

EFNEP Behavior Checklist Review

October 2012

Mary Kay Wardlaw, PhD, Co-Chair, University of Wyoming
Gail Hanula, PhD, RD, LD, Co-Chair, University of Georgia

Janie Burney, PhD, University of Tennessee
Sue Snider, PhD, University of Delaware
Lorelei Jones, MEd, North Carolina State University
Audrey Adler, MS, RD, Rutgers University
Beverly Phillips, MS, University of Wisconsin
Susan Baker, EdD, Colorado State University
Kathryn McGirr, MS, RD, Colorado State University
Jung Sun Lee, PhD, RD, University of Georgia
Kathy Orchen, MPH, Rutgers University
Katherine Dickin, PhD, Cornell University
Virginie Zoumenou, PhD, University of Maryland Eastern Shore

EXECUTIVE SUMMARY

The EFNEP Behavior Checklist: Relevance in 2012

Introduction

EFNEP programs across the country teach basic nutrition, food safety, food resource management, and more recently, the importance of physical activity. Two evaluation instruments are used in EFNEP nationwide. Nutritional intake is measured by a 24-hour diet recall at baseline and following completion of the intervention. A ten-item survey, referred to as the EFNEP Behavior Checklist, measures behaviors in the constructs of food safety, food resource management, food security, and nutrition practices. The survey responses are on a 5-point Likert scale ranging from “never do this” to “always do this.” In addition, some institutions add questions from a database of items submitted by various states prior to 2006, when technical issues arose that prohibited additions or changes to this database. From 2007-2010, 39 institutions reported the use of an average of nine additional questions through the NEERS5 system (range 2-41).

Methods

In 2011, Dr. Helen Chipman, National Program Leader for EFNEP at USDA NIFA, charged a committee comprised of EFNEP staff throughout the country with examining the evidence base for questions on the EFNEP Behavior Checklist to determine whether the behaviors that are currently measured are those that are the most important for improving the health and well-being of EFNEP participants, and to identify gaps.

Usage data of questions from the optional database were compiled by USDA NIFA, and separated into construct areas by the committee co-chairs. Four subcommittees were formed to review the literature in the core areas of food security, food safety, food resource management, and nutrition and physical activity.

Results

Food Security

Significance of the Problem

In 2010, 48.8 million people lived in food-insecure households (Jensen, Nord, Andrews, & Carlson, 2011). The prevalence of food insecurity varied considerably among household types. Some groups with rates of food insecurity higher than the national average (14.5 percent) were households with incomes below the Federal poverty line—\$22,113 for a family of four in 2010—(40.2 percent) and households with children, headed by a single woman (35.1 percent).

According to the 2010 Dietary Guidelines, research has shown that some Americans lack access to affordable nutritious foods in their neighborhoods. This lack of access makes it challenging for many people to consume a diet consistent with the Dietary Guidelines, and may be related to overall disparities in health. It is important to insure that all Americans have access to nutritious

foods and opportunities for physical activity. Access includes not only availability, but affordability, quality and safety.

Rationale for the Intervention

The mission of EFNEP is to serve families with limited resources. Nationally, 77% of EFNEP families reported participating in at least one food assistance program in FY11. According to the USDA ERS, over 40% of food insecure households did not participate in one or more of the three largest Federal food and nutrition assistance programs during the month prior to the 2010 survey of food security. It is crucial that EFNEP education efforts include food resource management skills and that families be made aware of food assistance programs available in their community

Conclusions and Recommendations

The Dietary Guidelines suggest that to help ensure that all Americans have access to nutritious foods, food security should be increased among at-risk populations by promoting nutrition assistance programs. EFNEP provides information on resources available in the community. Participation in a variety of food assistance programs is measured pre- and post-intervention when demographic information is collected. In FY11, 5% of EFNEP graduates reported that they enrolled in one or more food assistance programs as a result of EFNEP. It is important that this information continue to be collected.

There is one core question on Food Security on the EFNEP Behavior Checklist. This question is also in the domain of Food Resource Management.

- How often do you run out of food before the end of the month?

The current question may not be a valid measure because it has been reported as confusing to participants. Some may interpret the question as asking whether they run out of any food, such as milk, before the end of the month. Also, parents might be concerned about the perception of child neglect if the family does not have enough food to feed their children and may not respond truthfully to a question they perceive as threatening. The validated 1-item screen to measure hunger (Kleinman et al. 2007) may be a better measure of food security and could be tested as part of a revised behavior checklist. The question is as follows:

- In the past month, was there any day when you or anyone in your family went hungry because you did not have enough money for food?

EFNEP plays an important role in decreasing the risk of food insecurity by increasing awareness of food assistance programs and helping individuals manage their food resources.

Food Safety

Food safety education has been an important component of EFNEP educational efforts for over twenty years; however, 2010 represented the first time this critical topic was included in the Dietary Guidelines for Americans. Ensuring food safety is a foundation for building healthy eating patterns since foodborne illness affects millions of people in the US annually. The Centers

for Disease Control and Prevention's 2011 estimates are that 1 in 6 or 48 million Americans get sick, 128,000 are hospitalized, and 3,000 die from foodborne illnesses each year. (www.cdc.gov/foodborneburden/index.html; accessed 05/02/2012)

The Key Recommendation from the Dietary Guidelines 2010 is to: "*Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.*"

Rationale for the Intervention

There is evidence in the literature that food safety education can play an important role in reducing foodborne illnesses. According to the Dietary Guidelines for Americans, 2010, a set of four basic food safety principles work together to reduce the risk of foodborne illnesses, including: clean, separate, cook, and chill. The behaviors most likely to prevent food safety problems include:

- Washing hands
- Rinsing vegetables and fruits,
- Preventing cross-contamination,
- Cooking foods to safe internal temperatures,
- Storing foods safely.

Conclusions and Recommendations

There is an inconsistency between what is currently measured on the EFNEP Behavior Checklist and the highest priority topics identified in the review of the literature. The Behavior Checklist core questions on food safety both focus on food storage. The questions are as follows:

- This question is about meat and dairy foods. How often do you let these foods sit out for more than two hours?
- How often do you thaw frozen foods at room temperature?

While food storage is identified as one of five food safety priorities in the Dietary Guidelines for Americans 2010, the literature does not support focusing solely on food storage for the prevention of foodborne illness.

Based on the literature review, it appears that the high priority indicators on which EFNEP educational programming and outcome evaluation efforts should focus are the following:

- Learners more often washing hands for at least 20 seconds with warm water and soap before eating and preparing food.
- Learners more often washing cutting boards, knives, and hands that have been in contact with raw meat, poultry and fish.
- Learners more often using a food thermometer to tell when food is done (meat, casseroles, leftovers).

It is recommended that questions on the above indicators be tested as part of a revised EFNEP Behavior Checklist.

Food Resource Management

Significance of the Problem

There is evidence that in low income households nutrient availability for the household members was enhanced when careful or thrifty food shopping practices were used. Several studies found low income households may opt to purchase less fruits and vegetables and other nutritious foods perceived as costly. EFNEP data suggest a strong association between the practice of thinking about healthy food choices when shopping for food and the quality of the household dietary intake.

Rationale for the Intervention

Based on the reviewed literature, the high priority indicators on which EFNEP educational programming and outcome evaluation efforts should focus are the following:

- Learners more often plan meals.
- Learners more often make a grocery list.
- Learners save money when shopping for food and actual grocery spending is closer to the USDA recommendations for their family size.
- Learners eat more meals and snacks at home.
- Learners more often use price comparison and cost reduction tools and strategies.
- Learners more frequently choose to do their major food shopping at lower cost supermarkets.
- Learners shop for food fewer times during the month.
- Learners more often use strategies to reduce impulse buying.
- Learners plan less costly meals that use less meat and fewer expensive convenience foods.

Conclusions and Recommendations

Food Resource Management education is a key component of EFNEP and education programs provided by Cooperative Extension. It should remain an integral part of the core behavior checklist. There is consistency between what is currently measured on the EFNEP Behavior Checklist and the highest priority topics identified in the review of the literature, although not all of the high priority indicators are measured. The Behavior Checklist core questions on Food Resource Management focus on meal planning, shopping with a grocery list, and comparing prices. The questions are as follows:

- How often do you plan meals ahead of time?
- How often do you compare prices before you buy food?
- How often do you shop with a grocery list?
- How often do you run out of food before the end of the month?

It is recommended that the first three core questions on Food Resource Management be retained.

There are no questions in the optional database on the indicators of shopping at lower cost supermarkets or shopping for food fewer times during the month. It is not recommended that questions be added to measure these indicators because they are environmental in scope and less likely to change as a result of the EFNEP intervention. In regard to impulse buying, shopping with a list and comparing prices are two strategies often employed to reduce impulse buying and these are currently measured. A question measuring the final indicator, “Learners plan less costly meals that use less meat and fewer expensive convenience foods,” could be developed either for the list of core questions or for inclusion in the optional database. The question on eating in restaurants should be retained in the optional database.

Nutrition Practices

The Nutrition Practices Subcommittee divided their review into multiple (ten) sections to coincide with the 2010 Dietary Guidelines. Only areas not currently measured through the 24-hour diet recall in EFNEP are reported in the Executive Summary, with the exception of sodium since there is currently a question on the Behavior Checklist on sodium. Additional information on all ten areas is provided in the final committee report.

Added sugar and sugar-sweetened beverages (SSB):

Significance of the Problem

Sugars are found naturally in fruits and milk products, but the majority of sugars in typical American diets are sugars added to foods during processing, preparation, or at the table. Many foods that contain added sugars supply calories; but few, or no, essential nutrients and no dietary fiber. Both naturally occurring sugars and added sugars increase the risk of dental caries. Added sugars contribute an average of 16% of the total calories in American diets. The major sources of added sugars in the diets of Americans are soda, energy drinks, and sports drinks (36% of added sugar intake). Beverages contribute an average of 400 calories per day, primarily from regular soda and energy and sports drinks. Reducing the consumption of sources of added sugars will lower the calorie content of the diet without compromising its nutrient adequacy.

Rationale for the Intervention

The contribution to health and healthy weight objectives of setting limits on discretionary calorie intake has been established, and foods with high sugar content are an important part of this. A review of the literature indicates that sugar-sweetened beverage consumption is relevant to the EFNEP audience, has implications for energy intake and weight status, and can potentially be changed through educational intervention. Because sugars are added to foods and beverages by manufacturers and by consumers at home, Americans can reduce their consumption of added sugars in a variety of ways:

- Limit the amount of added sugars when cooking or eating by using less table sugar.
- Consume fewer and smaller portions of foods and beverages that contain added sugars, such as grain-based desserts, sodas, and other sugar-sweetened beverages.

The Key Recommendation from the Dietary Guidelines 2010 is to, “*Reduce the intake of calories from solid fats and added sugars.*”

Conclusions and Recommendations

A question about sugar-sweetened beverages could be included in the core set of Behavior Checklist questions because it is a change that can be made and measured over the course of a 6-week intervention. Both 24-hr recall and food frequency measures are commonly used in the literature, suggesting that a frequency item on sugar-sweetened beverages could be included in the Behavior Checklist. If a frequency question is added, the main challenges will be (1) to develop an item that is brief and clear yet comprehensive (i.e. it may not be possible to include all types of SSBs) and (2) to sufficiently measure behavior change using only 5 response options, given the wide range of existing and ideal levels of intake. An alternative approach would be to include a question on availability of sugar-sweetened beverages at home (e.g. “How often is regular soda available at home for you and your family to drink?”) but no research was found that used or tested this type of question. An item using the Behavior Checklist format was developed and tested for comprehension, reliability, and convergent validity at Cornell, “How often do you drink regular (not diet) soda?” This question is similar to a question in the optional database used an average of 35,000 times annually from 2007-2010, “Do you drink regular (not diet) soda every day?” The question tested by Cornell may be easier to understand, especially for those who drink soda occasionally, but not every day. It is recommended that the question from Cornell, “How often do you drink regular (not diet) soda?” be incorporated into a revised EFNEP Behavior Checklist for testing.

In regard to decreasing consumption of added sugar, it is anticipated that the new EFNEP evaluation and reporting system, Web-NEERS, will provide information on consumption of solid fats and added sugars (SoFAS) as a part of the analysis of the 24-hour diet recall.

Portion Size

Significance of the Problem

Although there is no single “American” eating pattern, Americans in general eat too many calories and too much solid fat, added sugars, refined grains, and sodium. A healthy eating pattern is recommended, such as the USDA Food Pattern or the DASH Eating Plan. The USDA Food Patterns identify daily amounts of nutrient-dense foods to eat from five major food groups, with an allowance for oils and limits on solid fat and added sugars. However, the food supply has changed dramatically over the past 40 years. The average number of calories per day available per person increased approximately 600 calories over this time period. The recommended eating patterns were developed to meet nutrient needs without exceeding calorie requirements. Too often, however, Americans choose foods that are not in nutrient-dense forms or they consume larger portions than recommended, and as a result, consume more calories than they expend which can lead to increased risk of overweight or obesity

Rationale for the Intervention

Strong evidence shows that portion size is associated with body weight in that consuming smaller portions is associated with weight loss. Studies examining the relationship between food and the environment have found that communities with a larger number of quick-service restaurants tend to have higher body mass indices. Many portion sizes offered for sale have increased. Research has shown that when larger portion sizes are served, people tend to consume more calories.

The Key Recommendation from the Dietary Guidelines 2010 is to: “*Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.*”

Conclusions and Recommendations

Research in this area is limited and the most important behavior to evaluate is not clear. Themes that emerged from the literature are described in the final report.

Physical Activity

Significance of the Problem

According to the Dietary Guidelines, research supports that participation in regular physical activity helps people maintain a healthy weight and prevent excess weight gain. When combined with reduced calorie intake, physical activity may aid weight loss and the maintenance of weight loss. More screen time, particularly television viewing, is associated with overweight and obesity in children, adolescents, and adults. Substituting activity for sedentary time can help weight management and it has other health benefits.

Rationale for the Intervention

The potential benefit of regular physical activity has been well-documented in several studies in diverse populations. Certain population groups such as low income or ethnic minority groups are more likely to be physically inactive than the general population. Since the prevalence of physical inactivity is high among these populations it has become a public health challenge to increase their physical activity levels. Although it may not be realistic for participants in a 6-week nutrition intervention to increase physical activity significantly, some activity is better than none and any amount of physical activity will have health benefits.

Conclusions and Recommendations

The basic challenges of most of the intervention studies reviewed in the literature were in determining valid or reliable measures to assess the interventions. In EFNEP, physical activity data is currently collected from participants apart from the behavior checklist. Participants are asked to indicate their level of activity on most days: less than 30 minutes, 30-60 minutes, or

more than 60 minutes. This can be confusing in terms of the placement of the question on the form as well as participant understanding of the question.

Rather than measuring minutes of physical activity, EFNEP should focus on variables from the models that mediate inactivity and how those variables could be modified through the intervention. A measure of self-efficacy for physical activity could be used to assess individual's confidence to engage in exercise behavior as well as the level of support an individual receives from his/her family and friends. If actual behavior is to be measured, most of the interventions reviewed used tools that use the, 'How often' or 'How many times' or 'How many days' approach to assess frequency, time and intensity. These approaches would need further testing for use in EFNEP.

Family Meals

Significance of the Problem

The frequency of family meal consumption has been shown to be related to positive health outcomes and healthy eating habits in a number of epidemiological studies. Of the studies examined, three showed that children and adolescents who ate family meals more frequently were less likely to be overweight. Higher intakes of fruits and vegetables were associated with higher frequency of family meals in eight studies. One study showed an intervention encouraging family meal consumption among WIC clients led to an increase in the number of meals eaten together, however it did not examine the effect of increasing the number of family meals on positive health outcomes and healthy eating habits.

Rationale for the Intervention

Although the Dietary Guidelines do not specifically address family meals as an evidence-based recommendation, they do offer as a potential strategy for balancing caloric intake, “Cook and eat at home more often, preferably as a family.” At www.choosemyplate.gov resources are offered featuring ideas for developing healthy eating habits for preschoolers, including making mealtime a family time and the importance of serving as a healthy role model for children.

Conclusions and Recommendations

It would be valuable to include a question on family meals in the EFNEP Behavior Checklist as many curricula teach this and it impacts overall nutrition and health. Questions that were used in studies on family meals were fairly consistent from study to study; however, minor differences were noted. Though these questions would need further testing for the EFNEP audience, the following are recommended for consideration:

- During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times (Neumark-Sztainer et al., 2003, Burgess-Champoux et al., 2009)
- Over the past 7 days, on how many days did you eat a meal with other members of your household? (Johnson et al., 2006)

- How often do you eat together with your children at least 1 meal a day – almost never, 1 to 2 days each week, 3 to 4 days each week, 5 to 6 days each week, every day (Dickin et al., 2012)

Sodium

Significance of the Problem

The Dietary Guidelines recommend a reduction of daily sodium intake to less than 2,300 milligrams with further reductions to 1,500 milligrams among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. Most Americans consume more sodium than they need with an estimated intake of approximately 3,400 milligrams per day.

Rationale for the Intervention

Excess sodium consumption is a significant public health problem, so nutrition education on this topic is needed. According to the Dietary Guidelines, Americans can reduce their consumption of sodium in a variety of ways:

- Read the Nutrition Facts label for information on the sodium content of foods and purchase foods that are low in sodium.
- Consume more fresh foods and fewer processed foods that are high in sodium.
- Eat more home-prepared foods, where you have more control over sodium, and use little or no salt or salt-containing seasonings when cooking or eating foods.
- When eating at restaurants, ask that salt not be added to your food or order lower sodium options, if available.

Conclusions and Recommendations

Sodium intake of EFNEP participants is currently assessed on the 24-hour diet recall. However, there is a question on the core Behavior Checklist related to sodium as follows:

- How often have you prepared foods without adding salt?

Only a small proportion of the total sodium is from salt added at the table and in cooking. Most comes from salt added during food processing and frequent consumption of foods that contain lower amounts of sodium, such as yeast breads, chicken and chicken mixed dishes, and pasta and pasta dishes. The current question does not assess the most important behavior related to decreasing sodium consumption.

Within Centers for Disease Control and Prevention, the Division for Heart Disease and Stroke Prevention is working to add a module to the 2012 BRFSS to assess salt intake as a way to measure salt reduction. This work may provide validated questions to test with the EFNEP audience.

A Key Recommendation of the Dietary Guidelines 2010 is to, “*Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.*” Education on this topic, with an appropriate measure, could be considered as well.

For Future Consideration

There are several questions in NEERS5 that were not addressed in the literature review. The review was organized around the Dietary Guidelines for Americans 2010. The research basis for the following questions should be addressed in future work.

1. When deciding what to feed your family, how often do you think about healthy food choices?
2. How often do you use the “Nutrition Facts” on the food label to make food choices?
3. How often do your children eat something in the morning within two hours of waking up?

In addition, although not part of the Behavior Checklist, it is recommended that USDA NIFA or future committees examine the issue of collecting data regarding the amount of money spent on food with consideration to the following:

1. A question on money spent on food needs to be properly tested for validity and reliability.
2. For a low-income family, how do we determine which is indicative of improved behaviors, more money spent on food or less money spent on food? Can/should this be correlated with data on nutritional quality of food choices and food safety (wasting less food)?

Behavior Checklist Review Committee

Final Report

October 2012

Table of Contents

Charge for Committee4
Time Line.....4
Overall Input.....5
 Instrument Length.....5
 Constructs5
 Future Considerations6

Summary Reports

Food Security.....7
Food Safety12
Food Resource Management.....15
Nutrition Practices.....17
 Sugar-sweetened Beverages.....17
 Added Sugar.....19
 Whole Grains21
 Fat23
 Portion Sizes25
 Calcium.....27
 Physical Activity29
 Family Meals31
 Sodium33
 Fruits and Vegetables35
 Other Nutrition Practices37
Additional Input.....39

Attachments – Committee Reports

A. Food Safety40

B. Food Security.....46

C. Food Resource Management.....48

D. Nutrition Practices53

 D.1 - Sugar-sweetened Beverages53

 D.2 - Added Sugar63

 D.3 - Whole Grains67

 D.4 - Fat81

 D.5 - Portion Sizes105

 D.6 - Calcium.....111

 D.7 - Physical Activity124

 D.8 - Family Meals127

 D.9 - Sodium.....138

 D.10 - Fruits and Vegetables140

Charge for Committee:

Mary Kay Wardlaw and Gail Hanula were invited by Helen Chipman to co-chair a project that looks into the evidence base for questions on the behavior checklist, not in regard to validity and reliability although those are important, but in regard to whether the behaviors that are measured are those that are the most important to improving the health and well-being of EFNEP participants.

EFNEP programs across the country teach basic nutrition, food safety, food resource management, and more recently, the importance of physical activity. Nutritional intake is measured by the 24-hour diet recall, but the behavior checklist is the only evaluation tool for measuring the other constructs.

The co-chairs were charged with forming subcommittees, one for each of the constructs: nutrition and physical activity, food safety, food security, and food resource management. The subcommittees would look at the evidence base for each of these constructs in regard to what is most important in improving the health and well-being of EFNEP participants according to the literature, and then determine whether this is what we are measuring with the current behavior checklist questions - the 10 standard questions and the optional questions. New questions could be proposed as well. For example, we teach food resource management, but what does the literature show to be the most important behaviors in regard to saving money on food? And then, are these behaviors what we are measuring?

The information was shared with the EFNEP research committee. From volunteers, the four committees were formed.

Timeline:

By June 1, 2011

- Identify subcommittee members and chairs
 - Four subcommittees: Nutrition practices & physical activity, food safety, food resource management, and food security
- Hold initial meeting to lay out objectives

By December 1, 2011

- Subcommittees will have reviewed literature/research in their respective areas and have identified what needs to be measured or the critical components of each domain
- Mary Kay and Gail will have gathered and categorized questions from around the country, from ERS, etc.

By May 1, 2012

- Subcommittees will have reviewed questions and identified those best suited for our audience, identified gaps or areas that need to be measured but have no current question, and eliminated those that are duplicates or not usable
- Committee as a whole will have some recommendations for a new potential core set of questions, additional questions, and needs for further testing

Overall Input

Instrument Length

In trying to determine the optimal number of questions, it may be worthwhile to consider what states are currently doing relative to the Behavior Checklist. From 2007-2010, 39 institutions reporting through the NEERS5 system used additional questions. These varied from 2 to 41 questions in addition to the 10 core questions used nationally. On average, 9 to 10 additional questions are added to the core by programs that choose to ask more questions.

The committee chairs of this Review came to a consensus that around 15 questions may be optimal given participant burden and the potential to gather some of the relevant data from a dietary recall.

Constructs

The Behavior Checklist has been, and continues to be, an important tool to measure the impact of the Expanded Food and Nutrition Education Program (EFNEP) nationwide. The four key areas or constructs measured, along with a summary of the committee's findings, are as follows:

Food Resource Management

In regard to Food Resource Management, the core questions on the Behavior Checklist are appropriate based on the literature, current practice, and sensitivity to change over the course of a 6-8 session intervention. This particular construct is somewhat unique to EFNEP, and a hallmark of the program.

Food Security

Only one question on the current Behavior Checklist measures the construct of Food Security, and it is in regard to how often a family runs out of food. This is an important construct. However, there is concern that the current question is confusing and possibly threatening to parents who are concerned that running out of food may be perceived as child neglect.

Food Safety

The literature does not support the current questions as the most important concepts to stress for the prevention of foodborne illness. The literature clearly supports teaching hand washing as an important component of food safety. However, the committee believes it would be difficult to measure the impact of EFNEP in increasing hand washing or improving hand washing techniques using the current format of a pre- and post-test. Preventing cross-contamination is not in the core set of questions; the literature supports its inclusion and it is felt by the committee that this behavior would be sensitive to change in a 6-8 week intervention. The committee believes that the current questions on Food Safety on the Behavior Checklist are not well understood by participants and there is concern that the literature does not support food storage as the most important means of preventing foodborne illness.

Nutrition (includes Physical Activity)

The nutrition construct was by far the largest of the constructs reviewed by the committee. Each topic is important, so the emphasis was placed on behaviors that are measurable and achievable based on the literature, and on information not currently available from results of the analysis of the 24-hour diet recall. The committee feels that based on the literature, priority should be given to addressing the issue of consumption of sweetened beverages. A question on physical activity is supported by the literature, but the current question was felt by many to be confusing. The importance of family meals is supported in the literature, and the topic could be included in a set of core questions. Data on changes in the intake of fat, calcium, fruits, and vegetables is available from the 24-Hour Diet Recall, and it is anticipated that whole grain consumption data will be available in the near future in Web-NEERS. While including questions on food consumption in the Behavior Checklist has value as a validation measure, the committee feels it is most important to minimize respondent burden and not ask duplicative questions as part of the core set of questions.

Future Considerations

In addition to the areas of concern addressed above in regard to the constructs, there were several other items where the committee had questions.

1. The response categories on the current Behavior Checklist should be examined. Response options that are more easily quantified than, for example, “sometimes,” may yield more informative data. Be cautious of “how often” questions and how they are interpreted. Need to be sensitive to how they translate as well to other languages.
2. Do we need to develop a standard collection of prompts used across the country to help participants understand the questions?
3. Focus on what is feasible to change and measure in 6-8 sessions over 6 to 8 weeks.
4. While the focus of EFNEP is not on preventing childhood obesity, nutrition education is important in the primary prevention of childhood obesity. As a nutrition education program, EFNEP should be recognized for its important role in helping families all over the United States improve their health.*

* JNEB article reference from Kate Dickin *Developing a Measure of Behavior Change in a Program to Help Low-Income Parents Prevent Unhealthy Weight Gain in Children*. Journal of Nutrition Education and Behavior 2012; 44 (1):12-21).

FOOD SECURITY

Dr. Jung Sun Lee and Dr. Gail Hanula, The University of Georgia

In 2010, 48.8 million people lived in food-insecure households (Jensen, Nord, Andrews, & Carlson, 2011). The prevalence of food insecurity varied considerably among household types. Some groups with rates of food insecurity higher than the national average (14.5 percent) were households with incomes below the Federal poverty line—\$22,113 for a family of four in 2010—(40.2 percent) and households with children, headed by a single woman (35.1 percent). Fifty-nine percent of all food-insecure households participated in one or more of the three largest Federal food and nutrition assistance programs during the month prior to the 2010 survey.

The mission of EFNEP is to serve families with limited resources. Nationally, 77% of EFNEP families reported participating in at least one food assistance program in FY11. However, according to the USDA ERS, over 40% of food insecure households did not participate in one or more of the three largest Federal food and nutrition assistance programs during the month prior to the 2010 survey of food security. It is crucial that EFNEP education efforts include food resource management skills and that families be made aware of food assistance programs available in their communities.

In order to assess food security status, Lee, Johnson, Brown, & Nord (2011) found that a modified version of the six-item U.S. Household Food Security Survey Module (HFSSM) was a valid measure of food security in older adults. The original six-item module has been used successfully in mail-out, take-home and on-site self-administered surveys (Blumberg et al., 1999). The difference in the questions proposed by Lee et al. is that the single question asking about frequency of cutting the size of meals or skipping meals was separated into two questions. The validated modified six questions used by Lee et al. are found in Appendix B. Questions similar to the first four questions are found in the optional database of questions for the EFNEP Behavior Checklist.

In medical settings, shorter screening tools have found to be valid measures of food insecurity and hunger. Hager et al. (2010) reported that a 2-item screen to identify families at risk for food insecurity was both sensitive and specific, using a 12-month time frame. The first question used was the same as Question 1 used by Lee et al. (2011) with the exception of the time frame, and the second question was as follows: “Within the past 12 months we worried whether our food would run out before we got money to buy more.” Kleinman et al. (2007) reported that a 1-item screen to measure hunger had 83% sensitivity and 80% specificity. The question was, “In the past month, was there any day when you or anyone in your family went hungry because you did not have enough money for food?” This question is similar to the 6th question used by Lee et al. (2011), but broader in scope, including not just the respondent, but anyone in the family. In addition, research conducted by Keenan et al. suggests that food insecure individuals may take drastic measures to insure that they have enough food to eat. The question they asked was, “Do you do drastic things, like eat foods that may be unsafe, to make sure that you have food to eat?” A question such as this could be included in the food security or food safety construct.

Dietary Guidelines for Americans 2010

Chapter 6 of the 2010 Dietary Guidelines, “Helping Americans Make Healthy Choices,” features a Call to Action with three guiding principles. The first of these principles deals with the issue of food security. It is to, “Ensure that all Americans have access to nutritious foods and opportunities for physical activity.” Research has shown that some Americans lack access to affordable nutritious foods in their neighborhoods. This lack of access makes it a challenge for many people to consume a diet consistent with the Dietary Guidelines, and may be related to overall disparities in health. In order to make healthy lifestyle choices, people need to be aware of and have access to those healthy choices. Access includes not only availability, but affordability and safety. Acceptability of the choices is also important. Strategies suggested to help ensure that all Americans have access to nutritious foods include:

- Expanding access to grocery stores, farmers markets, and other outlets for healthy foods.
- Increasing food security among at-risk populations by promoting nutrition assistance programs.

The second guiding principle could also relate to food security. It is to, “Facilitate individual behavior change through environmental strategies.” Many people lack the information or motivation needed to achieve and maintain healthy nutrition behaviors. More consumer education is needed on achieving calorie balance and meeting nutrient needs, but information alone does not lead to behavior change. People need to value the outcomes associated with the change and believe that the changes can fit into their lifestyles. A culturally sensitive environment that supports and facilitates healthy behavior changes should be in place for this to occur. Strategies suggested to address these issues and support behavior change include:

- Empower individuals and families with improved nutrition literacy, gardening, and cooking skills to heighten enjoyment of preparing and consuming healthy foods.
- Initiate partnerships with food producers, suppliers, and retailers to promote the development and availability of appropriate portions of affordable, nutritious food products in food retail and foodservice establishments.
- Support future research that will further examine the individual, community, and system factors that contribute to the adoption of healthy eating and physical activity behaviors; identify best practices and facilitate adoption of those practices.

The final principle is, “Set the stage for lifelong healthy eating, physical activity, and weight management behaviors.” Lifelong habits are developed throughout childhood and every opportunity should be provided to build healthy habits at the earliest stages of life. Parents and caregivers serve as important role models for children and are responsible for providing them with nutritious foods. Strategies to create and promote healthy lifestyles for children include:

- Provide comprehensive health, nutrition, and physical education programs in educational settings and place special emphasis on food preparation skills, food safety, and lifelong physical activity.
- Support children’s programs that promote healthy nutrition and physical activity throughout the year, including summer.

The ultimate goal of the Dietary Guidelines for Americans is to improve the health of our Nation's current and future generations by facilitating and promoting healthy eating and physical activity choices so that these behaviors become the norm. Meeting this goal will require comprehensive, system-wide approaches so that the healthy choices are the easy, accessible, and desirable choices for all Americans.

NEERS5 CORE Questions

How often do you run out of food before the end of the month?

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
WI096	5	23565	23737	23434	22449	23296	How often do you use a written spending plan or budget?
FNS125	5	19590	11041	10316	10940	12972	How often [during the year] did this happen--almost every month, some but not all months, or only 1 or 2 months?
IA108	5	9826	11636	11291	11021	10944	How often do you use community food resources like a food pantry or soup kitchen?
CA050	5	12225	10509	10154	9976	10716	It's too expensive to eat a lot of nutritious foods.
FNS124	L	8163	10513	10982	9161	9705	In the past year, has any adult in your household ever had their meals cut or had to skip meals due to lack of money?
FNS135	L	8163	10513	10982	9161	9705	In the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?
WI110	L	7892	8698	8170	8915	8419	I sometimes can't afford to eat properly.
IA107	5	3604	4650	5073	4734	4515	How often do you budget enough money for food purchases?
FNS155	5	9930	1523	1298	1323	3519	In the last 12 months, (I/we) couldn't afford to eat balanced meals.
CA045	5	4658	6574	532	7	2943	Do you worry about whether your food will run out before you can buy more?

FNS132	L	8222	1224	1073	1094	2903	In the past 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?
FNS154	5	8163	1224	1071	1094	2888	In the last 12 months, the food that (I/we) bought just didn't last, and (I/we) didn't have money to get more.
WI097	5	4201	4840	1	0	2261	How often do you keep track of some or all of your expenses?
WI100	5	1694	1650	244	12	900	How often do you set aside money for occasional bills? (car license, ins., water bill)
NY108	L	79	147	336	267	207	While pregnant, did you ever eat less than you should because food ran low and there wasn't enough money to buy more?
PA093	L	96	148	196	229	167	I don't have money for groceries.
FNS157	5	130	0	0	0	33	(My/Our child was/The children were) not eating enough because (I/we) just couldn't afford enough food.
WI109	L	59	0	2	0	15	We sometimes eat the same thing for several days because we only have a few kinds of food and don't have money for more.
3	L	0	0	0	0	0	Last month, did you ever have to cut the size of your children's meal because there was not enough money to buy food?

REFERENCES

- Blumberg S. J., Bialostosky, K., Hamilton, W. L., Briefel, R.R. (1999). The Effectiveness Of A Short Form Of The Household Food Security Scale. *Am J Public Health*. 89:1231–4.
- Hager, E. R., Quigg, A. M., Black, M. M., Coleman, S. M., Heeren, T., Rose-Jacobs, R., Cook, J. T., Ettinger Decuba, S. A., Casey, P. H., Chilton, M., Cutts, D. B., Meyers, A. F., & Frank, D. A. (2010). Development And Validity Of A 2-Item Screen To Identify Families At Risk For Food Insecurity. *Pediatrics* 126:E26-32.
- Jensen, A., Nord, M., Andrews, M. & Carlson, S. (2011). Household Food Security in the United States 2010. <http://Www.Ers.Usga.Gov/Publications/Err125/> Accessed May 29, 2012.
- Keenan, D. P., Olson, C., Hersey, J. C., & Parmer, S. Measures Of Food Insecurity/Security. (2001). *Journal of Nutrition Education* 33: S49-S58.
- Kleinman, R. E., Murphy, M., Wieneke, K. M., Desmond, M. S., Schiff, A., Gapinski, J. A. (2007). Use Of A Single-Question Screening Tool To Detect Hunger In Families Attending A Neighborhood Health Center. *Ambulatory Pediatrics* 7:278-284.
- Lee, J. S., Johnson, M. A., Brown, A., Nord, M. (2011). Food Security Of Older Adults Requesting Older Americans Act Nutrition Program In Georgia Can Be Validly Measured Using A Short Form Of The U.S. Household Food Security Survey Module. *J. Nutr* (In Press).

FOOD SAFETY

Dr. Janie Burney, University of Tennessee with information submitted by Joyce McDowell, The Ohio State University

The literature suggests that food safety education can play an important role in reducing foodborne illnesses. According to Hillers, Medeiros, Kendall, Chen, and DiMascola (2003), there is a need to decide how much attention should be focused on infrequent but very risky behaviors (e.g., unpasteurized milk or uncooked seafood) and how much should be focused on less risky, more prevalent behaviors (e.g., lack of effective or no hand-washing and cross-contamination). Hillers et al. (2003) recommends that the primary focus should be on the common food-handling errors for most audiences. When the audience is at high risk for foodborne illness (e.g., *L. monocytogenes* or *T. gondii*) or known to be likely to consume foods that are more likely to be contaminated with pathogens, information for the high-risk foods also is appropriate (Hillers et al., 2003). Children have a higher risk of serious complications from *E. coli* 0157:H7, so food safety for parents of young children should include specific information about ways to reduce the risk of acquiring this pathogen.

Consumer food handling behaviors associated with the prevention of thirteen foodborne illnesses were reported by Medeiros, Kendall, Hillers, Chen, and Dimascola (2003). Constructs validated to pathogens were “cook thoroughly,” “cross contamination,” “personal hygiene,” and “safe temperatures.” According to Phang and Bruhn (2011), the most critical violation, defined as one that could by itself potentially lead to a foodborne illness, was neglect of hand washing. Medeiros et al. (2001) also reported this as most critical, along with avoiding cross-contamination. Phang and Bruhn (2011) state that there is a need to address appropriate refrigerator temperatures, however, Medeiros, et al. (2001) suggest that keeping food at safe temperatures be a secondary message if a limited amount of time is available for food safety education.

Based on the reviewed literature, the high priority indicators on which EFNEP educational programming and outcome evaluation efforts should focus are the following:

- Learners more often washing hands for at least 20 seconds with warm water and soap before eating and preparing food.
- Learners more often washing cutting boards, knives, and hands that have been in contact with raw meat, poultry and fish.
- Learners more often using a food thermometer to tell when food is done (meat, casseroles, leftovers).

Dietary Guidelines for Americans 2010

Ensuring food safety is an important principle for building healthy eating patterns since foodborne illness affects millions of people in the US annually. The 2011 estimates from the Centers for Disease Control and Preventions reported 1 in 6 or 48 million Americans get sick, 128,000 are hospitalized, and 3,000 die from foodborne illnesses.

(www.cdc.gov/foodborneburden/index.html; accessed 05/02/2012) Washing hands, rinsing vegetables and fruits, preventing cross-contamination, cooking foods to safe internal

temperatures, and storing foods safely are the behaviors most likely to prevent food safety problems. A set of four basic food safety principles work together to reduce the risk of foodborne illnesses, including: clean, separate, cook, and chill. Additionally, some foods pose a particularly high risk of foodborne illness and should be avoided. These include unpasteurized cheeses, juice, and (raw) milk, raw or undercooked animal foods, including seafood, poultry, eggs, and meat, and raw sprouts.

Key Recommendation:

Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.

NEERS5 CORE Questions

This question is about meat and dairy foods. How often do you let these foods sit out for more than two hours?

How often do you thaw frozen foods at room temperature?

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CO001	5	20835	37628	43496	50301	38065	I wash my hands with soap and warm running water before preparing food.
IN113	5	20646	36461	43496	45564	36542	How often do you use a meat thermometer to measure the doneness of meat?
PA088	4	17192	19164	12647	16451	16364	How often do you wash your hands in warm soapy water before preparing food?
16	5	18354	12898	244	8079	9894	Do you wash in hot soapy water, utensils and surfaces that have touched raw poultry or meat before using them again?
IN114	5	5676	6598	4316	4525	5279	How often do you use a refrigerator thermometer?
CO003	5	0	524	5216	4525	2566	After working with raw meat or chicken or seafood, I wash my hands with soap and warm running water before cooking.
IN119	5	804	2432	2563	2479	2070	How often do you separate raw meat, poultry and fish from vegetables, fruits and prepared products?

VA125	5	3604	4650	0	0	2064	After grocery shopping, how often do you go home immediately and put cold and frozen food in refrigerator or freezer?
IN100	5	2866	2168	933	1124	1773	How often do you eat soft cheeses such as feta, brie, camembert, blue-veined, or Mexican-style?
IN122	5	2866	2168	933	1124	1773	How often do you eat raw hot dogs, or lunchmeat such as bologna?
IN124	5	2866	2168	933	1124	1773	How often do you heat lunch meats, cold cuts and deli meats until steaming hot?
NY106	5	258	139	3716	130	1061	Do fresh vegetables spoil before you can use them?
VA123	5	1694	1650	244	12	900	In storing large quantities of hot foods, do you place them in shallow containers in the refrigerator?
CO009	L	1074	1743	0	0	704	Do you refrigerate fried chicken within 2 hours of preparing and serving?
CO006	L	1074	1743	0	0	704	Do you use a food thermometer to determine if hamburger patties have been cooked enough?
OR121	4	430	625	336	510	475	How often do you cook ground beef or meat loaf until it is no longer pink?
WI108	5	251	794	532	0	394	How often do you thaw frozen meat at room temperature?
TEMP09	L	79	147	336	51	153	After a feeding, formula left in the bottle should be thrown away.
CO002	5	0	0	0	130	33	After playing with a pet and before getting a snack, I wash my hands with soap and warm running water.
IN116	5	52	20	8	2	21	How often do you refrigerate or freeze foods within 2 hours after serving?
VA126	5	40	20	8	2	18	How often do you check "sell-by" or expiration dates to make sure food can be used before it spoils?

FOOD RESOURCE MANAGEMENT

The literature suggests that many low income households do use careful or thrifty food shopping practices and there is evidence that the nutrient availability for the household members was enhanced. Several studies found low income households may opt to purchase less fruits and vegetables and other nutritious foods perceived as costly. EFNEP data suggest a strong association between the practice of thinking about healthy food choices when shopping for food and the quality of the household dietary intake.

Food Resource Management is an area unique to EFNEP and an area we have long tracked in data collection. It should remain an integral part of the core behavior checklist. Of the current four questions, the fourth causes confusion with participants and overlaps with food security.

Based on the reviewed literature the high priority indicators on which EFNEP educational programming and outcome evaluation efforts should focus are the following:

- Learners more often planning several days of meals for their families, rather than making last minute decisions about what and where to eat.
- Learners more often make a plan for the food they will purchase prior to going to the grocery store; the plan for food to be purchased is more frequently written down in the form of a grocery list.
- Learners report that they are saving money when shopping for food; actual weekly or monthly grocery spending is closer to the USDA recommendations for their family size.
- Learners report that they are eating more meals and snacks at home consuming foods that they have prepared; number of meals eaten away from home is reported to decrease.
- Learners more often use price comparison and cost reduction tools and strategies such as: coupons, unit pricing, bulk purchasing, store brands, in store promotions, use of less processed foods.
- Learners more frequently choose to do their major food shopping at lower cost supermarkets.
- Learners shop for food fewer times during the month.
- Learners more often use strategies to reduce impulse buying such as avoiding shopping when hungry and shopping without young children whenever possible.
- Learners plan less costly meals that use less meat, more mixed dish foods, and fewer expensive convenience foods.

NEERS5 CORE Questions

How often do you plan meals ahead of time? (also considered a nutrition practices question)

How often do you compare prices before you buy food?

How often do you shop with a grocery list?

How often do you run out of food before the end of the month? (also considered a food security question).

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA051	N	15217	19404	18540	19918	18269.8	How many times a week do you eat in a restaurant?
CA050	5	12225	10509	10154	9976	10716	It's too expensive to eat a lot of nutritious foods.
WI103	5	1127	3344	7457	7318	4811.5	How often do you make main dishes from scratch?
IA107	5	3604	4650	5073	4734	4515.25	How often do you budget enough money for food purchases?
28	N	0	0	2	3316	829.5	How many times during the month do you check grocery ads to find sales on food items you need?
HI108	5	0	0	0	3293	823.25	I inventory my food supply before going food shopping.
PA089	4	102	690	901	137	457.5	How often do you prepare dishes from scratch?
IA111	5	635	166	1	0	200.5	How often do you spend money on unplanned purchases?
WI115	5	597	190	1	0	197	How often do you feel confident about your abilities to manage money?
IA110	5	597	166	1	0	191	How often do you pay bills on time?

NUTRITION PRACTICES

The Nutrition Practices Committee divided their review into 10 sections to coincide with the 2010 Dietary Guidelines.

Sugar Sweetened Beverages (SSB)

(7 articles reviewed by Kate Dickin)

Overall, given the high prevalence of SSB consumption, the links with unhealthy weight gain, and likelihood of change, it makes sense to include a question on SSBs in the Behavior Checklist. This review indicates that SSB consumption is relevant to the EFNEP audience, has implications for energy intake and weight status, and can potentially be changed through educational intervention. The reviewer believes a question about sugar sweetened beverages should be included in the core set of Behavior Checklist questions because it is a change that can be made and measured during the lesson series.

Both 24-hr recall and food frequency measures are commonly used in the literature, suggesting that a frequency item on SSBs could be included in the Behavior Checklist. Alternatively, if the methods for collecting and analyzing 24-hr dietary recall data in EFNEP are also amended, changes could be made to allow assessment of SSB consumption using the recall data.

If a frequency question is added to the Behavior Checklist, the main challenges will be (1) to develop an item that is brief and clear yet comprehensive (i.e. it may not be possible to include all types of SSBs) and (2) to sufficiently measure behavior change using only 5 response options, given the wide range of existing and ideal levels of intake.

Other measurement approaches reviewed here collect more detailed data, using multiple questions and/or a larger number of response options, which may not be feasible in the Behavior Checklist. An alternative approach would be to include a question on availability of SSBs at home (e.g. “How often is regular soda available at home for you and your family to drink? -- never/almost never, occasionally, about half the time, most of the time, always/almost always”) but no research was found that used or tested this type of question.

An item using the Behavior Checklist format was developed and tested for comprehension, reliability, and convergent validity at Cornell. How often do you drink regular (NOT diet) soda?

Dietary Guidelines for Americans 2010 (Sugar-Sweetened Beverages and Added Sugars).

Sugars are found naturally in fruits and milk products, but the majority of sugars in typical American diets are sugars added to foods during processing, preparation, or at the table. Many foods that contain added sugars often supply calories, but few or no essential nutrients and no dietary fiber. Both naturally occurring sugars and added sugars increase the risk of dental caries. Added sugars contribute an average of 16% of the total calories in American diets. As a percent of calories from total added sugars, the major sources of added sugars in the diets of Americans

are soda, energy drinks, and sports drinks (36% of added sugar intake). Beverages contribute an average of 400 calories per day, primarily from regular soda and energy and sports drinks. Reducing the consumption of sources of added sugars will lower the calorie content of the diet without compromising its nutrient adequacy.

Because sugars are added to foods and beverages by manufacturers and by consumers at home, Americans can reduce their consumption of added sugars in a variety of ways:

- Limit the amount of added sugars when cooking or eating by using less table sugar.
- Consume fewer and smaller portions of foods and beverages that contain added sugars, such as grain-based desserts, sodas, and other sugar-sweetened beverages.

Key Recommendation:

Reduce the intake of calories from solid fats and added sugars.

USAGE data on ADDITIONAL NEERS5 Question

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA044	5	28317	36312	40469	38401	35875	Do you drink regular soda (soda that is not diet) every day?

Added Sugar

(7 articles reviewed by Audrey Adler)

There are no questions on the current Behavior Checklist that relate to added sugar as part of discretionary calories. There is one question about soda that is included in a previous section.

In the literature reviewed, no behavior related questions concerning high sugar content foods were found. None-the-less, the contribution to health and healthy weight objectives of setting limits on discretionary calorie intake has been established, and foods with high sugar content are an important part of it. Given the national focus on obesity, a question on this topic should be considered ideally in the core question set, but at least in the additional questions. Separate questions on sugar-sweetened beverages, added sugar and fat may be optimal but not realistic relative to participant burden and number of questions.

Many of the articles reviewed related to snacking. A few key ideas to consider are the following:

- Among middle-income women, awareness of healthful snacks was considered to have low importance as a barrier to healthful snacking.
- Added sugars intake was inversely related to education and family income.
- From NHANES, snacking was not associated with poorer overall diet quality, but was associated with a slightly more nutrient-dense diet.
- The daily calories from snack foods exceeded the discretionary calories recommended in the Dietary Guidelines.
- Regular use of sugar information on nutrition panels is associated with a significantly lower density of added sugar in the diet. Yet, general use of the nutrition label (i.e., not specifically the sugar information) was not shown to impact the consumption of added sugar.
- Persons in the low-nutrient-dense intake group reported higher intake of sweets, sweet bread desserts, and dairy desserts and also reported higher BMI. The likelihood of undesirable weight or nutritional status was twice as high for individuals in this group.

Dietary Guidelines for Americans 2010 (Sugar-Sweetened Beverages and Added Sugars).

Sugars are found naturally in fruits and milk products, but the majority of sugars in typical American diets are sugars added to foods during processing, preparation, or at the table. Many foods that contain added sugars often supply calories, but few or no essential nutrients and no dietary fiber. Both naturally occurring sugars and added sugars increase the risk of dental caries. Added sugars contribute an average of 16% of the total calories in American diets. As a percent of calories from total added sugars, the major sources of added sugars in the diets of Americans are soda, energy drinks, and sports drinks (36% of added sugar intake). Reducing the consumption of sources of added sugars will lower the calorie content of the diet without compromising its nutrient adequacy. Because sugars are added to foods and beverages by manufacturers and by consumers at home, Americans can reduce their consumption of added sugars in a variety of ways:

- Limit the amount of added sugars when cooking or eating (using less table sugar)
- Consume fewer and smaller portions of foods and beverages that contain added sugars, such as grain-based desserts, sodas, and other sugar-sweetened beverages.

Key Recommendation:

*Reduce the intake of calories from solid fats and added sugars.

Whole Grains

(12 articles reviewed by Lorelei Jones)

Most of the articles reviewed included research on fat and fiber dietary behaviors. Data on whole grains may be collected via the dietary recall. Behaviors of choosing whole grains more often may be appropriate for the additional question set. The EFNEP questions that were used in these articles, or had related concepts tested, were the following and the reviewer suggests they be considered:

CA049 – When you eat bread, do you eat whole wheat bread? 5-choice

VA115 – *Do you eat 6 or more servings of breads, cereals, rice and pasta in a day? 5-choice*
(Note: this question was deleted)

WI103 – How often do you make main dishes from scratch? 5-choice

Overall, the review indicated that asking questions about fiber and whole grain intake are worthwhile. The following considerations were gleaned from the research findings:

1. Ask about willingness to make changes in eating habits in order to be healthier.
2. Assess confidence in identifying a whole grain product. For example, “Do you know how to identify whole grain products?” Using “I regularly choose whole grain products” on the entry/exit forms with an Agree-Disagree scale may not be valid because participants may not correctly identify whole grains.
3. Questions about fiber and whole grains are difficult due to the lack of knowledge participants have about whole-grains. Examples or definitions need to be provided.
4. Ask about other whole grain products beyond bread, like cereals, tortillas, crackers or pasta.
5. Assess frequency of whole-grain and high-fiber foods -- if participant consumes whole grain products every day.
6. Ask questions about substituting whole-grain past and brown rice for their refined counterparts.
7. Write questions so they are about specific foods instead of “low-fat foods,” “fried foods,” “fatty meats,” or “breads/cereals.” Perhaps have questions about whole grain pasta, brown rice, and oatmeal.

Dietary Guidelines for Americans 2010.

Although Americans generally eat enough total grains, most of these grains are refined rather than whole grains. On average, Americans eat less than 1-oz.-equivalent of whole grains per day.

Whole grains are a source of nutrients such as iron, B vitamins, and fiber. Evidence indicates that whole-grain intake is associated with lower body weight, reduced incidence of type 2 diabetes, and may reduce the risk of cardiovascular disease. At least half of the recommended total grain intake should be whole grains (about 3 oz.-equivalents per day). Replacing refined-grain foods with whole-grain foods will help keep total calorie intake within limits. Individuals who consume all of their grains as whole grains should include some that have been fortified with folic acid, such as ready-to-eat whole grain cereals.

Key Recommendations:

Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.

Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in American diets. These foods include vegetables, fruits, whole grains, and milk and milk products.

Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA049	5	24623	37672	56674	58229	44300	When you eat bread, do you eat whole wheat bread?
WI103	5	1127	3344	7457	7318	4812	How often do you make main dishes from scratch?
PA089	4	102	690	901	137	458	How often do you prepare dishes from scratch?

Fat

(25 articles reviewed by Lorelei Jones)

Most of the articles reviewed included research on fat and fiber dietary behaviors. Data on dietary fat intake may be collected via the dietary recall. Behaviors of choosing lower fat food choices, selecting snacks, and lower fat cooking techniques may be appropriate for the additional question set. The EFNEP questions that were used in these articles, or had related concepts tested were the following and the reviewer suggests they be considered:

- 002 – In the past month, how often did you read food labels to select food with less fat content? 5-choice
- 011 – Do you trim the fat from meat (such as beef, chicken, or pork) before cooking or eating? 5-choice
- 015 – *How many times in a two week period do you serve bacon, sausage, or other fatty meats? Numeric value (Note: this question was deleted)*
- 018 – Do you eat low-fat food instead of regular-fat food? 5-choice
- CA042 – Do you take skin off chicken before eating? 5-choice
- CA046 – Do you eat low fat foods instead of high fat foods? 5-choice
- CA047 – Do you use low-fat (2%), very low-fat (1%) or nonfat milk? 5-choice
- IN121 – How often do you eat fried foods? 5-choice
- MA004 – *Do you currently eat mostly low-fat foods every day (raw or prepared fruits, vegetables without butter or other fat)? 5-choice (Note: this question was deleted)*
- WI102 – How often do you eat low-fat foods instead of high-fat foods? 5-choice
- WI103 – How often do you make main dishes from scratch? 5-choice

Overall, the research raised the following considerations:

1. Ask questions about adding butter or other fats to baked potatoes, breads, and vegetables.
2. Ask questions about butter, deli meats, and desserts.
3. Write questions that are about specific foods instead of “low-fat foods,” “fried foods,” “fatty meats,” or “breads/cereals” -- perhaps French fries, buttered toast, sausage and bacon.

Dietary Guidelines for Americans 2010.

Fat contributes an average of 34% of calories to the American diet. This percentage has changed little from 1990-2006, despite longstanding recommendations to reduce dietary fat. The IOM established acceptable ranges for total fat intake for adults ages 19 years and older are 20-35% of calories. This range is associated with reduced risk of chronic diseases, such as cardiovascular disease, and provides for adequate intake of essential nutrients. In terms of cardiovascular disease risk, the types of fatty acids consumed are more important than the total amount of fat in the diet. Solid fats are abundant in the American diet, contributing an average of 19% of total calories, and thus contribute significantly to excess calorie intake.

Major food sources of solid fat in the American diet include grain-based desserts (11%), pizza (9%), regular (full-fat) cheese (8%); sausage, franks, bacon, and ribs (7%), and fried white potatoes (5%). To reduce intake of solid fat, many Americans should limit their consumption of

these major food sources, and other common solid fats. These include butter, beef fat, chicken fat, pork fat (lard), stick margarine, shortening, and the fat in milk. Replacing foods high in solid fat with foods that are high in monounsaturated and polyunsaturated fat is recommended, such as replacing butter/lard/stick margarine with vegetable oil, including canola, olive, safflower, soybean, corn and cottonseed oils. Purchasing and preparing foods in ways that help reduce solid fat is also recommended, such as purchasing low-fat or fat-free milk and choosing lean meats and poultry and trimming the fat. The amount of synthetic trans fatty acids in the US food supply has decreased dramatically since 2006 when declaration of the amount of these on the Nutrition Facts label became mandatory.

Key Recommendations:

Consume less than 10% of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.

Keep trans fatty acid consumption as low as possible, especially by limiting foods that contain synthetic sources of trans fats, such as partially hydrogenated oils, and by limiting other solid fats.

Reduce the intake of calories from solid fats and added sugars.

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA047	5	32293	29097	33935	40323	33912	Do you use low-fat (2%), very low-fat (1%) or nonfat milk?
WI102	5	8240	16448	20737	19187	16153	How often do you eat low-fat foods instead of high-fat foods?
CA046	5	3123	15263	17208	25845	15360	Do you eat low-fat foods instead of high fat foods?
IN121	5	11472	9822	9246	9846	10097	How often do you eat fried foods?
18	5	1753	12386	12458	5322	7980	Do you eat a lower-fat food instead of a regular-fat food?
WI103	5	1127	3344	7457	7318	4812	How often do you make main dished from scratch?
CA042	5	8132	1160	3565	0	3214	Do you take the skin off chicken before eating it?
11	5	0	0	927	3404	1083	How often do you trim fat from meat (such as beef, chicken, or pork) before cooking or eating?
2	5	335	912	728	229	551	In the past month, how often did you read food labels to select foods with less fat?
PA089	4	102	690	901	137	458	How often do you prepare dishes from scratch?

Portion Size

(12 articles reviewed by Kathy Orchen)

Portion size estimation is expected to be one of the largest sources of uncertainty in dietary assessment of the individual. Research data are limited on whether people monitor portion sizes and consistently choose to eat recommended serving sizes, thus consuming the appropriate amount of calories for maintaining or losing weight. Limited data are available on the efficacy of visual or tactile devices designed to enhance patient understanding and control of portion sizes. The response to the variations in portion size was not influenced by who determined the amount of food on the plate or by subject characteristics such as sex, body mass index, or scores for dietary restraint or disinhibition.

Due to research being limited in this area, the most important behavior to evaluate is not clear from the research. Question(s) do need to be designed to determine practicing portion control. The question(s) can help designate the necessity to practice portion control. This area impacts obesity and weight control.

The following themes emerged from the research literature:

- Value for money is important when purchasing and that large portion sizes offer more value for money than small portion sizes.
- Consumers perceive market place portions as standard portions.
- People's energy intake increases when offered a larger portion.
- People interpret package size as a single serving size and are unaware that a package contains multiple servings.
- Larger portions have become standard.
- People tend to select substantially larger portions than the recommended portion sizes.
- People tend to overeat palatable, high-energy-dense food, without deliberate intention.
- Portion size labeling or portion size information seems to be ineffective in decreasing energy intake.
- Portion size information did not influence satiety ratings or total intake.
- People find it difficult to self-regulate the consumption of large portion sizes.
- Effects of portion size can persist over several days, with no indication of meal to meal compensation.
- Simply advising people "to eat less" may not be as effective as encouraging consumption of low energy density foods such as fruits and vegetables, and moderation when consuming foods high in energy density.

Dietary Guidelines for Americans 2010.

Although there is no single "American" eating pattern, Americans in general eat too many calories and too much solid fat, added sugars, refined grains, and sodium. A healthy eating pattern is recommended, such as the USDA Food Pattern or the DASH Eating Plan. These patterns focus on foods in their most nutrient-dense forms, prepared without added fat and sugar, including vegetables, fruits, whole grains, fat-free or low-fat milk products, and lean protein

sources. The USDA Food Patterns identify daily amounts of nutrient-dense foods to eat from five major food groups, with an allowance for oils and limits on solid fat and added sugars. The patterns were developed to meet nutrient needs without exceeding calorie requirements. Too often, however, Americans choose foods that are not in nutrient-dense forms and consume more calories than they expend.

The food supply has changed dramatically over the past 40 years. The average number of calories per day available per person increased approximately 600 calories over this time period. Many portion sizes offered for sale also have increased. Research has shown that when larger portion sizes are served, people tend to consume more calories. Strong evidence shows that portion size is associated with body weight in that consuming smaller portions is associated with weight loss. Studies examining the relationship between food and the environment have found that communities with a larger number of quick-service restaurants tend to have higher body mass indices. As a result of the changing food environment, individuals need to deliberately make food choices that are nutrient dense, low in calories, and appropriate in portion size.

Key Recommendations:

Prevent and/or reduce overweight and obesity through improved eating and physical activity behaviors.

Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.

Maintain appropriate calorie balance during each stage of life...

Select an eating pattern that meets nutrient needs over time at an appropriate calorie level.

Account for all foods and beverages consumed and assess how they fit within a total healthy eating pattern.

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
WY101	5	12005	30236	34031	38119	28598	When you have the option of getting a 'super-sized' portion of food or beverage, how often do you order it?

Calcium

(14 articles reviewed by Audrey Adler)

Calcium should continue as a focus in EFNEP education as it is necessary for health throughout the life span and few people consume recommended amounts. Ideally, questions would go beyond dairy foods to include other sources such as fortified foods. There are several key concepts from the literature to consider when designing core questions and additional items for the Behavior Checklist.

1. Self-efficacy and awareness
 - a. I can find the calcium content of foods by reading food labels.
 - b. I am sure I can increase the amount of calcium in my diet.
 - c. Adequate calcium is important to me.
 - d. I intend to lower my risk for osteoporosis.
2. Questions about ease of availability of milk and ability to store.
3. Question on frequency of soft drink intake or how often soft drinks are chosen over milk when a choice is available.
4. Question about avoidance of dairy due to intolerance.
5. Question on calcium-fortified beverages or foods.
6. Food specific frequency questions about milk or yogurt.
7. Questions regarding attitudes about milk/dairy foods such as:
 - a. I like the taste of it.
 - b. It causes indigestion/upsets my stomach.
 - c. It causes me to gain weight.
 - d. It has too much fat for my blood.
 - e. I was told not to drink it.
 - f. It is expensive.

Dietary Guidelines for Americans 2010.

Americans consume less than recommended amounts of vegetables, fruits, whole grains, milk and milk products, and seafood. As a result, the following nutrients are low enough to be of public health concern for the general population: potassium, dietary fiber, calcium, and vitamin D.

Calcium is important for optimal bone health and serves vital roles in nerve transmission, constriction and dilation of blood vessels, and muscle contraction. Low bone mass is a risk factor for osteoporosis and bone fractures. Age groups of particular concern include children ages 9 years and older, adolescent girls, adult women, as well as adults ages 51 years and older.

Milk and milk products contribute substantially to calcium intake. Dietary Guidelines encourage fat-free or low-fat milk and milk products and/or alternative calcium sources such as calcium-fortified foods and beverages.

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA047	5	32293	29097	33935	40323	33912	Do you use low-fat (2%), very low-fat (1%) or nonfat milk?
VA117	5	18046	21182	30750	29304	24821	Do you consume 2 - 3 servings of Milk, Yogurt, and Cheese each day?

Physical Activity

(4 articles reviewed by Tarana Kahn)

The potential benefit of regular physical activity has been well documented in several studies in diverse populations. Certain population groups such as low income or ethnic minority groups are more likely to be physically inactive than the general population. Since the prevalence of physical inactivity is high among these populations it has become a public health challenge to increase their physical activity levels. Many community-based interventions were designed and implemented to change the physical activity behavior among diverse populations.

Some studies used self-reported assessment of stages of physical activity behavior changes, physical activity behavior, and Trans-theoretical Model behavior change constructs. Physical activity behavior was measured by 7-Day physical activity recall in some studies. Also, self-efficacy was measured to assess individual's confidence to engage in exercise behavior as well as the level of support an individual receives from his/her family and friends. Some studies used 24-hour activity records over three-days.

The basic challenges of most of the intervention studies were the theoretical framework, or valid or reliable measures to assess the interventions. Based on these facts from the studies, EFNEP should focus on implementing theory-based curricula to help identify the variables from the models that mediate inactivity and how those variables could be modified through the interventions to maximize program effectiveness.

In the literature, to evaluate actual behavior change, most of the interventions used tools which have 'How often' or 'How many times' or 'How many days' to assess frequency, time and intensity. These approaches could be used with EFNEP as well by further cognitive testing of more specific examples.

The core 10-question behavior checklist used nationally in EFNEP has no question on physical activity but many states add an item to the checklist from the question bank. Physical activity data is collected from participants separate from the behavior checklist. They are asked to indicate their level of activity on most days: less than 30 minutes, 30-60 minutes, or more than 60 minutes. This can be confusing in terms of the placement of the question on the form as well as participant understanding of the question. In addition, the potential to ask about physical activity behavior as well as attitudes about physical activity should be considered.

Research on a physical behavior checklist is currently being conducted at Clemson University.

Dietary Guidelines for Americans 2010.

Balancing calories to manage weight is one of the key recommendations from the Dietary Guidelines. Physical activity is one side of the calorie balance equation. The Dietary Guidelines refer to the 2008 Physical Activity Guidelines for Americans for recommendations on time and intensity relative to age:

Children and adolescents should do 60 minutes or more of physical activity daily.

All adults should avoid inactivity. Some is better than none and any amount of physical activity will have health benefits. For substantial benefits, 150 minutes of moderate-intensity per week is suggested.

Older adults follow adult guidelines or are as physically active as their abilities and conditions allow.

Research supports that participation in regular physical activity helps people maintain a healthy weight and prevent excess weight gain. When combined with reduced calorie intake, physical activity may aid weight loss and maintenance of weight loss. More screen time, particularly television viewing, is associated with overweight and obesity in children, adolescents, and adults. Substituting activity for sedentary time can help weight management and have other health benefits.

USAGE data on ADDITIONAL NEERS5 Questions

Ques ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
WI114	5	34193	50305	45532	61749	47945	How often do you participate in at least 30 minutes of moderate physical activity (sweeping, gardening, etc.) every day?
MA001	5	9905	12466	14127	15380	12970	Are you currently physically active for at least 30 minutes per day, on 4 or more days per week?
UT100	5	3604	5115	8290	4670	5420	How often do you walk, take the stairs, run with your kids, and take other opportunities to be physically active?
WY102	5	273	3348	3479	3574	2669	How often does self-consciousness about your body size or shape keep you from participating in physical activity?
ME001	5	299	85	3989	5767	2535	How ready are you to make changes in your lifestyle to be physically active most days?
VA120	4	1730	675	933	130	867	Do you exercise for a total of 30 minutes each day?

Family Meals

(14 articles reviewed by Justine Hoover)

The frequency of family meal consumption has been shown to be related to positive health outcomes and healthy eating habits in a number of epidemiological studies. Of the studies examined, three showed that children and adolescents who ate family meals more frequently were less likely to be overweight. Higher intakes of fruits and vegetables were associated with higher frequency of family meals in eight studies. Only one study showed an intervention encouraging family meal consumption among WIC clients led to an increase in the number of meals eaten together, however it did not examine the effect of increasing the number of family meals on positive health outcomes and healthy eating habits. Based on the findings of these studies and the fact that many EFNEP curricula teach family meals, a question on family meals would be important to include on the EFNEP behavior checklist.

Questions that were used in these studies were fairly consistent from study to study; however, minor differences were noted. Though these questions would need further testing for the EFNEP audience, the following are recommended:

- During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times.
- Over the past 7 days, on how many days did you eat a meal with other members of your household?
- How often do you eat together with your children at least 1 meal a day – almost never, 1 to 2 days each week, 3 to 4 days each week, 5 to 6 days each week, every day

Other questions are available that would be useful. However, these questions are more exclusive in that they ask about all family members eating together (which may not be realistic) and specific meals or times of day.

It would be valuable to include a question on family meals in the EFNEP Behavior Checklist as many curricula teach this and it impacts overall nutrition and health.

Dietary Guidelines for Americans 2010.

Although the Dietary Guidelines don't specifically address family meals as an evidence-based recommendation, they do offer as a potential strategy for balancing caloric intake, "Cook and eat at home more often, preferably as a family." At choosemyplate.gov, the following resources are offered:

1. Ideas for developing healthy eating habits among preschoolers including making mealtime a family time. www.choosemyplate.gov/preschoolers/healthy-habits/making-mealtime-family-time.html

2. The 10 Tips Nutrition Education Series features “be a healthy role model for children” and includes focusing on each other at the table. www.choosemyplate.gov/food-groups/downloads/TenTips/DGTipsheet12BeAHealthyRoleModel.pdf

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
IA105	5	9936	14913	17477	21287	15903	How often do you eat meals or snacks with one or more family members?
VA118	5	273	407	310	423	353	Are you alone when you eat your meals?

Sodium

(4 articles reviewed by Virginie Zoumenou)

There appears to be few studies on measuring sodium intake for a low-income audience. One study found a simple questionnaire on salt preference was not effective. Two studies used short dietary salt questionnaires. Within CDC, the Division for Heart Disease and Stroke Prevention is working to add a module to the 2012 BRFSS to assess measures of salt intake as a way to assess salt reduction. This work may provide validated questions to test with the EFNEP audience.

Dietary Guidelines for Americans 2010.

The Dietary Guidelines recommend a reduction of daily sodium intake to less than 2,300 milligrams with further reductions to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. Most Americans consume more sodium than they need with an estimated intake of approximately 3,400 mg per day. The recommendation is challenging to meet. Only a small proportion of the total sodium is from salt added at the table and in cooking. Most comes from salt added during food processing and frequent consumption of foods that contain lower amounts of sodium, such as yeast breads, chicken and chicken mixed dishes, and pasta and pasta dishes.

Americans can reduce their consumption of sodium in a variety of ways:

- Read the Nutrition Facts label for information on the sodium content of foods and purchase foods that are low in sodium.
- Consume more fresh foods and fewer processed foods that are high in sodium.
- Eat more home-prepared foods, where you have more control over sodium, and use little or no salt or salt-containing seasonings when cooking or eating foods.
- When eating at restaurants, ask that salt not be added to your food or order lower sodium options, if available.

Key Recommendation:

Reduce daily sodium intake to less than 2,300 mg and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500 mg recommendation applies to about half of the US population, including children, and the majority of adults.

Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.

NEERS 5 CORE Question

How often have you prepared foods without adding salt?

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA051	N	15217	19404	18540	19918	18270	How many times a week do you eat in a restaurant?
WI103	5	1127	3344	7457	7318	4812	How often do you make main dishes from scratch?
1	5	811	1160	2	0	493	In the last month, how often did you read food labels to select foods with less salt or sodium?
12	5	40	12	8	2	16	How often during the last week have you eaten food without adding salt at the table?
CA043	5	0	0	0	0	0	Do you buy packaged food products that are low in salt?

Fruits and Vegetables

(8 articles reviewed by Virginie Zoumenou)

There appears to be few articles that tested measurement tools for fruit and vegetable consumption with low-income audiences. The articles reviewed offered conflicting results on the effectiveness of Food Frequency Questionnaires. One tested a pre-coded 24-hour diet recall.

Dietary Guidelines for Americans 2010.

Why are Americans encouraged to eat more vegetables and fruits?

1. They are major contributors of a number of nutrients that American under-consume, including folate, magnesium, potassium, dietary fiber, and vitamins A, C, and K.
2. Eating vegetables and fruits is associated with reduced risk of many chronic diseases, including cardiovascular disease that can lead to heart attack and stroke. Some may be protective against certain types of cancer.
3. Most, when prepared without added fats or sugars, are relatively low in calories. Eating them instead of higher calorie foods can help people achieve and maintain a healthy weight.

Few Americans consume recommended amounts of vegetables or fruits. Children and adults up to 30 years of age get more than half of their fruit intake as juice. While 100% fruit juice can be part of a healthful diet, it lacks dietary fiber and, in excess, can contribute extra calories. The majority of the fruit eaten should come from whole fruits.

Beans and peas are the mature forms of legumes. Due to a high nutrient content, they may be considered both as a vegetable and as a protein food. Green peas and green (string) beans are not “Beans and Peas,” rather they are grouped with onions, lettuce, celery and cabbage as vegetables.

The core question set does not assess fruits or vegetables.

USAGE data on ADDITIONAL NEERS5 Questions

Question ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
CA048	5	30129	39965	42717	45568	39595	Do you eat more than one kind of fruit each day?
CA041	5	27467	35805	42961	45580	37953	Do you eat more than one kind of vegetable each day?
NY104	5	6462	9130	13580	13774	10737	Do you serve different vegetables and fruits every day?
NY100	5	12469	10127	9398	9976	10493	How often are 5 servings of fruits and vegetables offered to your family, to eat each day?

VA113	5	5912	5522	5936	5231	5650	Do you eat 3 or more servings of Vegetables each day?
MA002	5	6532	6604	3587	3886	5152	Do you currently eat 2 or more servings of fruit every day? This includes fresh, frozen, canned, and 100% fruit juice.
MA003	5	6533	6604	3587	3882	5152	Do you currently eat 3 or more servings of vegetables every day, including fresh, frozen, canned, and 100% juice?
6	5	5450	4754	4601	4801	4902	Do you serve more than one kind of vegetable to your family each day?
WI105	5	1031	3196	3095	7519	3710	How often do you serve more than one kind of fruit to your family each day?
VA114	5	2308	872	5936	5231	3587	Do you eat 2 or more servings of fruits each day?
WI104	5	1842	4356	3097	2479	2944	How often do you serve more than one kind of vegetable to your family each day?
WI113	5	258	139	151	5170	1430	How often do you serve 2 or more kinds of vegetables during your family's main meal?
NY102	5	258	604	4269	204	1334	Do you try new ways of preparing vegetables and fruits?
NY107	5	258	139	3716	130	1061	Do you have enough time to prepare vegetables as often as you want?
NY106	5	258	139	3716	130	1061	Do fresh vegetables spoil before you can use them?
IN117	5	413	792	1179	750	784	How often do you consume foods like these: green, leafy vegetables; grains; orange juice; and beans?
NY103	5	258	663	1051	260	558	Do you eat five or more servings of vegetables and fruits each day?
5	5	344	407	312	423	372	Do you serve more than one kind of fruit to your family each day?
NY105	5	258	139	151	130	170	Do you know how to tell if a fresh vegetable is of good quality?

Other Nutrition Practices

There are several questions in NEERS5 that were not addressed in the literature review. The review was organized around the Dietary Guidelines for Americans 2010.

NEERS5 CORE Nutrition Practices Questions

When deciding what to feed your family, how often do you think about healthy food choices?

How often do you use the “Nutrition Facts” on the food label to make food choices?

How often do your children eat something in the morning within two hours of waking up?

USAGE data on ADDITIONAL NEERS5 Questions

Ques ID	Type	Times Used 2007	Times Used 2008	Times Used 2009	Times Used 2010	Average Usage per year	qUserText
IA102	5	18817	36127	40751	45346	35260	How often do you make meals that include a variety of foods from the food guide pyramid?
IA103	5	7147	19589	26115	35439	22073	How often do you let your children choose how much to eat?
IN112	5	10765	10871	9105	10039	10195	How often do you drink at least 6 cups of water a day?
IN103	5	7892	8698	8170	8915	8419	How often do you consume caffeine containing foods, such as coffee, tea, cocoa, soft drinks, or chocolate candy?
IA104	5	5310	6300	244	12	2967	How often do you let your children choose whether to eat the foods that are offered?
IN106	5	3279	2960	2112	1874	2556	How often do other family members or friends smoke around you?
IN102	5	2945	2315	1269	1175	1926	How often do you eat foods from each group in the Food Guide Pyramid?
IN107	5	2866	2168	933	1340	1827	How often are you in a smoky area for longer than an hour?
IN104	5	2866	2168	933	1124	1773	How often do you use street drugs?
IN105	5	2866	2168	933	1124	1773	How often do you use tobacco?
IN109	5	2866	2168	933	1124	1773	How often do you use alcohol?
PA079	4	0	0	3565	291	964	How much of an affect do you feel what you eat will have on your future health?
IN123	L	413	792	1180	966	838	Do you plan to breastfeed your baby?

PA077	L	1671	157	33	0	465	When you do your grocery shopping now, do you try to buy foods from all the different food groups?
PA092	L	1671	157	33	0	465	I don't have time to cook.
TEMP 02	5	79	147	336	342	226	When you think about breastfeeding in a public place, how comfortable are you?
TEMP 04	5	79	147	336	342	226	I know when to feed my baby by: 1-Don't, 2-The time, 3-My schedule, 4-Baby crying, 5-Signs.
TEMP 05	4	79	147	336	342	226	I know it is time to stop feeding my baby when: 1-Don't know, 2-Food's gone, 3-Think it's time, 4-Baby stops
TEMP 06	L	79	147	336	342	226	When a mother is running out of formula, it is okay to add extra water to it.
TEMP 07	L	79	147	336	342	226	If a mother is running out of formula, it is okay to use cow's milk or evaporated milk instead.
IN120	5	79	147	336	267	207	When you have your baby, how often do you plan on breastfeeding your child?
9	L	155	148	198	229	183	Do you feel that what you eat will have an effect on your health?
PA084	4	155	148	198	229	183	How do you feel about cooking?
TEMP 03	5	79	147	336	126	172	When I give my baby a new food, the earliest the next new food can be given is: 1-Same day, 2-Next day, 3-After a few days.

ADDITIONAL INPUT

Recommendations from 2010 Behavior Checklist Group

A small committee examined Behavior Checklist questions as part of the Web-NEERS advisory group in 2010 and offered the following recommendations.

1. Identified best questions to add to basic checklist
 - a. Family meals
 - b. Hand washing
 - c. Food Groups: Fruits, Vegetables, Calcium, Whole Grains
 - d. Physical Activity - 30 minutes of moderate physical activity daily
 - e. Cooking at home
 - f. Food Labels – Using the food label to make food choices
2. Core Questions to change/delete
 - a. Delete Question 7: Too vague, not behavior based.
 - b. Delete Question 8: Not helpful. Most sodium does not come from adding during cooking or at the table.
 - c. Change Question 10: Confusing as written. What about those without children?
3. Comments & General Recommendations
 - a. Checklist should only include behavior items, not knowledge or intent.
 - b. Multiple versions of questions should be tested to be most understood by the audience completing the form.
 - c. If a question has been used more than 20,000 times (there are 14 of these), it should be submitted for further testing of validity and reliability.
 - d. While the 24 Hour Recall can give a “snapshot” the behavior checklist can show trends for types of foods consumed. BC should include dietary questions to get a better general picture of a person's overall dietary lifestyle.
 - e. Basic Core 10 Questions need to be evaluated as well.
 - f. As new Dietary Guidelines are released, the core questions should be revisited or reviewed. Need to look at the research and ask: "What do we need to be asking?"

Goal: Target changing those behaviors most likely to result in illness.

Issues:

1. Evaluate whether food safety educational programming in EFNEP is addressing the most salient food safety behaviors.
 - a. Those causing the most foodborne illness.
 - b. Those more likely to affect the EFNEP audience.
2. Need to decide how much attention should be focused on infrequent but very risky behaviors (e.g., unpasteurized milk or uncooked seafood) and how much should be focused on less risky, more prevalent behaviors (e.g., lack of effective or no hand-washing and cross-contamination). (Hillers et al., 2003).
 - a. Hillers et al. (2003) recommend primary focus should be on the common food-handling errors for most audiences.
 - b. When the audience is at high risk for foodborne illness (e.g., *L. monocytogenes* or *T. gondii*) or known to be likely to consume foods that are more likely to be contaminated with pathogens, information for the high-risk foods also is appropriate. (Hillers et al., 2003).
3. Use caution in interpreting self-reported behavior changes to evaluate outcomes of food safety educational programming. However, self-reported practices have predicted observed behavior. (Fein et al., 2011)

Current Trends and Sources of Contamination

- No decline in *Salmonella* infections in 15 years. A total of 19,089 infections, 4,247 hospitalizations, and 68 deaths were reported from FoodNet sites in 2010. *Salmonella* infection was the most common infection reported (17.6 illnesses per 100,000 persons) and was associated with the largest number of hospitalizations (2,290) and deaths (29) (CDC, 2011).
- Rising number of multistate outbreaks.
- Noroviruses are the most common cause of gastroenteritis in the United States. CDC estimates that each year more than 20 million cases of acute gastroenteritis are caused by noroviruses. That means about 1 in every 15 Americans will get norovirus illness each year. Norovirus is also estimated to cause over 70,000 hospitalizations and 800 deaths each year in the United States. (<http://www.cdc.gov/Features/Norovirus/>)
- New and different contaminated foods, such as prepackaged raw cookie dough, bagged spinach, and peanut butter, causing illness.

Five Food Safety Constructs

1. Personal Hygiene

- Hand washing - Inadequate in technique and duration: (Phang and Bruhn, 2011)
 - Wash for less than 20 seconds
 - Do not wash directly after handling meat

- Frequently does not involve using soap
- **Most critical violation** (one that could by itself potentially lead to a foodborne illness) was neglect of hand washing

2. Avoid Cross-Contamination

- **Most critical violation** along with neglect of hand washing (Medeiros et al., 2001)
- High numbers of potential cross-contamination events
 - Lettuce
 - Gloves
 - Knives, cutting boards, and faucets
- Did not wash cutting boards and knives before reuse
- Not using paper towels
- Not drying utensils adequately

3. Adequate Cooking

- Depend on visual cues to tell when food is done (Phang and Bruhn, 2011)
- Don't use food thermometer

4. Keep Food at Safe Temperatures

- Most understand the importance of storing leftovers in a refrigerator in a timely fashion.

5. Foods from Unsafe Sources

- Many foods from unsafe sources are more frequently consumed by a particular gender or ethnic group, or the recommendations apply to only a certain high-risk group.

Food Safety Education Needs

- Gap between awareness of importance of hand washing and the actual practice of adequate hand washing should be addressed.
- Educational materials need to emphasize the important role of the consumer in preventing foodborne illness and that foodborne illnesses can result from foods prepared in the home. (Phang and Bruhn, 2011)
- Address the lack of reliability of visual cues during cooking. (Phang and Bruhn, 2011)
- Need to educate consumers about the importance of cooking meat to the recommended temperatures and using thermometers to verify those temperatures. (Phang and Bruhn, 2011)
- Continue to address appropriate refrigerator temperatures. (Phang and Bruhn, 2011)
- Emphasize faucet cleaning and soap and water as a way of preventing cross-contamination.
- Find effective ways to “reveal” the invisible pathogens and teach how to avoid cross-contamination. (Medeiros et al., 2001)
- When a limited time is allocated for food safety education, we suggest that keeping food at safe temperatures be secondary messages rather than the focus of the lesson. Pathogens primarily associated with inadequate control of refrigeration and hot holding (*S. aureus*, *C. perfringens*, and *B. cereus*) cause relatively mild illness and are less commonly reported. (Medeiros et al., 2001)
- For most audiences, it seems appropriate to focus on the more common illnesses, such as campylobacteriosis and salmonellosis. We suggest that basic safe handling practices

should be included in education programs aimed at high-risk populations, with special emphasis being placed on the specific behaviors appropriate for the target audience. (Hillers et al., 2003)

Audience-Focused Education

Food safety education is most likely to be effective if the messages are directed specifically toward the audience.

- Children have a higher risk of serious complications from *E. coli O157:H7*-food safety education for parents of young children should include specific information about ways to reduce the risk of acquiring *E. coli O157:H7*.
 - Cook ground beef to a minimum of 160 F.
 - Drink only pasteurized milk and apple juice.
 - Wash fresh fruits and vegetables thoroughly before eating.
 - Do not use fresh manure to fertilize vegetable gardens.

References

Medeiros LC, Hillers, VN, Kendall PA, Mason A. Food safety education: what should we be teaching to consumers? *J Nutr Ed.* 2001;33:108-113.

Hillers VN, Medeiros L, Kendall P, Chen G, DiMascola S. Consumer food-handling behaviors associated with prevention of 13 foodborne illnesses. *J Food Protection.* 2003;66:1893-1899.

Phang HS and Bruhn CM. Burger preparation: what consumers say and do in the home. *J Food Prot.* 2011;74:1708-1716.

Fein SB, Lando AM, Levy AS, Teisl MF, Noblet C. Trends in U.S. consumers' safe handling and consumption of food and their risk perceptions, 1988 through 2010. *J Food Protection.* 2011;74:1513-1523.

Centers for Disease Control and Prevention. Vital signs: incidence and trends of infection with pathogens transmitted commonly through food—Foodborne Diseases Active Surveillance Network, 10 US sites, 1996—2010. *MMWR.* 2011;60:749-755.

A Validated Set of Questions to Assess the Microbiological Safety of Consumer Food Handling and Eating Behaviors

The developers of this scale are:

Patricia Kendall, Ph.D., R.D. and Mary Schroeder, M.S., R.D.
Department of Food Science and Human Nutrition
Colorado State University
Fort Collins, CO 80523-1571
970-491-1945 (voice)
970-491-7252 (FAX)
kendall@cahs.colostate.edu

Lydia C. Medeiros, Ph.D., R.D. and Gang Chen, Ph.D.
Department of Human Nutrition, The Ohio State University
Columbus, OH 43210-1295

Virginia "Val" Hillers, Ph.D., R.D. and Verna Bergmann, M.S., R.D.
Department of Food Science and Human Nutrition, Washington State University
Pullman, WA 99164-6376

The project was partially funded by USDA grant #99-35201-8126.

Background information about the choice of topics included in the scale is presented in: Medeiros L, Kendall P, Hillers V, Chen G and DiMascola S. Identification and classification of consumer food-handling behaviors for food safety education. *J Amer. Diet. Assoc.* 2001, 101:1326-1337.

Validation data for this instrument reported in: Kendall P, Elsbernd A, Sinclair K, Schroeder M, Chen G, Bergman V, Hillers V, Medeiros L. Observation versus self-report: validation of a consumer food behavior questionnaire. *Journal of Food Protection* 2004;67:2578-2586.

This material is written and produced for public distribution. You may reprint, provided you do not use it to endorse a commercial product. Please give credit to the authors and *Journal of Food Protection*.

October 2004
©2004 Colorado State University

Food Handling and Eating Preferences Questionnaire

1. This is a survey about food preferences and ways you fix food. It is not a test, and there are no wrong answers. When answering questions, check the box that applies to the way you usually do things.

	Never	Rarely	Some of the time	Most of the time	Always	Does not apply to me
a. I wash my hands with soap and warm running water before preparing food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. After playing with a pet and before getting a snack, I wash my hands with soap and warm running water.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. After cutting raw meat, chicken, or seafood, I wash all items that came in contact with the raw food (e.g. cutting board, knife, counter top) with hot, soapy water before I continue cooking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I thoroughly rinse fresh vegetables under running water before eating them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I wash the plate used to hold raw meat, poultry, or seafood with hot, soapy water before returning cooked food to the plate OR I use a clean plate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. I wash my hands with soap and warm running water after working with raw meat, chicken, or seafood and before I continue cooking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. When I cook fish, I check that the flesh flakes easily with a fork before serving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. I store my eggs at room temperature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Do you refrigerate the following foods within 2 hours of preparing and serving?

	YES	NO
a. Cooked rice	<input type="checkbox"/>	<input type="checkbox"/>
b. Fried chicken	<input type="checkbox"/>	<input type="checkbox"/>
c. Refried or cooked beans	<input type="checkbox"/>	<input type="checkbox"/>

3. Food Preferences. Do you eat the following foods?

	YES	NO
a. Rare hamburger	<input type="checkbox"/>	<input type="checkbox"/>
b. Eggs with runny yolks	<input type="checkbox"/>	<input type="checkbox"/>
c. Raw oysters/Oysters on the half shell	<input type="checkbox"/>	<input type="checkbox"/>
d. Raw fish	<input type="checkbox"/>	<input type="checkbox"/>
e. Homemade cookie dough	<input type="checkbox"/>	<input type="checkbox"/>
f. Alfalfa or other raw sprouts	<input type="checkbox"/>	<input type="checkbox"/>
g. Ceviche (marinated raw fish)	<input type="checkbox"/>	<input type="checkbox"/>
h. Sushi (made with raw fish)	<input type="checkbox"/>	<input type="checkbox"/>

4. For each question below, please check what you usually do.

	YES	NO
a. If you have diarrhea, do you prepare food for others?	<input type="checkbox"/>	<input type="checkbox"/>
b. Do you use a thermometer to check the temperature of your refrigerator?	<input type="checkbox"/>	<input type="checkbox"/>
c. Do you use a thermometer to determine if hamburger patties have been cooked enough?	<input type="checkbox"/>	<input type="checkbox"/>
d. Do you use a thermometer to determine if leftovers have been reheated enough?	<input type="checkbox"/>	<input type="checkbox"/>
e. Do you use a thermometer to determine if chicken breasts have been cooked enough?	<input type="checkbox"/>	<input type="checkbox"/>

5. The following questions are for women who are currently pregnant or who have been pregnant in the past 2 years. Please think about your food preferences and ways you usually do things when pregnant.

When you are pregnant, do you like to eat the following foods?

	YES	NO
a. Cold hot dogs	<input type="checkbox"/>	<input type="checkbox"/>
b. Soft cheese like Brie, Camembert and queso fresco	<input type="checkbox"/>	<input type="checkbox"/>
c. Smoked fish served cold without re-heating	<input type="checkbox"/>	<input type="checkbox"/>
d. Cold deli meats	<input type="checkbox"/>	<input type="checkbox"/>

Attachment B – Food Security

Table 1. Modified version of the six-item U.S. Household Food Security Survey Module*

These next questions are about the food eaten in your household in the last 30 days and whether you were able to afford the food you need.

1. During the last 30 days, how often was this statement true: The food that we bought just didn't last, and we didn't have money to get more.	1) Often 2) Sometimes 3) Never
2. During the last 30 days, how often was this statement true: We couldn't afford to eat balanced meals.	1) Often 2) Sometimes 3) Never
3. In the past 30 days, did you or other adults in your household ever cut the size of your meals because there wasn't enough money for food? ¹	1) Yes, on 3 or more days 2) Yes, on 1 or 2 days 3) No
4. In the past 30 days, did you or other adults in your household ever skip meals because there wasn't enough money for food? ¹	1) Yes, on 3 or more days 2) Yes, on 1 or 2 days 3) No
5. In the last 30 days, did you ever eat less than you felt you should because there wasn't enough money to buy food?	1) Yes 2) No
6. In the last 30 days, were you ever hungry but didn't eat because you couldn't afford enough food?	1) Yes 2) No

¹ Modified items

*Lee, J. S., Johnson, M. A., Brown, A., Nord, M. (2011). Food security of older adults requesting Older Americans Act Nutrition Program in Georgia can be validly measured using a short form of the U.S. Household Food Security Survey Module. *J. Nutr* (In Press).

Brief Review of Literature Related to Food Resource Management Education for Low-Income Households February, 2012

Food Resource Management and Food Resource Management Education--Definitions

Food Resource Management is described as the handling of all foods and resources that may be used to acquire foods by an individual or family.

[Hershey, Anliker, Miller, Mullis, Daugherty, Das, Bray, Dennee, Sigman-Grant & Thomas, Food shopping practices are associated with dietary quality in low-income households. JNE Vol 33 Supplement 1, S16- 26]

Food Resource Management education is defined as education designed “to enhance practice related to thrifty shopping for preparation of nutritious foods.”

[Weimer, McKinney & Benning, Tools to assess nutrition education with low-income families. JNE 2001 Vol 33 Supplement 1, S1.]

Food Resource Management Behaviors and Practices of Low Income Households

1500 low and moderate income families were surveyed about their efforts to plan, shop for and cook healthy meals by Share our Strength Cooking Matters in December, 2011. The survey found:

- 78% of families reported eating at home most of every day
- Low-income families made meals from scratch more often than moderated income families
- Most common barriers to cooking healthy meals were cost, time and conflicting family schedules
- 30% of families expressed dissatisfaction with the price of healthy foods in their food stores
- Many respondents demonstrated a lack of understanding of the nutritional value of frozen and canned fruits and vegetables
- 4 in 5 families said they were interested in learning more about cooking healthy meals
- 51% of families reported primarily shopping for groceries on a weekly basis
- 2 in 3 families said they were interested in learning how to better budget their money for meals.
- Families that reported regularly practicing food budgeting and meal planning behaviors (i.e. using a written grocery list and planning meals before shopping) were the same families who reporting eating healthy meals and/or meals made from scratch most days of the week.

[It's Dinnertime: A Report on Low-Income Families' Efforts to Plan, Shop for and Cook Healthy Meals; Share Our Strength's Cooking Matters, APCO Insight & ConAgra Foods Foundation. January 2012. <http://www.strength.org/cmstudy/>]

Food shopping practices can influence the dietary quality of the members of low income households. Explorations of the food shopping practices of low income households has found that many do use careful or thrifty practices: about 40% of respondents said they used comparison shopping to find good buys, stocked up on bargains, and/or used coupons; about half looked for specials and/or used a shopping list. When these behaviors were used by households, there is evidence that the nutrient availability for the household members was enhanced. When examining EFNEP data a strong association is present between the practice of thinking about healthy food choices when shopping for food and the quality of the household dietary intake.

[Hershey, Anliker, Miller, Mullis, Daugherty, Das, Bray, Dennee, Sigman-Grant & Thomas, Food shopping practices are associated with dietary quality in low-income households. JNE Vol 33 Supplement 1, S16- 26]

Analysis of Continuing Survey of Food Intakes by Individuals (CSFII) data in the late 1990's found that lower-income women with young children were more likely than higher income women to consider very important how well the food purchased would keep, the price of the food, and the ease of preparation. Low-income women were less likely to use the information on the label with purchasing food.

[Morton & Guthrie, Diet-related knowledge, attitudes, and practices of low-income individuals with children in the household. Family Economics & Nutrition Review 1997, 10: 2-15.]

Review of data from the 1993 Marketing Research Corporation of America survey found that households on a strict budget were less likely to make a complete shopping list before shopping for food, shop around for bargains at various stores, and stock up on larger amounts of sale items. It appeared that the need to focus on the cost of items and purchasing only needed foods limited the use of these strategies by lower income shoppers.

[Dinkins, Food preparers: their food budgeting, cost-cutting, and meal planning practices. Family Economics & Nutrition Review 1997, 10: 34-37.]

The Economic Research Service of the USDA examined a 1998 sample of food store purchase data. They found that lower-income households spend less on food purchases than higher-income shoppers. Lower-income shoppers economize by purchasing items that are on sale, selecting private label or generic products, and looking for less expensive meats, fruits and vegetables.

[Leibtag & Kaufman, Exploring food purchase behavior of low-income households—How do they economize? Agriculture Info Bulletin No. 747-07, ERS, USDA; June 2003]

Focus groups with low-income women in Minnesota found that food shopping practices were influenced by availability of transportation and store accessibility. Food resource management practices used included shopping based on food price, use of in-store specials, shopping at certain stores known for lower prices, use of generic foods, buying in bulk, shopping without their children, prioritizing valued food items such as meat, avoiding waste, and limiting expensive foods that were less likely to be eaten by family members such as fruits and vegetables.

[Wiig & Smith, The art of grocery shopping on a food stamp budget: factors influencing the food choices of low-income women as they try to make ends meet. *Public Health Nutrition* 12 (10): 1726-1734; 2008.]

25 Ohio lower-income women were interviewed about food purchasing and food choices during difficult economic times. Money saving shopping strategies mentioned by most of the women included: shopping at multiple food stores, using coupons, planning for food shopping trips to identify sales and specials, preparing a grocery shopping list, selected items on sale, buying smaller quantities to reduce waste, buying fewer luxury foods, doing more cooking at home/eating at restaurants less often.

[Miller & Branscum, The effect of a recessionary economy of food choice: implications for nutrition education, *JNEB* in press, 2011.]

The Economic Research Service examined the effect of the recession on all food purchasing behavior, across income levels, and found that households were eating out less, taking advantage of sale prices at food stores, using coupons and promotions, substituting comparable lower cost foods including private label and store brands, and shopping at stores that typically offer lower prices such as warehouse and supercenters.

[Kumcu & Kaufman, Food spending adjustments during recessionary times, *Amber Waves*, September 2011.]

Nutrition Education on Food Resource Management for Low-Income Households

25 persons with low or moderate incomes were interviewed about the food choices and their food management skills. It was found that respondents who felt they were good managers of their food resources and had good skills in this area were proud of those abilities. Knowing how to economize, be flexible, cook basic foods for their families, and keep food costs down was associated with self-efficacy. The authors suggested that when teaching food resource management skills, concepts such as flexibility, personal decision-making, and lifelong learning should be emphasized.

[Bisogni, Jastran, Shen & Devine, A biographical study of food choice capacity: standards, circumstances, and food management skills, *JNEB* 37 (6): 284-291, 2005]

Focus groups of 27 working parents were used to examine barriers to family meals. Participants suggested that educational programs on food resource management topics should include: feeding tips and recipes for children, meal planning, meal preparation, quick healthful meal ideas, and tips for increasing healthful food consumption by all family members.

[Fulkerson, Dubid, Sydell, Boutelle, Garwick, Story, Newmark-Sztainer, Dudovitz, Focus groups with working parents of school-aged children: what's needed to improve family meals? *JNEB* 43 (3): 189 – 193, 2011]

The recent recession has increased interest in skills and information related to stretching food dollars. Conclusions from recent focus groups with 25 limited-income participants suggest that educational programming topics should include: effective food shopping practices, using food labels, meal planning, food preparation skill building, techniques for incorporating fruits and vegetables into meals, and household food budgeting.

[Miller & Branscum, The effect of a recessionary economy of food choice: implications for nutrition education, *JNEB* in press, 2011.]

Food consumption data shows that low-income households eat fewer servings of fruits and vegetables and spend less on fruits and vegetables than other households. There is evidence that consumers who have more knowledge of the nutritional importance of these foods make more healthful choices within these food groups. Examination of the cost of fruits and vegetables has shown that there are many low cost fruits and vegetables and therefore many options for low-income households to consume more even on a limited food budget.

[Guthrie, Understanding fruit and vegetable choices—economic and behavioral influences, Agriculture Info Bulletin No 792-1, 2004]

An Australian study of 355 low-income women and their fruit and vegetable consumption concluded that strategies to increase fruit and vegetable consumption should focus on modifying perceptions about the cost, availability and taste of those foods.

[Williams, Ball & Crawford, Why do some socioeconomically disadvantaged women eat better than others? An investigation of the personal, social and environmental correlates of fruit and vegetable consumption, *Appetite* 55: 441 – 446, 2010]

A randomized study in which experimental group participants received a series of 5 nutrition education lessons found that those participants were more food secure than the control group of participants showing that well-prepared relevant lessons are effective at enabling low-income household to better manage their food resources.

[Eicher-Miller, Mason, Abbott, McCabe & Boushey, The effect of food stamp nutrition education on the food insecurity of low-income women participants, *JNEB* 41 (3): 161 – 168, 2009.]

Interviews were conducted with 56 Australian women from all income categories to examine barriers to better dietary quality. Lower-income women more frequently cited lack of adequate time to prepare meals themselves and the cost of more healthful foods (particularly fruits and vegetables) as concerns related to healthful eating. The authors conclude that educational programs for low-income households should be focused on less costly healthful foods and quick, easy ways to prepare healthy family meals.

[Inglis, Ball & Crawford, Why do women of low socioeconomic status have poorer dietary behaviours than women of higher socioeconomic status? A qualitative exploration, *Appetite* 45: 334 – 343, 2005]

Focus groups with residents in a predominately low-income region of Mississippi found that respondents thought that healthful food was not affordable for them. When asked, participants suggested that nutrition education classes should focus on teaching food preparation skills and providing healthful recipes to motivate better eating practices.

[McGee, Johnson, Harrick, Richardson, Simpson, Gossett, Thornton, Johnson & Boggle, Food shopping perceptions, behaviors, and ability to purchase healthful food items in the lower Mississippi delta, *JNEB* 43 (5): 339 – 348]

Indicators of Improved Food Resource Management behaviors for EFNEP

Question: Based on the evidence available about the food resource management behaviors and the effectiveness of food resource management education for limited income families with young children, what are the high priority indicators on which EFNEP educational programming and outcome evaluation efforts should focus?

Following participation in the EFNEP lesson series:

- Learners are more often planning several days of meals for their families, rather than making last minute decisions about what and where to eat.
- Learners are more often making a plan for the food they will purchase prior to going to the grocery store; the plan for food to be purchased is more frequently written down in the form of a grocery list.
- Learners report that they are saving money when shopping for food; their actual grocery spending amounts per week or month are closer to the amounts recommended for by USDA for their size of family.
- Learners report that they are eating more meals and snacks at home consuming foods that they have prepared; number of meals eaten away from home is reported to decrease.
- Learners are more often using price comparison and cost reduction tools and strategies such as: coupons, unit pricing, bulk purchasing, store brands, in store promotions, use of less processed foods.
- Learners are more frequently choosing to do their major food shopping at lower cost supermarkets.
- Learners are shopping for food fewer times during the month.
- Learners are more often using strategies to reduce impulse buying such as avoiding shopping when hungry and shopping without young children whenever possible.
- Learners are planning less costly meals that use less meat, more mixed dish foods, and fewer expensive convenience foods.

D.1 – Nutrition Practices: Sugar-sweetened Beverages (Kate Dickin)

Sugar-Sweetened Beverages (SSBs)

The objective was to search for evidence of whether or not consumption of SSBs is an area that should be measured in using the EFNEP Behavior Checklist and what measures might be appropriate. This involved identifying evidence that:

- a. SSB consumption has important implications for the EFNEP audience,
- b. there is reasonable likelihood that SSB consumption could change as a result of participation in an intervention or program similar to EFNEP, and
- c. This behavior could be measured using a limited-response frequency type of measure such as the Behavior Checklist.

Overview

Information on the most relevant papers found is provided in later pages. A number of difficulties were encountered in finding research that directly addressed these questions. Although there is a growing literature on SSBs and several review articles, very few are intervention studies, and fewer still involve interventions comparable to EFNEP or participants typical of EFNEP (or even adults). This summary includes some other literature that may shed light on the questions above, even though these studies did not fit well within the original review criteria.

a. Implications of SSB consumption

Most of the published research on consumption of SSBs in adults is epidemiological, aimed at identifying links with overweight and obesity or chronic disease, primarily in observational studies. Several recent reviews of this research vary in their conclusions about the strength of the evidence, but except for reviews funded by the beverage industry (Gibson 2008) there seems to be some consensus that SSB consumption is associated with increased BMI and that this is likely mediated by increased energy intake (Bachman, Baranowski et al. 2006; Malik, Schulze et al. 2006; Dennis, Flack et al. 2009). Because most studies are cross-sectional, there is the possibility of confounding since SSB intake is associated with lower physical activity and higher consumption of energy-dense foods, and there are methodological problems such as self-report and short follow-up periods. It is clear that soft drink consumption is high in the US population, constituting the largest portion of energy intake (Block 2004).

b. Likelihood of change in SSB consumption

One longitudinal and one intervention study of SSB consumption in adults were found and both indicated that this behavior can change over time, and reduced consumption is associated with weight loss (Schulze, Manson et al. 2004; Chen, Appel et al. 2009). Neither study assessed change in relation to an intervention comparable to EFNEP. Studies of change in SSB consumption among adolescents and children participating in educational interventions also suggest that SSB behavior change is possible. Adolescent or child research is included in the review pages when the results and methods are relevant for the purposes of this committee.

Another line of research involves analysis of data on purchase of SSBs in relation to cost, in order to assess the likely impact of taxes on SSBs. This type of policy intervention is not directly comparable to EFNEP, but the following information was of interest, given the low-income program audience. “Lower-income households purchase more beverage calories from stores than those in higher-income households. For example, we show that those in the lowest income quartile purchased roughly an additional 44 kcal/d in beverages from stores than those in the highest income quartile. During the course of a year, this could equate to a difference in weight of more than 1.8 kg. Although the differences in beverage calories may be offset by differences in calories from food or non-store bought purchases, this finding is consistent with greater rates of obesity among lower-income households.” (Finkelstein, Zhen et al. 2010)

c. Measurement approaches

Most of the research on adults assessed SSB intake using 24-hr recall methods. Food frequency items more like the Behavior Checklist were used in some studies. Some of these, however, had more than 5 response options and more than one question on intake was often needed to assess the range of SSBs. No measures of shopping/home availability of SSBs were found, except for the research on response to changes in cost, which used longitudinal records of purchasing behavior of individuals or households.

Summary and recommendations based on review

This review indicates that SSB consumption is relevant to the EFNEP audience, has implications for energy intake and weight status, and can potentially be changed through educational intervention, although evidence of change resulting from an EFNEP-type intervention is preliminary. The NEERS 5 database includes only one question: CA044 “Do you drink regular soda (soda that is not diet) every day?” which appears to be a yes/no question not suitable for capturing change among people who do not fit in the “every day” category. Both 24-hr recall and food frequency measures are commonly used in the literature, suggesting that a frequency item on SSBs could be included in the Behavior Checklist. Alternatively, if the methods for collecting and analyzing 24-hr dietary recall data in EFNEP are also amended, changes could be made to allow assessment of SSB consumption using the recall data. If a frequency question is added to the Behavior Checklist, the main challenges will be (1) to develop an item that is brief and clear yet comprehensive (i.e. it may not be possible to include all types of SSBs) and (2) to sufficiently measure behavior change using only 5 response options, given the wide range of existing and ideal levels of intake. An item using the Behavior Checklist format was developed and tested for comprehension, reliability, and convergent validity at Cornell (see review, below). Other measurement approaches reviewed here collect more detailed data, using multiple questions and/or a larger number of response options, which may not be feasible in the Behavior Checklist. Perhaps questionnaires that cover a variety of eating practices (such as used by EFNEP in other states such as CA) would be a better source of single items on SSBs, rather than the current review that used search terms specific to SSBs and mostly located multi-item measures. An alternative approach would be to include a question on availability of SSBs at home (e.g. “How often is regular soda available at home for you and your family to drink? -- never/almost never, occasionally, about half the time, most of the time, always/almost always”) but no research was found that used or tested this type of question. Overall, given the high prevalence of SSB consumption, the links with unhealthy weight gain, and likelihood of change, it makes sense to include a question on SSBs in the Behavior Checklist.

Article Reviews: Sugar-sweetened beverages (SSBs)

Article #1

1. Citation

Chen, L., L. J. Appel, et al. (2009). "Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial." The American Journal of Clinical Nutrition **89**(5): 1299-1306.

2. What behavior(s) was examined?

SSB consumption, in relation to weight loss. Variables included calories consumed from SSBs, change in SSB consumption, liquid calories as percent of total calories

3. What key behavioral component(s) was identified? What was found in the study?

Subjects in an RCT for other purposes (*pre and early hypertension*) received nutritional advice only or more intensive behavioral interventions on nutrition and physical activity. SSB consumption was not addressed directly by the interventions so in this paper, data for all groups were pooled and intervention assignment included as a covariate. The objective was to assess relationships between SSB consumption and weight loss over time, regardless of intervention assignment.

It was found that participants significantly reduced liquid calories and SSB consumption at 6 mos. and 18 mos. and reduced SSB consumption was significantly related to weight loss over time.

4. If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Two 24-hr recalls at baseline, 6 mos., 18 mos., using multiple pass and portion estimation techniques, by phone.

5. Describe the sample

Overweight and obese adults with pre or early hypertension. 34% African American, few Latino or Asian participants. 70% had household income > 45,000.

Article #2

1. Citation

Dickin K, Lent M, Lu A, Sequeira J, Dollahite J. Developing a measure of behavior change in a program to help low-income parents prevent unhealthy weight gain in children. In: Journal of Nutrition Education and Behavior; Online: 14 October 2011.

2. What behavior(s) was examined?

Frequency of soda consumption for parent and for child, at the beginning and end of an 8-week behavioral education intervention. Measured as part of an assessment of change in several food, physical activity and parenting behaviors.

3. What key behavioral component(s) was identified? What was found in the study?

Regular soda intake, as reported by parents for themselves and for their children. This paper is about the development and testing of a Behavior Checklist that included this question. The study found that the Checklist items were understood as intended (cognitive testing with EFNEP-eligible respondents led to revisions of wording), had good test-retest reliability, and convergent validity with more in-depth measures of similar behaviors.

The items on soda intake were convergent not only with other measures of soda intake, but also with a variety of behaviors including diet quality scale, parental modeling of healthy food, and several subscales of a measure of home food and activity environment.

Note: Unpublished results of a study of pre-post behavior change among EFNEP participants who participated in a pilot program found statistically significant improvements in reported parent and child soda intake, as assessed with this measure. The program was an 8-session EFNEP series on food, active play and parenting practices for low-income parents of 3-11 year-old children.

4. If participants were asked questions to elicit behavior change, please list any specifics that were described in the article. What was the question(s)?

“How often do you drink regular (NOT diet) soda?”

The original item was “How often do you drink regular soda or sugary drinks (juice drinks, sports drinks, energy drinks, etc.)?” but this was modified after cognitive testing indicated that people had trouble responding to a question that included so many different beverages. Also, at the beginning of the program, people do not always understand the difference between juice drinks and 100 juices.

What format was used, e.g., Likert scale and what values were used:

5-point frequency format based on existing EFNEP Behavior Checklist.

Values 1-5 = less than once/week; 1-3 days a week; 4-6 days a week; once a day; 2 or more times a day

5. Describe the sample.

Low-income parents (or care-givers; most were mothers) of 3-11 year old children in New York State, in rural and urban areas.

Article #3

1. Citation

Winett RA, Roodman AA, Winett SG, Bajzek W, Rovniak LS, Whiteley JA. The Effects of the *Eat4Life* Internet-Based Health Behavior Program on the Nutrition and Activity Practices of High School Girls. Journal of Gender, Culture, and Health 1999; 4(3):239-254.

2. What behavior(s) was examined?

Change in consumption of regular soda, pre- to post-intervention, comparing controls to girls in an intervention consisting of a 5-module on-line program that provided tailored information, goal-setting and feedback related to eating and physical activity.

3. What key behavioral component(s) was identified? What was found in the study?

Girls participating in the intervention reported a statistically significant larger decrease in consumption of regular soda, than those in the control group (ANCOVA, $p < 0.05$).

4. If research participants were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

- **What was the question(s)?**

Exact wording not given, but participants were asked how many regular sodas were consumed “yesterday”.

- **What format was used, e.g., Likert scale**

Adaptation of 24-hour recall and food frequency methodology.

- **What values were used, e.g., ratings scale 1-5; never/once in a while/ sometimes/often/always**

N/A. Asked numbers of sodas, so no set of response options.

5. Describe the sample.

9th and 10th grade girls in a rural low-income school. Although these were teens, they were from the target income level and not that different in age as compared to some EFNEP mothers. Also the goals, duration and intensity of the intervention were comparable to EFNEP, despite differences in delivery mode (i.e. on-line intervention in school).

Article # 4

1. Citation

James J, Thomas P, Cavan D, Kerr D. Preventing childhood obesity by reducing consumption of carbonated drinks: cluster randomised controlled trial. BMJ 2004;328(7450):1237.

2. What behavior(s) was examined?

Consumption of carbonated drinks and change in response to a 4-session educational intervention over the course of the school year.

3. What key behavioral component(s) was identified? What was found in the study?

This is one of the only (randomized, controlled) studies of change in SSB consumption in response to an educational intervention, so was included here even though it was conducted with school children. It provides evidence that this is a modifiable behavior, and can be influenced by education.

“A targeted, school based education programme produced a modest reduction in the number of carbonated drinks consumed, which was associated with a reduction in the number of overweight and obese children.” (James, Thomas et al. 2004)

Consumption of carbonated drinks over three days decreased by 0.6 glasses (average glass size 250 ml) in the intervention group but increased by 0.2 glasses in the control group (mean difference 0.7, 95% confidence interval 0.1 to 1.3). At 12 months the percentage of overweight and obese children increased in the control group by 7.5%, compared with a decrease in the intervention group of 0.2% (mean difference 7.7%, 2.2% to 13.1%). (James, Thomas et al. 2004)

4. If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Children completed “drink diaries” before and after the intervention. Intake of carbonated or “fizzy” drinks was the focus, but consumption of water, juice and other beverages was also assessed. No other details were provided on the measure used.

5. Describe the sample.

Children aged 7-11 years in England.

Article #5

1. Citation

Zoellner J, Estabrooks PA, Davy BM, Chen Y-C, You W. Exploring the Theory of Planned Behavior to Explain Sugar-sweetened Beverage Consumption. Journal of Nutrition Education and Behavior 2011 (on-line/in press)

2. What behavior(s) was examined?

SSB consumption and factors predicting SSB consumption.

3. What key behavioral component(s) was identified? What was found in the study?

Consumption of SSBs in relation to Theory of Planned Behavior (TPB) constructs expected to predict behavior (in this case, SSB consumption), e.g. behavioral intentions, attitudes toward performing the behavior, subjective norms, and perceived behavioral control. This was cross-sectional research designed to assess the usefulness of TPB as a theoretical framework for

understanding SSB consumption and designing interventions. It was found that SSB consumption was high and TBP constructs were significant predictors, with 38% of the variance in SSB consumption explained by behavioral intentions, perceived behavioral control, subjective norms, and attitudes.

4. If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

“The valid and reliable 19-item quantitative beverage intake questionnaire to assess beverage intake patterns over the past month was used.* the instrument queries 7 frequencies, including:

- never or less than 1 time/wk.,
- 1 time/wk.
- 2 or 3 times/wk.
- 4-6 times/wk.
- 1 time/d
- 2 times/d, or
- 3 or more times/d.

Portion sizes are also reported in fluid ounces and include less than 6, 8, 12, 16, or more than 20. Sugar-sweetened beverage intake is quantified by summing kilocalories from 7 items including regular soft drinks, sweetened juice beverage/ drink, sweetened tea, coffee with sugar, mixed alcoholic drinks, meal replacement shakes/protein drinks, and energy drinks.” (Zoellner, Estabrooks et al. 2011)

*Validity and reliability of the Beverage Intake Questionnaire are reported in:

Hedrick VE, Comber DL, Estabrooks PA, Savla J, Davy BM. The Beverage Intake Questionnaire: Determining Initial Validity and Reliability. *Journal of the American Dietetic Association* 2010;110(8):1227-1232.

The authors adapted an existing TPB questionnaire to address TPB constructs including attitudes, subjective norms, perceived behavioral control, and intention, in relation to SSB consumption. These measures would be worth looking into if there is interest in measuring mediating variables.

5. Describe the sample.

Residents of Virginia. Most were female, white, and had less than a high school education. Average annual income was less than \$30,000 and mean age was 41 years.

Article #6

1. Citation

Schulze MB, Manson JE, Ludwig DS, Colditz GA, Stampfer MJ, Willett WC, et al. Sugar-Sweetened Beverages, Weight Gain, and Incidence of Type 2 Diabetes in Young and Middle-Aged Women. *JAMA: Journal of the American Medical Association* 2004;292(8):927-934.

2. What behavior(s) was examined?

The association between SSB consumption and weight change in women over a period of 4 years (i.e. not an intervention but longitudinal analysis of a cohort).

3. What key behavioral component(s) was identified? What was found in the study?

Weight gain over a 4-year period was highest among women who increased sugar-sweetened soft drink consumption from 1 or fewer drinks per week to 1 or more drinks per day and was smallest among women who decreased their intake. SSB consumption was also associated with incidence of type II diabetes. (Schulze, Manson et al. 2004)

4. If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

Mailed questionnaire included a 133-item semi-quantitative food frequency questionnaire asking how often had consumed a common portion size on average in the previous year. There were 3 items on consumption of sugar-sweetened soft drinks ("Coke, Pepsi, or other cola with sugar," "caffeine-free Coke, Pepsi, or other cola with sugar," and "other carbonated beverages with sugar"), 4 items on fruit juice ("apple juice," "orange juice," "grapefruit juice," and "other juice"), 1 item on fruit punch, and 3 items on diet soft drinks ("low-calorie cola with caffeine," "low-calorie caffeine-free cola," and "other low-calorie beverages").(Schulze, Manson et al. 2004)

9 response options, ranging from "never" to "6 or more times per day," were aggregated into 4 categories (<1 drink per month, 1-4 drinks per month, 2-6 drinks per week, and ≥1 drink per day).

5. Describe the sample:

51,603 women in the Nurses' Health Study II.

Article #7

1. Citations

Ontai, L., L. Ritchie, et al. (2009). "Guiding family-based obesity prevention efforts in low-income children in the United States. Part 1: What determinants do we target?" Intl J Child Adolesc Health 2: 19-30.

Townsend, M. S., T. Young, et al. (2009). "Guiding family-based obesity prevention efforts in low-income children in the United States. Part 2: What behaviors do we measure?" Intl J Child Adolesc Health 2: 31-48.

2. What behavior(s) was examined?

SSB consumption, as part of a pair of review articles on identifying and measuring modifiable behaviors in low-income families, related to obesity prevention.

3. What key behavioral component(s) was identified? What was found in the study?

The reviews found 2 studies that looked at consumption of sweetened beverages and specifically, drinking soda. Found that this behavior was positively associated with consumption of fast food and of high-fat snacks in the home.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Authors were not able to identify any self-report tools for measuring this behavior.

4. Describe the sample.

Focus of review was low-income families with young children, but no studies of SSB consumption in this group were found.

Other examples of questions that have been used to assess SSB consumption:

(These papers were not focused on SSB consumption and were not reviewed in detail, but the measures used may be of interest)

A. Vereecken CA, Keukelier E, Maes L. Influence of mother's educational level on food parenting practices and food habits of young children. *Appetite* 2004;43(1):93-103.

Parents were asked to report children's usual frequency of intake of "soft drinks" as well as other foods. There were 6 response options:

1. Rarely or less than once a week
2. Once a week
3. 2-4 times a week
4. 5-6 times a week
5. Once a day, every day
6. More than once a day, every day

Use of these response options is desirable since people who consume (or report their children consuming) SSBs only once a week do not always feel comfortable with a response option of 1-3 times a week.

B. *School physical activity and nutrition (SPAN) project student questionnaire* for 8th - 11th Grades http://www.sph.uth.tmc.edu/catch/catch_em/8-11%20Eng%20SPAN%20v8.pdf

This questionnaire has been tested and psychometric information published (Hoelscher, Day et al. 2003), however it does not appear that the SSB questions were included in that assessment.

These questions are about YESTERDAY.

Yesterday, how many times did you drink any punch, Kool-Aid®, sports drinks, or other fruit-flavored drinks? *Do not count* fruit juice.

NONE	1 TIME	2 TIMES	3 or More
Yesterday, how many times did you drink any <i>regular</i> (not diet) sodas or soft drinks?			
NONE	1 TIME	2 TIMES	3 or More

REFERENCES

- Bachman, C. M., T. Baranowski, et al. (2006). "Is There an Association Between Sweetened Beverages and Adiposity?" Nutrition Reviews **64**(4): 153-174.
- Block, G. (2004). "Foods contributing to energy intake in the US: Data from NHANES III and NHANES 1999-2000." Journal of Food Composition and Analysis **17**: 439-447.
- Chen, L., L. J. Appel, et al. (2009). "Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial." The American Journal of Clinical Nutrition **89**(5): 1299-1306.
- Dennis, E. A., K. D. Flack, et al. (2009). "Beverage consumption and adult weight management: A review." Eating Behaviors **10**(4): 237-246.
- Finkelstein, E. A., C. Zhen, et al. (2010). "Impact of Targeted Beverage Taxes on Higher- and Lower-Income Households." Arch Intern Med **170**(22): 2028-2034.
- Gibson, S. (2008). "Sugar-sweetened soft drinks and obesity: A systematic review of the evidence from observational studies and interventions." Nutrition Research Reviews **21**: 134-147.
- Hoelscher, D. M., R. S. Day, et al. (2003). "Reproducibility and validity of the secondary level School-Based Nutrition Monitoring student questionnaire." Journal of the American Dietetic Association **103**(2): 186-194.
- James, J., P. Thomas, et al. (2004). "Preventing childhood obesity by reducing consumption of carbonated drinks: cluster randomised controlled trial." BMJ **328**(7450): 1237.
- Malik, V. S., M. B. Schulze, et al. (2006). "Intake of sugar-sweetened beverages and weight gain: a systematic review." The American Journal of Clinical Nutrition **84**(2): 274-288.
- Schulze, M. B., J. E. Manson, et al. (2004). "Sugar-Sweetened Beverages, Weight Gain, and Incidence of Type 2 Diabetes in Young and Middle-Aged Women." JAMA: The Journal of the American Medical Association **292**(8): 927-934.
- Zoellner, J., P. A. Estabrooks, et al. (2011). "Exploring the Theory of Planned Behavior to Explain Sugar-sweetened Beverage Consumption." Journal of Nutrition Education and Behavior.

Attachment D.2 – Added Sugar (Audrey Adler)

There are no questions on the current Behavior Checklist that relate to added sugar as part of discretionary calories. In the literature reviewed, no behavior related questions concerning high sugar content foods were found. None-the-less, the contribution to health and healthy weight objectives of setting limits on discretionary calorie intake has been established, and foods with high sugar content are an important part of it. The committee should consider creating questions on this topic.

Article #1

Citation Schunk JM, McArthur LH, Maahs-Fladung CA. Correlates for Healthful Snacking among Middle-income Midwestern Women. *J Nutr Ed Behav.* 2009;41(4):274-280.

What behavior(s) was examined? Self-administered assessment of healthfulness of snacking patterns of middle- to upper-income women. Measured psychosocial correlates for healthful snacking, including self-efficacy, perceived barriers, stage of change; awareness of nutritional characteristics of healthful snacks.

What key behavioral component(s) was identified? What was found in the study?

- Higher calorie snacks (e.g., cookies, cheese, pastry, chocolates, nuts, etc.) were consumed at moderate or high frequency by at least 1/3 of subjects; lower calorie snacks (e.g., fruit, low-fat dairy, pretzels, vegetables, etc.) were also consumed at moderate or high frequency by at least 1/3 of subjects.
- The range of snacking occasions reported by normal weight women was smaller than the range of snacking occasions reported by overweight and obese women.
- Confidence in accessing healthful snacks was related to emotions, convenience, and social situations.
- Some barriers to healthful snacking were identified as highly important to subjects; awareness of healthful snacks was considered to have low importance.

Describe the sample.

56 urban women of middle- to upper-income, mean age of 43.9 years, mean BMI of 25.9 kg/m².

Article #2

Citation Thompson FE, McNeel TS, Dowling EC, Midthune D, Morrisette M, Zeruto CA. Interrelationships of Added Sugars Intake, Socioeconomic Status, and Race/Ethnicity in Adults in the United States: National Health Interview Survey, 2005. *J Am Diet Assoc.* 2009;109:1376-1383.

What behavior(s) was examined? The Five-Factor Screener used in the 2005 NHIS Cancer Control Supplement asked frequency of use information; the added sugars component consisted of four food groupings: soda; fruit drinks; doughnuts, sweet rolls and muffins; and cake, cookies, and pies. These items were found to be most predictive of added sugars intake in earlier CSFII analysis. NHANES data indicates that the largest sources of added sugars intake are sodas,

grain-based desserts, and fruit drinks. Intake data was analyzed by race/ethnicity, education level, gender, family income.

What key behavioral component(s) was identified? What was found in the study?

- Added sugars intake was inversely related to both education and family income, and subject to differences based on race/ethnicity and gender.

Describe the sample.

Adults 18 years and older who participated in the 2005 US National Health Interview Survey Cancer Control Supplement.

Article #3

Citation Zizza CA, Xu B. Snacking Is Associated with Overall Diet Quality among Adults. *Journal of the Academy of Nutrition and Dietetics*. 2012;112:291-296.

What behavior(s) was examined? Data from three continuous NHANES cycles were combined. Dietary intake and quality were evaluated; the Healthy Eating Index component for energy from solid fat, alcohol and added sugars provided data on intake of these foods, which is deemed to serve as a proxy for discretionary energy.

What key behavioral component(s) was identified? What was found in the study?

- Age, BMI, and energy from meals were each inversely associated with snacking frequency.
- Snacking was not associated with poorer overall diet quality, but was associated with a slightly more nutrient-dense diet.

Describe the sample.

Adults age 20 and older who participated in the 1999-2004 NHANES surveys.

Article #4

Citation Cohen DA, Sturm R, Scott M, Farley TA, Bluthenthal R. Not Enough Fruit and Vegetables or Too Many Cookies, Candies, Salty Snacks, and Soft Drinks? *Public Health Reports*. 2010;125:88-95.

What behavior(s) was examined? Questionnaire via telephone asked about consumption of selected food items deemed to be of importance to obesity, including fruit, vegetables, candy, cookies, salty snacks, soda, and alcohol; estimated calories were based on number of servings consumed in the previous 24 hours.

What key behavioral component(s) was identified? What was found in the study?

- Discretionary calories consumed from each type of snack food were assessed by gender, income, ethnicity, education. The daily calories from these selected foods exceeded the amount of discretionary calories recommended in the Dietary Guidelines.
- Fruit and vegetable consumption was lower than recommended, but not as discrepant as the discretionary calories.
- No evidence was found suggesting that increased fruit and vegetable consumption was offset by decreased consumption of soda, candy, cookies, and salty snacks.

Describe the sample.

Adults from two densely populated census tracts in Los Angeles and New Orleans.

Article #5

Citation Weaver D, Finke M. The relationship between the use of sugar content information on nutrition labels and the consumption of added sugars. *Food Policy*. 2003;28:213-219.

What behavior(s) was examined? Subjects who claimed to always use the nutrition label for sugar information were evaluated against all other subjects for total consumption of added sugar using CSFII and DHKS data.

What key behavioral component(s) was identified? What was found in the study?

- Regular use of sugar information on nutrition panels is associated with a significantly lower density of added sugar in the diet.
- General use of the nutrition label (i.e., not specifically the sugar information) was not shown to impact the consumption of added sugar.

Describe the sample.

Adults 20 years and older who completed both the CSFII and DHKS between 1994 and 1996.

Article #6

Citation Deshmukh-Taskar P, Micklas TA, Yang s, Berenson GS. Does Food Group Consumption Vary by Differences in Socioeconomic, Demographic, and Lifestyle Factors in Young Adults? The Bogalusa Heart Study. *J Am Diet Assoc*. 2007;107:223-234.

What behavior(s) was examined? Food consumption patterns for various food groups, including snacks and desserts.

What key behavioral component(s) was identified? What was found in the study?

- African-American young adults consumed more servings of snacks and desserts than other racial/ethnic groups.
- The number of servings of snacks and desserts was significantly higher in married young adults compared with unmarried young adults.

- In general food group consumption varied by socioeconomic, demographic, and lifestyle factors in young adults.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Participants were asked to indicate how often, on average, they had consumed a given amount of a specified food during the past year; responses ranged from “never or less than once a month” to “five or more times a day”.

Describe the sample.

Young adults aged 20 to 38 years and enrolled in the Bogalusa Hear Study.

Article #7

Citation Ledikwe JH, Smiciklas-Wright H, Mitchell DC, Miller CK, Jensen GL. Dietary Patterns of Rural Older Adults Are Associated with Weight and Nutritional Status. *J Am Geriatr Soc.* 2004;52:589-595.

What behavior(s) was examined? Dietary intake of various food groups and subgroups.

What key behavioral component(s) was identified? What was found in the study?

- No significant difference found in intake of “sweets” between subjects with low-nutrient-dense intake patterns and high-nutrient-dense intake patterns.
- Persons in the low-nutrient-dense intake group reported higher intake of sweets, sweet bread desserts, and dairy desserts. These individuals were reported as having higher BMI. The likelihood of having undesirable weight or nutritional status was twice as high for individuals whose dietary pattern was characterized by low-nutrient-dense food choices.

Describe the sample.

Rural adults aged 66 to 87.

Article #1

Citation: Auld GW, Bruhn CM, McNulty J, Bock MA, Gabel K, Lauritzen G, Medeiros D, Newman R, Nitzke S, Ortiz M, Read M, Schutz H, Sheehan ET. Reported adoption of dietary fat and fiber recommendation among consumers. *J Am Diet Assoc.* 2000;100:52-58.

What behavior(s) was examined?

Removing skin from chicken, choosing whole grain bread, choosing reduced fat milk, trimming fat from meat, fruit and vegetable intake

What key behavioral component(s) was identified?

Subjects are more likely to adopt fat-reduction behaviors than fiber intake increasing behaviors. Lower-income respondents consumed more fruits and vegetables. Overall, women were more likely than men to adopt new behaviors. If the health impact of the behavior change was stressed, respondents were more likely to adopt the behavior. The easier it was to incorporate the behavior, the more likely it was to be adopted.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Questions asked: If it were good for your health, would you:

drink 1% or skim milk?

Take skin off poultry?

Trim fat from meat?

Eat whole grain breads?

Eat more fruits and vegetables?

If respondents answered yes and reported practicing the behavior often, additional questions were asked regarding how often the behaviors had been practiced in the last month.

EFNEP questions this relates to/Questions to consider asking

CA047 – Do you use lower fat milk?

CA042 - Do you take skin off chicken before eating?

011 – Do you trim the fat before cooking?

CA049 – Do you eat whole wheat bread?

Article #2

Citation: Burgess-Champoux TL, Rosen R, Marquart L, Reicks M. The Development of Psychosocial Measures for Whole Grain Intake among Children and Their Parents. *J Am Diet Assoc.* 2008;108:714-717.

What behavior(s) was examined?

Intention for whole grain consumption, ability to identify whole grain products, and self-efficacy to choose whole grains. Availability of whole grains in the home was also examined. Behavior was examined for both parents and children.

What key behavioral component(s) was identified?

Inability to identify whole-grain products is a major inhibiting factor in whole grain consumption and in developing validated questions about whole grain intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

The children's questionnaire was developed to assess psychosocial determinants, specifically knowledge, intention, availability, and self efficacy. Ability to identify whole grains was measured on a seven point scale where participants were asked to identify the whole grain (brown rice vs white rice) and one point assigned to each correct answer. Availability of whole grains in the home were measured using a three response option (1=almost never, 2=sometimes, and 3 = almost always) to seven questions. Self efficacy to choose whole grains was measured using three response options (1= I'm not sure I can, 2= I'm a little bit sure I can, and 3= I know I can) to seven questions.

The parent questionnaire measured availability of whole grain foods in the home, consumption of whole grains, modeling behaviors, enabling behaviors, and attitude statements regarding health benefits and child intake of whole grains.

EFNEP questions this relates to/Questions to consider asking

CA049 Do you eat whole wheat bread?

Consider asking a question to assess confidence in ability to identify a whole grain product. For example, "Do you know how to identify whole grain products?" Using "I regularly choose whole grain products" on the entry/exit forms with an Agree-Disagree scale may not be valid because participants may not correctly identify whole grains.

Article #3

Citation: Buzzard IM, Stanton CA, Figueiredo M, Fries EA, Nicholson R, Hogan CJ, Danish SJ. Development and reproducibility of a brief food frequency questionnaire for assessing the fat, fiber, and fruit and vegetable intakes of rural adolescents. *J Am Diet Assoc.* 2001;101:1438-1446.

What key behavioral component(s) was identified?

Grouping foods resulted in lower correlations as compared to asking about individual foods. It is crucial to ask about foods that are familiar to the students. Asking questions in a longer format that took up more paper (version A of the survey) resulted in more accurate answers. When questions were presented in a grid format (version B of the survey), the respondents were more likely to mark the same answer for multiple questions, which resulted in error.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Questions were not asked to elicit behavior change. Questions were asked to assess intake of fat, fiber and fruits and vegetables in rural adolescents. The 25 food items asked about were: white bread or rolls (include sandwiches and toast); whole wheat, rye, or brown bread or rolls; cold or hot cereal or grits; pizza; milk (drink or add to cereal); cheese (include in sandwiches and cheeseburgers); fruit or vegetable juice; fruit (include all kinds); beans like baked beans, red beans, or black-eyed peas (include beans in chili, bean soup, and beans and rice); green salads (like lettuce or spinach salads); French fries, fried potatoes, or hash browns; baked, boiled, or mashed potatoes; vegetables (include all kinds); fried chicken or chicken nuggets; fried fish (include fish sticks and fried shrimp); hot dogs; bologna or salami; mayonnaise on sandwiches; bacon or sausage (include span, scrapple, and chit'lins); hamburgers, cheeseburgers, meatloaf or meatballs; chips (include potato chips, corn chips, tortilla chips, and cheese curls); donuts, sweet rolls, or muffins; cake, cookies, brownies, or pie; ice cream or milkshakes; and candy bars.

Response options depended on the question. Some questions about frequency of consumption had the response options: never or less than once a day; 1-2 times a day; 3-4 times a day; 5 or more times a day. Questions about groups of food had response options about types of food. For example, the question "When you eat breads or rolls, which do you eat?" had the response options Mostly white bread, mostly brown or whole-grain bread, about half-white and half brown or whole grain bread, and don't usually eat bread.

The paper has examples of how the questions were worded. There were multiple versions of the survey as researchers explored the validity and reliability of each.

EFNEP questions this relates to/Questions to consider asking

015 Do you serve fatty meats?

CA047 Do you use lower fat milk?

IN121 How often do you eat fried foods?

VA115 You eat 6 or more servings of breads/cereal?

Consider wording the questions so that examples of the foods are provided. Consider asking a whole grains question that provides examples of whole grain food products.

Article #4

Citation: Fernandez S, Olendzki B, Rosal MC. A Dietary Behaviors Measure for Use with Low-Income, Spanish-Speaking Caribbean Latinos with Type 2 Diabetes: The Latino Dietary Behaviors Questionnaire. *J Am Diet Assoc.* 2011;111:589-599.

What behavior(s) was examined?

Behaviors related to metabolic syndrome factors, such as whole grain consumption, sugar intake, and fat intake.

Specific behaviors looked at included: use of white bread and white rice, low fat milk consumption, removing skin from chicken, fried food consumption, and altering food to increase the healthfulness of the food.

The population for this study was low-income, Spanish-speaking, Caribbean Latinos with Type 2 diabetes. While this is not exactly the same population as EFNEP participants, the Latino Dietary Behaviors Questionnaire could possibly be applicable to the Spanish speaking EFNEP population, even those without diabetes or non-Caribbean heritage.

What key behavioral component(s) was identified?

Dietary choices and limiting portion is significantly related to a participant's percent energy from fat. The number of meals is associated with dietary fiber. Fat consumption behaviors were associated trans-fat intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Questions were not asked to elicit behavior change. Questions were asked to assess what behaviors participants practiced and the frequency of such behaviors.

Questions were in Spanish. Questions listed below have been taken from the English-translated version of the LDBQ. Response options were Likert scales, ranging from 3 to 5 options. Possible answer ranges are included here. Some questions were reversed scored.

1. How often do you eat fried foods per week? 5=never, 0=2 or more a day
2. How often do you drink regular soft drinks or soda pop? (includes regular soda and regular juices) 5=never, 0=2 or more times per day
3. How often do you drink diet soft drinks or soda pop? (including diet soda and juices) 5=never, 0=2 or more times a day
4. How often do you eat regular white rice or white bread? (not whole grain) 5=never, 0=2 or more times a day
5. How often do you drink 1% or skim milk? 0=rarely or never, 3=all the time
6. How often do you eat sweets with artificial sweeteners? (Like Splenda, Equal, or Sweet n Low)(including desserts, candies, pastry, and ice cream) 0=rarely or never, 3= all of the time
7. How often do you drink coffee or tea without sugar or with artificial sweeteners? (like Splenda, Equal, or Sweet N Low) 0=rarely or never, 3= all of the time

8. How often do you eat chicken with the skin? 3=rarely/never, 1= all of the time
9. How often do you control the amount of food that you eat? Or try to eat smaller portions?
0=rarely/never, 3=all of the time
10. How often do you change your foods to make them healthier? 0=rarely/never, 3=all of the time
11. How often do you eat a complete breakfast and not just coffee and crackers?
0=rarely/never, 3=all of the time
12. How many complete meals do you eat during the day almost every day? (do not include snacks or what you pick at during the day)(Interviewer: breakfast ought to include more than just coffee and crackers) 1=only one complete meal, 3=three complete meals
13. How many times in a week or month do you eat breakfast, lunch, or dinner prepared at restaurants or fast food places (such as McDonalds, Burger King, Wendy's, Arby's, Pizza Hut, KFC; do not include Meals on Wheels) 0=3 or more times per month, 3=almost never or less than one time per month

EFNEP questions this relates to/Questions to consider asking

Question 1 from the study relates to IN121 How often do you eat fried foods?

Question 4 from the study relates to CA049 Do you eat whole wheat bread?

Question 5 from the study relates to CA047 Do you use lower fat milk?

Question 8 from the study relates to CA042 Do you take the skin off chicken before eating?

Question 10 from the study relates to 011 and WI103 Do you trim the fat before cooking?/Do you make main dishes from scratch?)

Article #5

Citation: Glanz K, Kristal A, Sorensen G, Palombo R, Heimendinger J, Probart C. Development and validation of measures of psychosocial factors influencing fat and fiber-related dietary behavior. *Preventative Medicine*. 1993;22:373-387.

What behavior(s) was examined?

Fiber and fat consumption after intervention based on 24- item food frequency questionnaire.

What key behavioral component(s) was identified?

Factors most strongly associated with dietary intake were self- rated diet, past success at change, and motivation to eat low- fat foods.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

(1 to 5)

Low- fat foods taste good.

How important to you is eating low- fat foods?

How confident are you that you will decrease the amount of fat in your diet during the next 6 months?

How high in fat is your overall diet?

For how long have you followed a diet that is low in fat?

How high in fiber is your overall diet?

For how long have followed a diet that is high in fiber?

Have you tried to make any changes to lower the fat in your diet in the past 6 months?

How successful were in making those changes?

Have you tried to make any changes to increase the fiber in your diet in the past 6 months?

How successful were you in making those changes?

EFNEP questions this relates to/Questions to consider asking

CA046 Do you eat low-fat foods?

MA004 Do you eat mostly low-fat foods? Do you currently eat mostly low-fat foods every day (raw or prepared fruits, vegetables without butter or other fat)?

WI102 How often do you eat low-fat foods? How often do you eat low-fat foods instead of high-fat foods?

CA049 Do you eat whole wheat bread?

VA115 Do you eat 6 or more servings of breads/cereal?

Article #6

Citation: Hur IY, Reicks M. Relationship between Whole-Grain Intake, Chronic disease Risk Indicators, and Weight Status among Adolescents in the national health and Nutrition Examination Survey, 1999-2004. *J Am Diet Assoc.* 2011, In Press.

What behavior(s) was examined?

Intake of whole grains in adolescents

What key behavioral component(s) was identified?

Approximately half of adolescents between 12 and 19 are not consuming any whole grains.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

24 hour FFQ and intake data over 2 days

MyPyramid Food Equivalent Database (MPED 2.0)

No behavior change questions asked – just analysis of current behaviors

Article #7

Citation: Kristal Ar, Abrams BF, Thornquist MD, Disogra L, Croyle RT, Shattuck AL, Henry HJ. Development and Validation of a Food Use Checklist for Evaluation of Community Nutrition Interventions. *Am J Pub Health*. 19909;80:1318-1322.

What key behavioral component(s) was identified?

Over reporting tends to happen with FBQ when compared to a 24 hour recall. Lack of knowledge of what defines a whole grain product causes

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

Simple yes/no questions were asked about the food consumption habits of participants. No questions were asked to elicit behavior change. These questions were designed to be a faster method of assessing dietary intake of fat and fiber. Consumption was asked about the following foods: cereal, high-fiber cereal, pastry, bacon or sausage, milk, fruit, salad, vegetables at lunch, vegetables at dinner, butter on vegetables, dark bread, muffins, butter on bread, fried food, cold cuts, ground beef, cakes, and ice cream. The cereal question was worded as such: "Cereal (hot or cold) a. if yes, was it any of the following? Any bran cereal, Raisin Bran, Wheatena, Shredded Wheat, Oat bran, oatmeal or Fruit n Fiber?" By providing brand names, researchers found that participants were prompted to report high-fiber consumption more accurately. The milk question was worded as such: "Milk, including milk on cereal, chocolate milk or café con leche. a. if yes, was it: regular or whole milk? Low-fat or 2% milk? Skim, 1% or non-fat milk."

EFNEP questions this relates to/Questions to consider asking

015 Do you serve fatty meats? could relate to the survey consumption of bacon and sausage

CA047 Do you use lower fat milk? could relate to the survey consumption of milk

IN121 How often do you eat fried foods? relates to the survey question about deep fried food consumption

This is yet another paper commenting on the difficulty of asking questions about fiber and whole grains due to the lack of knowledge participants have about whole-grains. If a question is developed for EFNEP concerning whole-grain consumption, examples or definitions need to be provided.

Article #8

Citation: Melanson KJ, Angelopoulos TJ, Nguyen VT, Martini M, Zukley L, Lowndes J, Dube TJ, Fiutem JJ, Yount BW, Rippe JM. Consumption of whole grain cereals during weight loss: Effects on dietary quality, dietary fiber, magnesium, vitamin B-6 and obesity. *J Am Diet Assoc*. 2006;106:1380-1388.

What topic area was covered?

Whole grain cereal consumption during weight loss

What behavior(s) was examined?

The consumption of whole grain cereals either once or twice daily in addition to a hypocaloric diet and exercise

What key behavioral component(s) was identified?

At least a daily intake of fiber-rich whole grain cereals was related to lower fat intake, and higher fiber, magnesium and vitamin B-6

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article N/A

EFNEP questions this relates to/Questions to consider asking

Consider asking if participant consumes whole grain products every day, as whole grain consumption is linked to lower fat intake.

Article #9

Citation: Murphy SP, Kaiser LL, Townsend MS, Allen LH. Evaluation of validity of items for a food behavior checklist. *J Am Diet Assoc.* 2001;101:751-756.

What topic area was covered?

Intake of fats, fruits/vegetables, and dairy. Study also looked at food security. Brief mention of whole wheat bread consumption not being statistically correlated to any nutrient the study looked at.

What behavior(s) was examined?

Consumption of F/V, dairy, fat and cholesterol. Target population: low-income women in California.

What key behavioral component(s) was identified?

Increasing fruit and vegetable intake correlates to decrease in fat consumption. Some of the questions asked correlated with serum testing, validating the use of the questions as a measuring intake of the food groups/components looked at.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were asked about the subjects current behaviors. 39 item check list, most with a 4 point Likert scale (never, sometimes, often, usually/always) or yes/no response. 22 of the questions had statistically relevant responses. The 22 questions were:

1. Do you eat more than one kind of fruit daily?

2. How many of servings of fruit do you eat each day?
3. During the past week did you have citrus fruit or citrus juice?
4. Do you eat more than one kind of vegetable a day?
5. How many servings of vegetables do you eat each day?
6. Do you eat two or more servings of vegetables at your main meal?
7. During the past week did you have raw vegetables?
8. Do you eat fruit and vegetables as snacks?
9. Do you eat low-fat instead of high-fat foods?
10. Do you drink milk daily?
11. During the past week did you have milk as a beverage or on cereal?
12. During the past week did you have eggs?
13. During the past week did you have fish?
14. If you eat eggs, about how many eggs do you usually eat in a week?
15. Do you take the skin off the chicken?
16. How many times a week do you usually eat food from a fast-food restaurant?
17. When shopping, do you use the Nutrition Facts on the food label to choose from?
18. Do you drink regular soft drinks?
19. Do you buy Kool-Aid, Gatorade, Sunny Delight, or other fruit drink/punch?
20. Would you describe your diet as excellent, very good, good, fair or poor?
21. Do you worry whether your food will run out before you can buy more?
22. Do you run out of food before the end of the month?

EFNEP questions this relates to/Questions to consider asking

Question 9 from the study “Do you eat low-fat instead of high-fat foods?” is similar to EFNEP database questions 018, CA046, and MA004. Do you eat low-fat foods?/Do you eat mostly low-fat foods? Question 15 from the study “Do you take the skin off the chicken?” is similar to EFNEP database question CA042 Do you take skin off chicken before eating? Question 17 from the study “When shopping, do you use the Nutrition Facts on the food label to choose foods?” is similar to EFNEP database question 002 Do you read food labels for fat content?

Fat related questions from the study that did not show correlations and are similar to EFNEP questions were about: fry meats, trim fat from meat, use low-fat milk, use low-fat cheeses, make main dishes from scratch. These are similar to EFNEP questions, 011, 015, 018, CA047, IN121 and WI103.

The authors also noted that whole wheat bread consumption was also not statistically significantly correlated to any of the looked at nutrients or food groups.

Article #10

Citation: Segal-Isaacson CJ, Roestt JW, Gans KM. Validation of a short Dietary Assessment Questionnaire: the Rapid Eating and Activity Assessment for Participants Short Version (REAP-S). *The Diabetes Educator*. 2004;30:774-782.

What topic area was covered?

Fat and fiber (with regards to whole grain and high-fiber starch) intake

What behavior(s) was examined?

Consumption of certain foods, frequency of restaurant dining, drink consumption, and self-efficacy in regards to changing eat habits to be healthier.

What key behavioral component(s) was identified?

The Rapid Eating Assessment for Participants – Shortened version (REAPS) is an acceptable quick way to assess dietary fat and fiber intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

Questions were not asked to elicit behavior change, but were asked to determine whether or not the REAPS was useful screening tool as compared to the 1998 Block FFQ. Questions asked were:

In an average week, how often do you:

1. Skip breakfast?
2. Eat 4 or more meals from sit-down or take restaurants?
3. Eat less than 2 servings of whole grain products or high fiber starches in a day? Servings = 1 slice of 100% whole grain bread, 1 cup whole grain cereal like Shredded Wheat, Wheaties, Grape Nuts, high fiber cereals, oatmeal, 3-4 whole grain crackers, ½ cup brown rice or whole wheat pasta, boiled or baked potatoes, yucca, yams, or plantain.
4. Eat less than 2 servings of fruit a day? Serving ½ cup or 1 med fruit or ¾ cup 100% fruit juice
5. Eat less than 2 servings of vegetables a day? Servings= ½ cup vegetables or 1 cup leafy raw vegetables
6. Eat or drink less than 2 servings of milk, yogurt or cheese a day? Servings= 1 cup milk or yogurt, 1 ½ -2 ounces cheese.
7. Eat more than 8 ounces (see sizes below) of meat, chicken, turkey or fish per day? Note: 3 ounces of meat or chicken is the size of a deck of cards or one of the following: 1 regular hamburger, 1 chicken breast, or leg (thigh and drumstick), or 1 pork chop.
8. Use regular processed meats (like bologna, salami, corned beef, hotdogs, sausage or bacon) instead of low fat processed meats (like roast beef, turkey, lean ham; lo-fat cold cuts/hotdogs)?
9. Eat fried foods such as fried chicken, fried fish, French fries, fried plantains, tostones, or fried yucca?

10. Eat regular potato chips, nacho chips, corn chips, crackers, regular popcorn, nuts instead of pretzels, low-fat chips or low-fat crackers, air-popped popcorn?
11. Add butter, margarine, or oil to bread, potatoes, rice or vegetables at the table?
12. Eat sweets like cake, cookies, pastries, donuts, muffins, chocolate and candies more than 2 times per day?
13. Drink 16 ounces or more of non-diet soda, fruit drink/punch or Kool-Aid a day?
14. You or a member of your family usually shops and cooks rather than eating sit-down or take-out restaurant food?
15. Usually feel well enough to shop or cook.
16. How willing are you to make changes in your eating habits in order to be healthier?

Questions 1-13 had response options: usually/often, sometimes, rarely/never, and 7, 8, 10 had an additional response option stating rare consumption of those foods. Questions 14 and 15 had yes/no response options. Question 16 had a Likert scale response of 1-5, “very willing” to “not at all willing.”

EFNEP questions this relates to/Questions to consider asking

REAPS question #3 relates to EFNEP question CA049 Do you eat whole wheat bread? Consider expanding the EFNEP question to ask about other whole grain products beyond bread, like tortillas, crackers or pasta.

REAPS question #9 relates to EFNEP question IN121 How often do you eat fried foods?

REAPS questions 11 and 16 should be considered as additions to the EFNEP database.

Article #11

Citation: Shannon J, Kristal AR, Curry SJ, Beresford SAA. Application of a Behavioral Approach to Measuring Dietary Change: The Fat- and Fiber-related Diet Behavior Questionnaire. *Cancer Epidemiology, Biomarkers and Prevention*. 1997;6:355-361.

What topic area was covered?

Fat and fiber intake. The validity, reliability, and responsiveness of a 33- item fat and fiber-related behavior questionnaire and how this instrument provides insight into the process of adopting healthy diets.

What behavior(s) was examined?

Self- help intervention to reduce fat and increase fiber intake.

Subscales of fat related behaviors looked at were: substitution of specially manufactured low-fat foods; avoiding fat as a flavoring; modifying meats to be low in fat; replace high-fat foods with fruits and vegetables; and replacing high-fat meats with low-fat alternatives.

Subscales of fiber related behaviors looked at were: consumption of cereals and grains; consumption of fruits and vegetables; and substitution of high-fiber foods for low-fiber foods.

What key behavioral component(s) was identified?

The two behaviors that correlated most with reduction of dietary fat intake were: avoiding fat as a flavoring and substituting specially manufactured low-fat foods.

Fiber intake related behaviors were not quite as clearly correlated. Increasing consumption of cereals and grains appeared to be the most important behavior related to increasing fiber intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Questions asked: In the past three months how often did you....

- Eat ice milk, frozen yogurt, or sherbet instead of ice cream?
- Use low-calorie salad dressing instead of regular?
- Use yogurt instead of sour cream?
- Eat low-fat cheese instead of regular cheese?
- Drink low-fat or nonfat milk instead of whole?
- Use Pam instead of oil, margarine, or butter?
- Eat a potato without butter or margarine?
- Eat bread without butter or margarine?
- Put butter or margarine on vegetables?
- Take the skin off chicken?
- Eat baked or broiled fish?
- Eat raw vegetables for a snack?
- Eat two or more vegetables at dinner?
- Eat a vegetable at lunch?
- Eat fruit for dessert?
- Eat a vegetarian dinner?
- Eat a meatless pasta sauce?
- Eat fish or chicken instead of red meat?
- Eat high-fiber cereals
- Eat cereal (hot or cold) for breakfast
- Eat whole grain-crackers or bread?
- Add bran to casseroles or cereal?
- Eat fruit for dessert?
- Eat raw vegetables for snacks instead of chips?
- Eat fruit for breakfast?
- Eat a vegetable at lunch?
- Eat two or more vegetables at dinner?
- Eat whole wheat instead of regular pasta?
- Eat brown rice instead of white rice?
- Eat a vegetarian dinner? (asked both in fiber and fat behavior items)

Answers were modified from a four point to a three point response scale: usually/always, sometimes, and rarely/never.

EFNEP questions this relates to/Questions to consider asking

CA047 Do you use lower fat milk?

CA042 Do you take skin off chicken before eating?

011 Do you trim the fat before cooking?

CA049 Do you eat whole wheat bread?

VA115 Do you eat 6 or more servings of breads, cereals, rice and pasta in a day?

015 Do you serve fatty meats?

018 Do you eat low fat foods?

WI102 How often do you eat low-fat foods?

MA004 Do you eat mostly low-fat foods?

We may want to ask if EFNEP participants eat high-fiber or whole-grain cereals (providing examples in the question) and consider asking about whole-grain crackers. Correlation for the other high fiber food questions was hard to determine because the FFQ that was used as a validity tool was unable to distinguish most whole-grain foods from their refined-grain counterparts. We may want to consider including a question about substituting whole-grain past and brown rice for their refined counterparts.

Article #12

Citation: Thompson FE, Midthune D, Subar AF, Kahle LL, Schatzkin A, Kipnis V. Performance of a short tool to assess dietary intakes of fruits and vegetables, percentage energy from fat and fibre. *Public Health Nutrition*. 2004;7:1097-1106.

What key behavioral component(s) was identified?

The screener resulted in similar recall estimates of percentage energy from fat for men, but slightly lower estimates for women. The screener underestimated fiber intake.

The survey was a good, quick way to estimate dietary fat and fiber intake.

Survey is validated and supported by the National Cancer Institute and is available on the NCI site for use.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Questions were not asked to elicit behavior change. Instead, the questions were asked to determine how effective a short dietary questionnaire (Multifactor Screener from the National Cancer Institute) is at estimating fat intake and fiber intake when compared to

dietary recalls. Questions were also asked about fruit and vegetable intake. Questions asked were:

1. How many times per day, week, or month did you usually eat cold cereals?
2. How many times per day, week, or month did you use milk, either to drink or on cereal?
 - 2a. What kind of milk did you usually use?
3. How many times per day, week, or month did you usually eat bacon or sausage, not including low fat, light or turkey varieties?
4. How often did you eat hot dogs made of beef or pork?
5. How often did you eat whole grain bread including toast, rolls, and in sandwiches? Whole grain breads include whole wheat, rye, oatmeal and pumpernickel.
6. How often did you drink 100% fruit juice such as orange, grapefruit, apple, and grape juices? Do not count fruit drinks such as Kool Aid, lemonade, cranberry juice cocktail, Hi-C and Tang.
7. How often did you eat fruit? Count fresh, frozen, or canned fruit. Do not count juices.
8. How often did you use regular fat salad dressing or mayonnaise, including on salad and sandwiches? Do not include low-fat, light, or diet dressings.
9. How often did you eat lettuce or green leafy salad, with or without other vegetables?
10. How often did you eat French Fries, home fries, or hash brown potatoes?
11. How often did you eat other white potatoes? Count baked potatoes, boiled potatoes, mashed potatoes, and potato salad. Do not include yams or sweet potatoes.
12. How often did you eat cooked dried beans, such as refried beans, baked beans, bean soup, and pork and beans?
13. How often did you usually eat other vegetables?
14. How many times per day, week, or month did you usually eat any kind of pasta? Count spaghetti, noodles, macaroni and cheese, pasta salad, rice noodles, soba, and any other kind of pasta.
15. How often did you eat peanuts, walnuts, seeds or other nuts? Do not include peanut butter.
16. How often did you eat regular fat potato chips, tortilla chips, or corn chips? Do not include low-fat chips.

Response options were in check boxes with the options of: never, 1-3 times last month, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day 2 times per day, 3 times per day, 4 or more times per day. For question 2a, the response options were various percentage fat milks.

EFNEP questions this relates to/Questions to consider asking

This could be applicable to all the fat and fiber questions, but the EFNEP questions that ask about food frequency probably relate to the survey questions a lot better. EFNEP questions that ask about food frequency are: IN121 How often do you eat fried foods?, WI102 How often do you eat low-fat foods?

This survey suggests that even though the correlation was lower for fiber than fat and F/V, asking questions about fiber and whole grain intake are worthwhile. Consider the addition of more questions about frequency of whole-grain and high-fiber foods.

Article #1

Citation: Block G, Gillespie C, Rosenbaum EH, Jenson C. A Rapid Food Screener to Assess Fat and Fruit and Vegetable Intake. *American Journal of Preventative Medicine*. 2000;18:284-288.

What key behavioral component(s) was identified?

The 15-items on used on the short Block Food Screener have good correlation values when compared to the lengthy 1995 Block 100-item FFQ, which has been previously validated as an accurate tool for measuring dietary intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change. Questions were asked to assess the validity of a short screener about food consumption. The questions were not available in the study paper. The screener is available for purchase at <http://nutritionquest.com/assessment/list-of-questionnaires-and-screeners>. There was a free sample of the fat intake screener, which I assume was similar. The sample has 17 items listed and frequency of consumption is asked about those food items. The screener used for the study had 15 items in the Meat/Snack category (meats, dairy, spread, snacks) that had relatively high correlation values (0.6-0.72) and response categories were: once per month or less, 2-3 times per month, 1-2 times per week, 3-4 times per week, or 5 or more times per week. As these are the same response options for the free sample screener, it is reasonable to assume the screener used in the study is similar to the free sample screener.

EFNEP questions this relates to/Questions to consider asking

Without seeing the exact questions, it is impossible to know which EFNEP questions this study is most applicable to. Based on the questions from the free sample survey, the majority of the EFNEP fat-related questions would be addressed. Specific foods asked about on the free sample survey that relate to EFNEP asked questions are: bacon or breakfast sausage, full fat cheese, whole milk, and French fries/fried potatoes.

Article #2

Citation: Anderson CAM, Kumanyika SK, Shults J, Kallan MJ, Gans KM, Risica PM. Assessing change in dietary fat behaviors in a weight-loss program for African Americans: A Potential Short Method. *J Am Diet Assoc*. 2007;107:838-842.

What key behavioral component(s) was identified?

30 questions from the SisterTalk FHQ would be sufficient in assessing diet.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Relating to Fat: (saturated and trans fatty foods)

- How often do you eat sausage or bacon?
- How often do you eat pork, beef, or lamb?
- How often do you eat other kinds of desserts or sweets? (Remember foods like cookies, cake, candy, doughnuts, pastry)

Relating to Grains:

- How often do you eat hot cereal or grits?

EFNEP questions this relates to/Questions to consider asking:

VA115 Question: You eat 6 or more servings of breads/cereal? User text: Do you eat 6 or more servings of breads, cereals, rice and pasta in a day?

015 Do you serve fatty meats? How many times during a two- week period do you serve bacon, sausage, or other fatty meats?

Article #3

Citation: Auld GW, Bruhn CM, McNulty J, Bock MA, Gabel K, Lauritzen G, Medeiros D, Newman R, Nitzke S, Ortiz M, Read M, Schutz H, Sheehan ET. Reported adoption of dietary fat and fiber recommendations among consumers. *J Am Diet Assoc.* 2000;100:52-58.

What key behavioral component(s) was identified?

Subjects are more likely to adopt fat-reduction behaviors than fiber intake increasing behaviors. Lower-income respondents consumed more fruits and vegetables. Overall, women were more likely than men to adopt new behaviors. If the health impact of the behavior change was stressed, respondents were more likely to adopt the behavior. The easier it was to incorporate the behavior, the more likely it was to be adopted.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions asked: If it were good for your health, would you:

- drink 1% or skim milk?
- Take skin off poultry?
- Trim fat from meat?
- Eat whole grain breads?
- Eat more fruits and vegetables?

If respondents answered yes and reported practicing the behavior often, additional questions were asked regarding how often the behaviors had been practiced in the last month.

EFNEP questions this relates to/Questions to consider asking:

CA047 – Do you use lower fat milk?

CA042 - Do you take skin off chicken before eating?

011 – Do you trim the fat before cooking?

CA049 – Do you eat whole wheat bread?

Article #4

Citation: Buzzard IM, Stanton CA, Figueiredo M, Fries EA, Nicholson R, Hogan CJ, Danish SJ. Development and reproducibility of a brief food frequency questionnaire for assessing the fat fiber, and fruit and vegetable intakes of rural adolescents. *J Am Diet Assoc.* 2001;101:1438-1446.

What key behavioral component(s) was identified?

Grouping foods resulted in lower correlations as compared to asking about individual foods. It is crucial to ask about foods that are familiar to the students. Asking questions in a longer format that took up more paper (version A of the survey) resulted in more accurate answers. When questions were presented in a grid format (version B of the survey), the respondents were more likely to mark the same answer for multiple questions, which resulted in error.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change. Questions were asked to assess intake of fat, fiber and fruits and vegetables in rural adolescents. The 25 food items asked about were: white bread or rolls (include sandwiches and toast); whole wheat , rye, or brown bread or rolls; cold or hot cereal or grits; pizza; milk (drink or add to cereal); cheese (include in sandwiches and cheeseburgers); fruit or vegetable juice; fruit (include all kinds); beans like baked beans, red beans, or black-eyed peas (include beans in chili, bean soup, and beans and rice); green salads (like lettuce or spinach salads); French fries, fried potatoes, or hash browns; baked, boiled, or mashed potatoes; vegetables (include all kinds); fried chicken or chicken nuggets; fried fish (include fish sticks and fried shrimp); hot dogs; bologna or salami; mayonnaise on sandwiches; bacon or sausage (include span, scrapple, and chit'lins); hamburgers, cheeseburgers, meatloaf or meatballs; chips (include potato chips, corn chips, tortilla chips, and cheese curls); donuts, sweet rolls, or muffins; cake, cookies, brownies, or pie; ice cream or milkshakes; and candy bars.

Response options depended on the question. Some questions about frequency of consumption had the response options: never or less than once a day; 1-2 times a day; 3-4 times a day; 5 or more times a day. Questions about groups of food had response options about types of food. For example, the question “When you eat breads or rolls, which do you

eat?” had the response options Mostly white bread, mostly brown or whole-grain bread, about half-white and half brown or whole grain bread, and don’t usually eat bread.

The paper has examples of how the questions were worded. There were multiple versions of the survey as researchers explored the validity and reliability of each.

EFNEP questions this relates to/Questions to consider asking

015 Do you serve fatty meats?

CA047 Do you use lower fat milk?

IN121 How often do you eat fried foods?

VA115 Do you eat 6 or more servings of breads/cereal?

Consider wording the questions so that examples of the foods are provided. Consider asking a whole grains question that provides examples of whole grain food products.

Article #5

Citation: Capps O, Cleveland L, Park J. Dietary behaviors associated with total fat and saturated fat intake. *J Am Diet Assoc.* 2002;102:490-502.

What key behavioral component(s) was identified?

The nine questions that were significant predictors of both total fat intake and saturated fat intake were: adding fat to potatoes, amount of fat added to breads, consumption of chips, meat portion sizes, egg consumption, fried chicken consumption, trimming fat, lower-fat milk consumption, and low fat cheese consumption. However, the most highly adopted behaviors were trimming fat from meat, removing skin from chicken, and eating chips infrequently and the least adopted behaviors were never adding fat to potatoes, never using margarine or butter on bread, eating lower fat cheeses, and having fruit for dessert.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not about eliciting behavior change, but assessing what behaviors participants had adopted and which behaviors were associated with lower total fat and saturated fat intake.

Data was collected from the Continuing Survey of Food Intakes by Individuals (CSFII) and the Diet and Health Knowledge Survey (DHKS). Responses were four point choices, including always to never, none to generous, number of times, and portion sizes. Questions asked were:

1. How often do you add butter, margarine, or sour cream to baked or boiled potatoes?
2. How often do you eat other cooked vegetables with butter or margarine added?
3. How often do you eat other cooked vegetables with cheese or another creamy sauce added?

4. Would you describe the amount of butter or margarine you usually spread on breads and muffins as
5. About how many times in a week do you eat bakery products like cakes, cookies, or donuts?
6. About how many times in a week do you eat chips, such as potato or corn chips?
7. At your main meal, about how many times in a week do you eat beef, pork or lamb?
8. When you eat meat, do you usually eat portions that are
9. How many eggs do you usually eat in a week?
10. When you eat fried chicken how often do you eat it fried?
11. When you eat chicken, how often do you remove the skin?
12. When you eat meat and there is visible fat, do you trim the fat?
13. How often do you eat lower fat luncheon meats instead of regular luncheon meats?
14. How often do you use skim or 1% instead of 2% or whole milk?
15. How often do you eat special low fat cheese when you eat cheese?
16. How often do you eat ice milk, frozen yogurt, or sherbet instead of ice cream?
17. How often do you use low calorie instead of regular salad dressing?
18. How often do you eat fish or poultry instead of meat?
19. How often do you have fruit for dessert when you eat dessert?

EFNEP questions this relates to/Questions to consider asking

IN121 How often do you eat fried foods? - could be related to survey question 10.

CA042 Do you take skin off chicken before eating? - directly relates to survey question 11.

011 Do you trim the fat before cooking? - directly relates to survey question 12.

018, CA046, MA004, WI102 (all asking about low-fat food) - could be related to survey questions 13, 15-17.

CA047 Do you use lower fat milk? - directly relates to survey question 14.

I believe other studies have also found that asking about added fats correlates well to intake. EFNEP should consider asking a question about adding butter or other fats to baked potatoes, breads, and vegetables.

Article #6

Citation: Dennison BA, Jenkins PL, Rockwell HL. Development and Validation of an Instrument to Assess Child Dietary Fat Intake. *Preventative Medicine*. 2000;31:214-224.

What key behavioral component(s) was identified?

Whole fat milk consumption is the biggest source of dietary fat for children. Focusing on switching to lower fat milk should be incorporated into nutrition education. Children who consumed low fat milk had lower dietary fat intake. Children who consumed buttered bread had higher levels of fat intake. Questionnaires are acceptable ways to assess fat intake in children.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

Questions were not asked to elicit behavior change. Instead, the questions were asked to assess whether or not the 17-item questionnaire was a good way to measure fat intake in young children. The questions were asked of the parents and validated against FFQs.

Questions asked were:

When serving chicken to your child in the past month, how often do you:

- 1.) serve it baked or broiled?
- 2.) Remove the skin?

When serving hamburger meat to your child in the past month, how often did you:

- 3.) buy an extra lean cut?

In the past month, how often did you serve your child:

- 4.) hot dogs for lunch or dinner?
- 5.) Fish or chicken for dinner?

In the past month, how often did you give your child:

- 6.) 2% milk instead of whole milk?
- 7.) Very low-fat (1%) or skim milk?
- 8.) Part skim milk or reduced fat cheese?

In the past month, how often did you:

- 9.) serve your child two or more vegetables at dinner?
- 10.) Put butter on your child's bread, rolls, or muffins?

In the past month, how often did you give your child:

- 11.) cheese as a snack?
- 12.) Potato, corn, or taco chips as a snack or side dish?
- 13.) A peanut butter sandwich for lunch?

In the past month, for breakfast, how often did you serve:

- 14.) eggs?
- 15.) Hot or cold cereal?
- 16.) Breakfast meats (bacon or sausage)?
- 17.) Sweet rolls, Danish, or doughnuts?

Responses were on a 5 to 1 scale, Always (5) to Rarely or never (1) with "not applicable."

Questions were about children but given to the children's parents/caretakers.

EFNEP questions this relates to/Questions to consider asking

015 Do you serve fatty meats?

CA042 Do you take skin off chicken before eating it?

CA047 Do you use lower fat milk?

Also applicable to EFNEP questions about low-fat foods (018, CA046, MA004, WI102)

Consider adding a question about how often the participant adds butter to breads and rolls.

Article #7

Citation: Fernandez S, Olendzki B, Rosal MC. A dietary Behaviors Measure for Use with Low-Income, Spanish-Speaking Caribbean Latinos with Type 2 Diabetes: The Latino Dietary Behaviors Questionnaire. *J Am Diet Assoc.* 2011;111:589-599.

What behavior(s) was examined?

Behaviors related to metabolic syndrome factors, such as whole grain consumption, sugar intake, and fat intake. Specific behaviors looked at included: use of white bread and white rice, low fat milk consumption, removing skin from chicken, fried food consumption, and altering food to increase the healthfulness of the food.

The population for this study was low-income, Spanish-speaking, Caribbean Latinos with Type 2 diabetes. While this is not exactly the same population as EFNEP participants, the Latino Dietary Behaviors Questionnaire could possibly be applicable to the Spanish speaking EFNEP population, even those without diabetes or non-Caribbean heritage.

What key behavioral component(s) was identified?

Dietary choices and limiting portion is significantly related to a participant's percent energy from fat. The number of meals is associated with dietary fiber. Fat consumption behaviors were associated trans-fat intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change. Questions were asked to assess what behaviors participants practiced and the frequency of such behaviors.

Questions were in Spanish. Questions listed below have been taken from the English-translated version of the LDBQ. Response options were Likert scales, ranging from 3 to 5 options. Possible answer ranges are included here. Some questions were reversed scored.

1. How often do you eat fried foods per week? 5=never, 0=2 or more a day
2. How often do you drink regular soft drinks or soda pop? (includes regular soda and regular juices) 5=never, 0=2 or more times per day

3. How often do you drink diet soft drinks or soda pop? (including diet soda and juices)
5=never, 0=2 or more times a day
4. How often do you eat regular white rice or white bread? (not whole grain) 5=never, 0=2 or more times a day
5. How often do you drink 1% or skim milk? 0=rarely or never, 3=all the time
6. How often do you eat sweets with artificial sweeteners? (Like Splenda, Equal, or Sweet n Low)(including desserts, candies, pastry, and ice cream) 0=rarely or never, 3= all of the time
7. How often do you drink coffee or tea without sugar or with artificial sweeteners? (like Splenda, Equal, or Sweet N Low) 0=rarely or never, 3= all of the time
8. How often do you eat chicken with the skin? 3=rarely/never, 1= all of the time
9. How often do you control the amount of food that you eat? Or try to eat smaller portions?
0=rarely/never, 3=all of the time
10. How often do you change your foods to make them healthier? 0=rarely/never, 3=all of the time
11. How often do you eat a complete breakfast and not just coffee and crackers?
0=rarely/never, 3=all of the time
12. How many complete meals do you eat during the day almost every day? (do not include snacks or what you pick at during the day)(Interviewer: breakfast ought to include more than just coffee and crackers) 1=only one complete meal, 3=three complete meals
13. How many times in a week or month do you eat breakfast, lunch, or dinner prepared at restaurants or fast food places (such as McDonalds, Burger King, Wendy's, Arby's, Pizza Hut, KFC; do not include Meals on Wheels) 0=3 or more times per month, 3=almost never or less than one time per month

EFNEP questions this relates to/Questions to consider asking

Question 1 from the study relates to IN121 (How often do you eat fried foods?)

Question 4 from the study relates to CA049 (Do you eat whole wheat bread?)

Question 5 from the study relates to CA047 (Do you use lower fat milk?)

Question 8 from the study relates to CA042 (Do you take the skin off chicken before eating?)

Questions 10 from the study relates to 011 and WI103 (Do you trim the fat before cooking?/Do you make main dishes from scratch?)

Article #8

Citation: Glanz K, Kristal A, Sorensen G, Palombo R, Heimendinger J, Probart C. Development and validation of measures of psychosocial factors influencing fat and fiber-related dietary behavior. *Preventative Medicine*. 1993;22:373-387.

What key behavioral component(s) was identified?

Factors most strongly associated with dietary intake were self- rated diet, past success at change, and motivation to eat low- fat foods.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

(1 to 5)

Low- fat foods taste good.

How important to you is eating low- fat foods?

How confident are you that you will decrease the amount of fat in your diet during the next 6 months?

How high in fat is your overall diet?

For how long have you followed a diet that is low in fat?

How high in fiber is you overall diet?

For how long have followed a diet that is high in fiber?

Have you tried to make any changes to lower the fat in your diet in the past 6 months?

How successful were in making those changes?

Have you tried to make any changes to increase the fiber in your diet in the past 6 months?

How successful were you in making those changes?

EFNEP questions this relates to/Questions to consider asking

CA046 Do you eat low-fat foods?

MA004 Do you eat mostly low-fat foods?

Do you currently eat mostly low-fat foods every day (raw or prepared fruits, vegetables without butter or other fat)?

WI102 How often do you eat low-fat foods?

How often do you eat low-fat foods instead of high-fat foods?

CA049 Do you eat whole wheat bread?

VA115 Do you eat 6 or more servings of breads/cereal?

Article #9

Citation: Hart A, Tinker L, Bowen DJ, Longton G, Beresford SAA. Correlates of Fat Intake Behaviors in Participant in the Eating for a Healthy Life Study. *J Am Diet Assoc.* 2006;106:1605-1613.

What key behavioral component(s) was identified?

The Fat and Fiber Related Behavior Questionnaire (please see Shannon doc) was used. This paper looked at socioeconomic factors - such as income, education, race, health status, and religious activity as correlates to fat intake. Household income was not strongly associated when education was included in the model. Living companion was not strongly related to fat

summary score when race as taken into account. Minority ethnic groups tend to have higher fat intake than whites/Asians/Pacific Islanders. Dietary differences between Hispanic groups may confound issues of treating Hispanics in a large group.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

Please see Shannon doc for the questions used. This paper provided additional support to the validity and reliability of the Fat and Fiber Behavior Questionnaire. This paper also gathered participant information in order to identify any socioeconomic correlates to fat intake.

EFNEP questions this relates to/Questions to consider asking

This study lends more support to the fat intake questions addressed in Shannon.docx and lends support to the Faithful Families program. We may also want to consider including questions with more ethnically diverse foods and to tailor educational materials for different ethnic groups.

Article #10

Citation: Horn-Ross PL, Lee VS, Collins CN, Stewart SL, Canchola AJ, Lee MM, Reynolds P, Clarke CA, Bernstein L, Stram DO. Dietary assessment in the California Teachers Study: reproducibility and validity. *Cancer Causes Control*. 2008;18:595-603.

What key behavioral component(s) was identified?

Block95 FFQ. With the exception of unsaturated fats, β -carotene, and absolute caloric intake, all other nutrients were well measured

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions not provided.

Examples of choices for frequency were never, once/day, or 5+ per day. For portions: small, medium or large.

EFNEP questions this relates to/Questions to consider asking

Article related to fat intake questions, but the results were less satisfactory. Population is not a good match for EFNEP population, so this article may be irrelevant to our needs.

Article #11

Citation: Keenan DP, Achterberg C, Kris-Etherton PM, Abusabha R, von Eye A. Use of qualitative and quantitative methods to define behavioral fat-reduction strategies and their

relationship to dietary fat reduction in the Patterns of Dietary Change Study. *J Am Diet Assoc.* 1996;96:1245-1250, 1253.

What key behavioral component(s) was identified?

No “one size fits all” behavior

Subjects were primarily adult, white, well-educated females

Six important strategies account for greatest decrease in dietary fat: decrease fat flavorings, decrease recreational foods, decrease cooking fat, replace meat, change breakfast, and use fat-modified foods.

Most important strategy was decreased use of fat as flavoring

Subjects who used multiple strategies experienced greater reduction in dietary fat intake

Subjects are receptive to using multiple strategies

Subjects less receptive to the idea of decreasing recreational foods

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Retrospective study, SYNTH protocol to assess dietary behavioral change patterns.

Telephone screening, two FFQs specially designed to examine high and low fat food choices, interviews on sustained food changes

EFNEP questions this relates to/Questions to consider asking

018, CA046, CA047, MA004, WI102

Article #12

Citation: Kristal AR, Abrams BF, Thornquist MD, Disogra L, Croyle RT, Shattuck AL, Henry HJ. Development and Validation of a Food Use Checklist for Evaluation of Community Nutrition Interventions. *Am J Pub Health.* 1990;80:1318-1322.

What key behavioral component(s) was identified?

Over reporting tends to happen with FBQ when compared to a 24 hour recall. Lack of knowledge of what defines a whole grain product causes

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Simple yes/no questions were asked about the food consumption habits of participants. No questions were asked to elicit behavior change. These questions were designed to be a faster method of assessing dietary intake of fat and fiber. Consumption was asked about the following foods: cereal, high-fiber cereal, pastry, bacon or sausage, milk, fruit, salad, vegetables at lunch, vegetables at dinner, butter on vegetables, dark bread, muffins, butter on bread, fried food, cold cuts, ground beef, cakes, and ice cream. The cereal question was worded as such: “Cereal (hot or cold) a. if yes, was it any of the following? Any bran cereal, Raisin Bran, Wheatena, Shredded Wheat, Oat bran, oatmeal or Fruit n Fiber?” By providing

brand names, researchers found that participants were prompted to report high-fiber consumption more accurately. The milk question was worded as such: “Milk, including milk on cereal, chocolate milk or café con leche. a. if yes, was it: regular or whole milk? Low-fat or 2% milk? Skim, 1% or non-fat milk.”

EFNEP questions this relates to/Questions to consider asking

015 Do you serve fatty meats? - could relate to the survey consumption of bacon and sausage

CA047 Do you use lower fat milk? - could relate to the survey consumption of milk

IN121 How often do you eat fried foods? - relates to the survey question about deep fried food consumption

This is yet another paper commenting on the difficulty of asking questions about fiber and whole grains due to the lack of knowledge participants have about whole-grains. If a question is developed for EFNEP concerning whole-grain consumption, examples or definitions need to be provided.

Article #13

Citation: Neuhouser ML, Kristal AR, Patterson RE. Use of food nutrition labels is associated with lower fat intake. *J Am Diet Assoc.* 1999;99:45-53.

What key behavioral component(s) was identified?

People who maintain low-fat diets read nutrition labels. It is unknown if reading nutrition labels causes someone to adopt a low-fat diet. Since label use is common, perhaps stressing the importance of low-fat diets and teaching how to interpret %DV should be incorporated or stressed in a lesson. Participants were categorized by 5 stages of change for adopting a low-fat diet (precontemplation, contemplation, decision, action or maintenance.)

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change. Instead, questions were asked to assess whether or not participants read food labels and how they used food labels. A three point response scale was used to report importance of eating low-fat foods (very important, somewhat important, or not important). Other health related behaviors were assessed, as was health history. Nutrition label use questions were answered using a four point scale, ranging from usually to never.

EFNEP questions this relates to/Questions to consider asking

002 Do you read food labels for fat content?

This article supports keeping this question in the database as a measurement of dietary fat intake.

Article #14

Citation: Di Noia J, Schinke SP, Contento IR. Dietary fat intake among urban, African American adolescents. *Eating Behaviors*. 2008;9:251-256.

What key behavioral component(s) was identified?

African American urban youth are have a higher preference for corn chips, potato chips, popcorn, crackers, fried chicken, doughnuts, pastries, cakes and cookies than their national white counterparts. There is also a fat intake difference amongst females and males. The preference for higher-fat fried foods amongst youth African Americans mirrors preferences in adult African Americans. The possibility remains that youth questions can be reliably applied to the adult population.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change. Questions were asked to assess dietary preferences that may account for the high rate of obesity in African Americans. Questions were about frequency of consumption of specific high-fat foods. Responses were on a 4-point Likert scale from 0(=once a month) or less to 4(=five or more times a week.) Foods that were asked about were: corn chips, potato chips, popcorn, crackers, fried chicken, doughnuts, pastries, cake, cookies, ice cream, whole milk, French fries, fried potatoes, bacon, breakfast sausage, fats used for cooking, pizza, fats used on bread or potatoes, cold cuts, lunch meats, ham, eggs, hamburgers, ground beef, meat burritos, tacos, salad dressings, beef or pork, cheese, cheese spreads, hot dogs, and polish or Italian sausage.

EFNEP questions this relates to/Questions to consider asking

Most of the EFNEP questions are directed and asked to adults and these questions were directed to youth; however, I believe the questions and findings of this study should be considered in development or in support of EFNEP survey questions.

018/CA046 Do you eat low-fat foods?

MA004 Do you eat mostly low-fat foods?

IN121 How often do you eat fried foods?

This article also lends support to adding a question about the frequency of fat (butter, oils, margarine) added to foods such as potatoes and bread.

Article #15

Citation: Patterson RE, Kristal AR, Tinker LF, Carter RA, Bolton MP, Agurs-Collins T. Measurement characteristics of the Women's Health Initiative Food Frequency Questionnaire. *Annals of Epidemiology*. 1999;9:178-187.

What behavior(s) was examined?

Low- fat, hormone replacement therapy, and calcium/ vitamin D supplementation.

What key behavioral component(s) was identified?

The WHI FFQ needs to be compared to independent and unbiased measures to confirm its validity.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Related to low- fat food preparation. Example: How often do you add fat during food preparation? (“never or less than once per month” to “2+ per day”)

EFNEP questions this relates to/Questions to consider asking

011 Do you trim the fat before cooking? How often do you trim the fat from meat (such as beef, chicken, or pork) before cooking or eating?

Article #16

Citation: Rockett HRH, Wolf AM, Colditz GA. Development and reproducibility of a food frequency questionnaire to assess diets of older children and adolescents. *J Am Diet Assoc.* 1995;95:336-340.

What behavior(s) was examined?

TV dinner consumption, where breakfast was eaten, the filling for tacos and enchiladas, beverage choices, how meat is cooked, is fat trimmed from meat, form of margarine they used.

What key behavioral component(s) was identified?

Reproducibility was higher for girls than boys. Protein and iron foods had the lowest reproducibility.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

How often do you have a ready- made dinner such as a TV dinner?

Where do you eat breakfast?

What filling do you use for tacos, enchiladas, and burritos?

How often do you drink carbonated beverages, fruit drinks, water, coffee, tea, and assorted alcoholic beverages?

How well done do you cook your meat?

How much fat is removed from your meat when cooking it?

How often do you eat fried food at home or away from home?

What form of margarine do you use?

The frequency categories ranged from “never or less than once per month” to “six+ per month”.

EFNEP questions this relates to/Questions to consider asking

011 Do you trim the fat before cooking? How often do you trim the fat from meat (such as beef, chicken, or pork) before cooking or eating?

015 Do you serve fatty meats? How many times during a two week period do you serve bacon, sausage, or other fatty meats?

CA042 Do you take skin off chicken before eating?

IN121 How often do you eat fried foods?

Article #17

Citation: Rohrmann S, Klein G. Validation of a short questionnaire to qualitatively assess the intake of total fat, saturated, monounsaturated, polyunsaturated fatty acids, and cholesterol. *Journal of Human Nutrition and Dietetics*. 2003;16:111-117.

What key behavioral component(s) was identified?

The short questionnaire was reasonably good at qualitatively assessing intake of total fat, cholesterol, SFA, and MUFA, but results were less than favorable for PUFA intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change; instead, questions were asked in attempt to validate a 20-item questionnaire when compared to a 148-item FFQ. Participants were asked “How often do you eat the following food items?” Items asked about were: bratwurst (frying sausage), sausages, salami, upper cuts, fried chicken, canned/broiled/smoked fish, 3.5% milk, full-fat cheese, boiled eggs, scrambled eggs/egg salad/omelet, egg white/egg yolk, dried egg, butter, margarine, salad oil, bacon/lard, nuts, French fries, pasta, sponge cake/biscuit, flan/layer cake/tart. There were five response options: once a day or more, 4-6 times a week, 1-3 times a week, 2-3 times a month, and once a month, less, or never.

EFNEP questions this relates to/Questions to consider asking

Relates to the EFNEP questions about frequency of consumption of high-fat foods. The survey questions about sausages and bacon/lard could relate to EFNEP question 015 Do you serve fatty meats?. Survey questions about French fries and fried chicken could relate to EFNEP question IN121 How often do you eat fried foods? The survey question about 3.5% milk could relate to EFNEP CA047 Do you use lower fat milk?

Consider the addition of questions about butter, deli meats, and desserts.

Article #18

Citation: Satia JA, Galanko JA. Comparison of Three Methods of Measuring Dietary Fat Consumption by African American Adults. *J Am Diet Assoc.* 2007;107:782-791.

What behavior(s) was examined?

Dietary fat consumption by African American adults using three methods that capture different domains of fat consumption. Also assesses the degree of agreement between the three instruments. Fat consumption was determined by a fat- related diet habits questionnaire, a household food inventory, and a fat screener.

What key behavioral component(s) was identified?

- High- fat foods in the home were statistically significantly associated with fewer healthful fat- related dietary behaviors and high intakes of total and saturated fat.
- Respondents with more reduced- fat foods in the home had more healthful fat- related dietary behaviors and lower total fat and saturated fat intakes.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

How often...

- Avoid fat as a flavoring and in fried foods
- Modify meats to be lower in fat
- Substitute manufactured low fat foods
- Replace high- fat foods with fruits and vegetables and lower- fat foods

Likert Scale was used.

EFNEP questions this relates to/Questions to consider asking

011 Do you trim the fat before cooking? How often do you trim the fat from meat (such as beef, chicken, or port) before cooking or eating?

015 Do you serve fatty meats? How many times during a two week period do you serve bacon, sausage, or other fatty meats?

018 Do you eat low-fat foods? Do you eat a lower-fat food instead of a regular fat food?

CA042 Do you take skin off chicken before eating? Do you take the skin off chicken before eating it?

IN121 How often do you eat fried foods? How often do you eat fried foods?

Article #19

Citation: Schlundt D, Hargreaves MK, Buchowski MS. The Eating Behavior Patterns Questionnaire predicts dietary fat intake in African American women. *J Am Diet Assoc.* 2003;103:338-345.

What behavior(s) was examined?

Attitudes, beliefs, and behaviors associated with daily eating habits. Examples: meal patterns, food purchasing, eating out, role of food in family and community, food and health beliefs, food and emotions, food preparation.

What key behavioral component(s) was identified?

The Eating Behaviors Patterns Questionnaire is not a substitute for traditional methods of dietary assessment. But it is a good measure of eating patterns that are potentially relevant to health outcomes and disease prevention.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

(A lot, but I will go over the most relevant)

5 point Likert scale (1= strongly agree, 5= strongly disagree)

- I reduce fat in recipes by substituting ingredients and cutting portions
- I am very conscious of how much fat is in the food I eat
- I use low- fat food products
- I count fat grams
- Fish and poultry are the only meats I eat
- I try to limit my intake of red meats
- I buy meat every time I go to the store
- A complete meal includes a meat, a starch, a vegetable, and bread

EFNEP questions this relates to/Questions to consider asking

002 Do you read food labels for fat content? In the past month, how often did you read food labels to select foods with less fat?

011 Do you trim the fat before cooking? How often do you trim the fat from meat (such as beef, chicken, or port) before cooking or eating?

015 Do you serve fatty meats? How many times during a two week period do you serve bacon, sausage, or other fatty meats?

018 Do you eat low-fat foods? Do you eat a lower-fat food instead of a regular fat food?

CA046 Do you eat low-fat foods? Do you eat low-fat foods instead of high fat foods?

MA004 Do you eat mostly low-fat foods? Do you currently eat mostly low-fat foods every day (raw or prepared fruits, vegetables without butter or other fat)?

WI102 How often do you eat low-fat foods? How often do you eat low-fat foods instead of high-fat foods?

Article #20

Citation: Serdula M, Byers T, Coates R, Mokdad A, Simoes EJ, Eldridge L. Assessing Consumption of High-fat Foods: The Effect of Grouping Foods into Single Questions. *Epidemiology*. 1992;3:503-508.

What behavior(s) was examined?

Consumption of high-fat foods. The behaviors were not the focus of the study; instead, the purpose of the study was to determine whether or not asking about high-fat foods in groups or as individual items altered the self-reported intake of the participants.

What key behavioral component(s) was identified?

Grouping foods together, at least in this survey, resulted in lower-average intakes. The paper notes a few possible reasons, and points out that answering questions about specific foods is easier for the participant than answering grouped questions.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

The individual foods that asked about were: hot dogs, ham, lunch meats or cold cuts, bacon, sausage, hamburgers and cheeseburgers, meatloaf, fried chicken, fried fish, French fries, other fried potatoes, cheese spreads, cheese, doughnuts, cookies, cake, pie, other pastries, potato chips or corn chips, popcorn, salty snacks, mayonnaise, salad dressing, butter, margarine, eggs, milk. Foods were then grouped by similar items. Respondents were instructed to estimate usual frequency of consumption with the prompt, "All of the questions are about foods you commonly eat or drink. Please tell me how often you eat each of the following..."

EFNEP questions this relates to/Questions to consider asking

015 Do you serve fatty meats?, 018/CA046 Do you eat low-fat foods?, IN121 How often do you eat fried foods?, MA004 Do you eat mostly low-fat foods?, WI102 How often do you eat low-fat foods?, VA115 Do you eat 6 or more servings of breads/cereal?, CA049 Do you eat whole grain bread?

Consider asking questions about specific foods instead of "low-fat foods," "fried foods," "fatty meats," or "breads/cereals." Perhaps have questions about whole grain pasta, brown rice, and oatmeal for assessing whole grain intake and questions about French fries, buttered toast, sausage and bacon for assessing fat intake.

Article #21

Citation: Shannon J, Kristal AR, Curry SJ, Beresford SAA. Application of a Behavioral Approach to Measuring Dietary Change: The Fat and Fiber-related Diet Behavior Questionnaire. *Cancer Epidemiology, Biomarkers and Prevention*. 1997;6:355-361.

What behavior(s) was examined?

Self- help intervention to reduce fat and increase fiber intake.

Subscales of fat related behaviors looked at were: substitution of specially manufactured low-fat foods; avoiding fat as a flavoring; modifying meats to be low in fat; replace high-fat foods with fruits and vegetables; and replacing high-fat meats with low-fat alternatives.

Subscales of fiber related behaviors looked at were: consumption of cereals and grains; consumption of fruits and vegetables; and substitution of high-fiber foods for low-fiber foods.

What key behavioral component(s) was identified?

The two behaviors that correlated most with reduction of dietary fat intake were: avoiding fat as a flavoring and substituting specially manufactured low-fat foods.

Fiber intake related behaviors were not quite as clearly correlated. Increasing consumption of cereals and grains appeared to be the most important behavior related to increasing fiber intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions asked: In the past three months how often did you....

- Eat ice milk, frozen yogurt, or sherbet instead of ice cream?
- Use low-calorie salad dressing instead of regular?
- Use yogurt instead of sour cream?
- Eat low-fat cheese instead of regular cheese?
- Drink low-fat or nonfat milk instead of whole?
- Use Pam instead of oil, margarine, or butter?
- Eat a potato without butter or margarine?
- eat bread without butter or margarine?
- Put butter or margarine on vegetables?
- Take the skin off chicken?
- Eat baked or broiled fish?
- Eat raw vegetables for a snack?
- Eat two or more vegetables at dinner?
- Eat a vegetable at lunch?
- Eat fruit for dessert?
- Eat a vegetarian dinner?
- Eat a meatless pasta sauce?
- Eat fish or chicken instead of red meat?
- Eat high-fiber cereals
- Eat cereal (hot or cold) for breakfast
- Eat whole grain-crackers or bread?
- Add bran to casseroles or cereal?

- Eat fruit for dessert?
- Eat raw vegetables for snacks instead of chips?
- Eat fruit for breakfast?
- Eat a vegetable at lunch?
- Eat two or more vegetables at dinner?
- Eat whole wheat instead of regular pasta?
- Eat brown rice instead of white rice?
- Eat a vegetarian dinner? (asked both in fiber and fat behavior items)

Answers were modified from a four point to a three point response scale: usually/always, sometimes, and rarely/never.

EFNEP questions this relates to/Questions to consider asking

CA047 Do you use lower fat milk?

CA042 Do you take skin off chicken before eating?

011 Do you trim the fat before cooking?

CA049 Do you eat whole wheat bread?

VA115 Do you eat 6 or more servings of breads, cereals, rice and pasta in a day?

015 Do you serve fatty meats?

018 Do you eat low fat foods?

WI102 How often do you eat low-fat foods?

MA004 Do you eat mostly low-fat foods?

We may want to ask if EFNEP participants eat high-fiber or whole-grain cereals (providing examples in the question) and consider asking about whole-grain crackers. Correlation for the other high fiber food questions was hard to determine because the FFQ that was used as a validity tool was unable to distinguish most whole-grain foods from their refined-grain counterparts. We may want to consider including a question about substituting whole-grain past and brown rice for their refined counterparts.

Article #22

Citation: Thompson FE, Midthune D, Subar AF, Kahle LL, Schatzkin A, Kipnis V. Performance of a short tool to assess dietary intakes of fruits and vegetables, percentage energy from fat and fiber. *Public Health Nutrition*. 2004;7:1097-1106.

What key behavioral component(s) was identified?

The screener resulted in similar recall estimates of percentage energy from fat for men, but slightly lower estimates for women. The screener underestimated fiber intake.

The survey was a good, quick way to estimate dietary fat and fiber intake.

Survey is validated and supported by the National Cancer Institute and is available on the NCI site for use.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Questions were not asked to elicit behavior change. Instead, the questions were asked to determine how effective a short dietary questionnaire (Multifactor Screener from the National Cancer Institute) is at estimating fat intake and fiber intake when compared to dietary recalls. Questions were also asked about fruit and vegetable intake. Questions asked were:

1. How many times per day, week, or month did you usually eat cold cereals?
2. How many times per day, week, or month did you use milk, either to drink or on cereal?
 - 2a. What kind of milk did you usually use?
3. How many times per day, week, or month did you usually eat bacon or sausage, not including low fat, light or turkey varieties?
4. How often did you eat hot dogs made of beef or pork?
5. How often did you eat whole grain bread including toast, rolls, and in sandwiches? Whole grain breads include whole wheat, rye, oatmeal and pumpernickel.
6. How often did you drink 100% fruit juice such as orange, grapefruit, apple, and grape juices? Do not count fruit drinks such as Kool Aid, lemonade, cranberry juice cocktail, Hi-C and Tang.
7. How often did you eat fruit? Count fresh, frozen, or canned fruit. Do not count juices.
8. How often did you use regular fat salad dressing or mayonnaise, including on salad and sandwiches? Do not include low-fat, light, or diet dressings.
9. How often did you eat lettuce or green leafy salad, with or without other vegetables?
10. How often did you eat French Fries, home fries, or hash brown potatoes?
11. How often did you eat other white potatoes? Count baked potatoes, boiled potatoes, mashed potatoes, and potato salad. Do not include yams or sweet potatoes.
12. How often did you eat cooked dried beans, such as refried beans, baked beans, bean soup, and pork and beans?
13. How often did you usually eat other vegetables?
14. How many times per day, week, or month did you usually eat any kind of pasta? Count spaghetti, noodles, macaroni and cheese, pasta salad, rice noodles, soba, and any other kind of pasta.
15. How often did you eat peanuts, walnuts, seeds or other nuts? Do not include peanut butter.
16. How often did you eat regular fat potato chips, tortilla chips, or corn chips? Do not include low-fat chips.

Response options were in check boxes with the options of: never, 1-3 times last month, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day 2 times per day, 3 times per day, 4 or more times per day. For question 2a, the response options were various percentage fat milks.

EFNEP questions this relates to/Questions to consider asking

This could be applicable to all the fat and fiber questions, but the EFNEP questions that ask about food frequency probably relate to the survey questions a lot better. EFNEP questions that ask about food frequency are: IN121 How often do you eat fried foods?, WI102 How often do you eat low-fat foods?

This survey suggests that even though the correlation was lower for fiber than fat and F/V, asking questions about fiber and whole grain intake are worthwhile. Consider the addition of more questions about frequency of whole-grain and high-fiber foods.

Article #23

Citation: Townsend MS, Kaiser LL, Allen LH, Joy AB, Murphy SP. Selecting Items for a Food Behavior Checklist for a Limited-Resource Audience. *Journal of Nutrition Education and Behavior*. 2003;35:69-82.

What behavior(s) was examined?

Fruit and vegetable intake, milk intake, fat and cholesterol intake, diet quality.

What key behavioral component(s) was identified?

The EFNEP survey was practical for evaluating behavior change with study participants

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

(Related Items)

- Do you drink milk daily?
- During the past week did you have fish?
- Do you take the skin off the chicken?
- How many times a week do you usually eat food from a fast- food restaurant?
- During the past week, did you have eggs?
- If you eat eggs, about how many eggs do you usually eat in a week?

EFNEP questions this relates to/Questions to consider asking

011 Do you trim the fat before cooking? How often do you trim the fat from meat (such as beef, chicken, or pork) before cooking or eating?

015 Do you serve fatty meats? How many times during a two week period do you serve bacon, sausage, or other fatty meats?

CA042 Do you take skin off chicken before eating? Do you take the skin off chicken before eating it?

CA047 Do you use lower fat milk? Do you use low-fat (2%), very low-fat (1%) or nonfat milk?

Article #24

Citation: Willett W, Stampfer M, Feng Chu N, Spiegelman D, Holmes M, Rimm E. Assessment of Questionnaire Validity for Measuring Total Fat Intake using Plasma Lipid Levels as Criteria. *American Journal of Epidemiology*. 2001;154:1107-1112.

What behavior(s) was examined?

Frequency of consumption of various foods, specifically those that relate to total fat intake. Total fat intake was compared to plasma triglyceride levels.

What key behavioral component(s) was identified?

Higher total fat intake was associated with lower fasting triglyceride levels. The inverse relationship between total fat intake and fasting triglyceride levels was more pronounced in overweight men than in those with a BMI less than 25.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

The questions were asked not to elicit behavior change, but to assess food frequency. Researchers used the Health Professionals Follow-up Study questionnaire from 1994 to compare reported consumption frequency of various foods to plasma triglyceride levels. Questions were grouped as: dairy foods, fruits, vegetables, eggs/meat/etc., breads/cereals/starches, beverages, sweets/baked goods/misc. Other questions included frequency of liver consumption, trimming visible fat on meats, use of fats for cooking and baking, and frequency of fried food consumption. Survey is available online at http://www.hsph.harvard.edu/hpfs/hpfs_qx.htm and is considered by National Cancer Institute to be a validated questionnaire.

EFNEP questions this relates to/Questions to consider asking

The questions analyzed in this paper directly relate to EFNEP questions: 011 Do you trim the fat before cooking?, 015 Do you serve fatty meats?, 018/CA046/WI102/MA004 Do you eat low-fat foods?, CA042 Do you take skin off chicken before eating?, CA047 Do you use lower fat milk?, IN121 How often do you eat fried foods?. Consider asking a question about butter use.

Article #25

Citation: Yaroch AL, Resnicow K, Petty AD, Khan LK. Validity and reliability of a modified qualitative dietary fat index in low-income, overweight, African American adolescent girls. *J Am Diet Assoc*. 2000;100:1525-1529.

What behavior(s) was examined?

Dietary fat habits of adolescent girls.

What key behavioral component(s) was identified?

Behavior change was not measured in this study.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Questions:

1. How often do you add butter or margarine to vegetables?
2. How often do you read food labels when deciding what to eat?
3. How often do you drink diet soda?
4. How often do you drink low-fat or nonfat milk?
5. How often do you drink whole milk?
6. How often do you eat sweets (egg, chocolate, candy, cakes, cookies, ice cream)?
7. How often do you use low-calorie dressing on your salad?
8. How often do you eat meals without meat (a vegetarian meal)?
9. How often do you have fruit for dessert?
10. How often do you snack on raw vegetables?
11. How often do you eat low-fat ice cream, ice milk, or low-fat yogurt?
12. How often do you eat reduced-fat cheese?
13. How often do you eat pretzels or low-fat chips (egg, Baked Lay's)?
14. How often do you remove the skin from chicken?
15. How often do you trim (cut away) the fat from meat?
16. How often do you eat fried foods (egg, French fries, fried chicken, fried fish)?
17. How often do you choose a low-fat food at a fast-food restaurant (egg, salad, baked potato, grilled chicken sandwich)?
18. How often do you eat until you are stuffed?

Frequency of behavior: never, occasionally, usually, always

EFNEP questions this relates to/Questions to consider asking

002
011
018
CA042
CA046
CA047
IN121
MA004
WI102

Suggest that FFQ's should be age and culturally sensitive

Article #1

Citation: Steenhuis I and Vermeer WM. Portion size: review and framework for interventions. *International Journal of Behavioral Nutrition and Physical Activity*. 2009;6:58-68.

What behavior(s) was examined?

Effects of portion size on energy intake

Assess the currently available portion size interventions and their effectiveness on food intake

What key behavioral component(s) was identified?

- People's energy intake increases when offered a larger portion
- Larger portions are made attractive by offering more value for money, i.e. having a lower price per unit
- People experiencing portion distortion perceive larger portions sizes as an appropriate amount to consume at a single occasion; larger portions have become standard; consumers perceive market place portions as standard portions
- People tend to select substantially larger portions than the recommended portion sizes
- Labels on food packing are not always clear with respect to the serving size
- Using the terms 'small', 'medium', and 'large' also creates confusion, as people's interpretation of these terms differ
- People interpret package size as a single serving size and are unaware of the fact that a package contains multiple servings
- People tend to overeat palatable, high-energy-dense food, without deliberate intention
- Portion size labeling or portion size information seems to be ineffective in decreasing energy intake
- Consumers had particularly favorable attitudes toward a larger variety of portion sizes and pricing strategies, followed by labeling interventions

Article #2

Citation: Flood JE, Roe LS, Rolls BJ. The effect of increased beverage portion size on energy intake at a meal. *J Am Diet Assoc*. 2006 Dec;106(12):1984-90

What behavior(s) was examined?

Increasing beverage portion size significantly increased the weight of beverage consumed, regardless of the type of beverage served ($P < 0.05$).

What key behavioral component(s) was identified?

As a consequence, for the caloric beverage, energy intake from the beverage increased by 10% for women and 26% for men when there was a 50% increase in the portion served ($P < 0.01$).

Food intake did not differ between conditions, so when the energy from the caloric beverage was added to the energy from food, total energy intake at lunch was increased significantly ($P < 0.001$) compared with noncaloric beverages.

Serving a larger portion of beverage resulted in increased beverage consumption, and increased energy intake from the beverage when a caloric beverage was served. Serving a caloric beverage resulted in an overall increase in total energy consumed at lunch. Therefore, replacing caloric beverages with low-calorie or noncaloric beverages can be an effective strategy for decreasing energy intake.

Article #3

Citation: Ueland O, Cardello AV, Merrill EP, Leshner LL. Effect of portion size information on food intake. *J Am Diet Assoc.* 2009 Jan;109(1):124-127.

What key behavioral component(s) was identified?

Portion size information did not influence satiety ratings or total intake. Consumers associated portion size more with daily nutrient requirements than with an ideal quantity for a satiating meal ($P < 0.01$). Information about portion size may not be a good tool to manipulate food-intake behavior. Consumers' concept of portion size is associated more with objective measures of food than with personal experience about the amount that would be appropriate to eat.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article,

pre- and post-preload hunger/fullness ratings, liking ratings, amount consumed of the pasta after the preload

Likert ratings of statements about different definitions of portion size

Article #4

Citation: Rools BJ, Roe LS, Meengs JS, Wall DE. Increasing the portion size of a sandwich increases energy intake. *J Am Diet Assoc.* 2004 Mar;104(3):367-372.

What key behavioral component(s) was identified?

Portion size of the sandwich significantly influenced lunch intake for both males and females. Majority of individuals consumed the entire 6" sandwich. When served the 12" sandwich, compared with the 8" sandwich, females consumed 12% more energy (74 kcal) & males consumed 23% more energy (186 kcal). Despite these differences, ratings of hunger and fullness were not significantly different after eating the 12" & 8" sandwiches. Increasing the portion size of a food served as a discrete unit leads to increased energy intake at a single meal without differentially influencing ratings of hunger and satiety.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Hunger and Satiety

Linear mixed model with repeated measures; analysis of covariance to examine influence of subject characteristics

Article #5

Citation: Ello-Martin JA, Ledikwe JH, Rolls BJ. The influence of food portion size and energy density on energy intake implications for weight management. *Am J Clin Nutr.* 2005 Jul;82(1Suppl):236S-241S.

What key behavioral component(s) was identified?

One strategy to address the effect of portion size is decreasing the energy density (kilojoules per gram; kilocalories per gram) of foods. Several studies have demonstrated that eating low-energy-dense foods (such as fruits, vegetables, and soups) maintains satiety while reducing energy intake.

Article #6

Citation: Croker H, Sweetman C, Cooke L. Mothers' views on portion sizes for children. *J Hum Nutr Diet.* 2009 Oct;22(5):437-443.

What key behavioral component(s) was identified?

Participants were unconcerned about portion sizes and would not welcome official guidance, particularly if it involved weighing foods. Mothers fed their children the amount that they believed they would eat and felt that this varied across children and across occasions. The weighing task revealed a wide variation in portion sizes served to children, with portions of the more energy-dense foods being smaller on average than those of less energy-dense foods.

There was little understanding of age-appropriate serving sizes amongst mothers in this study

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Four focus groups with a total of 14 volunteer mothers of 8-11-year-old children taking part in a larger school-based study.

Article #7

Citation: Nielsen SJ, Popkin BM. Patterns and trends in food portion sizes, 1977-1998. *JAMA*. 2003;289:450-453.

What key behavioral component(s) was identified?

Portion sizes vary by food source, with the largest portions consumed at fast food establishments and the smallest at other restaurants. Between 1977 and 1996, food portion sizes increased both inside and outside the home for all categories except pizza.

Article #8

Citation: Vermeer WM, Steenhuis IH, Seidell JC. Portion size: a qualitative study of consumers' attitudes toward point-of-purchase interventions aimed at portion size. *Health Educ Res*. 2010 Feb;25(1):

What key behavioral component(s) was identified?

Many participants thought that portion sizes of various products have increased during the past decades and are larger than acceptable. The majority also indicated that value for money is important when purchasing and that large portion sizes offer more value for money than small portion sizes. Furthermore, many experienced difficulties with self-regulating the consumption of large portion sizes. Among the portion-size interventions that were discussed, participants had most positive attitudes toward a larger availability of portion sizes and pricing strategies, followed by serving-size labeling. In general, reducing package serving sizes as an intervention strategy to control food intake met resistance.

Consumers consider interventions consisting of a larger variety of available portion sizes, pricing strategies and serving-size labeling as most acceptable to implement

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Eight semi-structured focus group discussions; the interview guide

Constructs from the diffusion of innovations theory

Data were coded and analyzed with Atlas.ti 5.2 using the framework approach

Article #9

Citation: Ledikwe JH, Ello-Martin JA, Rolls BJ. Portion Sizes and the Obesity Epidemic. *Am Soc Nutr Sci*. 2005;905-909.

What key behavioral component(s) was identified?

Participants in the study appeared to be unaware of the changes in the amount of food offered and the subsequent effect on their intake, hunger, and satiety

Portion size of amorphous food that have no defined shape, such as macaroni & cheese, has been shown difficult to judge, esp. when portions are large

Larger sandwiches are purchased because the consumers perceive them as better value in that they get more food for their money

There was a systematic and significant effect of portion size on intake

The amount of food in a pack has also been shown to influence how much is eaten; portion size had a significant effect on snack intake; increased snack intake w/increasing pkg. size did not adjust intake of subsequent dinner meal to compensate for the increased energy intake and fullness

The effects of portion size can persist over several days, with no indication of meal to meal compensation

Simply advising people “to eat less” may not be as effective as encouraging the consumption of foods with a low energy density such as fruits and veg., while encouraging moderation when consuming foods high in energy density

Rise in portion size is partially attributable to consumer demand for economic value

Many restaurants are providing low cost per unit as a marketing strategy

Article #10

Citation: Vermeer WM, Steenhuis IH, Leeuwis FH, Heymans MW, Seidell JC. Small portion sizes in worksite cafeterias: do they help consumers to reduce their food intake? *Int J Obes (Lond)*. 2011 Sep;35(0):1200-1207.

What key behavioral component(s) was identified?

The consumer data indicated that 19.5% of the participants who had selected a small meal often-to-always purchased more products than usual in the worksite cafeteria. Small meal purchases were negatively related to being male ($B=-0.85$ (0.20), $P=0.00$, CI: -1.24 to -0.46, $n=178$). When offering a small meal in addition to the existing size, a percentage of consumers that is considered reasonable were inclined to replace the large meal with the small meal. Proportional prices did not have an additional effect.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Longitudinal randomized controlled trial assessing the impact of introducing small portion sizes and pricing strategies on consumer choices.

Article #11

Citation: Kesman RL, Ebbert JO, Harris KI, Schroeder DR. Portion control for the treatment of obesity in the primary care setting. *BMC Res Notes*. 2011;4:346.

What behavior(s) was examined?

Evaluate a portion control intervention including dietary counseling and a portion control plate to facilitate weight loss among obese patients in a primary care practice.

What key behavioral component(s) was identified?

Subjects in the portion control intervention had a greater percentage weight change from baseline compared to usual care at 3 months. A trend toward increased weight loss with the portion control intervention was observed using the LOCF analysis at 3 months. Non-significant trends toward increased weight loss with the portion control intervention were observed at six months. Among participants in the portion control intervention, the percentage weight change from baseline to 6 months did not differ significantly between those who reported using the portion control plate ≥ 2 times per day compared to those using the plate < 2 times per day.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

65 obese patients [body mass index (BMI) ≥ 30 and < 40] to an intervention including counseling by a dietitian incorporating a portion control plate or to usual care.

Primary endpoint was the percentage weight change from baseline at 3 and 6 months

Article #12

Citation: Rolls BJ, Morris EL, Roe LS. Portion size of food affects energy intake in normal-weight and overweight men and women. *Am J Clin Nutr*. 2002;76(6):1207-1213.

What behavior(s) was examined?

Investigated whether the response to portion size depended on which person, the subject or the experimenter, determined the amount of food on the plate.

What key behavioral component(s) was identified?

Subjects consumed 30% more energy (676 kJ) when offered the largest portion than when offered the smallest portion. The response to the variations in portion size was not influenced by who determined the amount of food on the plate or by subject characteristics such as sex, body mass index, or scores for dietary restraint or disinhibition.

Current Behavior Checklist Questions

1. Do you eat 2-3 servings of dairy group each day?
2. Do you consume 2-3 servings of milk, yogurt, and cheese each day?

Questions from Reviewed Articles

Questions Associated with Positive Health Outcomes

1. from article #2, questions regarding self efficacy / and awareness of risks of osteoporosis and poor calcium intake (Y/N)
 - I can find the calcium content of foods by reading food labels
 - I am sure I can increase the amount of calcium in my diet
 - Adequate calcium is important to me
 - I intend to lower my risk for osteoporosis
2. From article #4, women were found to maintain increased calcium intake during instances of lower levels of perceived difficulty in making a change.
 - Should assess the perceived difficulty of increasing dairy and calcium intake for at risk populations.
3. From article #7, education regarding self efficacy, perceived barriers to behavior change was successful in improving dietary calcium intake and knowledge
 - Should consider questions which assess individuals feelings of self efficacy/barriers to change

Challenges/Benefits Associated with Calcium Intake

1. From article #3, availability of milk at meals was a factor associated with calcium intake at follow up.
 - Possible question might concern ease of availability of milk at meal times, ability to store milk, and taste preferences for dairy.
2. From article #3, calcium intake negatively associated with soft drink intake.
 - Possible question to address frequency of soft drink intake / how often soft drink is chosen instead of milk when both options are available.
3. From article #7, self-reported milk avoiding children were found to have low dietary calcium intake, low BMD, and small stature compared to milk drinking counterparts. 60% of children who avoided milk did so because they did not like the taste.
 - Possible question might address taste preferences for milk (i.e. Do you like the taste of milk? Do you avoid milk consumption because you do not like the taste?)
 - Alternatively, address consumption avoidance based on intolerance (i.e. Do you avoid milk consumption because you believe you are intolerant?)

Other

- From article 1, calcium fortified foods may be becoming the most prevalent source of calcium for some individuals.

- Possible question to address: How often do you use calcium fortified foods (i.e. orange juice)? Do you think calcium fortified foods are more expensive than non-fortified foods? (Y/N)
- From article 2, interest in improving health outcomes may be tied to socioeconomic determinants such as free time for education/classes, level of achieved education, prior interest in topic / personal health.
- From article 5, several questions regarding personal, socioeconomic, health, and dietary factors related to calcium consumption in women:
 - Milk quantity intake
 - One or more servings daily
 - One to five servings a week
 - Less than one serving a week
 - Yogurt consumption
 - One or more servings daily
 - One to five servings a week
 - Less than one serving a week
 - Skipping meals
 - Almost never
 - One to five times a week
 - Almost every day
 - Snacks
 - Almost never
 - At least once a day
 - One to five days a week
- From article 5, a series of questions regarding attitudes about milk (Y/N)
 - I do not like milk
 - It causes indigestion
 - It causes me to gain weight
 - It has too much fat for my blood
 - I was told not to drink it
 - I enjoy milk
- From article 10:
 - I grew up eating/drinking _____ (cheese; yogurt, milk, pizza, dark-green leafy vegetables)
 - _____ is/are expensive (cheese, yogurt, milk, pizza, dark green leafy vegetables)
 - I like the taste of _____ (cheese, yogurt, milk, tofu).
 - I don't know to how to prepare _____ (dark green leafy vegetables, tofu so my family will like them.
 - Yogurt upsets my stomach; milk makes me sick. I heat milk to make it easier to digest. (Y/N)

- From article 14: Perceived milk tolerance was determined by responses on a PMI questionnaire:
 - “I am allergic to milk,”
 - “I get a stomach-ache after drinking milk,”
 - “I have been told that milk will make my stomach hurt after I drink it” on a scale of 1-5 (“strongly disagree” to “strongly agree”)

Article #1

Citation: Mojtahedi MC, Plawecki KL, Chapman-Novakofski KM, McAuley E, Evans EM. Older black women differ in calcium intake source compared to age- and socioeconomic status-matched white women. *J Am Diet Assoc.* 2006;106:1102-1107.

What behavior(s) was examined?

Calcium intake and source, evaluated by interview using a 46-item calcium food frequency questionnaire including all food groups and supplements

A second aim was to investigate racial differences in food sources of calcium and supplemental calcium usage

Describe the sample.

Older black women (n=33) and white women (n=33), matched in age and socioeconomic status. Postmenopausal women, age range 60 to 80 years, from central Illinois. Exclusion criteria included neurological illness, and orthopedic/cognitive limitations.

What key behavioral component(s) was identified? What was found in the study?

- Racial differences in sources of calcium, with white women consuming more calcium from dairy foods and black women consuming more calcium from grain foods.
- Participants were matched on socioeconomic status in the study, thus eliminating racial differences mediated by socioeconomic status.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article. NA

Article #2

Citation: Tussing L, Chapman-Novakofski K. Osteoporosis prevention education: behavior theories and calcium intake. *J Am Diet Assoc.* 2005;105: 92-97.

What behavior(s) was examined?

The goal of this study was to determine whether an educational, theory based osteoporosis prevention program would significantly impact calcium intake.

Describe the sample.

42 women (80% white), mean age 48 years (range 32-67years), who participated in an 8-week educational intervention similar to a community class.

What key behavioral component(s) was identified? What was found in the study?

- Dietary calcium intake: Post-intervention dietary calcium intake significantly increased to 821 +/- 372 mg/day from the baseline intake of 644 +/- 383 mg/day
- The attitude that calcium intake was important accounted for 33.4-47.5% of the variance in intention to consume more dairy and calcium rich foods.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

Statistically significant improvements in calcium intake were found post intervention in individuals who reported self-efficacy regarding calcium intake in response (Y/N) to the following statements

- I can find the calcium content of foods by reading food labels
- I use food labels to make shopping decisions
- I am sure I can increase the amount of calcium in my diet

Subjects also reported being more aware of the risks of osteoporosis post-intervention, which may have been a motivating factor in desire to increase calcium intake.

- Adequate calcium intake is important to me
- I intend to lower my risk for osteoporosis

Article #3

Citation: Larson NI, Neumark-Sztainer D, Harnack L, Wall M, Story M, Eisenberg ME. Calcium and dairy intake: longitudinal trends during the transition to young adulthood and correlates of calcium intake. *J Nutr Educ Behav* 2009; 41:254-260.

What behavior(s) was examined?

1. Changes in calcium and dairy intake during the transition from middle adolescence to young adulthood
2. Baseline correlates of calcium intake in young adulthood

Describe the sample.

This was a large ethnically and socioeconomically diverse population, in a 5 year follow up study centered in Minneapolis/St. Paul, MN schools. High school students (n=1521. 45% male), mean age 15.9 years at baseline.

What key behavioral component(s) was identified? What was found in the study?

- From middle adolescence to young adulthood, females and males both significantly reduced their intake of calcium, dairy, and milk foods, with daily mean total intakes of dairy products reduced by approximately 0.5 servings in both genders.
- In both sexes, baseline availability of milk at meals was the only factor associated with calcium intake at follow up – For every SD increase in milk availability, energy-adjusted intake of calcium increased 0.17 units for females and 0.11 units for males
- In females, concern about health and self-efficacy for healthful eating was associated with higher calcium intake and greater increases in intake from baseline.
- Having a positive taste preference for milk and family meal frequency were associated with higher Ca intake.
- Lower Ca intake was associated with perceived barriers to healthful eating, snack frequency, fast food frequency, and soft drink intake.
- In males, lactose intolerance was the only factor found to be associated with lower Ca intake and decreases in intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article. NA

Article #4

Citation: Blalock SJ. Predictors of calcium intake patterns: a longitudinal analysis. *Health Psychology* 2007;26:251-258.

What behavior(s) was examined?

Calcium intake and stage of change with respect to calcium intake

Describe the sample.

Potential participants were identified from the records of licensed female drivers age 35-43 in North Carolina counties (inclusion factors: premenopausal, osteoporosis free, non-pregnant and non-breastfeeding). Most participants (mean age 38.6 years) were white (76.9%) or African American (10.2%), married (76.3%) and well educated with an average of 14.7 years of education.

What key behavioral component(s) was identified? What was found in the study?

Isolated instances of adequate calcium intake as predicted by higher levels of knowledge and perceived benefits, whereas long term maintenance was predicted by lower levels of perceived difficulty.

Article #5

Citation: Pfister AK, Wulu JT, Saville PD. Factors determining calcium intake in elderly women of Appalachia. *Southwestern Medical Journal* 2001;94:1006-1012.

What behavior(s) was examined?

Personal, socioeconomic, health, and dietary factors related to calcium consumption in women aged 65 and older, as well as attitudes about milk and calcium intake.

Describe the sample.

A sample of 206 women aged 65 years or older from ambulatory clinics at the Charleston Area Medical Center. Subjects were given a dietary interview via 24-hour recall, followed by a questionnaire regarding specific questions about consumption of dairy products. All subjects were free of chronic diseases which have the potential to affect satiety. None of the subjects had greater than 5 lb weight loss over the past two years.

What key behavioral component(s) was identified? What was found in the study?

- 1) The following behaviors were found so be significantly positively associated with higher calcium intake:
 - a) Consuming one or more glasses of milk daily
 - b) Eating one or more servings of yogurt daily
 - c) Daily snacking
 - d) Not skipping meals
- 2) Individuals who reported enjoying the taste of milk had a higher mean calcium intake than individuals who did not enjoy the taste of milk
- 3) Participants of low (under \$10,000/year) or middle (between \$10,000-\$30,000/year) SES were 80% and 60% respectively less likely to have higher calcium intake than those of high SES (more than \$30,000/year)
- 4) In this population of elderly women, the mean dietary calcium intake was far below the recommended value. No participant achieved the recommended value.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Subjects were not asked to elicit a behavior change.

Article #6

Citation: Babatunde OT, Himburg SP, Newman FL, Campa A, and Dixon A. Theory driven intervention improves calcium intake, osteoporosis knowledge, and self efficacy in community dwelling older black adults. *Journal of Nutrition Education and Behaviour* 2011;43:434-440.

What behavior(s) was examined?

Changes in dietary calcium intake, osteoporosis knowledge, health benefits, and self-efficacy after completion of an osteoporosis education program

Describe the sample.

African American men and women (n=110) 50 years and older from three south Florida counties, recruited from churches and community based organizations.

What key behavioral component(s) was identified? What was found in the study?

The study utilized an osteoporosis intervention based on a theoretical framework: the Revised Health Belief Model. This framework is a combination of the Health Belief Model and the Self-efficacy theory. This model incorporates perceived susceptibility, severity, benefits, barriers, and motivation, as well as self efficacy.

Overall, the educational program developed on a theoretical framework of RHBM was successful in improving calcium intake, knowledge, and self efficacy compared to a control group which did not receive the educational program.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Topics for osteoporosis education program included:

Lesson 1: Severity of osteoporosis

Lesson 2: Susceptibility to osteoporosis

Lesson 3: Benefits of changing calcium intake

Lesson 4: Barriers to reducing risk factors – lactose intolerance

Lesson 5: Barriers to reducing risk factors – improving Vitamin D, reducing alcohol intake, and smoking. Supplements considerations

Promoting self –efficacy was a major component of the education program.

Article #7

Citation: Black RE, Williams SM, Jones IE, and Goulding A. Children who avoid drinking cow milk have low dietary calcium intakes and poor bone health. *Am J Clin Nutr.* 2002;76:675-680.

Describe the sample.

50 milk avoiding children (30 girls, 20 boys) aged 3-10 years. Parents of subjects were interviewed

What key behavioral component(s) was identified? What was found in the study?

Dietary calcium intake was measured with a food-frequency questionnaire. BMD was measured with DXA methods. Results for the study population were compared with the results of 200 self-reported milk-drinking control children.

Main reasons for milk avoidance:

1. Intolerance (40%)
2. Bad taste (42%)
3. Lifestyle choice (18%)

In growing children, long term avoidance of cow milk was found to be associated with small stature and poor bone health.

76% of “milk avoider” children also had a family member who avoided milk.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Most milk avoiding subjects (60%) avoided milk because they did not like the taste. Most parents (96%) rated cow’s milk as an important nutritional food for growing children, a high proportion (44%) never sought nutritional advice from professionals. 76% of parents reported attempting to reintroduce cow milk into the diets of their children.

Article #8

Citation: Barr, SI. Dieting attitudes and behavior in urban high school students: implications for calcium intake. *Journal of Adolescent Health* 1995;6:458-464.

What behavior(s) was examined?

This study assessed whether dieting concerns were associated with the calcium intake of adolescents of varying ethnicity

Describe the sample.

A population of 782 ethnically diverse students, grades 8 - 12, in six urban high schools. Male subjects (n=338) mean age 15.5. Female subjects (n=444) mean age 15.1 years. 37% Caucasian / 38% Asian / 23% mixed or other ethnicity

What key behavioral component(s) was identified? What was found in the study?

A questionnaire sought information on age, ethnic origin, height and weight, desired weight, and the number of meals and snacks consumed per week. Eating attitudes were also assessed using the EAT-26 test. A previously validated FFQ was also used to validate calcium intake.

It was found that in this population, greater concern about dieting and body size did not directly compromise calcium intake but was associated with the type of milk used.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article. NA

Article #9

Citation: Neumark-Sztainer D, Story M, Dixon LB, Resnick MD, Blum RW. Correlates of inadequate consumption of dairy products among adolescents. *Journal of Nutrition Education* 1997;29:12-20.

What behavior(s) was examined?

A comprehensive school based health behavior survey was administered to identify the sociodemographic, personal, psychosocial, and behavioral correlates of low consumption of dairy products among adolescents.

Describe the sample.

36,284 public school students in grades 7-12 in Minnesota. Ethnically: 86% Caucasian, 8% African American, 1% Hispanic, 2% American Indian, 3% Asian American. Approximately 49% male, 51% female. Socioeconomic status was based on parental education and employment status : 14% low SES, 56% medium SES, 30% high SES.

What key behavioral component(s) was identified? What was found in the study?

Inadequate consumption of dairy products was assessed as part of a brief food frequency questionnaire. Dieting frequency was assessed, as well as some health compromising behaviors (binge eating, drink, smoking, suicide attempts.)

The risk factors for low consumption of dairy foods included: being female, nonwhite, low socioeconomic status. Dieting was strongly associated with low consumption of dairy foods

Study concluded that: interventions aimed at increasing consumption of calcium rich foods in this population should include education and environmental components.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article. NA.

Article #10

Citation: Reicks M, Ballejos ME, Goodell LS, et al. Individual and family correlates of calcium-rich food intake among parents of early adolescent children. *J Am Diet Assoc.* 2011;111:376-384.

What behavior(s) was examined?

The study assessed attitudes / preferences and parenting practices regarding calcium-rich food intake

Describe the sample.

The sample population was a sample of self-reporting non-Hispanic white, Hispanic, and Asian (n=661) parents recruited from nine states (Arizona, California, Colorado, Hawaii, Michigan, Minnesota, Oregon, Utah, and Washington.)

What key behavioral component(s) was identified? What was found in the study?

The study endeavored to identify individual and family factors associated with intake of calcium-rich foods among parents of early adolescents.

Questionnaires assessed two major constructs: attitudes/preferences regarding parental intake of calcium-rich foods, and socio-environmental factors regarding child intake of calcium rich foods.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

The following questions were asked to assess parental intake of calcium rich foods and socio-environmental factors regarding calcium intake:

1. I grew up eating/drinking _____ (cheese; yogurt, milk, pizza, dark-green leafy vegetables)
2. _____ is/are expensive (cheese, yogurt, milk, pizza, dark green leafy vegetables)
3. I like the taste of _____ (cheese, yogurt, milk, tofu).
4. I don't know to how to prepare _____ (dark green leafy vegetables, tofu so my family will like them.
5. Yogurt upsets my stomach; milk makes me sick. I heat milk to make it easier to digest. (Y/N)

Several other questions were also asked to assess perceived health benefits, concerns about weight, and ease of use of calcium rich products.

The study found that parent's perception that calcium-rich foods were convenient to use was positively associated with calcium intake from all food sources. Parents' perception that calcium rich foods conveyed health benefits was positively associated with intake of calcium as well.

Article #11

Citation: Vue, J, Reicks M. Individual and environmental influences on intake of calcium-rich food and beverages by young Hmong adolescent girls. *Journal of Nutrition Education and Behavior* 2007;39:264-272.

What behavior(s) was examined?

Individual and environmental factors for girls and reported intake of calcium rich food and beverages.

Describe the sample.

A convenience sample of 10-13 year old Hmong girls (n=102) and their parents

What key behavioral component(s) was identified? What was found in the study?

The study was cross sectional in design and involved in-depth interviews with parents regarding environmental factors in the home.

Intake of calcium rich foods and beverages in a population of adolescent Hmong girls was assessed. It was found that intake of calcium rich foods such as yogurt, cheese, and tofu, was associated with availability in the home. Availability within the home was found to be influenced by several factors such as food preference, cost, and tradition.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

This was a cross sectional study so no behavior change was asked to be elicited. However this study was significant because of the cultural dimension involved with the population of Hmong girls. Perhaps future questions should consider the cultural traditions involving milk consumption and what bearing this has on behavior and decision making.

Article #12

Citation: Prevention of osteoporosis: a randomized clinical trial to increase calcium intake in children with juvenile rheumatoid arthritis. *Pediatr. Psychol.* 2005;30:377-386

What behavior(s) was examined?

Increasing dietary calcium intake in children with chronic health conditions which put them at a greater risk for low BMD.

Describe the sample.

49 children with Juvenile Rheumatoid Arthritis.

Children were assigned to either of two treatment groups and three day food diaries were collected at baseline and post treatment to analyze calcium intake.

What key behavioral component(s) was identified? What was found in the study?

The study found that behavioral intervention involving dietary counseling, education, and parent involvement can be successful in increasing dietary Ca intake in a population of children with chronic disease.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

It was found that children in the BI treatment group demonstrated significantly greater increase in average dietary CA intake than children in the ESC treatment group. No differences were found between the two groups at baseline. However, children in BOTH groups demonstrated significant gains in dietary Ca intake baseline to post treatment. However, children in the BI group were more likely to meet the Ca intake goal of 1500 mg / day of Ca.

Treatment protocols:

BI – (Behavioral intervention) Families in this group had six visits over 8 weeks, including a baseline assessment, four weekly treatment sessions, and a post treatment assessment. Small

groups met for 60-90 minutes/ session led by a PhD psychologist . Parents were provided with nutritional information and child behavior management strategies focused on motivating children to eat Ca rich food sources. A stepwise approach was used each session which focused on increasing Ca at particular meals. Parents were also provided with feedback via graphs of their child’s weekly Ca intake. Children were taught how to identify high Ca foods and how to track their progress to meet their Ca goals.

ESC (enhanced standard of care) intervention was designed to provide the typical delivery of dietary counseling which might be available in a medical center setting. ESC participants had three visits over an 8 week period. Families were counseled in a group during pretreatment, and individually for one 60 minute session during treatment and one post treatment intervention. Parents received information about optimal Ca intake and received the same graphs BI parents received regarding child intake.

*The increased frequency of the BI treatment as well as the group counseling sessions seemed to increase the efficacy of this treatment compared to the ESC intervention (the same educational materials were provided to each group.)

Article #13

Citation: Wizenberg, T., Oldenburg, B., Frendin, S., De Wit, L., Riley, M., & Jones, G. The effect on behavior and bone mineral density of individualized bone mineral density feedback and educational interventions in premenopausal women: A randomized controlled trial. *BMC Public Health*. 2006;6(12).

What behavior(s) was examined? Osteoporosis preventive behavior:

Dietary calcium intake, calcium supplement use, smoking behavior, physical activity

Describe the sample. Population-based random sample of 470 healthy pre-menopausal women aged 25-44. Participants were randomized to one of two interventions: an informational brochure or Osteoporosis Prevention and Self-management Course.

What key behavioral component(s) was identified? What was found in the study?

Individualized bone mineral density (BMD) feedback and minimal educational interventions (informational brochures) increased hip bone density, but not spine bone density. Starting calcium supplements and persistent self-reported change in physical activity were the behaviors related to change in femoral neck density. There was no additional effect of receiving the group education over the information brochure.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

FFQ was used to measure calcium intake. Information on calcium supplement use was obtained “by questionnaire”. Taking a calcium supplement was reported as taking a supplement containing calcium alone or as a main ingredient and at a frequency of not less than 4 times/week.

Physical activity was assessed by questionnaire. Physical activity levels were assessed by how many days in the last 14 the subject reported performing at least 20 minutes of strenuous and light exercise in 5 categories (0 days, 1-2 days, 3-5 days, 6-8 days, 9 or more days).

Smoking history included: history (current/former/never), cigarettes per day, age at uptake, age at ceasing.

Article #14

Citation: Matlik, L., Savaiano, D., McCabe, G., VanLoan, M., Blue, C. L., & Boushey, C. J. (2007). Perceived milk intolerance is related to bone mineral content in 10- to 13-year-old female adolescents. *Pediatrics*. 2007;120(3): 669-677.

What behavior(s) was examined?

Calcium intake in relation to perceived milk intolerance

Describe the sample.

Cross-sectional study – sub study of the Adequate Calcium Today (ACT) project, a school-randomized intervention project conducted at sites in 6 states. This study collected data from 8 schools in California and 6 schools in Indiana. 291 adolescent girls (Asian, Hispanic, non-Hispanic white) in grade 6

What key behavioral component(s) was identified? What was found in the study?

Calcium intake. Perceived milk intolerance was found to be associated with decreased dietary calcium intake. No significant difference was found between ethnic groups.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Perceived milk tolerance was determined by responses on a PMI questionnaire: “I am allergic to milk,” “I get a stomach-ache after drinking milk,” “I have been told that milk will make my stomach hurt after I drink it” on a scale of 1-5 (“strongly disagree” to “strongly agree”). A FFQ was used to estimate dietary calcium intake.

Attachment D.7 – Physical Activity (Tarana Kahn)

Article #1

Citation: Fahrenwald NL, Atwood JR, Walker SN, Johnson DR, Berg. A Randomized Pilot Test of “Moms on the Move”: A Physical Activity Intervention for WIC Mothers. *Annals of Behavioral Medicine*. 2004;27(2):82-90.

What key behavioral component(s) was identified?

- Stage of PA behavior change was assessed using the stage of exercise adoption tool, which was modified to include moderate PA guidelines.
- PA behavior was measured by 7 Day PA recall and the Digi Walker SW 200 Step counter.
- The Exercise Benefits/Barriers Scale measured decisional –balance.
- Self- Efficacy was measured by Self Efficacy for Exercise scale, which has five items that measure confidence in resisting relapse, making time for PA and overcoming negative effect.
- Subscale of the Process of exercise Adoption tool were used to measure self-liberation, counter-conditioning and environmental reevaluation.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Stage of Exercise Adoption tool had five questions based on ‘Yes’ or ‘No’ response to classify participants into five stages of PA behavior.

7 Day PA recall measured self- report of past week’s PA EE through a 15 minutes interview adapted to specify that moderate activity was the pace of a brisk walk versus a normal walk. Also child -care and household chores performed at the pace of brisk walk were added for exemplary purposes.

Exercise Benefit/Barriers Scale had 43 items and used a 4- point forced choice Likert Scale. Self -Efficacy for Exercise Scale used 5 points Likert Scale with item description for each scale point ranging from 1 (not at all confident) to 5 (very confident).

Subscale of process of Exercise Adoption tool used 5 point Likert Scale with item descriptions for each scale point ranging from 1 (never), to 3 (sometimes), to 5 (a lot).

Article #2

Citation: Whitt Glover MC, Hogan PE, Lang W, Heil DP. Pilot study of a faith based physical activity program among sedentary black. *Preventive Chronic Disease*. 2008;5(2)
Available at: http://www.cdc.gov/pcd/issues/2008/apr/06_0169.htm.

What key behavioral component(s) was identified?

- Walking was assessed weekly in steps per day by using pedometer. Participants maintained weekly logs of pedometer step counts, which were used to self- monitor walking and

received a weekly summary to track walking progress throughout the study. Participants were advised of the 10,000 steps recommendation for daily walking and were told that striving to reach this goal was in line with achieving the recommendation for MPA.

- Questionnaire was used to assess moderate and vigorous physical activity in minutes per week at baseline and 3 months.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Steps were analyzed per day categorically: Less than 5000 steps/ day (sedentary), 5000 to 7499 (low active), 7500-9999 (somewhat active), 10,000 to 12,499 (active), 12,500 or more (highly active).

Modified version of the International Physical Activity Questionnaire (IPAQ) was used to assess participation by minutes per week in MPA, VPA and walking.

To increase the accuracy of self –reported data, questions related to frequency was modified from open ended to close ended questions. Participants selected days per week from a list ranging from 0 days to 7 days. Questions on duration of PA were also modified from open ended to categorical responses to try to reduce the overestimation: “I do not do __ activity for more than 10 minutes in arrow”; “ 10-15 minutes”; “15-30 minutes”; “30-45 minutes”; “45-60 minutes”; and “over 60 minutes”. Question order from the original version of IPAQ was also modified to ask about daily walking before asking about other MPA. Also question was modified to ask about the timing of usual PA instead of PA in the past 7 days.

Article #3

Citation: Newton RL, Perri MG. A randomized pilot trial of exercise promotion in sedentary African American adults. *Ethnicity & Disease*. 2004;14: 548-557.

What key behavioral component(s) was identified?

Physical activity was categorized into moderate, hard and very hard.

Adherence to exercise was measured.

Process of changes measures included self-efficacy for exercise behavior and social support.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

7 day physical activity (PAR) was developed as a measure of physical activity.

Self- monitoring exercise logs measured adherence. Participants were instructed to record any walking that was performed to meet the prescription that was provided to the participants, in bouts ≥ 10 minutes.

Self -Efficacy for exercise behavior scale was used to assess an individual’s confidence to engage in exercise behaviors. Factor analysis revealed two factors from the items were resisting relapse and making time for exercise.

Sallis Family Support for Exercise Habits scale was used to assess the level of support for exercise an individual receives from his/her family and friends.

Article #4

Citation: Ainsworth BE, Irwin ML, Addy CL, Whitt MC, Stolarczyk LM. Moderate physical activity of minority women: The Cross Cultural Activity Participation study. *Journal of women's health and gender based medicine*. 1999;8(6):805-813.

What behavior(s) was examined?

The Cross Cultural Activity Participation Study (CAPS) was a 5-year study designed to identify the prevalence of daily moderate intensity physical activity among African American and Native American women residing in South Carolina and New Mexico and develop surveys that measures culturally relevant moderate intensity physical activities.

What key behavioral component(s) was identified?

The moderate intensity activities were identified as heavy household cleaning, caring for children, pushing a wheel chair, home repair activities, washing the car, yard work and garden activities, dancing, sports, conditioning activities, walking for exercise and various volunteer, religious and occupational activities related to brisk walking, lifting, carrying and pushing objects.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Subjects completed twelve 24-hour PA records during three-day periods. Subjects recorded all activities performed throughout the day in the PA record. Each change in activity was a new entry in the PA record. Subjects recorded the following for each PA record entry:

- The time of the day they started the new activity
- Body position (reclining, sitting, standing or walking)
- General characterization of the purpose for doing the activity (e.g. occupation, household, childcare, self-care, walking)
- Detailed description of the activity (e.g. typing, eating, walking for exercise)
- A perceived effort (light, moderate vigorous) for the activity.

The subjects who met the CDC-ACSM moderate physical activity recommendation on most days of the week were those who recorded at least 30 minutes per day of moderate intensity activities on at least 3 of the 4 days that physical activities were recorded.

List of Family Meals Related Questions

Current Behavior Checklist Questions

1. How often do you eat meals or snacks with one or more family members
2. How often do you let your children choose how much to eat
3. How often do you let your children choose whether to eat the foods that are offered

Developing a Measure of Behavior Change... (Article in press by Dicken KL, et al. *J Nutr Educ Behav.*)

1. How often do you eat together with your children at least 1 meal a day – almost never, 1 to 2 days each week, 3 to 4 days each week, 5 to 6 days each week, every day

Questions from Reviewed Articles

Questions Associated with Positive Health Outcomes

1. Article #1 - During the past week, on how many days did all the family members who live in the household eat a meal together – 0 to 2 days, 3 to 4 days, 5 to 6 days, every day
2. Article #2 - How many times in a typical week at least some of the family eats breakfast together
3. Article #2 - How many times in a typical week your family eats the evening meal together
4. Article #3 - How often does your family sit down together for a main meal – never/rarely, less than once a week, once a week, twice a week, three times a week, four times a week, five times a week or more
5. Article #4, #5 - It is important to sit down and eat at least one meal a day with other people (family or friends) – strongly disagree, somewhat disagree, somewhat agree, strongly agree
6. Article #4 - I usually eat dinner with other people – strongly disagree, somewhat disagree, somewhat agree, strongly agree
7. Article #6 - How often do you sit down with other members of your family to eat dinner or supper – never, some days, most days, every day
8. Article #7,14 - During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times
9. Article #11 – How many times was at least one parent present when you ate your evening meal in the past seven days?
10. Article #12 – How often does your family sit down together for dinner - <1 time per week, 1-3 times per week, ≥ 4 times per week
11. Article #13 – Which of the following meals does your family eat together at least 4 or more days per week – breakfast (yes or no), lunch (yes or no), dinner (yes or no)
12. Article #15 – Over the past 7 days, on how many days did you eat a meal with other members of your household?

Challenges/Benefits Associated with Family Meals

1. Article #8 - During the past 7 days, how many times did all, or most of your family living in your home eat dinner or supper (the evening meal) together – never, 1-2 days, 3-4 days, 5-6 days, 7 days
2. Article #8 - During the past 7 days, how many times did all, or most of your family living in your home eat breakfast together – never, 1-2 days, 3-4 days, 5-6 days, 7 days
3. Article #8 - During the past 7 days, how many times was at least one parent present when your child ate his/her evening meal – never, 1-2 days, 3-4 days, 5-6 days, 7 days
4. Article #9 - During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times

Parenting Style

1. Article #10 - During the past 7 days, how many times did all, or most, of your family living in your house eat a meal together – never, one to two times, three to four times, five to six times, seven times, more than seven times

Article #1

Citation: Rollins BY, Belue RZ, Francis LA. The beneficial effect of family meals on obesity differs by race, sex, and household education: the national survey of children’s health, 2003-2004. *J Am Diet Assoc.* 2010;110:1335-1339.

What behavior(s) was examined? Frequency of family meal consumption. The relationship between frequency of family meal consumption and weight status in children.

What key behavioral component(s) was identified? What was found in the study?

- Family meal frequency was high (5 or more days per week) for all children.
- “Family meal frequency was inversely associated with being obese in non-Hispanic white children only. Compared with non-Hispanic whites who ate none or few family meals (0 to 2 per week), the odds of being obese were 33% less in non-Hispanic whites who ate family meals almost every day. In addition, having family meals every day marginally reduced the odds of being obese by approximately 19%.”
- Hispanic boys were more likely to be overweight or obese if their frequency of family meals was greater. There was no relationship between weight status and family meal frequency in Hispanic girls.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

During the past week, on how many days did all the family members who live in the household eat a meal together? 0 to 2 days, 3 to 4 days, 5 to 6 days, every day

Describe the sample.

Non-Hispanic white, non-Hispanic black, and Hispanic children age 6-11 years whose mothers participated in the National Survey of Children's Health.

Article #2

Citation: Gable S, Chang Y, Krull JL. Television watching and frequency of family meals are predictive of overweight onset and persistence in a national sample of school-aged children. *J Am Diet Assoc.* 2001;107:53-61.

What behavior(s) was examined? Frequency of family meals, hours of television watching, and time spent in physical activity.

What key behavioral component(s) was identified? What was found in the study?

- “Children who watch more television during kindergarten and first grade and who eat fewer meals with their families during kindergarten and first grade are more likely to be clinically overweight at third grade.”
- “Children who watch more television, eat fewer meals with their families, and live in neighborhoods that are reported by parents as less safe for outdoor play are more likely to be members of the persistently overweight group [overweight in kindergarten and first grade that persists into third grade].”

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

- How many times in a typical week at least some of the family eats breakfast together...
- How many times in a typical week your family eats the evening meal together...

Describe the sample.

Students participating in the Early Childhood Longitudinal Study-Kindergarten Cohort – a nationally representative sample of children who entered kindergarten in the fall of 1998. This study examined the children at four time points – kindergarten fall and spring, first grade spring, and third grade spring.

Article #3

Citation: Sweetman C, McGowan L, Croker H, Cooke L. Characteristics of family mealtimes affecting children's vegetable consumption and liking. *J Am Diet Assoc.* 2011;111:269-273.

What behavior(s) was examined? Frequency of family meals, vegetable consumption by children, liking for vegetables by children.

What key behavioral component(s) was identified? What was found in the study?

- 44% of families sat down together for the main meal five times per week or more, and 13% sat down together once per week or less.
- Vegetable consumption of children was most strongly predicted by eating foods similar to their parents for the main meal and if the main meal was cooked from scratch.
- Vegetable liking of children was most strongly predicted by eating foods similar to their parents for the main meal and not using pre-prepared (convenience) foods.
- Frequency of family meals was not associated with vegetable consumption and liking.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

How often does your family sit down together for a main meal – never/rarely, less than once a week, once a week, twice a week, three times a week, four times a week, five times a week or more

Describe the sample.

Preschool children participating in the Poppets Study, a community survey conducted through preschools and Children’s Centers (equivalent of Head Start) in London.

Article #4

Citation: Larson NI, Nelson MC, Neumark-Sztainer D, Story M, Hannan PJ. Making time for meals: meal structure and associations with dietary intake in young adults. *J Am Diet Assoc.* 2009;109:72-79.

What behavior(s) was examined? Frequency of family meals, dietary intake, fast food intake. Relationship of family meals (referred to as social eating) and weight status.

What key behavioral component(s) was identified? What was found in the study?

- Obese young adults reported lower rates of social eating than those who were overweight or not overweight.
- Those who reported higher rates of social eating had higher intakes of fruit, vegetables, dark green vegetables, and orange vegetables.
- Those who ate on the run more frequently had higher intakes of soft drinks, fast food, total fat, and saturated fat.
- Measures of attitudes toward social eating indicated that young adults enjoy and value social eating.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

- It is important to sit down and eat at least one meal a day with other people (family or friends) – strongly disagree, somewhat disagree, somewhat agree, strongly agree
- I usually eat dinner with other people – strongly disagree, somewhat disagree, somewhat agree, strongly agree

Describe the sample.

Participants in Project Eating Among Teens-II at a five year follow-up when the majority was in their early twenties.

Article #5

Citation: Larson NI, Neumark-Sztainer D, Hannan PJ, Story M. Family meals during adolescence are associated with higher diet quality and healthful meal patterns during young adulthood.

What behavior(s) was examined? Frequency of family meals and social eating behavior, diet quality.

What key behavioral component(s) was identified? What was found in the study?

- Family meal frequency as an adolescent was positively associated with consumption of fruits, vegetables, dark green vegetables, and orange vegetables in young adulthood.
- Family meal frequency as an adolescent was negatively associated with consumption of soft drinks in young adulthood.
- Family meal frequency as an adolescent was positively associated with social eating behaviors as a young adult.
- Young adults place a high priority on social eating.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

It is important to sit down and eat at least one meal a day with other people (family or friends) – strongly disagree, somewhat disagree, somewhat agree, strongly agree

Describe the sample.

Participants in Project Eating Among Teens-II at a five year follow-up when the majority was in their early twenties.

Article #6

Citation: Gillman MW, Rifas-Shiman SL, Frasier L, Rockett HRH, Camargo Jr. CA, Field AE, Berkey CS, Colditz GA. Family dinner and diet quality among older children and adolescents. *Arch Fam Med.* 2000;9:235-240.

What behavior(s) was examined? Family meal frequency, dietary intake, physical activity frequency, television watching, frequency of homemade meals.

What key behavioral component(s) was identified? What was found in the study?

- Younger children ate family meals more frequently than older children.
- “Subjects who ate family dinner every day consumed an average of 0.8 more servings of fruits and vegetables than those who ate family dinner never or some days.”

- “Consumption of fried food and soda was reported much less frequently by subjects who ate family dinner more frequently.”
- “Participants who ate family dinner more frequently reported slightly higher energy intakes and also reported substantially higher intakes of several nutrients, including dietary fiber, calcium, folate, vitamins B6, B12, C, and E, and iron. In addition, they consumed less trans fat and saturated fat as a percentage of energy intake, and had lower glycemic loads.”
- These findings were similar among younger and older children.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

How often do you sit down with other members of your family to eat dinner or supper – never, some days, most days, every day

Describe the sample.

Sons and daughters (age 9-14 years) of participants in the Nurses Health Study-II.

Article #7

Citation: Neumark-Sztainer D, Hannan PJ, Story M, Croll J, Perry C. Family meal patterns: associations with sociodemographic characteristics and improved dietary intake among adolescents. *J Am Diet Assoc.* 2003;103:317-322.

What behavior(s) was examined? Frequency of family meals, dietary intake.

What key behavioral component(s) was identified? What was found in the study?

- Adolescents reported eating family meals an average of 4.5 times per week.
- Higher family meal frequency was reported among: younger children, Asian American children, children whose mothers were not employed full time, and children with higher socioeconomic status.
- “Frequency of family meals was positively associated with intakes of fruits, vegetables, grains, and calcium-rich foods, and negatively associated with soft drink intake.”
- “Youths reporting at least seven family meals had lower intakes of snack foods than youths reporting fewer family meals.”
- “Strong positive associations were found between family meal frequency and intakes of energy; percentage of calories from protein; calcium; iron; vitamins A, C, E, B-6, folate; and fiber.”

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times

Describe the sample.

Participants in Project Eating Among Teens. Adolescents age 11 to 18 years enrolled in public schools in Minnesota.

Article #8

Citation: Fulkerson JA, Story M, Neumark-Sztainer D, Rydell S. Family meals: perceptions of benefits and challenges among parents of 8- to 10-year-old children. *J Am Diet Assoc.* 2008;108:706-709.

What behavior(s) was examined? Family meal frequency.

What key behavioral component(s) was identified? What was found in the study?

- “More than three quarters of parents reported that all/most of their family ate the evening meal together at least five times per week.”
- Parents enjoyed and valued family meals and were able to name numerous benefits of family meals; however, parents also identified numerous barriers to family meals including planning and preparation.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

- During the past 7 days, how many times did all, or most of your family living in your home eat dinner or supper (the evening meal) together – never, 1-2 days, 3-4 days, 5-6 days, 7 days
- During the past 7 days, how many times did all, or most of your family living in your home eat breakfast together – never, 1-2 days, 3-4 days, 5-6 days, 7 days
- During the past 7 days, how many times was at least one parent present when your child ate his/her evening meal – never, 1-2 days, 3-4 days, 5-6 days, 7 days

Describe the sample.

Parents of 8 to 10 year old children were recruited from public schools and child care centers in the Minneapolis area.

Article #9

Citation: Fulkerson JA, Neumark-Sztainer D, Story M. Adolescent and parent views of family meals. *J Am Diet Assoc.* 2006;106:526-532.

What behavior(s) was examined? Frequency of family meals including priority, atmosphere, and structure of family meals.

What key behavioral component(s) was identified? What was found in the study?

- About half of adolescents reported eating five or more family meals in the past week, while parents/guardians reported slightly higher rates.
- About 2/3 of adolescents and nearly all parents/guardians reported the importance of eating as a family.

- Both adolescents and adults indicated that family meal time was about more than just the meal – conversation, learning manners, following rules.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times

Describe the sample.

Participants in Project Eating Among Teens and their parents/guardians. Adolescents age 11 to 18 years enrolled in public schools in Minnesota.

Article #10

Citation: Berge JM, Wall M, Neumark-Sztainer D, Larson N. Parenting style and family meals: cross-sectional and 5-year longitudinal associations. *J Am Diet Assoc.* 2010;110:1036-1042.

What behavior(s) was examined? The association between parenting style and frequency of family meals.

What key behavioral component(s) was identified? What was found in the study?

- Younger adolescents ate family meals more frequently than older adolescents.
- Parents with authoritative parenting styles most frequently had family meals, permissive parents had the next highest occurrence of family meals, followed by authoritarian, and neglectful parents had the lowest occurrence of family meals.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

During the past 7 days, how many times did all, or most, of your family living in your house eat a meal together – never, one to two times, three to four times, five to six times, seven times, more than seven times.

Describe the sample.

Participants in Project Eating Among Teens and their parents/guardians. Adolescents age 11 to 18 years enrolled in public schools in Minnesota.

Article #11

Citation: Videon TM, Manning CK. Influences on adolescent eating patterns: the importance of family meals. *Journal of Adolescent Health.* 2003;32:365-373.

What behavior(s) was examined? Frequency of family meals and dietary quality.

What key behavioral component(s) was identified? What was found in the study?

- “The number of evening meals eaten with a parent present is significantly associated with adolescents’ eating patterns. Adolescents who ate more than three family meals a week were significantly less likely to skip breakfast and less likely to report poor consumption of fruits, vegetables, and dairy foods, compared with adolescents who ate three or fewer family meals.”
- “The beneficial effect of family meals increased as the number of meals increased; adolescents who consumed six or seven family meals had an even lowered odds of skipping breakfast and poor vegetable, fruit, and dairy foods consumption than those who consumed four or five family meals.”

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

How many times was at least one parent present when you ate your evening meal in the past seven days?

Describe the sample.

Adolescents in grades 7 through 12 in the United States who participated in the National Longitudinal Study of Adolescent Health.

Article #12

Citation: Boutelle KN, Birnbaum AS, Lytle LA, Murray DM, Story M. Associations between perceived family meal environment and parent intake of fruit, vegetables, and fat. *J Nutr Educ Behav.* 2003;35:24-29.

What behavior(s) was examined? Frequency of meals and adult dietary quality.

What key behavioral component(s) was identified? What was found in the study?

- Those parents who more often planned dinner in advance had higher fruit and vegetable intakes.
- Those parents who more often reported watching television at dinner and who more often had arguments at the dinner table had higher intakes of fat.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

How often does your family sit down together for dinner? - <1 time per week, 1-3 times per week, ≥ 4 times per week

Also a number of statements about the environment during mealtime (television watching, use of manners, presence of arguments, rules at mealtime) of which the parents could either agree or disagree.

Describe the sample.

Parents of students in four junior high and middle schools in the Minneapolis/St. Paul Minnesota area.

Article #13

Citation: Andaya AA, Arredondo EM, Alcaraz JEA, Lindsay SP, Elder JP. The association between family meals, tv viewing during meals, and fruit, vegetables, soda, and chips intake among Latino children. *J Nutr Educ Behav.* 2011;43:308-315.

What behavior(s) was examined? Frequency of family meals and dietary quality.

What key behavioral component(s) was identified? What was found in the study?

- “Of those children who ate breakfast, lunch, or dinner with their family at least 4 days per week, 84%, 85%, and 80% at fruit and vegetables 5 or more times a week, respectively.”
- “Of those children who ate breakfast, lunch, or dinner with their family at least 4 days per week, 40%, 44%, and 43% consumed soda and chips 5 or more times a week, respectively.”

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Which of the following meals does your family eat together at least 4 or more days per week – breakfast (yes or no), lunch (yes or no), dinner (yes or no)

Describe the sample.

Children in kindergarten through second grade enrolled in San Diego, California elementary schools. The majority (90%) of the children were Latino.

Article #14

Citation: Burgess-Champoux TL, Larson N, Neumark-Sztainer D, Hannan PJ, Story M. Are family meal patterns associated with overall diet quality during the transition from early to middle adolescence? *J Nutr Educ Behav.* 2009;41:79-86.

What behavior(s) was examined?

Frequency of family meals and diet quality.

What key behavioral component(s) was identified? What was found in the study?

- Adolescents with higher frequency of family meals at both baseline and at the five year follow-up had lower consumption of fast food at follow-up.
- “Regular family meals were positively associated with mean daily intakes of vegetables, calcium-rich food, dietary fiber, and several nutrients (calcium, magnesium, potassium, iron, zinc, vitamin B6, and folate) for both male and female adolescents at follow-up.”
- Those who had regular family meals at both time points had better diet quality including more frequent consumption of breakfast and dinner, fruits and vegetables, and nutrients.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

During the past seven days, how many times did all, or most, of your family living in your house eat a meal together – never, 1-2 times, 3-4 times, 5-6 times, 7 times, more than 7 times

Describe the sample.

Participants in project Eating Among Teens – I at baseline (average age 12.8 years), and the same children as participants in Eating Among Teens – II at follow-up (average age 17.2 years).

Article #15

Citation: Johnson DB, Birkett D, Evens C, Pickering S. Promoting family meals in WIC: lessons learned from a statewide initiative. *J Nutr Educ Behav.* 2006;38:177-182.

What behavior(s) was examined?

Frequency of family meal consumption.

What key behavioral component(s) was identified? What was found in the study?

- At baseline, WIC clients reported eating family meals about 6 days per week.
- Intervention was called “Healthy Habits” and focused either on family mealtime or physical activity. After 6 months of intervention, participants in the family mealtime group reported eating family meals more frequently than those in the physical activity group (still about 6 days per week).

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article.

Over the past 7 days, on how many days did you eat a meal with other members of your household?

Describe the sample.

WIC clients in Washington state.

Article #1

Citation: Charlton KE, Steyn K, Levitt NS, Johathan D, Zulu JV, Nele JH. Development and validation of a short questionnaire to assess sodium intake. *Public Health Nutrition*. 2007;11(1):83-94.

What behavior(s) was examined?

Habitual dietary salt intake above or below the maximum recommended intake of 6g salt per day through specific food items.

What key behavioral component(s) was identified?

Positive correlations were found between Na content of 35 of the 42 food categories in the questionnaire and total Na intake, calculated from 24-hour recall data.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

During the PAST 7 days (1 week) did you eat any of the following? IF YES, ASK HOW OFTEN

Questionnaire with the Food item; the scale (NOT EVERY DAY; EVERY DAY)

NOT EVERY DAY (1–3 times per week, 4–6 times per week); EVERY DAY (1 time a day, 2 times a day, 3 times a day)

A Salt intake questionnaire was included in the article.

http://journals.cambridge.org/download.php?file=%2FPHN%2FPHN11_01%2FS1368980007000146a.pdf&code=0b053c5bcc27412b388169c5ae3c5095

Article #2

Citation: Keenan N, Fang J. Centers for Disease Control and Prevention. The BRFSS 2012 Salt Intake Module — Possible State-Added Questions in 2011. Available at:

<http://www.orau.gov/hsc/hdspinstitute/2010/session-summaries/wk-19A.htm>

What key behavioral component(s) was identified?

The BRFSS salt module was discussed. The module will have the capability of measuring behavior, knowledge of salt intake among American adults, as well as if any action has been taking to reduce salt intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Frequency of eating processed meats during past 30 days

Frequency of eating salty snacks during past 30 days; Frequency of eating frozen entrees during past 30 days; Frequency of eating canned /package soup during past 30 days;

Frequency of eating high salt foods during past 30 days

Format: survey by age group, ethnicity and gender

Values:<10 10-19 20-29 30-59 60-99 >=100

A Salt intake questionnaire was included in the a PowerPoint presentation

<http://www.ora.gov/hsc/hdspinstitute/2010/session-summaries/wk-19A.htm>

Article #3

Citation: Pietinen P, Tanskanen A, Tuomilehto J. Assessment of sodium intake by a short dietary questionnaire. *Scandinavian Journal of Social Medicine*. 1982;10:105-112.

What behavior(s) was examined?

Salt Intake

What key behavioral component(s) was identified?

Women doing light work had the least sodium excretion and men doing heavy work had the highest excretion.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

“The Questionnaire consisted of five questions concerning certain salting habits and self-rating of salt use, and the frequency of use of seven salty food items.”

Article #4

Citation: Hashimoto T, Yagami F, Sugawara T, Kawamura M. Salt preference according to a questionnaire vs. dietary salt intake estimated by a spot urine method in participants at a health check-up center. *Internal Medicine*. 2008;47:399-403.

What key behavioral component(s) was identified?

A simple questionnaire on salt preference was not effective in identifying excessive salt consumers

Article #1

Citation Johnson D, Beaudoin S, Smith LT, Beresford S, LoGerfo J. Increasing Fruit and Vegetable Intake in Homebound Elders: The Seattle Senior Farmers' Market Nutrition Pilot Program. *Preventing Chronic Disease – Public Health Research, Practice, and Policy*. 2004;1(1):1-9.

What key behavioral component(s) was identified?

The key behavioral component is increased access to fruit and vegetables translates to increased consumption.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article

“How often did you drink 100% juices such as orange juice, apple juice, or tomato juice?”

“Not counting juices, how often did you eat fruit, including fresh, canned, frozen, or dried?”

“How often did you eat green salad?”

“How often did you eat white potatoes such as baked, boiled, mashed, or in potato salad or mixed dishes? Do not include French fries, fried potatoes, or potato chips.”

“How often did you eat carrots? Include fresh, canned, and frozen, and carrots in mixed vegetables”

“Not counting carrots, white potatoes, or green salad, how often did you eat other vegetables?”

Format - Survey

They could provide answers in number of times per day, per week, or per month; they could respond with “never” or “don't know/not sure.”

Article #2

Citation: Thompson FE, Subar AF, Smith AF, Midthune D, Radimer KL, Kahle LL, Kipnis V. Fruit and vegetable assessment: performance of 2 new short instruments and a food frequency questionnaire. *J Am Diet Assoc*. 2002 Dec;102(12):1764-1772.

What key behavioral component(s) was identified?

The article evaluated the ability of 2 new short assessment instruments and a food frequency questionnaire (FFQ) to measure intake of fruit and vegetables. The "All-Day" screener asks frequency and portion size questions about 9 food items. The "By-Meal" screener is similar, except that it asks about 2 of those 9 food items in terms of mealtime.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Over the last month, how many times per month, week, or day did you drink 100% juice such as orange, apple, grape, or grapefruit juice? Do not count fruit drinks like Kool-aid,

lemonade, Hi-C, cranberry, juice drink, Tang, and Twister. Include Juice you drank at all mealtimes and between meals

Each time you drink 100% juice, how much did you usually drink?

Format - Survey

never, 1-2 times last month, 3, 1-2 times per week, 3-4 times per week, 4-6 times per week, 1 times per day, 2 times per day, 3 times per day, 4 times per day, 5 or more times per day.

Less than 3/4cup; 3/4 to 1 1/4 cups, 1 1/4 to 2 cups, more than 2

Both short surveys are available at

<http://riskfactor.cancer.gov/diet/screeners/fruitveg/allday.pdf>
<http://riskfactor.cancer.gov/diet/screeners/fruitveg/bymeal.pdf>

Article #3

Citation: Kristjansdottir AG, Andersen LF, Haraldsdottir J, DeAlmeida MDV, Thorsdottir I. Validity of a questionnaire to assess fruit and vegetable intake in adults. *European Journal of Clinical Nutrition*. 2006;60:408-415.

What key behavioral component(s) was identified?

The method assesses mean intake and ranks individuals by their usual intake. The precoded 24-h recall may be valuable tool for measuring average intake of fruits and vegetables among adults in a population of low intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

Did you eat fruit yesterday morning/midmorning?

- Yes No

If yes, What kind of fruit? How much?

Write 1 if you ate one apple, 1/2 if you ate a half

Apple		piece
Banana		piece
Orange		piece
tangerine		piece
pears		piece
Melon		slice
Fruit salad		Portion
Other		Piece or portion

Figure 1 An example of a specific precoded question on fruits in the 24-h recall part.

How often do you usually eat fresh fruit?

- Never
- Less than one day per week
- One day per week
- 2-4 days a week
- 5-6 days a week
- Every day, once a day
- Every day, twice a day
- Every day, more than twice a day

Figure 2 An example of a specific precoded question on fruits in the food frequency part.

Article #4

Citation: Michels K, Wlech A, Luben R, Bingham S, Day N. Measurement of Fruit and Vegetable Consumption with Diet Questionnaires and Implications for analyses and Interpretation. *National Institute of Health – Author Manuscript*. 2005;161:987-994.

What key behavioral component(s) was identified?

Consumption estimated with the Food Frequency Questionnaire was about twice as high as that obtained with the 7-day diary, and the ranking of individuals according to estimates of fruit and vegetable consumption from the 7-day diary and the Food Frequency Questionnaire differed substantially.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

7 day food diary with photo book for portion sizes & Food Frequency Questionnaire

- **Format** - How often do you eat carrots? 1-9 ranging from never to 1 per month
- **Values:** never/once in a while/ sometimes/often/always

Article #5

Citation: Bogers R, van Assema P, Kester A, Weterterp K, Dagnelie P. Reproducibility, Validity, and Responsiveness to Change of a Short Questionnaire for Measuring Fruit and Vegetable Intake. *Am J Epi*. 2004;159:900-909.

What key behavioral component(s) was identified?

The questions were valid among women but it remains to be established if valid among males.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

How often do you eat fruit or vegetables (cooked, raw, juice). The portion size was included. never/1-3 days/1 day/2 days/3 days/ 4 days/ 5 days/ 6 days

Example of question

How often did you eat during the past month		On a day when you ate or drank, how much did you take
	never/1-3 days/1 day/2 days/3 days/ 4 days/ 5 days/ 6 days	
Banana		

-SAMPLE QUESTIONNAIRE IN THE ARTICLE; *The short food frequency questionnaire for assessing fruit and vegetable consumption that was used in the validation study, Maastricht, the Netherlands, 2001–2002.*

Article #6

Citation: Kobayashi T, et al. Reproducibility and validity of the food frequency questionnaire for estimating habitual dietary intake in children and adolescents. *Nutrition Journal*. 2011;10:1-12.

What key behavioral component(s) was identified?

The study indicates that the food frequency questionnaire is a valid tool for assessing dietary intake.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

How often do you eat cucumbers?
Every day, 1-2 times per week, 2-3 times per week, 3-4 times per week
Photographs used to estimate one portion- 1/3-1/2-1.5x-2x

Article #7

Citation: Adams T, Colner W. The Association of Multiple Risk Factors with Fruit and Vegetable Intake Among a Nationwide Sample of College Students. *J Am Coll Health*. 2008;56:455-461.

What key behavioral component(s) was identified?

High fruit and vegetable consumption related to healthy behavior patterns.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article, such as:

Fruit and Vegetable Intake, categorical scale
N/A, 1-2 servings, 3-4 servings, 5+ servings per day

Article #8

Citation: Joshipura K, et al. The Effect of Fruit and Vegetable Intake on Risk of Coronary Heart Disease. *American College of Physicians – American Society of Internal Medicine*. 2001;134:1106-1114.

What key behavioral component(s) was identified?

Consumption of fruits and vegetables especially green leafy vegetables has a food affect on fighting coronary heart disease.

If subjects were asked questions to elicit behavior change, please list any specifics that were described in the article:

“For each food item on the questionnaire, nine responses were possible, ranging from “never or less than once per month” to “six or more times per day”