an opportunity to comment on the overall survey at the end.

The expert panel survey consisted of a total of 54 questions to be assessed. To minimize participant burden and increase response rate, the questions were randomized so that each expert received 18 questions to assess.

Fifty-four questions were divided into six groups of nine questions each. The questions were divided into groups according to their content. Questions about fruit consumption only were grouped together. Questions about vegetable consumption only were grouped together. Questions about both vegetable and fruit consumption were grouped together. Grouping the questions was done to ensure that each expert received the same number of questions about fruit consumption only, the same number of questions about vegetable consumption only, and the same number of questions about both vegetable and fruit consumption.

When the expert logged into the survey, Survey Gizmo randomly selected three questions from each group for the expert to answer. First, each selected question was presented in bold followed by 3 questions (A, B, and C) for the expert to answer about the selected question. The 3 questions posed to the experts about the selected question were based on a 6-point Likert scale (Strongly Agree, Agree, Somewhat Agree, Somewhat Disagree, Disagree, Strongly Disagree). A sample question for the expert panel appeared as follows:
I eat vegetables:

a. Every day  
b. Almost every day  
c. Sometimes  
d. Almost never  
e. Never

A. 3rd and 4th grade students will be able to understand this question.
   a. Strongly Disagree  
   b. Disagree  
   c. Somewhat Disagree  
   d. Somewhat Agree  
   e. Agree  
   f. Strongly Agree

B. 3rd and 4th grade students will be able to answer this question.
   a. Strongly Disagree  
   b. Disagree  
   c. Somewhat Disagree  
   d. Somewhat Agree  
   e. Agree  
   f. Strongly Agree

A. This question will assess behavior changes in vegetable and fruit consumption among 3rd and 4th grade students.
   a. Strongly Disagree  
   b. Disagree  
   c. Somewhat Disagree  
   d. Somewhat Agree  
   e. Agree  
   f. Strongly Agree

A 10% type 1 error (α) rate was used along with β = 0.2 and δ = 0.1. Type 1 error (α) is the rejection of the null hypothesis when it is actually true (56). Type II error (β) is the acceptance of the null hypothesis when it is false (57). Delta is the difference between the true proportion and the hypothesized proportion. To ensure better power, all proportional tests used a 0.1 significance level, null p = 0.8. Previous validation studies confirmed the appropriateness of these values.
The last part of the survey asked for overall comments about all of the questions as well as any comments about how the questions can be improved. Data collected from the expert panel comments was transcribed. The constant comparative method was used to analyze the data. Each person on the research team read the transcriptions and identified key concepts. The team then discussed and cross-coded for common major themes. Similarities and differences in key concepts helped to get a better understanding of the data.

The survey concluded by asking experts if they would be willing to participate in a 2nd round of revisions (if necessary) and thanking them for their time and consideration. The co-investigator allowed three weeks for the experts to respond to the survey. A reminder email was sent to potential experts at 7 days and 14 days after the initial email was sent.

**Expert Panel Incentives**

The expert panelists did not receive any incentives for their participation in the study.

**Focus Groups**

Approval from the Behavioral and Social Sciences Institutional Review Board from The Ohio State University and the Columbus City Schools Institutional Review Board in Franklin county, Ohio were obtained for the child FGs.

**Partner Questions**

Seventeen questions were assessed for face-validity following the expert panel. The expert panel content validated 9 questions. Of the 9 questions, 5 were questions about vegetable consumption, 3 were questions about fruit consumption,
and 1 was a question about both vegetable and fruit consumption. The research team decided to assess these nine questions as well as similar questions with the only difference being that the word “vegetable” was changed to “fruit” or vice versa. These were referred to as “partner questions”. For example if the question read, “Do you eat more than 1 kind of fruit daily?” then the question “Do you eat more than 1 kind of vegetable daily?” was assessed during FGs.

**Focus Groups Recruitment**

Children were eligible to participate in the research study if they were 9-11 year old students from SNAP eligible Columbus City Schools. Children were selected through purposive sampling. Focus group sampling targeted a homogenous sample. The research team introduced themselves and the purpose of the study to 3rd and 4th grade classes in eligible schools and then handed out consent forms to be sent home with students if they were interested in participating. Focus groups were scheduled so that the children knew the other group members. For this study a SNAP-Ed eligible school was defined as Columbus City schools where 50% or more students participate in the National School Lunch Program and School Breakfast Program in Ohio. The research team’s contacts were a school nurse and the head 4th grade teacher. Children were invited to participate from the school that agreed to participate in the study. Once a school agreed to participate, children were given flyers describing the study and inviting them to participate. The flyers offered a gift card as an incentive for their contribution. Once the child’s parent/guardian signed a consent form, FGs were scheduled. The FGs took place at the child’s elementary school during the school day.
Focus Group Interview Protocol

Eligible participants were organized into 7 FGs, consisting of 3-5 participants each. Focus groups were held at the child’s school. Focus groups were conducted following Krueger’s protocol (61). If new information was gathered after three FGs, more would be performed until saturation was reached (62). Undergraduate nutrition students were recruited and trained to assist as note takers and to transcribe data. Sessions were led by three individuals and lasted approximately 30 minutes (55). One individual was the moderator while the other two were the note takers. Moderators and note takers completed focus group training. All individuals took notes. The note takers were also observing any non-verbal behaviors that could potentially aid in interpretation. Sessions were recorded using two audio recorders. The FG script used developmentally appropriate language based on the participants’ cognitive development. The purpose of these FGs was to examine the 9 questions that received 75% or greater agreement among the expert panel for face validity with 9-11 year old SNAP-Ed eligible students. All participants were asked to complete an assent form and their parent/guardian was asked to complete a consent form. No identifying information was linked to participants’ responses during both the FG data collection and analysis phase of the study.

As participants arrived, they were given a card with a number and they were directed towards refreshments. Before the group began, participants were asked to fill out a demographic sheet and sign an assent form. Only children who brought signed parental consent forms were allowed to participate.
The moderator established rapport by thanking the participants for coming. Upon gaining participant assent and parent/guardian consent, the moderator explained that the notes and voice recordings would be kept completely confidential. Further, each child was assigned a number so that their responses could not be matched to their name. A script was used to keep focus groups uniform.

Each group began with a round-robin of numbers and age. Then the general purpose of the FG was explained and the moderator established ground rules (i.e. raise your hand to speak, keep your hands to yourself, no “putdowns”). Participants were reminded that their answers are neither right nor wrong and that it is okay to agree or disagree with others responses. In order to facilitate equal participation, the moderator went around the circle and called on all of the children by number asking, “What do you think?”

The discussion began with a warm-up question that requires a brief answer about a preference (i.e. What is your favorite food?) The warm-up question was designed to demonstrate that there are no right or wrong answers as well as for the children to become comfortable with the process. Then, the children were given a set of different colored note cards with one question on each card. This was done to focus each child’s attention on the specific question being discussed. Before discussing each individual question, the moderator read the question and its answers out loud and asked the children to answer the question on his or her note card. The moderator waited until all of the children were done selecting an answer to the question before the discussion began. The discussion was directed towards general perceptions and experiences with vegetable and fruit consumption.
The majority of the discussion focused on gathering the participant’s perceptions of the language interpretation of the questions, specifically pertaining to the content of the questions. Each FG gathered recommendations from the participants regarding their understanding of the questions, ease of language and word choice used in the questions. When the time period was almost up or if no new information was being offered, the moderator concluded the session by summarizing the discussion. The moderator then thanked the participants for their time and contribution as well as assured them that their responses will be kept confidential. Lastly, the moderator gave all participants their incentive before they left.

Focus groups 1 and 2 focused on the answer choices of the questions. The primary focus was finding out how many answer choices were best suited for the target population. The objective was to find the best answer choice options to accurately represent the actual actions of the target population with the children still being cognitively able to answer the question. Questions were presented with the number of answer choices ranging from two to five. The same exact question was presented (i.e. “I eat vegetables:”) with multiple answer choice sets (i.e. yes/no; always/sometimes/never; everyday/almost everyday/sometimes/almost never/never”). Each question and answer choices were presented and discussed after each child answered the question individually.

Focus groups 3, 4, and 5 focused on the actual question as opposed to the answer choices. Confirming that the children understood what the question was asking was the main purpose of the groups.
Focus groups 6 and 7 focused on the modifications of the questions and answer choices following FGs 1 through 5. The purpose of FGs 6 and 7 were to confirm that the modified questions were appropriate for the target population.

*Focus Group Incentives*

Participants who completed the FG participation were awarded $10 gift cards to compensate for their time. As a thank you for their participation, the co-investigator also gave a presentation to participating classes about the research process. Refreshments (apples, bananas, and bottled water) were provided during the focus groups.

*Focus Group Data Collection & Analysis*

Focus group data collection took place in Columbus City Schools. The constant comparative method was used to analyze the data. Data collected from FGs through audio recording or hand-written notes were transcribed. Each person on the research team read the transcriptions and identified key concepts. The team then discussed and cross-coded for common major themes. Similarities and differences in key concepts helped to get a better understanding of the data. Questions were modified and re-assessed according to major themes.

*Results*

*Expert Panel*

Of the 312 experts who were invited to participate, ninety-five of them enrolled in the study. The majority of participants were Extension Professionals (44.2%, n= 42) with the remaining participants identifying themselves as faculty at
a college/university (25.6%, n= 25), elementary school nurse (2.3%, n= 2),
elementary school teacher (3.5%, n= 3), or ‘other’ (23.3%, n= 22). The expert panel
was chosen based on their field of expertise as viewed by the research team;
however, experts may not view themselves as fitting into the same categories
determined by the research team, and thus experts self-selected to be part of the
‘other’ category instead of a category chosen by the research team. The majority of
participants were from the Midwest region (30.2%, n=29) while the remaining
participants were from the Mountain Plain Region (17.4%, n= 17), the Western
region (16.3%, n= 16), the Southeast region (14.0%, n= 13), the Mid-Atlantic region
(7.0%, n= 7), the Northeast region (7.0%, n= 7), or the Southwest region (5.8%, n= 6).
Table 3.1 Expert Panel Demographics

<table>
<thead>
<tr>
<th>N = 95</th>
<th>USDA FNS Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 44.2% (n = 42) Extension Professionals</td>
<td>• 30.2% (n = 29) Midwest</td>
</tr>
<tr>
<td></td>
<td>• 25.6% (n = 25) College/University Nutrition Faculty</td>
</tr>
<tr>
<td></td>
<td>• 17.4% (n = 17) Mountain Plain</td>
</tr>
<tr>
<td></td>
<td>• 5.8% (n = 6) Elementary School Nurses/Teachers</td>
</tr>
<tr>
<td>• 0% (n = 0) Child Psychologists</td>
<td>• 16.3% (n = 16) Western</td>
</tr>
<tr>
<td></td>
<td>• 23.3% (n = 22) ‘Other’</td>
</tr>
<tr>
<td></td>
<td>• 14% (n = 13) Southeast</td>
</tr>
<tr>
<td></td>
<td>• 7% (n = 7) Mid-Atlantic</td>
</tr>
<tr>
<td></td>
<td>• 7% (n = 7) Northeast</td>
</tr>
<tr>
<td></td>
<td>• 5.8% (n = 6) Southwest</td>
</tr>
</tbody>
</table>

The expert panel data was analyzed by each individual question. The research team was looking for a clear break in the percent agreement among panelists to use as a cut-off point, and thus chose a target of 75% agreement (agree/strongly agree) among experts. Of the 54 original questions, only 9 questions were considered content validated. Expert comments and opinions about each question were evaluated and taken into consideration before the 2nd round of surveys were considered. Because of the large reduction in the number of questions, the research team did not consider a 2nd round of surveying necessary. Once the expert panel data was analyzed, the questions with 75% or greater agreement
among the panel were used in the child focus groups. Of the 9 questions, 5 were questions about vegetable consumption, 3 were questions about fruit consumption, and 1 was a question about both vegetable and fruit consumption.

At the end of the expert panel survey, experts were asked for overall comments about the questions as well as how the questions can be improved. When the comments were discussed and cross-coded for common major themes by the research team, six major themes were found (see Table 3.2 below).

<table>
<thead>
<tr>
<th>Theme 1</th>
<th>Limit the number of answer choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 2</td>
<td>Use concrete answer choices; avoid using vague words</td>
</tr>
<tr>
<td>Theme 3</td>
<td>Use a simple reading level with less complex words</td>
</tr>
<tr>
<td>Theme 4</td>
<td>Avoid long time frames</td>
</tr>
<tr>
<td>Theme 5</td>
<td>Provide examples and pictures</td>
</tr>
<tr>
<td>Theme 6</td>
<td>Avoid measurements/portion sizes</td>
</tr>
</tbody>
</table>

Table 3.2 Expert Panel Major Themes

See Appendix D for the list of content validated questions.
Focus Groups

Twenty-eight children were enrolled in the study with a 0% drop out rate. Fifty-four percent were males and 46% were females. The majority of children were 9 and 10 years old (32% and 61%, respectively) with the remaining children being 11 years old (4%). Most of the children were Black/African-American (79%) with the remaining children self identified as ‘Other’ (21%). The ‘other’ category consisted of children whom did not self-identify themselves as being either White/Caucasian or Black/African-American. It was observed that some of the participants were part of a new immigrant population from Africa and they self-identified themselves as ‘other’ rather than Black/African-American. All children were from SNAP-Ed eligible schools.

<table>
<thead>
<tr>
<th>N = 7 Focus Groups (28 total participants)</th>
<th>Age:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 54% males, 46% females</td>
<td>• 32% 9 years old</td>
</tr>
<tr>
<td>• 79% Black/African American, 21% ‘Other’</td>
<td>• 61% 10 years old</td>
</tr>
<tr>
<td></td>
<td>• 4% 11 years old</td>
</tr>
</tbody>
</table>

Table 3.3 Focus Groups Demographics
Pilot Focus Group

A pilot FG was performed. The data was preliminary and was not used in the final data analysis. The group consisted of three 9 year olds. The purpose of the group was to practice the FG protocol and fix any errors in the protocol.

Focus Groups 1 and 2

Major themes from focus groups 1 and 2 are specified below (Table 3.4).

<table>
<thead>
<tr>
<th>Theme 1</th>
<th>5 answer choices is appropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 2</td>
<td>Use “I” instead of “You” when asking questions</td>
</tr>
</tbody>
</table>

Table 3.4 Major Themes from focus groups 1 and 2

Supporting Quote #1 (Taken from focus group #2)

Moderator: You think the one with five answer choices was easier? Ok, why do you think so?

Child: Because on number two, you only have to like just pick one, and it’s not that much choices for these, and number one [with 5 answer choices] has more, um, things you can pick.
Supporting Quote #2 (Taken from focus group #2)

**Moderator:** And now I’m going to show you two cards. One says “I watch TV” and the other one says, “You watch TV”.

**Child:** I don’t understand “You watch TV”. I don’t understand that.

---

**Focus Groups 3, 4, and 5**

Major themes from focus groups 3 through 5 are specified below (Table 3.5).

<table>
<thead>
<tr>
<th>Theme 3</th>
<th>Time frames should be specified in the question but keep them short and recent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 4</td>
<td>Keep phrases/words simple; avoid double negatives</td>
</tr>
</tbody>
</table>

Table 3.5 Major Themes from focus groups 3 through 5

---

Supporting Quote #1 (Taken from focus group #5)

**Moderator:** This question says, “I eat a variety of fruit every day; always, almost always, sometimes, almost never, or never”. Participant #4?

**Child:** What do variety means?

**Moderator:** What does variety mean? Does anybody know what variety means?

**ALL:** No.
Moderator: Variety means more than one. Like you mentioned an apple, orange, and banana that would be three kinds or three varieties of fruits. So variety means different ones.

Child: Ok.

Moderator: What word would you use to help us?

Child: Different

Moderator: Different fruits, or different kinds of fruits?

Child: Different kinds of fruits.

Focus Groups 6 and 7

Supporting Quote (Taken from Focus Group #6)

Child 5: During the past week, I ate fruit as a snack sometimes.

Moderator: Okay and why did you choose sometimes?

Child 5: Because, snacks is not healthy.

See Appendix G for the list of face validated questions.

Discussion

Expert Panel

Once the data was analyzed and the major themes were cross-coded, the questions and answer choices that received 75% or greater agreement among the expert panel constructs were found to be consistent with the expert panel common themes. Of the 9 content validated questions, the number of answer choices per
question ranged from two to five. All of the questions used simple, easy to understand language such as the word “eat” instead of “consume”. Questions either did not ask about a specific time frame or used short time frames (1 week or less). Further, none of the content validated questions asked about actual consumption or portion sizes (i.e. cups). None of the questions presented to the expert panel provided examples or pictures, however the researchers will take this into consideration when finalizing the questionnaire.

An objective of the study was to develop and content validate questions assessing dietary behavior changes in vegetable and fruit consumption in 9-11 year olds. Of the original 54 questions selected and/or developed by the research team, only 9 questions were considered content validated. Six major themes were also identified.

Many of the questions assessed by the experts were questions from previously used outcome evaluation tools; however, less than 17% of the questions proposed to the experts were considered appropriate for the target population. Using inappropriate program evaluation tools poses the risk of inadequately assessing program effectiveness. If programs are indeed shown to be ineffective at achieving desired results, the programs are at an increased risk of losing funding (15,16) and they may not impact reducing the incidence of childhood obesity.

See Appendix C for the Expert Panel Survey Data Analysis.

Focus Groups

Another objective of the study was to face validate questions assessing dietary behavior changes in vegetable and fruit consumption in 9-11 year olds. Four
major themes were identified during the FGs and appropriate modifications were made to the questions and answer choices.

Face validation is an important component of evaluation tools (35). Many of the questions assessed during the focus groups were later modified for appropriateness. Using cognitive developmentally and age appropriate questions is important, especially when working with children (43). If the children do not understand what the question is asking, the evaluation tool poses the risk of inadequately reporting program success and effectiveness.

*Focus Groups 1 and 2*

Participants confirmed that five answer choices could most accurately describe their actions and the question was easy to answer. Two answer choices (yes/no) were limiting because “yes” could mean “always, almost always, sometimes, or almost never” while “no” meant “never”. Although three answer choices were not as limiting as only 2 answer choices, it could not accurately describe what they did. Children who “almost always” did the action were reluctant to choose “always” because they did not do it everyday; however, they also felt as though they performed the action more than “sometimes”. Children also understood questions better when they started with “I” instead of “You”.

*Focus Groups 3, 4, and 5*

Children expressed that they did not understand the difference between eating “different vegetables (or fruits) everyday” and eating “new vegetables (or fruits) everyday”. Once a question about “new vegetables (or fruits)” was asked, many children assumed that the remaining questions were about “new vegetables
(or fruits)” as well, even if it was not stated in the question. Thus, questions about eating “new vegetables (or fruits)” should be placed towards the end of the tool, to limit the influence on previous questions. Further, the phrase “more than one” was not an appropriate phrase to use. The children did not understand that “more than one” meant two or more. Further, one of the content validated questions asked the students to “circle all that apply”. When the children were asked what this meant, they thought it meant to “choose the best option” and that they could “only circle one answer choice”. The moderator then asked how to phrase the question to make it so they can circle more than one option. The children responded that putting “you can circle more than one answer” in parentheses meant that they could circle more than one option. Following focus groups 1 through 5, modifications were made to the questions and answer choices according to the major themes identified during the groups.

**Focus Groups 6 & 7**

Focus groups 6 and 7 were performed to confirm that the most appropriate changes were made to the questions.

**Other Considerations**

Four major themes were identified during the FGs; however, several other recommendations should also be considered. First, the word “snack” was often viewed as a negative word despite the context that it was given in (i.e. “Do you eat vegetables as snacks?”). Even though nutrition education curriculums do focus on substituting vegetables and fruits in place of other nutrient poor options, the programs should teach the importance of vegetables and fruits as “snacks”.
Programs should continue to work on changing the meaning of the word "snack" and the negative connotation that goes with it.

A second recommendation is to consider the time of the month that the tool is being administered. When working with a low-income population, many participants rely on food assistance programs for food; however, 90% of SNAP participants run out of benefits by day 21 (6). Responses of children in the focus groups confirmed that vegetables and fruits were not always available at home and they acknowledged that their vegetable and fruit consumption was affected. Below is a quote from a participant:

(Taken from Focus Group #4 performed on May 15th)

**Moderator:** So if your answering this question *(During the past week, did you eat fruit: a. everyday, b. almost every day, c. sometimes, d. almost never, e. never)* right now you said that you ate fruit almost never? That was your answer right?

**Child 3:** yes

**Moderator:** But, you said that you would have answered differently?

**Child 3:** yes

**Moderator:** when?

**Child 3:** probably maybe, 2 weeks ago?

**Moderator:** 2 weeks ago? What would you have answered?

**Child 3:** Sometimes.

**Moderator:** Sometimes. Ok. Why would your answer have changed?
**Child 3:** Because we would buy more f-food, fruits and vegetables, and maybe we could go somewhere where they have free fruits and vegetables?

Of the fifty-four original questions, only five of them plus their partner questions (total of 10 questions) were considered face validated following the focus groups. The current study did successfully identify ten content and facevalidated questions, thus increasing the effectiveness of the developed tool. Future studies, however, should consider assessing the same ten questions for other types of validity and reliability, therefore potentially making the tool even stronger and more accurate. The current study also successfully identified major themes from the expert panel and the focus groups. These themes should be considered in other questionnaire development studies with 9-11 year olds. In addition, several other suggestions were made that should be considered. For example, administration of the tool should be done during the same time of the month for pre and post assessments. Some of the participants commented that they ate more vegetables and fruits at the beginning of the month because they are “able to go to places and get free food”; however, their opportunity to do so at the end of the month was limited.

To the best of our knowledge, our instrument is the first developed according to DG 2010. The questions were modified and/or developed according to the newest recommendations. Many of the previously used instruments were also not validated with low-income populations, thus limiting their external validity with low-income audiences. Our expert judgement also encompassed multiple fields of expertise.
relevant to the content of the questionnaire and it was representative of all of the USDA FNS regions. Finally, previously used questionnaires were more lengthy in the number of questions, whereas our questionnaire is only 10 questions.

**Implications**

The current study successfully developed a 10-item tool and validated it for face and content validity, thus providing adequate assessment of the SNAP-Ed program curricula and effectiveness of the program. The validated questions can provide a more accurate outcome evaluation of intervention programs. Several major themes were also identified that should be considered when developing other outcome evaluation tools in future studies with low-income 9-11 year olds.
CHAPTER 5

CONCLUSIONS

Validated questionnaires are an important evaluation tool to assess program outcomes. Overweight and obesity is a major health risk faced by children and adolescents. Having effective nutrition education programs is one way to address the issue. The research team successfully developed a 10-item questionnaire to assess behavior change in vegetable and fruit consumption for low-income 9-11 year olds. Further, the questionnaire was content and face validated for low-income 9-11 year olds. The tool can be used to efficiently measure dietary behavior change in vegetable and fruit consumption among low-income 9-11 year olds.

Limitations

This study has several limitations. To make the expert panel survey an acceptable length and thus minimize responder fatigue, the research team selected 54 questions that deemed appropriate and applicable to the study aims. This is a limitation because not all questions relating to child nutrition behavior change were used in the expert panel survey. Further, each participant was randomly given 18 questions to assess instead of all 54 questions. This was done to make the survey an acceptable length (30 minutes), thus decreasing respondent burden and potentially
increasing the response rate. This is a limitation of the study, however, because the respondents did not assess all of the same questions.

Another limitation with the expert panel is that some regions and areas of expertise were better represented than others. While the Extension professionals were well represented, fewer elementary school teachers and nurses responded to our survey. Thus, our sample of experts is underrepresented. Further, we tried to recruit an even number of participants from each region of the United States; however, the number of respondents from each region was not equal.

Some may argue that focus group methods with 9-11 year olds instead of individual cognitive interviews is less desirable. After reviewing the literature, the decision was made to use FGs because it has been suggested that FGs can capture children's perspectives and insights (55). Although FGs have not widely been used with the target population, studies that have used the technique have been successful and have suggested FGs to be an adequate assessment technique. Children are a difficult population in regards to qualitative research. To alleviate this problem, the research team received FG training and they made the FG environment as welcoming and child-friendly as possible as well as modified the focus groups as suggested.

**Strengths**

The study has several strengths that should be acknowledged. First, the expert panel in this study was larger than most. SNAP-Ed is a federal program, thus all who are SNAP-Ed eligible persons in every state and/or US territory are entitled
to participate. The research team was interested in the advice and assessment from experts all over the country, rather than just in Ohio. The research team contacted experts in the seven USDA FNS Regions, thus representing all 50 states in the study. The panel also consisted of experts from multiple fields of expertise. Developing outcome evaluation tools can be challenging because of the differing cognitive abilities among children. The research team considered the expertise from several different groups important. The main criterion of all sub-groups, however, was that they have either an expertise in nutrition and/or working with 9-11 year old children.

A second strength of the study is that seven focus groups were performed to confirm the major themes. Also the final 2 focus groups focused on assessing the modified questions according to major themes gathered in FGs 1 through 5.

Another strength of the study is that the questionnaire is only 10 questions, which is relatively short. It is important to develop and validate short assessment tools, especially with a young population, to limit respondent burden. Further, developing and validating the questionnaire for low-income populations is another strength of the study.

A final strength of the study is that it used the most recent Dietary Guidelines to develop to the questionnaire. It is important to develop questionnaires that are up-to-date with the most recent dietary recommendations. To the best of our knowledge, ours is the first study to develop this type of questionnaire according to DG 2010.
**Recommendations**

Future research is needed to assess the developed 10-item questionnaire for reliability and criterion-related validity. Follow-up studies should compare the tool against the gold standard (4-day food record) for dietary assessment and confirm the reproducibility of the questionnaire. Questions that cannot be compared against a 4-day food record, such as questions asking about trying new vegetables and fruits, should be compared against another dietary assessment such as a Food Frequency Questionnaire. Future research should also be done assessing other target messages of the SNAP-Ed program. Validating dietary behavior change questions that evaluate other target messages (such as increasing whole grain and low-fat/fat-free dairy consumption) would be valuable to further assess the effectiveness of the SNAP-Ed programming as a whole. Validated questionnaires evaluating dietary behavior changes focused on the entire curriculum are needed.
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Appendix A: Expert Panel Recruitment Email
Greetings,

My name is Lauren Manganiello and I am a graduate student in the Department of Human Nutrition at The Ohio State University. I work with community nutrition education programs and I am interested in developing and validating a vegetable and fruit questionnaire among children eligible for free or reduced price lunches, specifically 3rd and 4th graders.

The goal of community nutrition education programs is to teach participants how to make healthy food choices consistent with the current Dietary Guidelines for Americans, Dietary Guidelines 2010, (DG 2010) while staying within a limited budget. DG 2010 encourages people to increase their vegetable and fruit intake and to meet nutrient needs primarily through foods. Outcome evaluation of nutrition education programs is critical to measure its effectiveness.

The first phase of my study is to develop a questionnaire intended for 3rd and 4th grade students concerning vegetable and fruit consumption behavior changes from current publications, reported nutrition education questionnaires, and questions developed for DG 2010 recommendations. An expert panel will then review the questions to assess the questionnaire for content validity. The panel will include experts from several areas of research.

You are being asked to participate in this research because we consider you to be an expert in a related field to the instrument and your feedback will be a valuable assessment tool.

Below is a link to a survey about the questionnaire. Please review the instrument and provide your thoughts and experiences pertaining to the content of the questionnaire. Your feedback of the questionnaire will take about 30 minutes of your time. No incentives will be given for your participation.

Your participation in the study is voluntary. You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

This study has minimal risks. Although this study may not particularly benefit you as an individual, it will hopefully benefit society as a whole. Specifically, the study is intended to improve evaluation processes and curricula developed for children of this age group.

Efforts will be made to keep your study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups (as applicable to the research):
- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-
regulated research) supporting the study.

Although every effort to protect confidentiality will be made, no guarantee of internet survey security can be given as, although unlikely, transmissions can be intercepted and IP addresses can be identified.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Thank you so much for your time. Please feel free to contact the co-investigator, Lauren Manganiello, at manganiello.1@osu.edu or the principal investigator, Joyce McDowell, at 614-292-1655 if you have any questions, concerns, complaints, or feel you have been harmed as a result of study participation.

**By replying to the survey, you are implying consent.**
Appendix B: Expert Panel Survey
Children's Behavior towards Vegetables and Fruits (copy - January 17, 2012) -temp to get all questions

Demographics Page 1

Thank you for being part of our expert panel. We appreciate your help. To begin, we have a few questions about the demographics of our expert panel.

What region of the US do you work in?
(please check only one)

- **Mid-Atlantic Region** (Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Puerto Rico, Virginia, Virgin Islands, West Virginia)
- **Midwest Region** (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)
- **Mountain Plain Region** (Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming)
- **Northeast Region** (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont)
- **Southeast Region** (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)
- **Southwest Region** (Arkansas, Louisiana, New Mexico, Oklahoma, Texas)
- **Western Region** (Alaska, Arizona, California, Guam, Hawaii, Idaho, Nevada, Oregon, Washington)

Does your work relate to or impact children in grades 3 and 4?
(please select one)

- Yes
- No

If yes, how so?
(please select one)

- Research
- Health Care
- Program Leadership
- Nutrition Education
Demographics Page 2

Are you:
(please select one)

- Faculty at a College/University
- School Teacher (Elementary School)
- Extension Professional

What is your level of experience in creating/validating child nutrition questionnaires?
(please select one)

- Frequent
- Some
- None

Intro to Random Questions

On the next few pages in this survey, you will find a compilation of questions about vegetable and fruit intake (bolded questions). These questions were taken from both validated and not validated instruments currently used to evaluate vegetable and fruit consumption behavior changes in children. Please do not answer the question in bold. Please answer questions in Columns A, B, and C about the bolded question.

In Column A, the statement "Students will be able to understand this question" is intended to determine if students at the 3rd and 4th grade age level will be able to comprehend the meaning of the question being asked.

In Column B, the statement "Students will be able to answer this question" is intended to determine if students at the 3rd and 4th grade age level will be able to respond to the question given the content and answer choices.

In Column C, the statement "This question will assess behavior changes in vegetable and fruit consumption" is intended to determine if the question and its answer choices are able to evaluate the amount of change (if any) in vegetable and fruit consumption among 3rd and 4th grade students.

Please remember that 3rd and 4th graders are the target audience for the bolded questions.

Because we are not collecting any identifying information, your answers/opinions about the questions will not be connected to you.
Random Questions Page 1

Which food would you ask the adults in your house to buy?
   a. Bag of Fruit (e.g. oranges, apples, peaches)
   b. Bag of tortilla chips or potato chips

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
<th>QID 1</th>
<th>Column A - Students will be able to understand this question.</th>
<th>Column B - Students will be able to answer this question.</th>
<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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Yesterday, did you eat fruit? (do not count fruit juice)
   a. No, I didn't eat any fruit yesterday.
   b. Yes, I ate fruit 1 time yesterday.
   c. Yes, I ate fruit 2 times yesterday.
   d. Yes, I ate fruit 3 or more times yesterday.

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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I try new fruits when I can.
   a. Almost always
b. Sometimes  
c. Never

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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I eat different types of fruits every day.  
a. Almost always  
b. Sometimes  
c. Never

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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How many days in a week do you eat different kinds of fruits?  
a. 0 days  
b. 1-2 days  
c. 3-4 days  
d. 5-7 days

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 -
**Strongly Agree**

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**Do you eat more than 1 kind of fruit daily?**

- a. Yes
- b. No

*Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*

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**During the past week, did you have citrus fruit or citrus juice?**

- a. Yes
- b. No

*Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*
How many cups of fruit do you eat each day?

a. None  
b. 1 cup  
c. 2 cups  
d. 3 cups  
e. 4 cups  
f. 5 cups

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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Column A - Students will be able to understand this question.
Column B - Students will be able to answer this question.
Column C - This question will assess behavior changes in vegetable and fruit consumption.

Fruit is an easy snack.

a. Strongly agree  
b. Agree  
c. Not sure  
d. Disagree  
e. Strongly disagree

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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Random Questions Page 2

I like tasting new fruits that I haven't tried before.
   a. Strongly agree
   b. Agree
   c. Not sure
   d. Disagree
   e. Strongly disagree

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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<td>1-SD 2 3 4 5 6-SA</td>
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In my home, fruit is available to eat any time.
   a. Strongly agree
   b. Agree
   c. Not sure
   d. Disagree
   e. Strongly disagree

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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<td>1-SD 2 3 4 5 6-SA</td>
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Did you consume these foods yesterday? 100% fruit juice (not punch, sports drinks, fruit flavored drinks)
  a. Yes
  b. No

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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Did you consume these foods yesterday? Fruit (not juice)
  a. Yes
  b. No

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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Do you think that you eat much or little fruit?
  a. Very much fruit
  b. Much fruit
c. Not much, not little  
de. Little fruit  
e. Very little fruit  

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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To eat fruit every day is a habit for me.  
a. I fully agree  
b. I agree somewhat  
c. Neither agree, nor disagree  
d. I disagree somewhat  
e. I fully disagree  

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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How often do you usually eat fresh fruit?  
a. Never  
b. Less than one day per week  
c. 2-4 days per week  
d. 5-6 days per week
e. Every day, once a day  
f. Every day, twice a day  
g. Every day, more than twice a day

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
<th>QID 37</th>
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<th>Column B - Students will be able to answer this question.</th>
<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<tbody>
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<td>Ø   Ø   Ø   Ø   Ø</td>
<td>Ø   Ø   Ø   Ø   Ø</td>
</tr>
</tbody>
</table>

I like to eat fruit every day.  
a. I fully agree  
b. I agree somewhat  
c. Neither agree nor disagree  
d. I disagree somewhat  
e. I fully disagree

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<td>Ø   Ø   Ø   Ø   Ø</td>
<td>Ø   Ø   Ø   Ø   Ø</td>
</tr>
</tbody>
</table>

Yesterday I ate:  
a. A lot more fruits than I used to  
b. More fruits than I used to  
c. About the same amount of fruit as I used to  
d. Less fruits than I used to
e. A lot less fruits than I used to

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
<th>QID</th>
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<tbody>
<tr>
<td>43</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Random Questions Page 3

I eat fruit:

a. Every day
b. Almost every day
c. Sometimes
d. Almost never
e. Never

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<th>Column B - Students will be able to answer this question.</th>
<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<tbody>
<tr>
<td>45</td>
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</tr>
</tbody>
</table>

During the past week, I ate fruit:

a. Every day
b. Almost every day
c. Sometimes
d. Almost never
e. Never

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<tbody>
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<td>1-SD 2 3 4 5 6-SA</td>
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<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

When I eat fruit, I eat it (circle all that apply):
- a. With my breakfast
- b. As a morning snack
- c. With my lunch
- d. As an afternoon snack
- e. With my dinner

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

When I am offered a fruit that I have never eaten before:
- a. I always try new fruit
- b. I almost always try new fruit
- c. I sometimes try new fruit
- d. I almost never try new fruit
- e. I never try new fruit
Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
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</tbody>
</table>

Do you eat fruit or vegetables as snacks?
  a. Yes
  b. No

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

In the last two weeks, did you ask someone in your family to have fruit or vegetables at home for snacks?
  a. Yes
  b. No
  c. I don't have to ask

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
<th>Column A - Students will</th>
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<th>Column C - This question will assess</th>
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<tr>
<td>34</td>
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</tr>
</tbody>
</table>

In the last two weeks, did you ask someone in your family to have fruit or vegetables at home for breakfast?

a. Yes  
b. No  
c. I don’t have to ask

*Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*

| QID | 1-SD | 2 | 3 | 4 | 5 | 6-SA | 1-SD | 2 | 3 | 4 | 5 | 6-SA | 1-SD | 2 | 3 | 4 | 5 | 6-SA |
|-----|------|---|---|---|---|------|------|---|---|---|---|---|------|------|---|---|---|---|---|
| 34  |      |   |   |   |   |      |      |   |   |   |   |   |      |      |   |   |   |   |   |

In the last two weeks, did you ask someone in your family to have fruit or vegetables at home for dinner?

a. Yes  
b. No  
c. I don’t have to ask

*Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*
In the last two weeks, did you ask someone in your family to buy fruit or vegetables?
   a. Yes
   b. No
   c. I don't have to ask

*Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*

| QID 35 | 1-SD | 2 | 3 | 4 | 5 | 6-SA | 1-SD | 2 | 3 | 4 | 5 | 6-SA | 1-SD | 2 | 3 | 4 | 5 | 6-SA |
|--------|------|---|---|---|---|------|------|---|---|---|---|---|------|------|---|---|---|---|---|

Random Questions Page 4

I like to eat vegetables everyday.
   a. Yes
   b. No
   c. Maybe

*Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*

| QID 2  | 1-SD | 2 | 3 | 4 | 5 | 6-SA | 1-SD | 2 | 3 | 4 | 5 | 6-SA | 1-SD | 2 | 3 | 4 | 5 | 6-SA |
|--------|------|---|---|---|---|------|------|---|---|---|---|---|------|------|---|---|---|---|---|
I eat different kinds of vegetables every day.
   a. Almost always
   b. Sometimes
   c. Not very often

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<th>Column B - Students will be able to answer this question.</th>
<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
</tr>
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<tbody>
<tr>
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<td>○ ○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>

I eat vegetables every day.
   a. Hardly ever
   b. Sometimes
   c. Almost always

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<tr>
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<td>○ ○ ○ ○ ○ ○</td>
<td>○ ○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>

Do you eat more than one kind of vegetable each day?
   a. Yes
   b. No
Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

How many days in a week do you eat different kinds of vegetables?

a. 0 days  
b. 1-2 days  
c. 3-4 days  
d. 5-7 days  

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

Do you eat more than 1 kind of vegetable daily?

a. Yes  
b. No  

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<p>| Column A - Students will | Column B - Students will | Column C - This question will assess | |
|--------------------------|--------------------------|--------------------------------------|</p>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

How many cups of vegetables do you eat each day?

- a. None
- b. 1 cup
- c. 2 cups
- d. 3 cups
- e. 4 cups
- f. 5 cups

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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<thead>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

Do you eat 2 or more cups of vegetables at your main meal?

- a. Yes
- b. No

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree
During the past week, did you have raw vegetables?
   a. Yes
   b. No

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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</tr>
<tr>
<td>QID 16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Random Questions Page 5

I like tasting new vegetables that I haven't tried before.
   a. Strongly agree
   b. Agree
   c. Not sure
   d. Disagree
   e. Strongly disagree

Please select one for Column A, then Column B, then Column C using the following code: 1-Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
<tr>
<th>Column A - Students will be able to understand this question.</th>
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<tr>
<td>QID 16</td>
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<td></td>
</tr>
</tbody>
</table>
How many cups of vegetables do you usually eat each day? (1 cup = 1 cup of salad vegetables, ½ cup of cooked vegetables or 1 medium potato)

- a. I don’t eat vegetables
- b. Less than 1 cup a day
- c. 1-2 cups a day
- d. 3-5 cups a day
- e. More than 5 cups a day

*Please select one for Column A, then Column B, then Column C using the following code: 1- Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*

<table>
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<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Did you consume these foods yesterday? Beans, including pinto, baked, kidney, refried, pork and beans (not green).

- a. Yes
- b. No

*Please select one for Column A, then Column B, then Column C using the following code: 1- Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree*

<table>
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<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Did you consume these foods yesterday? Vegetables, including salads and potatoes (not French fries or chips)
a. Yes
b. No

Please select one for Column A, then Column B, then Column C using the following code: 1- Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<tr>
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<td>○ ○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>

Do you think that you eat many or few vegetables?
a. Very many vegetables
b. Many vegetables
c. Not many, not few
d. Few vegetables
e. Very few vegetables

Please select one for Column A, then Column B, then Column C using the following code: 1- Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<td>○ ○ ○ ○ ○ ○</td>
</tr>
</tbody>
</table>

To eat vegetables every day is a habit for me.
a. I fully agree
b. I agree somewhat
c. Neither agree, nor disagree
d. I disagree somewhat  

e. I fully disagree  

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree  

<table>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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</table>

How often do you usually eat salad or grated vegetables?  

a. Never  
b. Less than one day per week  
c. 2-4 days per week  
d. 5-6 days per week  
e. Every day, once a day  
f. Every day, twice a day  
g. Every day, more than twice a day  

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree  

<table>
<thead>
<tr>
<th>QID</th>
<th>Column A - Students will be able to understand this question.</th>
<th>Column B - Students will be able to answer this question.</th>
<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
</tr>
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<tbody>
<tr>
<td>38</td>
<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

How often do you usually eat other raw vegetables?  

a. Never  
b. Less than one day per week  
c. 2-4 days per week
d. 5-6 days per week  
e. Every day, once a day  
f. Every day, twice a day  
g. Every day, more than twice a day

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

How often do you usually eat potatoes?  

a. Never  
b. Less than one day per week  
c. 2-4 days per week  
d. 5-6 days per week  
e. Every day, once a day  
f. Every day, twice a day  
g. Every day, more than twice a day

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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</thead>
<tbody>
<tr>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Random Questions Page 6
How often do you usually eat cooked vegetables?
  a. Never
  b. Less than one day per week
  c. 2-4 days per week
  d. 5-6 days per week
  e. Every day, once a day
  f. Every day, twice a day
  g. Every day, more than twice a day

Please select one for Column A, then Column B, then Column C using the following code: 1- Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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</thead>
<tbody>
<tr>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Yesterday I ate:
  a. A lot more vegetables than I used to
  b. More vegetables than I used to
  c. About the same amount of vegetables as I used to
  d. Less vegetables than I used to
  e. A lot less vegetables than I used to

Please select one for Column A, then Column B, then Column C using the following code: 1- Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<td>1- SD</td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
I eat vegetables:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<tr>
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<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5-6-SA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

During the past week, I ate vegetables:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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<td>4</td>
</tr>
<tr>
<td>5-6-SA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When I eat vegetables, I eat them (circle all that apply):
   a. With my breakfast
b. As a morning snack  
c. With my lunch  
d. As an afternoon snack  
e. With my dinner

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

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</tbody>
</table>

When I am offered a vegetable that I have never eaten before:

a. I always try new vegetables  
b. I almost always try new vegetables  
c. I sometimes try new vegetables  
d. I almost never try new vegetables  
e. I never try new vegetables

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<tr>
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<td>○</td>
</tr>
</tbody>
</table>

How many days in a week do I eat dark-green vegetables?

a. 0 days  
b. 1-2 days  
c. 3-4 days
d. 5-6 days

e. Every day

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

How many days in a week do I eat orange or red vegetables?

a. 0 days
b. 1-2 days
c. 3-4 days
d. 5-6 days
e. Every day

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
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<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
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<tbody>
<tr>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
</tr>
</tbody>
</table>

(a) In the last week, did you try a food or foods you don't usually eat?

a. Yes
b. No

(b) What were they?

a. Fruits
b. Vegetables
c. Grains
d. Dairy
e. Mixed Dish

Please select one for Column A, then Column B, then Column C using the following code: 1 - Strongly Disagree, 2 - Disagree, 3 - Somewhat Disagree, 4 - Somewhat Agree, 5 - Agree, 6 - Strongly Agree

<table>
<thead>
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<th>Column B - Students will be able to answer this question.</th>
<th>Column C - This question will assess behavior changes in vegetable and fruit consumption.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
<td>1-SD 2 3 4 5 6-SA</td>
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<tr>
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<td>● ● ● ● ● ●</td>
<td>● ● ● ● ● ●</td>
<td>● ● ● ● ● ●</td>
</tr>
</tbody>
</table>

Additional Questions

Overall Comments about the bolded questions:

How would you improve the bolded questions?

Additional comments:

If you are willing to participate in a 2nd round of revisions, please provide your e-mail:

Thank You!

You have completed the survey. Thank you for your time and consideration.
Appendix C: Expert Panel Data Analysis
<table>
<thead>
<tr>
<th>QID</th>
<th>Responses per Question No</th>
<th>Able to understand %Agree</th>
<th>Able to answer %Agree</th>
<th>Able to assess behavior changes %Agree</th>
<th>Power</th>
<th>Meet Criteria*</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>30</td>
<td>93.3% (28/30)</td>
<td>90.0% (27/30)</td>
<td>86.7% (26/30)</td>
<td>&gt; 0.5</td>
<td>YES</td>
</tr>
<tr>
<td>47</td>
<td>30</td>
<td>90.0% (27/30)</td>
<td>76.7% (23/30)</td>
<td>83.3% (25/30)</td>
<td>&gt; 0.5</td>
<td>YES</td>
</tr>
<tr>
<td>17</td>
<td>28</td>
<td>96.4% (27/28)</td>
<td>92.9% (26/28)</td>
<td>92.6% (25/28)</td>
<td>&gt; 0.5</td>
<td>YES</td>
</tr>
<tr>
<td>4</td>
<td>26</td>
<td>76.9% (20/26)</td>
<td>76.9% (20/26)</td>
<td>88.5% (23/26)</td>
<td>&gt; 0.5</td>
<td>YES</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>92.9% (26/28)</td>
<td>96.4% (27/28)</td>
<td>89.3% (25/28)</td>
<td>&gt; 0.5</td>
<td>YES</td>
</tr>
<tr>
<td>46</td>
<td>31</td>
<td>96.8% (30/31)</td>
<td>96.8% (30/31)</td>
<td>80.6% (25/31)</td>
<td>&gt; 0.5</td>
<td>YES</td>
</tr>
<tr>
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<td>87.5% (21/24)</td>
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<td>&gt; 0.5</td>
<td>YES</td>
</tr>
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<td>YES</td>
</tr>
<tr>
<td>22</td>
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<td>68.0% (17/25)</td>
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</tr>
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<td>NO</td>
</tr>
<tr>
<td>28</td>
<td>28</td>
<td>71.4%</td>
<td>78.6%</td>
<td>59.3%</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>30</td>
<td>33</td>
<td>60.6%</td>
<td>54.5%</td>
<td>48.5%</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>32</td>
<td>30</td>
<td>50.0% (15/30)</td>
<td>30.0% (9/30)</td>
<td>48.3% (14/29)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>-----</td>
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<td>---------------</td>
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<td>--------------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>38</td>
<td>32</td>
<td>41.9% (13/31)</td>
<td>37.5% (12/32)</td>
<td>53.1% (17/32)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>39</td>
<td>17</td>
<td>35.3% (6/17)</td>
<td>29.4% (5/17)</td>
<td>29.4% (5/17)</td>
<td>&lt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>40</td>
<td>29</td>
<td>62.1% (18/29)</td>
<td>48.3% (14/29)</td>
<td>44.8% (13/29)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>41</td>
<td>30</td>
<td>73.3% (22/30)</td>
<td>53.3% (16/30)</td>
<td>60.0% (18/30)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>44</td>
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<td>71.4% (20/28)</td>
<td>64.3% (18/28)</td>
<td>67.9% (19/28)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>13</td>
<td>25</td>
<td>52.0% (13/25)</td>
<td>48.0% (12/25)</td>
<td>44.0% (11/25)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>48</td>
<td>30</td>
<td>93.3% (28/30)</td>
<td>83.3% (25/30)</td>
<td>65.5% (19/29)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>18</td>
<td>25</td>
<td>64.0% (16/25)</td>
<td>36.0% (9/25)</td>
<td>52.0% (13/25)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
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<td>33</td>
<td>45.5% (15/33)</td>
<td>50.0% (16/32)</td>
<td>24.2% (8/33)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>53</td>
<td>30</td>
<td>50.0% (15/30)</td>
<td>46.7% (14/30)</td>
<td>69.0% (20/29)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>54</td>
<td>23</td>
<td>69.6% (16/23)</td>
<td>45.8% (11/24)</td>
<td>50.0% (12/24)</td>
<td>&gt; 0.5</td>
<td>NO</td>
</tr>
<tr>
<td>55</td>
<td>22</td>
<td>57.1% (12/21)</td>
<td>68.2% (15/22)</td>
<td>50.0% (11/22)</td>
<td>&lt; 0.5</td>
<td>NO</td>
</tr>
</tbody>
</table>
Appendix D: Percent Agreement by Sub-questions

93
Percent Agreement by Subquestions

Able to understand
Able to answer

Question Number
Appendix E: Expert Panel Comments via Wordle.net
Wordle.net is an on-line application for generating “word clouds” from text that you provide. Words that appear more often in the text are given greater prominence. The expert panel comments were entered into wordle.net and the result was the figure above.
Appendix F: Content Validated Questions
Content Validated Questions

1. I eat fruit:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

2. Do you eat fruit or vegetables as snacks?
   a. Yes
   b. No

3. I eat vegetables every day.
   a. Hardly ever
   b. Sometimes
   c. Almost always

4. I eat vegetables:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

5. When I eat vegetables, I eat them (circle all that apply):
   a. With my breakfast
   b. As a morning snack
   c. With my lunch
   d. As an afternoon snack
   e. With my dinner

6. When I am offered a vegetable that I have never eaten before:
   a. I always try new vegetables
   b. I almost always try new vegetables
   c. I sometimes try new vegetables
   d. I almost never try new vegetables
   e. I never try new vegetables

7. Do you eat more than 1 kind of fruit daily?
   a. Yes
   b. No
8. During the past week, I ate fruit:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

9. I eat different kinds of vegetables every day.
   a. Almost always
   b. Sometimes
   c. Not very often
Appendix G: Focus Group Child Assent Form
The Ohio State University Assent to Participate in Research

Study Title: Vegetable and Fruit Behavior Questionnaire with 3rd and 4th Grade Children

Researcher: Joyce R. McDowell

Sponsor:

1. What is this study about?

The purpose of this focus group is to discuss the content of a vegetable and fruit questionnaire. You are being asked to participate in this research study because we are interested in your opinions and interpretations of the questionnaire and its content.

2. What will I need to do if I am in this study?

We will start off by discussing each question on the questionnaire separately. I will start by reading the question out loud to you and we will open up the discussion on what your thoughts, feelings, and experiences are pertaining to the language and wording of the questions on the questionnaire.

3. How long will I be in the study?

The focus group will take about 2 hours of your time.
4. Can I stop being in the study?
   You may stop being in the study at any time.

5. What bad things might happen to me if I am in the study?
   This study has minimal risks. Confidentiality in a focus group setting can only be
   guaranteed to the extent that all members of the focus group maintain participant
   confidentiality. If you feel uncomfortable at anytime, you may stop being in the study.

6. What good things might happen to me if I am in the study?
   Although this study may not particularly benefit you as an individual, it will hopefully
   benefit society as a whole. Specifically, the study is intended to improve evaluation
   processes and curricula developed for children of this age group.

7. Will I be given anything for being in this study?
   For participating in a focus group, you will receive a $10 gift card to compensate for
   your time. The gift card will be given at the end of the focus group.

8. Who can I talk to about the study?
   For questions about the study you may contact Joyce McDowell at (614) 292-1655
   or Jmcdowell@ehe.osu.edu.
   To discuss other study-related questions with someone who is not part of the research
   team, you may contact Ms. Sandra Meadows in the Office of Responsible Research
   Practices at 1-800-678-6251.
Signing the assent form

I have read (or someone has read to me) this form. I have had a chance to ask questions before making up my mind. I want to be in this research study.

Signature or printed name of subject

Date and time

Investigator/Research Staff

I have explained the research to the participant before requesting the signature above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining assent

Signature of person obtaining assent

Date and time

This form must be accompanied by an IRB approved parental permission form signed by a parent/guardian.
Appendix H: Focus Group Parental Consent Form
The Ohio State University Parental Permission
For Child’s Participation in Research

Study Title: Vegetable and Fruit Behavior Questionnaire with 3rd and 4th Grade Children
Researcher: Joyce R. McDowell

This is a parental permission form for research participation. It contains important information about this study and what to expect if you permit your child to participate.

Your child’s participation is voluntary.
Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose:
The purpose of this focus group is to discuss the content of a vegetable and fruit questionnaire. Your child is being asked to participate in this research study because we are interested in his/her opinion and interpretation of the questionnaire and its content.

Procedures/Tasks:
We will start off by discussing each question on the questionnaire separately. I will start off by reading the question out loud to your child and we will open up the discussion on what his/her thoughts, feelings, and experiences are pertaining to the language and wording of the questions on the questionnaire.

Duration:
The focus group will take about 2 hours of your child’s time.

Your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

Risks and Benefits:
This study has minimal risks. Although this study may not particularly benefit your child as an individual, it will hopefully benefit society as a whole. Specifically, the study is intended to improve evaluation processes and curricula developed for children of this age group.
Confidentiality:
Efforts will be made to keep your child’s study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child’s participation in this study may be disclosed if required by state law. Also, your child’s records may be reviewed by the following groups (as applicable to the research):
- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Further, confidentiality in a focus group setting can only be guaranteed to the extent that all members of the focus group maintain participant confidentiality.

Incentives:
For participating in a focus group, your child will receive a $10 gift card to compensate for his/her time. The gift card will be given at the end of the focus group.

Participant Rights:
You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:
For questions, concerns, or complaints about the study you may contact Joyce McDowell.

For questions about your child’s rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.
If your child is injured as a result of participating in this study or for questions about a study-related injury, you may contact Joyce McDowell at (614) 292-1655 or jmcdowell@ehe.osu.edu.
Signing the parental permission form

I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

______________________________  ________________
Printed name of subject        Signature of person authorized to provide permission for

______________________________  ________________
Printed name of person authorized to provide permission for subject  Signature of person authorized to provide permission for subject

______________________________  __________________________
Relationship to the subject     Date and time

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

______________________________  ________________
Printed name of person obtaining consent  Signature of person obtaining consent

Page 4 of 4  Form date: 12/15/05
Appendix I: Face Validated Questions
1) During the past week, I ate fruit as snacks:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

2) During the past week, I ate vegetables as snacks:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

3) When I eat vegetables, I eat them (you can circle more than one answer):
   a. With my breakfast
   b. As a morning snack
   c. With my lunch
   d. As an afternoon snack
   e. With my dinner
   f. I do not eat vegetables

4) When I eat fruit, I eat them (you can circle more than one answer):
   a. With my breakfast
   b. As a morning snack
   c. With my lunch
   d. As an afternoon snack
   e. With my dinner

5) During the past week, I ate fruit:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never

6) During the past week, I ate vegetables:
   a. Every day
   b. Almost every day
   c. Sometimes
   d. Almost never
   e. Never
7) I eat different kinds of fruit every day.
   a. Always
   b. Almost always
   c. Sometimes
   d. Not very often
   e. Never

8) I eat different kinds of vegetables every day.
   a. Always
   b. Almost always
   c. Sometimes
   d. Not very often
   e. Never

9) When I am offered a fruit that I have never eaten before:
   a. I always try new fruits
   b. I almost always try new fruits
   c. I sometimes try new fruits
   d. I almost never try new fruits
   e. I never try new fruits

10) When I am offered a vegetable that I have never eaten before:
    a. I always try new vegetables
    b. I almost always try new vegetables
    c. I sometimes try new vegetables
    d. I almost never try new vegetables
    e. I never try new vegetables