

**Development and Testing of a Food and Nutrition Practice Checklist
(FNPC) for Use with Basic Nutrition and Disease Prevention
Education Programs**

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by

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(Abstract)

Each year, the Expanded Food and Nutrition Education Program (EFNEP) and Food Stamp Nutrition Education (FSNE) receive around 60 million dollars in federal funding. In order to document impacts, it is critical that these programs utilize valid and reliable instruments. By having validated instruments that measure behavior changes, it can be documented that these federally funded programs are achieving program objectives. To date, research on measurements of change is either lacking or under-reported.

The goal of this study was to develop a valid and reliable assessment instrument to be utilized with a specific curriculum titled Healthy Futures, which is used within Virginia FSNE. To accomplish this, an expert panel was assembled to conceptualize and construct the instrument. The instrument was pilot-tested, evaluated, then finalized and tested. Results with 73 individuals representing 34 white, non-Hispanics and 36 non-Hispanic blacks, found that the physical activity and dietary quality domains of the instrument had achieved an acceptable test-retest reliability coefficient of .70, however the food safety domain achieved a 0.51. For validity, the instrument scored an overall Spearman Correlation Coefficient of 0.28 for physical activity, 0.34 for food safety, and 0.20 for dietary quality. All three domains were sensitive to change ($p < 0.0001$). The results indicate that this instrument could detect dietary and physical activity change among limited resource participants of FSNE with confidence.

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CHAPTER 1

Introduction

There are several nationwide nutrition education programs targeting low-income families and individuals, including the Expanded Food and Nutrition Education Program (EFNEP), Food Stamp Nutrition Education (FSNE), and the Supplemental Nutrition Program for Women, Infants, and Children (WIC). These programs utilize millions of tax-payer dollars for nutrition education. Therefore, it is essential to document their effectiveness in reaching program objectives for bringing about improvement in nutrition and food-related behaviors among participants (1-4).

Unfortunately, there are few reports in the scientific literature of well-tested instruments for measuring food and nutrition behavior change accomplished by nutrition education programs (5-8). To evaluate the impacts of such programs, it is important to have instruments that are reliable, valid, and sensitive to change. Furthermore, assessment instruments should be based on indicators that have been selected to best represent a program's goals (6).

Of major concern in EFNEP, FSNE, and similar programs, such as WIC, is that assessment instruments be suitable for use with low-income clients who have low literacy levels. Currently, there is little information concerning the reliability and validity of instruments that have been used to assess behavior changes in these nutrition education programs (8). If scientific rigor is lacking in the development of evaluation instruments, nutrition educators and funding agencies will not have confidence in the outcomes that are reported (7). This definitely highlights the need for more research to establish reliable and valid evaluation measures for indicators and constructs in nutrition education (5-8).

Methods that are widely used to evaluate nutrition-related behavior change, which have gone through rigorous testing, are 24-hour food recalls, food frequency questionnaires, and food records. However, these methods have both strengths and weaknesses.

In the 24-hour food recall method, an interviewer (usually a person trained in using the method) obtains information about all food items consumed during the past 24 hours, the previous day, or a defined 24-hour period (9). Interviews usually consist of either face to face or telephone interviews and are recorded manually, or with use of a computer. Typically the interviewer uses props to help participants recall amounts of foods consumed (9). Interviewers must be aware of available foods in the community, as well as typical preparation methods.

Strengths of the 24-hour food recall method include efficacy in allowing for comparison of groups of people, high compliance rate, low bias, and minimal burden on subjects. One major disadvantage is the very high intraindividual variability, which necessitates the use of multiple recalls to determine usual eating habits (9, 10). This method is also relatively expensive to administer and analyze (9, 10). Also, clients may not always remember exactly what they ate, thus leading to inaccurate results (10). However, the 24-hour recall is often used as an unofficial gold standard for measuring actual food/nutrient intake (9).

The food frequency questionnaire is composed of a list of common foods which allows participants to report their dietary intake over an extended period of time. The time frame is specified by the instrument, which is usually one month or longer (8). Food frequency questionnaires are inexpensive and allow for the collection of information on usual food intake. If usual serving sizes are obtained, nutrient intake can be calculated. However, this method has limitations in that clients may not be able to retrieve dietary intake from memory and may develop their own interpretation of regular food consumption (9, 10). The method may be

inadequate in intervention research because they may not be sensitive to the behavioral target of the intervention (10). In addition, they tend to overestimate food intake (8-10).

The food record (diary) method requires participants to weigh, measure, or estimate and record all foods consumed over a specified period of time. A typical time length is three to seven consecutive days or multiple periods within a year. This method requires that subjects be instructed on how to record foods eaten and amounts, and may require that demonstration to be given on correct procedures (9). A major strength of this method is that clients do not have to rely on memory to record intake. This method is sometimes used to develop structured food frequency questionnaires (10). However, it is labor intensive, expensive, and time consuming for both the subject and investigator. It usually results in low participant compliance because there is considerable burden on the participant to keep accurate records. Participants may also fail to record details of the foods that were consumed, which can lead to inaccurate results. The act of recording foods may cause subjects to change what they eat during the record-keeping period, leading to false assumptions about usual food intake (9).

In summary, all three dietary intake methods tend to be expensive to administer and analyze, are subject to misinterpretation of questions and responses, and are labor intensity. Thus, there is a suggested need for user-friendly, inexpensive, and time-efficient instruments for nutrition education evaluation that are also reliable and valid.

One example of the use of two dietary assessment methods together to effectively document the benefit of a government-funded nutrition education program was a cost-benefit analysis (CBA) conducted on the Virginia EFNEP (11). In that study, investigators wanted to evaluate the economic efficiency of the Virginia EFNEP by comparing health benefits with program implementation costs during one year (11). Investigators used well-established

assessment procedures of the *EFNEP Evaluation and Reporting System, Version 3 (ERS3)*, including a 24-hour food recall and a food behavior checklist (FBC) to capture the behavioral impacts of the program. Results of the food recall and the FBC, collected at pre and post-intervention, were used to determine if participants had made improvements on known diet-related risks for several chronic diseases. Results of the study showed a positive cost-benefit ratio. This was used in discussions with federal legislators to gain additional federal tax dollars for EFNEP, on the basis that EFNEP could help prevent diet-related chronic diseases and conditions in low-income audiences.

The EFNEP Evaluation/Reporting System, Version 4 (ERS4) is the newest version of the software from the Cooperative State Research, Education, and Extension Service (CSREES). The program is designed to assist in collecting and analyzing demographic and evaluation data in EFNEP and other nutrition education programs (12). It consists of separate software sub-systems for unit, state, and federal levels that allow for the generation of a variety of reports useful for management purposes, identification of participant needs, and export of summary data for state and national assessment of the program's impact (12). A new version of ERS called the Nutrition Education Evaluation and Reporting System, Version 5 (NEERS5) will be available sometime during 2006 (Personal communication with Wells Willis, in a national EFNEP teleconference, April 2005). NEERS5 will retain many of the features of ERS5 including the 24-hour recall and food behavior checklists.

One of the components of the ERS4 system is a 10-item food behavior checklist, which has been used since the 1990s (12). A food behavior checklist (FBC) is an assessment tool by which participants report food-related behaviors by responding to a series of statements, called FBC items. Subjects report their behaviors by placing a check on a Likert scale for each item

(10, 13). The ERS basic-10 FBC measures key food and nutrition-related behaviors that are not measured using the 24-hour recall and other questions already included in ERS (13). The checklist format was chosen because it is user-friendly and tends to produce higher responsiveness among participants than the 24-hour recall, food record, or food frequency questionnaire (10, 13).

The Basic 10-item FBC allows for the generation of detailed summary reports on food-related behavior change (14) and has proven to be culturally appropriate for limited-resource white and black populations. It has also been shown to be sensitive to change among clients over a 10-year period and appears to have good internal reliability, with a Cronbach's alpha (α) greater than .70 (14). However, this basic FBC does not measure knowledge, attitudes, or skills since it was designed to only assess behavior change. Also, it is not useful when the nutrition education program is not of sufficient duration and intensity to bring about behavior change (14). Additionally, this instrument has not been fully tested for criterion-related validity. However, Hersey et al. (6) did conduct some analyses that produced results giving support for the validity of food shopping measures. The results of their study demonstrated that a positive relationship existed between improvement in self-reported food shopping practice (assessed by ERS4) and improvement in dietary quality (assessed by 24-hour recall).

In addition to the basic-10 FBC, ERS4 has a bank of more than 180 food behavior questions that can be selected to form additional behavior checklists (14). Many state EFNEP leaders are interested in developing one or more checklists using items from the ERS4 bank and testing them for validity and reliability (Personal communication with Wells Willis, in a national EFNEP teleconference, April 2005). Testing these new checklists against a gold standard, such

as previously validated instruments, would help to establish their validity and make them more useful for documenting the impact of EFNEP (8).

The FSNE program is an optional component of the Food Stamp Program that provides nutrition education to food stamp recipients. It is funded by the Food and Nutrition Service (FNS) of the United States Department of Agriculture (USDA). One of its objectives is to educate and encourage participants to make better use of their food stamps and other food resources to achieve a balanced, healthy diet (15). There is great interest among FSNE leaders, nationwide, in the development of validated, easy-to-use instruments for measuring behavior change as a result of the program (Personal communication with Ruby Cox, State EFNEP/FSNE Coordinator in Virginia, December 2004).

The FSNE project in Virginia is labeled the Smart Choices Nutrition Education Program (SCNEP). SCNEP leaders are interested in developing a behavioral checklist that can be used in conjunction with the core curriculum for SCNEP, which is the Healthy Futures Lesson Series (Personal communication with Ruby Cox, State EFNEP/FSNE Coordinator, December 2004). Healthy Futures is a 10-lesson curriculum that teaches participants the knowledge and practical skills necessary for making positive behavior changes toward a healthy lifestyle. The 10 lessons are as follows:

1. A. Committing to a Healthy Lifestyle (for Adults)
 B. Committing to a Healthy Lifestyle (for Children)
2. Choosing Healthy Foods
3. Stretching Food Dollars and Food Stamps
4. Keeping Food Safe
5. Cancer: Process, Detection, and Prevention
6. Preventing Cardiovascular Diseases and Diabetes
7. Cut the Fat for Better Health

8. Fiber Facts and Food Sources
9. Fruits, Vegetables, and Whole Grains Too - What's In It For You?
10. Calcium, Milk, and Your Health

Topics covered in this curriculum are similar to those covered by FSNE in other states and by EFNEP in many states. A validated behavior checklist that contains items on food intake, food buying, food safety, physical activity, and disease prevention behaviors is desired by program leaders (Personal communication with Ruby Cox, State EFNEP/FSNE Coordinator, December 2004). It is believed that a checklist would be the best assessment format because previous experiences in EFNEP and SCNEP have shown that participants appear to be able to self-administer checklists with relative ease and accuracy. To achieve dependable results, it is imperative that any checklists developed for EFNEP, or FSNE in general, be tested for reliability, validity, and sensitivity to cultural differences of participants, as well being sensitive to change.

Overall Goal of the Study

The goal of this study was to develop a valid and reliable assessment instrument for use with the *Healthy Futures* curriculum in teaching participants in EFNEP and FSNE. An assessment instrument of 20 to 30 items was constructed and tested for reliability, sensitivity to change, cultural sensitivity, and validity. Efforts were made to incorporate as many of the 187 ERS4 checklist items as appropriate. One advantage of using items included in the ERS4 checklist databank is that data entry and analysis would be easier in future uses of the instrument where ERS or NEERS5 are used as the evaluation system. The instrument was tested by using it as a pre and post-assessment instrument, along with the use of other assessment tools that served as "gold standards" for different subject matter domains.

Objectives for Validation Study

Objectives of the study are as follows:

1. To identify a limited number of key concepts and indicators for each lesson of the Healthy Futures curriculum.
2. To construct an assessment instrument based on the above key indicators that is suitable for measuring impacts with low-income participants involved in the Healthy Futures curriculum.
3. To test the full assessment checklist for reliability, sensitivity to change, and cultural appropriateness.
4. To divide the checklist items into appropriate domains (e.g. dietary quality, food safety, food buying, physical activity, and disease prevention practices) and test some of the domains for criterion-related validity by comparing each with a previously validated instrument and the 24-hour food recall.

Definition of Terms

1. Reliability: the extent to which an indicator yields consistent results; the more consistent the results given by repeated measurements, the higher the reliability of the indicator. Two types of reliability that are used widely in nutrition education are internal consistency reliability and test-retest reliability (16).
2. Validity: the extent to which the instrument measures what it is supposed to measure. There are three basic types of validity: content validity, criterion-related validity, and construct validity (16).
3. Sensitivity to change: the ability of an instrument to detect the magnitude of differences over time in behavior (8).

4. Cultural appropriateness: Cultural appropriateness- an inoffensive quality and potential utility of an instrument to be used among designated populations (50).
5. Dietary Quality: intake of servings (or cups, ounces) of whole grains, vegetables, fruits, meat and meat substitutes, and milk products (Personal communication with Ruby Cox, State EFNEP/FSNE Coordinator, September 2005).

CHAPTER 2

Review of Literature

Introduction

Currently, the impact of nutrition education programs for low-income adults appears to have been under investigated with scientific studies. Nationwide programs, such as the Expanded Food and Nutrition Education Program, Food Stamp Nutrition Education program, and the Supplemental Nutrition Program for Women, Infants, and Children (WIC), use millions of federal dollars, thus, it is crucial that reliable and valid evaluation data be obtained to document their progress in reaching program objectives (1-4). In short, there is a need for more research on valid and inexpensive ways to assess behavior change among low-income adults who participate in wide scale nutrition education programs. One reason for the limited availability of these types of assessment tools is that there are few gold standards for evaluating nutrition behavior change (17).

The process of evaluating results of nutrition education programs has most often included the use of pen and paper instruments (e.g., questionnaires, food behavior checklists, food recalls, and food records) by which participants self-report their food intake and food-related behaviors (8). However, many of the evaluation tools may not have been tested for reliability and validity, highlighting a need for more research to develop legitimate and dependable evaluation tools for use in conjunction with nutrition education. The availability of reliable and valid instruments would establish baseline data on behaviors of participants on which to base educational strategies and would enable educators and researchers to better assess the success of their interventions. These instruments could assist nutrition educators to reach their ultimate goal of better educating and assisting their participants to live a healthy lifestyle (8, 17-19).

Two nationwide nutrition education programs for which national and state leaders have expressed a need for reliable and valid, self-administered evaluation tools are the Expanded Food and Nutrition Education Program (EFNEP) and the Food Stamp Nutrition Education (FSNE) program (Personal communication with Ruby Cox, State EFNEP/FSNE Coordinator, February 2005). Leaders of these programs recognize that it is often not feasible to use 24-hour recalls, food records, and food frequency questionnaires, as most of the education is conducted in groups where these food intake methods are difficult to administer (17-19).

Description of EFNEP

EFNEP was launched as a Cooperative Extension Program for limited-resource families in the late 1960's and now operates in all 50 states and several U.S. territories. The purpose of EFNEP is to assist low income audiences to acquire the knowledge, skills, attitudes, and changed-behavior necessary for nutritionally sound diets, and to contribute to their personal development and improvement of the overall family diet and nutritional well-being (12, 20-21). The program is sponsored by the Cooperative State Research, Education, and Extension Service (CSREES), which is an agency within the U.S. Department of Agriculture, (USDA). USDA is part of the Executive Branch of the Federal Government that funds agricultural-related programs and research, including nutrition education and research. EFNEP participants include those who receive help from food assistance programs and other low-income families with incomes at or below 185% poverty. It consists of an adult and a youth component, better known as Adult EFNEP and 4-H EFNEP. In Adult EFNEP, participants learn how to make food choices to improve the nutritional quality of meals and snacks for the entire family (12, 20-21). In 4-H EFNEP, participants receive lessons on nutrition, food preparation, and food safety, fitness, avoidance of substance abuse, achieving healthy weights, and other health-related topics. National Goals of EFNEP are:

- To assist limited resources families and youth in acquiring the knowledge, skills, attitudes, and changed behaviors necessary for nutritionally sound diets;
- To contribute to participants' personal development and improvement in their total family diet and nutritional well being (21).

Description of FSNE

Similar to EFNEP, FSNE is a national effort that is dedicated to improving the nutritional status of low-income audiences. The Food and Nutrition Service (FNS), USDA, began providing funding for FSNE in the late 1980's by matching the dollars a state spends on nutrition education activities. Additional matching funds must be provided by state and local governments. To obtain FSNE funding, the state's Food Stamp Program (FSP) division must submit a Nutrition Education Plan (NEP) that is subsequently approved by FNS. In most states, the development and implementation of the NEP is subcontracted to other agencies, such as Cooperative Extension.

During the early years, seven state agencies were approved with an NEP. By 2003 the number increased to 50 state agencies being approved with NEPs (2). FSNE is not a mandatory component in the FSP, but is considered an option to states that desire to provide nutrition education to food stamp recipients as part of their FSP operation. However, while optional, FNS strongly encourages states to provide nutrition education for FSP participants and for those who are eligible. Since nutrition education is optional, states have the freedom to implement creative interventions that fit with FSNE purposes and objectives as well as creating a more decorous image of the FSP among current and potential participants. For example in Virginia, the NEP has been named the Smart Choices Nutrition Education Program (SCNEP) (22).

The primary national goal of FSNE is to provide educational programs that increase, within a limited budget, the likelihood of food stamp recipients making healthy food choices and

choosing an active lifestyle consistent with the most recent advice reflected in the Dietary Guidelines for Americans (2, 22). Other goals include:

- Establishing partnerships and collaborations that include other FNS programs in the planning and delivery of nutrition education.
- Creating activities that take place in local Food Stamp Program offices.
- Increasing fruit and vegetable consumption among low-income groups.
- Implementing interventions and activities that promote a healthy weight (2).

The Virginia SCNEP

FSNE was initiated in Virginia May 1996, under the acronym SCNEP (Smart Choices Nutrition Education program), and is in operation in 100 of the 107 Virginia counties and independent cities having a Cooperative Extension Office (22). SCNEP implementation involves collaboration between the Virginia Cooperative Extension (VCE), the Human Nutrition, Foods, and Exercise Department of Virginia Tech, and the Office of Temporary Assistance Programs of the Virginia Department of Social Services.

Goals for Adult Participants in the 2005 Plan are:

- To enroll 7,000 to 8,000 adult participants into SCNEP, with at least 50% being from FSP households and to involve each of them in 4 to 10 nutrition lessons, with the average being 8 lessons (8 to 20 contact hours). Non-FSP clients receive nutrition education as a result of being in groups with FSP participants.
- To bring about improvement in identified deficiencies in dietary quality, food behaviors, and food-related skills (food selection, buying, storing and preparation) leading to healthy, balanced food intakes, adequate levels of physical activity, progress toward achieving healthy weights (or cessation of further weight gain if participant is

overweight/obese) among adults from FSP households and FSP eligible households (130% poverty or below).

- To provide direct nutrition education of sufficient intensity to bring about behavior change, through providing six or more nutrition classes/educational experiences for most adult participants from FSP households.

Primary Goals for Youth Participants in the 2005 plan are:

- To enroll into SCNEP 9,000 to 10,000 low-income youth who are likely to be from households receiving food stamps.
- To bring about improvement in identified deficiencies/inadequacies in food-related behaviors, food-related skills (food selection, preparation, and safety), and physical activity patterns leading to healthy food choices, improved physical activity patterns, progress toward achieving healthy weights, and/or cessation of further weight gain among youth from FSP households and FSP-eligible households.
- To provide direct nutrition education of sufficient intensity to bring about behavior change, through providing six or more nutrition classes/educational experiences for youth likely to be in FSP households.

Desirable Characteristics of Evaluation Methods and Instruments

Depending on objectives, participants in nutrition education programs can be assessed on several different factors including knowledge, behavior, attitudes, and skills. EFNEP and FSNE leaders and most nutrition education experts favor evaluating food intake and food-related behavior changes among participants as a desirable means of capturing the impacts of nutrition education interventions (5-8, 18-19, 23). When evaluating food-related behavior change, it is important that assessment tools be reliable, valid, sensitive to change, easy to administer and

feasible to analyze. They should also be based on knowledge, skills, and behaviors that are taught by the program (5-9, 18-19, 23).

Reliability. When using an instrument, such as a food behavior checklist to measure behavior change, it is essential to test it for reliability. Reliability is the extent to which an indicator yields consistent results over repeated measures with the same subjects or with different subjects. The more consistent the results provided by repeated measurements, the higher the reliability of the indicator. On the other hand, the less consistent the results the lower the reliability would be (16). This is a general definition for reliability; however, there are different types of reliability. Two types that are used widely with nutrition education assessment instruments are internal consistency reliability and test-retest reliability. Internal consistency is the homogeneity of the items within an instrument that measure a single factor. Test-retest reliability is the method used to assess how constant the results remain the same from one occasion to another (28). For example, in a cancer study two questionnaires were used to determine the needs of prostate cancer patients (41). Both questionnaires had similar items except that in one instrument the questions were written in past-tense and were intended to be administered only at the end of a program. In the other, they were in present-tense and were intended to be administered at pre- and post- intervention. The questionnaires were tested for internal consistency reliability by assessing how the subjects responded to the two instruments. Test-retest reliability was also measured on the questionnaire by administering it twice with time elapsing between the administrations with no intervention between. Results were analyzed to determine how closely responses matched.

When assessing internal consistency, test-retest, and other types of reliability, Cronbach's coefficient alpha (α) is widely used since it closely corresponds to the definition and purpose of reliability (28). For example, in a study by Kendal et al. (29), a hunger and food insecurity

questionnaire had a high alpha coefficient of 0.85, while the minimum acceptable coefficient of reliability for behavior assessment is generally viewed to be 0.70. Stewart et al. (40) tested for reliability in a psychometric analysis and comparison study by repeatedly administering the instruments to 30 subjects with time between. Results showed that several subscales had inadequate internal consistency and test-retest reliability since alpha scores were lower than 0.7.

Another significant factor that should be noted when measuring reliability is that when measurements are repeated for an instrument, mean scores will not necessarily be exactly equal from one test to another. There will always be some differences in scores even when reliable instruments are administered to the same subjects on two or more occasions (28).

Validity. Validity is generally defined as the extent to which an indicator measures what it is supposed to measure. Validity is important in the evaluation process to provide assurance that a chosen assessment tool measures the true situation (16). Validity of an instrument is usually measured by comparing results on that instrument with another instrument of measurement that had been previously validated.

For instance, Murphy et al. (23) determined the validity of a food behavior checklist that was intended to assess the fruit and vegetable intake of adults. The investigators tested the instrument for validity by comparing results with serum carotenoid levels and fruit and vegetable intake collected with multiple 24-hour food recalls. Results suggested that the fruit and vegetable intake collected with the new behavior checklist was significantly correlated with serum carotenoid levels ($P < 0.001$) and with results of multiple 24-hour food recalls ($P < 0.05$).

Similar to reliability, attaining a fully valid instrument is not possible. Furthermore, if an indicator is found to be reliable, it does not mean that it is also valid, which is a mistake that some researchers make when developing and testing evaluation tools (16). Some investigators

tend to substitute very reliable evaluation tools for valid evaluation tools (8, 17), but this is problematic.

Although the general concept of validity seems uncomplicated, there are different factors that make validity a complex issue including the fact that there are different types of validity. Thus, a decision must be made about the types of validity to be tested and the strategies that be must be developed to test for the different types. In addition, there are challenges involved in the testing process.

Types of Validity. Three basic types of validity are content validity, criterion-related validity, and construct validity. Content validity is the extent to which a specific set of items reflects a content domain (28). This type of validity has played a major role in the development and assessment of various types of tests used in psychology and education. Obtaining a content-valid measure of any phenomenon involves a number of interrelated steps. First, the researcher must be able to specify the full domain of content that is relevant to the particular measurement situation. Secondly, they must select the most important concepts within the content domain that are to be measured since instruments that are extremely long are problematic. Thirdly, one must select wording for items that will be understood by the respondents. Finally, once the wording has been selected, it must be put into a question or statement that is testable.

Currently, there is no official criterion that indicates whether or not selected items of an instrument are content valid. In the final analysis, it is not possible to determine the specific extent to which an empirical measure is content valid, through the use of statistical analysis. Instead, it is usually determined by using an expert panel, which is a team of experts in the substantive area of the test. Through various procedures for sampling the domain that the test is intended to measure, these teams might also select the items that will make up the test (16, 27-28, 35).

For instance, in a study on content validity of a food safety knowledge questionnaire, Medeiros et al. (36) derived instrument items from food-handling concepts developed by a national panel of food safety experts. Consequently, content validity was established by the method of construction of the attitude and knowledge questions. Items were reviewed for wording, clarity, and relevance by the research team, cooperative extension faculty, nutrition faculty, nutrition graduate students, and an evaluation specialist. After the initial questions were developed, the wording of the questions was discussed during focus groups and interviews with FSNE and EFNEP participants and college students to ensure that items were relevant for different types of audiences. Items that were unclear were either discarded or reworded.

Construct validity is the ongoing process of testing hypotheses regarding relationships among the items of an instrument and subject responses to those items (27). Generally, three steps are used in determining construct validity. First, the theoretical relationship between the items themselves must be described. Second, the relationship of items in the instrument to each other must be examined. Finally, the relationship of the items must be interpreted in terms of how they fit into the overall findings in light of what was expected (16, 35).

Construct validity is established by administering an instrument to a representative sample of respondents for which the instrument was designed. Data are then analyzed through theoretically-based, logical expectations regarding the existence of meaningful constructs. In order to determine if an item is construct valid, the performance of item measure would have to be consistent with theoretically derived expectations. If the measure is inconsistent with theoretical expectations, it is usually concluded that the measure lacks construct validity (16, 27). The statistical techniques for examining construct validity are usually correlation (r) and factor analysis (16, 27-28).

One example of testing for construct validity is a study conducted by Grammatikopoulos et al. (30). They tested a self-assessment evaluation form for the Olympic education training program in Greece for construct validity by administering it to 438 physical education teachers in the program. The authors used confirmatory factor analysis, a technique often used to test construct validity (28). They achieved results indicating that the proposed model was an adequate fit [χ^2 98.34 ($p < 0.05$)]. Researchers also stated that the analysis supported a three-factor solution suggesting that the questionnaire is an internally consistent measure for evaluating the training in the Olympic education program.

Criterion-related validity involves the use of a previously validated instrument or measurement as the standard against which to compare results obtained by a new instrument (16). The measurement or instrument used as the criterion is often referred to as a “gold standard.” Two primary types of criterion-related validity that are used in education are concurrent validity and predictive validity. With concurrent validity, the test instrument is administered, with a previously validated instrument or measure being administered at the same time or in close proximity. Results from the two instruments are then compared. The most frequent statistic employed in this comparison is a correlation coefficient.

Predictive validity involves the use of an instrument to predict a future characteristic or behavior. The instrument is administered, and then at a later time, measures are obtained on some external criterion. Correlational analyses are most often used as the primary statistical technique. If correlation values are reasonably high, it is concluded that the prediction ability is successful and the instrument can continue to be used to estimate subjects’ future status regarding the variable of interest. For both types of criterion-related validity, there is no single validity coefficient that can be used. The statistical tests must be based on the type of data to be

collected with the criterion measurement and the design of the instrument being tested (16, 27-28, 35).

Townsend et al. (18) tested a food behavior checklist for criterion-related validity of fruit and vegetable consumption by measuring it against the gold standard of serum carotenoid levels of subjects. Results showed that the fruit and vegetable intake measured by the behavior checklist had a significant correlation with serum carotenoid values ($r = .44$, $P < 0.001$), suggesting that the checklist has acceptable criterion-related validity.

Craig et al. (43) tested their International Physical Activity Questionnaires (IPAQ) for concurrent and predictive validity. Concurrent validity was assessed by comparing the self-report data between long and short versions of the IPAQ. Both were administered on the same day. A comparison between telephone and self-administered versions of the IPAQ was also conducted. Predictive validity was assessed over a seven-day period by comparing the physical activity data from the two self-report IPAQ forms with the Computer Science and Application (CSA) accelerometer measurement of physical activity. Results indicated that the IPAQ had acceptable coefficients of validity. The researchers used Spearman's correlation coefficients for comparing the physical activity totals. For concurrent validity, results of comparisons between the long and short forms yielded a value of $\rho = 0.67$ (95% CL 0.64-0.70). For predictive validity, the long form was compared with the CSA accelerometer giving a value of $\rho = 0.33$ ($n = 744$, 95% CI 0.26-0.39). The short form was also tested against the CSA giving a value of $\rho = 0.30$ ($n = 781$, 95% CI 0.23-0.36).

Strategies in Validating Instruments. Although it is recognized that difficulties exist in determining how particular instruments should be validated, there are some strategies that must be implemented to accomplish credible results. When validating a new or previously untested instrument, it is essential to identify indicators or a standard with which to compare the

instrument being tested. Ideally researchers would like to have a “gold standard” against which to test a new instrument. The term “gold standard” refers to an accepted test or assessment instrument that is believed to measure the true state of a variable or characteristic. To be recognized as a gold standard, a test or assessment tool must have been shown, through extensive research, to consistently and accurately measure a construct (45).

An example of the use of a gold standard is a study by Frankenfeld et al. (31) who tested a soy food frequency questionnaire for validity by comparing its results with two different gold standards. One gold standard was a comprehensive food frequency questionnaire, while another standard was plasma levels of genistein and daidzein. Plasma was analyzed for genistein and daidzein with a liquid chromatography-mass spectrometry.

In another study by George et al. (32), a multicultural food frequency questionnaire was developed and validated with young women in the southwestern United States. The questionnaire was validated against 3-day diet records in young college women, which was cross-validated against the mean of two 24-hour recalls and 4-day food records in low-income postpartum woman.

Challenges in Validating Instruments. When validating instruments, there are certain challenges that must be addressed to develop effective instruments (27). First, some researchers tend to depend more on reliability and do not test instruments for validity (8, 17). This practice leads to producing instruments that may collect data that does not reflect the true situation (26). An instrument can be reliable, in that it produces similar results repeatedly, but does not produce results that measure the true situation (28).

Two possible reasons that some researchers fail to validate their instruments, but depend more on reliability, is that testing for validity can be expensive and time consuming. This is due to the fact that producing acceptable coefficients of validity requires that an instrument be tested

against a previously-validated instrument or type of measurement. A considerable number of subjects should be used, which increases time and cost. For example, in the Neuhouser et al. study (33), a dietary screener, a food frequency questionnaire, and a 24-hour dietary recall were administered to 18,882 subjects to validate the food frequency questionnaire. Use of this very large randomized sample of subjects created an unusual expense in terms of time and resources needed to communicate with and monitor participants and to analyze the large amount of data. After subjects reported their dietary intake on the 24-hour food recall, investigators waited one year before administering the food frequency questionnaire to the subjects (33). The long period between testing, added greatly to the expense of the study. Fortunately, instruments can be effectively tested with much smaller sample sizes and shorter time periods between administrations of the test.

Sensitivity to Change. An effective instrument must not only be reliable and valid, but must also be sensitive to change. Sensitivity to change is defined as the ability of an instrument to detect the magnitude of differences in behavior over time among the same participants (8). It is essential for a new instrument to be tested for sensitivity to change, during its development. Having sensitive instruments makes it much easier to determine if educational interventions are effective (34).

There are several important principles and guidelines for measuring sensitivity to change of instruments used to assess impact of nutrition education. If no changes are observed when an instrument is administered before and after an intervention, it can be concluded that either the instrument is insensitive or the educational program was not effective. On the other hand, sensitivity to change is dependent on the reliability of an instrument which is influenced, in part, by the specific indicator being measured. If reliability is too low, there is less chance of detecting changes and intended outcomes. Thus, reliability should be established before attempts

are made to test an instrument for its ability to detect change. However, researchers should keep in mind that some behaviors are less sensitive to change than others, particularly if only a brief intervention is used (17).

One example of testing an instrument for sensitivity to change is the study conducted by Townsend et al. to determine if a newly developed, 16-item food frequency questionnaire would identify change in food intake of EFNEP participants (18). The instrument was administered before and after a series of six EFNEP lessons with 100 participants, with six weeks elapsing between the two test periods. Results showed that the new instrument was effective in detecting change with this particular EFNEP intervention.

Cultural Appropriateness. Not to be confused with cultural sensitivity or cultural awareness, cultural appropriateness implies an inoffensive quality and potential utility of an instrument (51). An instrument is considered culturally appropriate when the respondents clearly understand the intent of the instrument and the characteristics of the items of that instrument. For example, when a respondent is asked, “Do you eat whole grains everyday?” the respondent should at least have some knowledge of what foods are considered whole grain. A culturally appropriate instrument does not reflect knowledge of culture specific foods or an ability to work within the conceptualization of the culture. Since there is not a lot of information on cultural appropriateness and assessment instruments, it is not clearly known as to how it can be assessed when validating an instrument. However, Teufel (51) mentioned that when validating culture-specific food frequency questionnaires, the questionnaires should be validated against multiple 24-hour food recalls.

Behavior Assessment Methods and Instruments Used for Evaluation of Nutrition Education

Food Intake Methods. Instruments that assess food intake can be very useful when measuring the impact of nutrition education programs. By measuring food intake, program leaders can determine the effectiveness of a program in regard to whether or not participants reach the program's objectives of improving their dietary intake. Methods used to evaluate dietary change have mostly involved the use of 24-hour food recalls, food frequency questionnaires, food records, and food behavior checklists.

24-hour Food Recall. In the 24-hour food recall method, an interviewer obtains information on all food items consumed during the past 24 hours, the previous day, or a defined 24-hour period (9). Interviews usually consist of either face-to-face or telephone interviews and may be recorded manually or with a computer. To obtain reliable and valid data, it is essential for interviewers to be training on recommend procedures, so as to aid the subject in recalling all they ate or drank without leading them to say what they think the interviewer wants to hear. In addition, interviewers must be aware of available foods in the community, as well as typical preparation methods. Interviewers also need to use props to help subjects recall amounts of foods consumed (9). Furthermore, a quality control system should be implemented so that interviewers will be consistent in their methods from one subject to another and over multiple collection periods. This usually necessitates training sessions for interviewers.

Advantages of the 24-hour food recall method include its efficacy in allowing for comparison of groups of people, high compliance rate, low bias, and minimal burden on subjects to remember what they ate and to provide the information. Disadvantages include the very high intraindividual variability, which necessitates the use of multiple recalls to determine usual eating habits (9, 10), if the method is used to report data on an individual basis. This method is also relatively expensive to administer and analyze (9, 10). Plus, participants may not always remember exactly what they ate (10). Nevertheless, it is considered to be a gold standard for

measuring actual food/nutrient intake of groups (9). Nutrition education programs such as EFNEP and FSNE have tended to use 24-hour food recalls to assess improvement of participants and overall program impact, because the method has been proven to work better than some other dietary intake methods with low-literacy and less-motivated subjects (17, 24).

Food Frequency Questionnaire. A food frequency questionnaire is composed of a list of common foods, which allows participants to report their dietary intake over an extended period of time. The time frame is specified by the instrument, which is usually one week, one month or longer (8). Food frequency questionnaires are inexpensive and allow for the collection of information on usual food intake. If usual serving sizes are obtained, estimation of nutrient intake can be assessed. Limitations of this method include that participants may not be able to retrieve dietary intake from memory and may develop their own interpretation of regular food consumption (9, 10). This method also tends to overestimate food intake (8-10), possibly because subjects may be swayed to say they ate foods on the list because of the power of suggestion. Low-income subjects may especially tend to say they ate certain foods on the list because of concern about what they should be eating versus what they can afford to eat.

Another factor is that leaders of an intervention must ensure that the food frequency questionnaire they choose matches the specific dietary behavior targeted by the intervention (10). In short, food frequency questionnaires must be selected or developed and validated for a specific purpose. For instance, Frankefeld et al (31) developed and validated a food frequency questionnaire to assist in the determination of soy protein consumption in postmenopausal women.

Food Records. The food record (diary) method requires participants to weigh, measure, or estimate and record all foods consumed over a specified period of time. A typical time length is three to seven consecutive days or multiple periods within a year. This method requires that

subjects be instructed on how to accurately record foods eaten and amounts, and usually requires demonstrations on correct measurement procedures (9). A major strength of this method is that participants do not have to rely on memory in order to record intake. However, it is labor intensive, expensive, and time consuming for both the subject and investigator. It usually results in low participant compliance because there is considerable burden on the participant to keep accurate records. It may also result in participants changing their food intake due to the act of recording. Participants may also fail to record details of the foods that were consumed (9).

Food records are often used as a gold standard in testing other types of dietary intake methods. In a study by George et al. (32), investigators used 4-day food records from 50 subjects as the gold standard against which to test their food frequency questionnaire for validity. Food Behavior Checklists. A food behavior checklist (FBC) is an instrument that consists of questions with Likert scale response categories (e.g. Always, Sometimes, and Never) that ask people about their food related practices and habits. It is typically short (no more than 25 questions) and focuses on a recent and defined time period. Likert Scale checklists and questionnaires are in a format in which the items are presented as declarative sentences that are followed by response options that indicate varying degrees of agreement with or endorsement of the statement (27-28, 35). The number of and exact wording of response options vary and can be either an odd or an even number (28).

For example, Brehm et al. (38) conducted an evaluation study with nutrition students participating as research assistants in a clinical research project. Students were asked to respond to a self-assessment instrument of their own nutrition counseling, education, interviewing, and assessment skills, using a five-point Likert scale. The options included 1=poor, 2=below average, 3=average, 4=good, and 5=excellent. In another study, seventh and eighth grade students were evaluated on nutrition knowledge, attitudes, and self-reported behavior by using

questionnaires to determine the impact of a school-based nutrition teaching program (39). In the nutrition attitudes section of the questionnaire, students responded to a five-point Likert scale (disagree very much, disagree a little, can't decide, agree a little, and agree very much).

A major advantage of behavior checklists is that they can be self-administered or administered quickly by non-professional personnel. The checklist format is user-friendly, tends to produce high responsiveness among participants, needs no coding before analysis, can be used in a telephone interview, and can be easily tailored to a specific intervention program. However, food behavior checklists are difficult to validate and results are not easy to interpret (10, 18). Food behavior checklists have typically been used to assess food and health-related behaviors, rather than food intake. However, there have been some recent attempts to develop checklists that can take the place of 24-hour recalls or other means of collecting food intake data. A study by Murphy et al. (23) illustrates the development and validation of a food behavior checklist to assess subjects' fruit and vegetable intake.

Questionnaires with Multiple-Choice, Fill-in-the-Blank, or True/False Response Categories.

This type of instrument is often used for measuring knowledge and attitudes. For example, in a study by Medeiros et al. (36) a food safety knowledge questionnaire had 43 questions that included 23 questions with agree/disagree/not sure responses, five that were multiple choice, and 15 that asked participants to indicate whether or not a food is safe to eat or should be avoided under the circumstances described. All the questions had a "not sure" response and were closed ended. In a study by Thomas et al. (37), pediatric dietitians responded to questionnaires that surveyed their knowledge and use of evidence-based nutrition (EBN). The questionnaire was divided into five parts and the response format consisted of either multiple-choice, fill-in-the-blank, yes/no, or ranking.

Behavioral Assessment Instruments in the Evaluation and Reporting System (ERS4)

The Evaluation and Reporting System (ERS) is a multilevel computerized evaluation system from CSREES originally developed to measure the impact of EFNEP (14). However, it is suitable for use in other nutrition education programs and is used by many states for assessing impacts of food stamp NEPs. It allows for the generation of a variety of reports useful for management purposes and assessment of individual participants. In addition, it allows for the exporting of summary data to state and federal levels and generation of statewide and nationwide impact reports (12). ERS also serves as a database that stores information in the form of records about program participants, their family structure, and their dietary preferences, as well as data on staff assignments and hours worked (14). In addition, the system consists of separate components for compilation of data at the unit (ERS), state (SRS), and federal (FRS) levels. This allows for downloading of data on participants and easy transfer of that data from one office or level to another (12, 14).

The ERS was developed over a four-year period by a 12- member National ERS Committee of state EFNEP coordinators, evaluation specialists, and the federal EFNEP leader (14). In addition, many other Extension professionals from across the nation and within CSREES were involved in testing and providing feedback on the program. An MS-DOS version of ERS was introduced in 1993. A Microsoft Windows version, with many new features, was introduced in 1998 (referred to as ERS4) and it is now being used throughout the United States and several U.S. territories. Work is now being conducted on an upgraded version of ERS to be renamed the Nutrition Education Evaluation and Reporting System, Version 5 (NEERS5), which will contain a greatly expanded food and nutrient data base and many new features. It is expected to be released during 2006 (Personal communication with Wells Willis, in a national EFNEP teleconference, April 2005).

The main components of the ERS4 collect and analyze adult participant information on demographics, prenatal/breastfeeding status, a 24-hour food recall, and a food behavior checklist (12, 14). There are also components that collect and summarize data on involvement of youth and volunteers, as well as staff. With all data, the system allows for generation of summaries at five levels: individual staff member, unit, groups of units, entire state, and nationwide. The 24-hour food recall component has a built-in database that utilizes data from a USDA food/nutrient database.

Food practice checklist component. The ERS4 system includes a basic 10-item checklist, referred to as the ERS Food Practice Checklist (ERS-FPC) that is used at pre and post-intervention with all adult participants. The response categories of this checklist are in a Likert-like scale, with the following choices: Never, Seldom, Sometimes, More of the time, and Almost Always. For report summaries, participant changes on the ERS-FPC are categorized into three major domains, including food resource management practices, nutrition practices, and food safety practices (12, 14).

The basic ERS-FPC was developed in such a way as to have content validity with the use of a nationwide expert panel. This panel reviewed the content of EFNEP curricula used across the nation and selected essential and appropriate concepts to be addressed in the checklist (13). Table 1 show steps taken on the development of ERS. The checklist was also tested for cultural sensitivity and shown to work well with limited-resource blacks, whites, and Latino population groups. (13). It has also been shown to have internal consistency reliability based on consistent achievement of Cronbach alpha values of 0.70 or higher (11, 24). In addition, it has been shown to have acceptable construct and face validity (14).

Table 1: Development and Testing of the ERS Behavior Checklist^a (14)

Construct	Task	Dates
National input	* National EFNEP Reporting System Committee (ERSC) identified the need for a behavior checklist; a subcommittee was formed.	Dec., 1990
Construct validity (1)	* A questionnaire sent to all state coordinators to assess what they felt were needed indicators for a national reporting system. * Existing instruments were solicited and reviewed by the Checklist subcommittee, together with other national tools such as the NFCS Diet and Health Knowledge Survey. * Four domains were identified based on objectives of the curriculum. * Subcommittee prepared the first draft, which was revised by ERSC.	Jan.-Feb., 1991
National input	* First checklist sent to EFNEP Coordinators in all states; 50 EFNEP Coordinators and others submitted extensive comments.	May-June 1991
	* Subcommittee prepared a summary of feedback, revised the draft instrument, and submitted these to the ERSC and members of USDA for review and comment.	Dec., 1991
Construct validity (2)	* An expert panel convened to review and respond to the draft checklist and summary of feedback from all states.	Feb.-Mar. 1992
	* Subcommittee revised the checklist in response to Expert Panel recommendations (which included suggestions regarding both the questions themselves and the response categories). Additional questions were drafted and/or selected from national standardized instruments, to identify the best indicators for the domains through focus groups and pilot testing.	May-June 1992
Face validity	* Prospective focus group leaders were provided with training materials and protocols. Focus groups were conducted in 5 states selected to represent a diversity of EFNEP clientele. Procedures were similar to those of cognitive testing; purpose was to ensure that terms and questions were clearly and accurately understood.	Sept.-Oct., 1992
	* Focus group results were summarized and the checklist revised. * Procedures for conducting the pilot test were developed, which involved a pre-post, treatment/control group design. 7 states participated. The draft instrument included about 25 items so that the weakest questions could be eliminated.	Jan.-Feb. 1993
Reliability Sensitivity Difficulty	* Pilot test results were analyzed by Michael Lambur and Ruby Cox. Analyses included internal reliability, sensitivity and difficulty, pre-post means and cross-tabs, and final reading level. Final revisions were made and the instrument was reduced to the strongest 15 questions.	Mar.-June, 1993

	* A new committee was established to revise the ERS checklist * A revised 10-item checklist, with an additional optional bank of questions, was released in ERS Version 3.3.	1994 - 1997
Reliability Validity	* The current core 10 behavior checklist items were further tested for internal indicators of validity and reliability, with excellent results.	2000

Adapted from the EFNEP Evaluation/Reporting System Users Guide.

In addition to the basic ERS-FPC, the ERS program contains a bank of more than 180 checklist items from which states can select items to construct additional checklists to assess specific state-based curricula or educational objectives. For example, the Virginia EFNEP/SCNEP has a curriculum titled, the Healthy Futures Series, which emphasizes change to achieve a healthy lifestyle and recommended disease prevention practices. Leaders of this program have an interest in selecting items from the ERS bank to form one or more assessment instruments appropriate for testing the effectiveness of the Healthy Futures curriculum in bringing about behavior change among limited resource adults in EFNEP and SCNEP (Personal communication with Ruby Cox, State SCNEP Coordinator, February 2005). The checklist items in the bank have a variety of response categories, including those with a Likert-like scale, true/false, and yes/no answers (12). Periodically, opportunity is provided for state EFNEP leaders to submit additional checklist items to be added to the ERS checklist bank.

Measurement Theory in Nutrition Education

In nutrition education programs, measurement theory of the social sciences for evaluation tools should be applied. In the book, *Reliability and Validity Assessment*, authors defined measurement as the assignment of numbers to objects or events (indicators that show results) that are generally consistent and fulfill an explicit purpose (16). Meanwhile, in *Practical Research: Planning and Design- 7th Ed.*, measurement is defined as “limiting the data of any phenomenon, substantial (tangible) or insubstantial (intangible), so that those data may be interpreted and compared to an acceptable qualitative or quantitative standard” (26). Given these definitions of

measurement, is essential if results of that instrument are to be viewed as establishing the reliability, validity, and sensitivity to change of a measurement that is dependable and suitable. Knowing the validity, reliability, and sensitivity to change of an instrument allows researchers or evaluators to accurately measure impacts of an event or program. This allows for achievement of statistical significance in data analysis, allowing for meaningful conclusions (16, 26-27).

Examples of Validation Studies on Food Behavior Checklists

In the study by Townsend et al. (18), properties of food behavior checklist items from a previous study were re-analyzed to determine item reduction for a shorter checklist for EFNEP and FSNE interventions. The purpose of this checklist was to assess fruit and vegetable intake. The 16-item FBC was measured for reliability, internal consistency, cultural sensitivity, sensitivity to change, and criterion and convergent validity. On testing the FBC items for these characteristics, results showed that the instrument was easy to administer to participants in a group, was suitable for low-income women, and had an elementary reading level (fourth grade). It also had a low respondent burden in addition to meeting requirements for validity ($r = .44$, $P < 0.001$), reliability ($P < 0.05$), cultural sensitivity ($P < 0.05$), and sensitivity to change. Thus it was concluded that the instrument was useful in evaluating the impact of EFNEP and FSNE interventions in a less cumbersome manner than 24-hour recalls (18).

In another evaluation study by Murphy et al. (23), the validity of 39 behavior checklist items were tested by using serum carotenoids as the criterion for fruit and vegetable intake. In addition, fruit and vegetable intake was assessed with multiple 24-hour recalls and compared with results from the checklist to test convergent validity of nutrient intake (23). According to the responses of EFNEP/FSNE subjects, 10 FBC items were significantly correlated with serum carotenoid levels ($P < 0.01$) and an additional 12 items showed hypothesized associations with

24-hour recall data ($P < 0.01$). This instrument can now be viewed as valid and can be used to determine the effectiveness of nutrition education programs.

In a retrospective study by Cason et al. (24), Food Stamp Program (FSP) participants and non-FSP participants were compared on changes in dietary intake and food-related behaviors as a result of exposure to nutrition education. By using the 24-hour food recall and the ERS-FPC (which had been previously validated) for assessment, both FSP and non-FSP participants made significant improvements on all dietary and nutrient factors ($P \leq 0.004$), as well as with ERS-FPC items ($P \leq 0.005$). Few differences were found between the two groups on dietary change. However, FSP participants made more improvement than non-FSP participants on four ERS-FPC items (#1 $P < 0.05$; #6 $P < 0.005$; #7 $P < 0.05$; #9 $P < 0.01$). By combining the use of the 24-hour food recall and the ERS-FPC, investigators were able to produce results that indicated that nutrition education was similarly effective in improving dietary intake and food-related behaviors of FSP and non-FSP participants. The validity of the ERS-FPC was further confirmed by testing it against the 24-hour food recall (24).

Defining Content Domain for Development of an Assessment Instrument

To insure content validity, it is essential to identify the scope of the subject matter taught in an educational program for which an instrument is being developed (28). In the current study, an instrument will be designed to cover three content domains addressed by paraprofessional educators in EFNEP and SCNEP in Virginia: food safety, dietary/nutritional quality, and physical activity. These content domains are included as recommended subject matter within the federal guidelines for FSNE and EFNEP (2, 12).

One of the main curricula used by both of these programs in Virginia is the Healthy Futures Series. This curriculum also has a web-based version on the Virginia Cooperative Extension (VCE) public website (46). It is a 10-lesson series that is usually delivered over 4 to

12 months to food stamp program participants and other limited income adults by paraprofessionals and volunteers, many of whom are indigenous to the target population. A hands-on, learn-by-doing approach is used which allows participants to gain the practical skills necessary to make positive behavior changes toward a healthy lifestyle. The following table shows lessons included in the Healthy Futures curriculum.

Table 2. Lessons for the Healthy Futures Intervention^a (25)

Lesson 1	Committing to a Healthy Lifestyle A. Adults B. Children
Lesson 2	Choosing Healthy Foods
Lesson 3	Stretching Your Food Dollars
Lesson 4	Keeping Your Food Safe
Lesson 5	Cancer: Process Detection, & Prevention
Lesson 6	Preventing Cardiovascular Disease & Diabetes
Lesson 7	Cut the Fat for Better Health
Lesson 8	Fiber Facts and Food Sources
Lesson 9	Fruits, Vegetables, & Whole Grains
Lesson 10	Calcium, Milk, & Your Health

^aThis table represents the 10 lessons of Healthy Futures Program

The lessons of Healthy Futures incorporate the latest research findings on chronic disease prevention and health promotion. They are appropriate for adults of all income levels, but they especially target middle and older participants from limited-resource households.

Objectives for participants of Healthy Futures include:

- Increasing awareness of their risks for certain chronic diseases and conditions;

- Convincing participants that certain dietary and lifestyle changes can reduce their risks factors; and
- Assisting them in learning knowledge, attitudes, skills and behavior that can help overcome these risks with steps that are feasible for limited-resource adults (25).

Process of Developing Instruments for Measuring Change

When developing questionnaires and other instruments used to measure change in attitudes, knowledge, and behaviors, there is no specific linear process that is recommended. Based on experience, various investigators have suggested steps that can be used in instrument development including conceptualization, construction, pilot testing, evaluation, and testing of the instrument (9, 27-28, 35).

Conceptualization. Conceptualization can generally be defined as the process that involves thinking about what is to be measured and the entire measurement process, prior to beginning construction of the questionnaire or instrument (9, 35). It is important to implement a process to delineate the scope of the program content to be covered by the instrument and to make decisions about whether the instrument will assess knowledge, attitudes, skills, or behaviors or a combination of these. It is generally recommended that an expert panel be used in this process to review program objectives and curricula and to construct a list of key concepts covered by the educational program. Based on the list of key concepts, the panel can select a limited number of specific knowledge, skills, behaviors, etc. to be measured from the wide array of possible items. This panel could also be used as to identify indicators of change for those skills, behaviors, etc.

The next step is to clearly describe the target population and its characteristics, such as literacy level, experience, ability, and probable commitment in responding to a questionnaire or other assessment tools. Based on this information, decisions can be made on the best overall format for the instrument and for individual items so that they will elicit thoughtful and accurate

responses with a minimum of bias. Another decision to be made is how the instrument will be administered, including whether it is to be self-administered or interviewer-administered and what the delivery mode will be (e.g. face-to-face, phone, mailed, or computer based). In all of these decisions, a major consideration is how to achieve the highest possible response rate. One other important step in the conceptualization phase is to develop a plan on how the results will be analyzed, how they will look, and how they will be used (9, 27, 35).

Construction. When beginning the construction of an instrument, there are many factors that need to be taken into consideration. Basic factors include selecting a scoring technique and a readability level appropriate for respondents. Other tasks include determining questionnaire format (visual appearance) and question order and placement, in light of what might make the most sense to respondents (9, 27). The budget and timetable for implementing an evaluation or a research project will also have considerable influence on questionnaire construction (9). Once decisions are made on the construction of the questionnaire, a draft of the questionnaire should be prepared. It should then be reviewed by an expert panel and revised and prepared for pilot testing (9, 27). The expert panel should involve individuals who are knowledgeable of the subject matter and who are qualified to make assessments about content validity (9). Finally, directions for respondents to follow in completing the instrument should be developed.

Pilot Testing. Once the instrument has been constructed, it needs to be pilot tested. During this phase, it is recommended that the questionnaire be administered with persons that have characteristics similar to the target population, in order to assess face validity and cultural sensitivity. It is also helpful to have respondents and/or the interviewer record the amount of time taken to complete the questionnaire so that an average administration time can be established. Moreover, respondents' views should be noted regarding the question order and placement and appropriateness of response categories. In addition, its mode of administration

should be evaluated to see if it is appropriate for the target population and the types of questions (9, 27, 35).

Evaluation. Based on the findings of the pilot test, including comments of respondents, a thorough evaluation of the instrument should be conducted by the researcher with the involvement of appropriate people. Results should be reviewed and appropriate changes should be made regarding question wording, response categories, item order, instructions, questionnaire length, and any other components that might need revision. If major changes are made, the revised instrument should be pretested again to ensure that the changes will bring about the desired results when used with respondents (9, 27, 35). During this phase there is usually an extensive amount of instrument editing with a final version being prepared (27). Once this has been done, the main test of the instrument can be conducted with data being analyzed for reliability and validity.

Testing of Instrument for Validity, Reliability, and Sensitivity to Change. To conduct the main test of the instrument a sample of subjects should be recruited that are similar to the population with which the instrument will be use. Also careful decisions with need to be made of how many subjects are needed and how the program intervention and data collection will be conducted. Depending on the type of data collected and the types of reliability and validity to be assessed, appropriate techniques and theories should be applied to conduct the statistical analysis of the questionnaire. Some of the techniques include factor analysis, item analysis, and reliability analysis (28). Based on results from the analysis, final revisions of the questionnaire should be made. If substantial changes need to be made in the instrument, more data should be gathered and analyzed. However, if great care is taken during questionnaire design there should be no need to repeat procedures and it may be feasible to produce the final form of the questionnaire without gathering additional data (9, 27-28, 35).

After producing the final instrument, it is then ready to be tested for validity. Methods used to measure validity include correlations with previously validated measures, comparisons with data from groups known to possess knowledge, skill, or behaviors, and additional factor analyses. These types of information are necessary for a meaningful interpretation of scores obtained from the new questionnaire (27). Additional reliability evidence should also be gathered to determine if the instrument consistently measures the characteristic of interest (9, 27, 35).

Conclusion

Currently, there is a lack of research on the behavior changes of low-income adults in nutrition education programs. In order to measure the impact of nutrition programs such as WIC, EFNEP, and the FSNE program, a validated instrument that measures behavior changes in participants is needed, especially since these programs receive federal funding. By having validated instruments that measure behavior changes, it can be documented that these federally funded programs are achieving program objectives. In order to achieve this, the instrument must be both reliability and validity and be sensitive to change so that results will be viewed as dependable and useful. Particularly, the instrument should be tested for criterion-related validity. In addition, since subjects are being assessed for behavior changes, a behavior checklist-type instrument would be the best format to use because it is user-friendly, it tends to produce higher responsiveness among participants, needs no coding before analysis, can be used in telephone interviews, and can be easily tailored to the Healthy Futures curriculum. A reasonable process for developing and testing an instrument for use with the Health Futures curriculum appears to be 1) conceptualization, 2) construction, 3) pretesting, 4) evaluation, and 5) testing. After collecting and analyzing data, results can determine if any changes need to be made to the final

instrument. Results can also be used by nutrition education programs that are using a similar curriculum.

CHAPTER 3

Methodology

Introduction

The goal of this study was to develop a valid and reliable assessment instrument for use with the *Healthy Futures* curriculum. *Healthy Futures* is used as the primary curriculum in carrying out the Virginia Food Stamp Nutrition Education (FSNE) plan, under the title of the Smart Choices Nutrition Education Program (SCNEP). This curriculum is also used to some extent in the Expanded Food and Nutrition Education Program (EFNEP) in Virginia. Although the *Healthy Futures* curriculum was designed specifically for use in Virginia, it covers topics that are addressed by FSNE and EFNEP, nationwide, since the same federal guidelines are in effect for all states. Thus, a valid and reliable instrument addressing topics in this curriculum may be useful in other states in the evaluation of FSNE and EFNEP impacts. For purposes of this study, the new instrument is referred to as the Food and Nutrition Practice Checklist (FNPC). The study was approved by the University Institutional Review Board for Research Involving Human Subjects.

Content domains covered in *Healthy Futures* include dietary quality, food safety, food purchasing, physical activity, and certain health-related lifestyle practices (such as smoking, stress, and sun exposure). The full instrument was tested for reliability, sensitivity to change, and cultural sensitivity when used with low-income adults targeted by SCNEP and EFNEP, who are primarily from the non-Latino Black and non-Latino White race categories. To limit the scope of the study to a manageable level, criterion-related validity was tested only for the dietary quality, food safety, and physical activity domains. Testing of the food buying and chronic disease prevention domains need to be conducted in a future study, once suitable “gold standards” are identified.

Objectives of the study were as follows:

1. To identify a limited number of key concepts and indicators for all lessons of the Healthy Futures curriculum.
2. To construct an assessment instrument based on the above key indicators that is suitable for measuring impacts with low-income participants involved in the Healthy Futures curriculum.
3. To test the full assessment checklist for reliability, sensitivity to change, and cultural sensitivity.
4. To test some of the domains (e.g. dietary quality, physical activity, and food safety) for criterion-related validity by comparing each with a previously validated instrument.

In the development and testing of the instrument, the following steps, generally recommended by several researchers, were taken: conceptualization, construction, pilot testing, evaluation, and testing of the instrument (9, 27, 28, and 35).

Development of the FNPC

Conceptualization. Early in the process, a decision was made to test the FNPC primarily for reliability and criterion-related validity. In addition the researchers decided that every lesson in the Healthy Futures curriculum would be covered, with the instrument including items testing key concepts taught in all of the lessons. An Expert Panel of persons familiar with EFNEP and SCNEP and the Healthy Futures curriculum was appointed to assist in conceptualization of the instrument. The Expert Panel consisted of two Area Coordinators, two Program Assistants (PAs), and two Food/Nutrition Agents working with the Virginia EFNEP/SCNEP.

This panel was convened by phone conference in November 2005 and their tasks and responsibilities were explained by the researchers. Panel members were informed that the target population for this study would consist of female adults between 20 and 60 years of age, from

limited-resource families, who were eligible to participate in EFNEP and SCNEP. It was emphasized that panel members were to identify concepts taught in lessons along with at least one indicator for each concept that could be used to assess behavior change. The achievement of behavior change is emphasized in federal guidelines of both FSNE (10) and EFNEP (12). Over the next month, panel members reviewed the lessons and developed three key concepts for each lesson, which were deemed to be the most important on which to assess participants. Each panel member was assigned one or two lessons to work with and was asked to forward their concepts and indicators by electronic mail to researchers. The researchers then compiled the concepts and indicators for all lessons and sent them out to all panel members to review. Since this list consisted of 30 concepts and 63 indicators for all 10 lessons of the curriculum, the researchers solicited the assistance of Expert Panel members to help shorten the list to a manageable number of items. The list was sent to panel members and they were asked to prioritize the concepts and indicators for each lesson from most important to least important in assessing EFNEP and FSNE program participants. Based on panel member suggestions and objectives of the study, researchers were able to shorten the list of behaviors to be measured and indicators for those behaviors to a list of 57.

With input from the Expert Panel, the researchers decided that the FNPC would be developed as a checklist with question response categories being of three types: Likert-like scale and true/false or yes/no, and some possible fill-in the blank responses. It was believed this format would be the most effective based on prior experience with EFNEP and FSNE participants and the belief that this format would elicit thoughtful and accurate responses with a minimum of bias.

The expert panel also decided that a self-administered instrument would be best to use. Previous experience has indicated that EFNEP and SCNEP participants can successfully

complete self-administered instruments if simple, straight-forward wording is used. However, if a subject cannot read or write, the instrument could be interviewer-administered. It was expected that the new instrument would be administered by PAs, who are paraprofessionals working in the EFNEP and FSNE programs.

Depending on the type of question and how the question was asked, the scales in Table 3 are the response categories selected for use in the FNPC. Subjects would be instructed to select only one response per question.

Table 3. Answer Choices and Scores for the Food and Nutrition Practice Checklist (25)

Scales	Answer Choices		
1	Never	False	No
2	Seldom	True	Yes
3	Sometimes		
4	Most of the time		
5	Always		

Construction: Based on the results accomplished with the Expert Panel, the researchers constructed the FNPC, using the following steps:

1. Using the key concepts and indicators of impact identified for each lesson of the Healthy Futures curriculum, the researchers selected or constructed checklist items that would be appropriate for measuring behavior change. Initially a list of the 187 additional checklist items from ERS4 were reviewed and appropriate items were identified that would address many of the behavioral indicators that were previously selected for the FNPC. One advantage of using items included in the ERS4 checklist databank is that data entry and analysis would be easier in future uses of the FNPC where ERS4 or NEERS5 would be

used as the evaluation system. However, for some indicators, no ERS4 items were available and new non-ERS4 checklist items were developed by the researchers. During this process, it was found that some ERS4 indicators address more than one behavioral indicator and duplications were eliminated. This process resulted in a total of 57 checklist items.

2. Once all instrument items were identified or developed, appropriate response formats (e.g. Likert scale, True/False, Yes/No), were selected. For the ERS4 items, the response categories set in the ERS4 program were used. Response categories for the new non-ERS4 items were selected to be similar to ERS4 items.
3. The researchers reordered the instrument items so that all items with the same response category would be placed together in the instrument. This was necessary to construct the checklist with a suitable layout in which items could be easily followed by respondents. The readability level for the instrument was assessed and found to be at the 3rd grade level, similar to the original ERS4 Basic-10 Food Practice Checklist which was shown to be at the 3.6 level (13).

Once the above FNPC was constructed, instructions were developed both for those who would administer the instrument and for respondents to follow. This included how responses were to be recorded on the instrument. Instructions for administering the instrument also included what interviewers were to say in providing encouragement to subjects to achieve accurate responses. Instructions also included what the PAs were to do if respondents appeared to be having difficulty reading or understanding the checklist items.

Pilot Testing During the pilot testing phase in January 2006, the FNPC was administered to three people with similar characteristics as the targeted population. These subjects were recruited by a SCNEP PA from among her currently-enrolled clients. The purpose of the pilot

test was to assess cultural sensitivity of the instrument, which items might be eliminated and how many, and to determine whether or not questions were clearly understood. There was great variation in the education level, and presumably the reading level of these pilot-test subjects. The first subject's level of education ended at the 5th grade, the second subject had a high school diploma, and the third subject had a master's degree.

Before the researchers administered the pilot version of the FNPC, the PA explained to the subjects the purpose of the pilot study and why they were chosen to participate. The researchers then explained the process and gave directions for completing the instrument. Subjects were also assured that their personal information would be kept confidential. They were urged to speak privately with either the PA or the researchers, if they needed help with any of the items.

During the instrument administration, the researchers kept careful notes on various aspects of the process. It was noted that it took only 15 minutes for all subjects to complete the questionnaire. None of the subjects appeared to have any difficulty reading and responding to the items. Once all three subjects had finished, a discussion was held and feedback was obtained on several aspects of the instrument. All of the respondents' comments were recorded by hand, either on a copy of the instrument or in separate notes. The subjects were asked to give their opinions on the wording and understandability of questions, the appropriateness of response categories, and the mode of administration (i.e. self-administered vs. interviewer administered). Generally, the subjects agreed that most items were clear and easy to respond to. However, they identified a few items that were either very difficult to answer or were redundant. They also made the suggestion that the number of questions be cut from 57 to about 30.

Once all comments and suggestions were obtained, the participants were thanked for their participation and were assured that their comments would be used to revise the instrument. They were also given a \$15 gift certificate for their participation.

Evaluation. Based on the findings of the pilot test, an evaluation of the FNPC was conducted to determine needed revisions and to produce a version for the main test phase. Aspects of the instrument that were evaluated included the understandability of the questions, consideration of participants' suggestions, length of the instrument, cultural sensitivity, question order, response choices, and administration time. During this phase, all comments of pilot subjects were reviewed by the researchers. Several changes were made to checklist items including rewording and shortening the questions for better understandability and deleting two questions that subjects felt were difficult to answer and were unnecessary due to duplication. The FNPC initially had 57 items before the pilot test and was then reduced to 55 items for the main test phase. The readability level remained at about the 3rd grade level. Once the FNPC was edited, it was deemed ready for the main test.

Main Test of the Instrument. The goals of the main test were to administer the FNPC to a much larger number of subjects and to analyze the data from this test to determine the reliability, validity, sensitivity to change, and cultural sensitivity of the instrument. Another goal was to identify which items could be eliminated to reduce the instrument to about 30. Subjects for the main test phase of the instrument were recruited from among newly-enrolled EFNEP and SCNEP participants, not previously exposed to the Healthy Futures curriculum. The FNPC was administered before and after a series of seven lessons were taught from the Healthy Futures curriculum. Other established assessment tools were also administered at pre and post-intervention and were to serve as "gold standards" for different domains of the FNPC.

Steps taken during the testing phase were as follows:

1. Subjects were recruited for the study, with each signing the informed consent form.
2. Once informed consent forms were obtained, the FNPC and the 24-hour food recalls were administered, twice at entry with one week between administrations. These instruments were administered twice to determine test-retest reliability and better assess subjects' average food intake.
3. At the second administration of the FNPC at entry, administer two previously validated instruments, which were considered as gold standards for the domains of food safety and physical activity.
4. Proceed to teach a set of seven lessons from the Healthy Futures curriculum to each participant.
5. At the completion of the lessons, administer all four instruments again.
6. Determine the validity of certain FNPC items on dietary quality by assessing that domain's relationship to dietary quality based on 24-hour food recalls.
7. Determine the validity of the FNPC items on food safety by assessing that domain's relationship to food safety based on the Food Handling and Eating Preferences Questionnaire (Kendall FHQ; 44).
8. Determine the validity of the FNPC items on physical activity by assessing that domain's relationship to physical activity based on the International Physical Activity Questionnaire (Craig IPAQ; 43).
9. Conduct an analysis of the full checklist for cultural sensitivity with non-Latino white, non-Latino black and Asian-decent subjects, by comparing the groups on changed on the FNPC and on comments made by respondents.
10. Analyze the full FNPC for reliability using the test-retest method and internal consistency method and also analyzing results to see if a Cronbach alpha and Pearson

Correlation Coefficient of at least .70 has been achieved. Both Cronbach alpha and Pearson Correlation Coefficient are highly recommended by social science in all reliability testing with .70 being acceptable for both types of reliability (16, 27, 35).

11. Analyze the full instrument for sensitivity to change by comparing pre and post-assessment data.

Recruitment of Subjects for the Main Test Phase: Subjects for the main test of the instrument were recruited from among adult females, who are the primary homemakers in limited-resource homes that are eligible for education through EFNEP and SCNEP. They were recruited by 22 PAs, who were selected by their supervisors as being especially reliable and effective. Criteria included that subjects would be between ages 20 and 60 years old and that they would represent the non-Latino White and non-Latino Black race groups in proportions similar to the usual EFNEP and SCNEP population. Some subjects who were of Latin or Asian descent were able to participate in the study because they were able to speak, read, and write English well and their diets were similar to the typical American diet. It was anticipated that the sample of EFNEP and SCNEP participants would represent the total population of the EFNEP and SCNEP programs described below.

Recruitment and teaching were done on either an individual or group basis, either in their home, a community center, or public location. Recruitment included the completion of the EFNEP/SCNEP Family Record, of which a copy of the first page and last page was to be provided to the researchers in this study. The first page of this record was used to collect demographic information and the last page was used to collect a 24-hour recall on the participant. The first page of the Family Record included recording the PA's unit number, the homemaker's name and address, income, race, geographic residence, number of children, instruction level, and participation in government programs. Data from this form to be used in

this study included ID number, unit number, race, instruction level, participation in government programs, and geographic residence. Other data collected with Family Records were used only for usual EFNEP and SCNEP purposes.

During 2004, EFNEP staff worked with 3,428 adult participants, of which 1,652 (48%) received food stamps. Among the EFNEP families, 59% reported being White, while 32% were Black. The household income of 63% of EFNEP families was 185% of poverty or below (49). Also in 2004, 6,021 adults were worked with in SCNEP, of which 2,377 (39%) were food stamp recipients and 1,727 (29%) participated in other public assistance programs. Among the SCNEP participants, 48% reported being White, while 47% selected Black as their race category. The household income of 87% of SCNEP families is 185% of poverty or below (50). The groups of subjects for this study were selected to approximate proportions of non-Latino Whites and non-Latino Blacks in the usual EFNEP and SCNEP population. Efforts were also made to select the subjects in such a way as to represent both urban and rural areas of Virginia.

Training of interviewers. Two teleconferences were conducted with EFNEP/SCNEP PAs on the research project in January 2006, regarding instrument administration, the intervention, and the importance of the study. Topics discussed included the necessity of consent forms, recruitment of participants, special Healthy Futures curriculum for the study, procedures for the intervention, and procedures for administering instruments. Administration procedures that were covered included the significance of the procedure for administering the instruments, the importance of not influencing subjects to give certain responses, providing a relaxed atmosphere, emphasizing to the subjects that there are no right or wrong answers, and allowing adequate time for the subjects to mark their responses.

Administration of the Instruments

To allow for testing of the FNPC for test-retest reliability, it was administered twice before beginning the intervention, with one week elapsing between the administrations. During the pre-assessment of the FNPC, the 24-hour food recall was also administered twice in order to determine an average intake to reflect subjects' usually dietary intake. However, during the second administration in the pre-assessment, two previously validated instruments were also administered; this included the Kendall FHQ and the Craig IPAQ. The FNPC, the 24-hour food recall, and the two previously-validated instruments were then administered again for validity testing during one to two weeks after subjects participated in the seven-lesson intervention curriculum described in the Intervention section below. Collection of data took place during both assessments. Before administering the instruments, PAs were explained the procedure for administration.

Before each administration period, PAs gave instructions to subjects on completing the instruments, as well as answering any questions they had. Unless it became clear to the PA that the subject could not read or the subject stated a preference to be interviewed, instruments were self-administered. If requested or needed, interviews consisted of the PA recording responses on forms.

Anonymity of subjects was maintained by using only ID numbers in this study, not the participants' names. ID numbers were recorded on study forms by EFNEP and SCNEP PAs. Study ID numbers were the same as ID numbers used for participation on EFNEP and SCNEP. These numbers were generated by a computer program already in use in EFNEP and SCNEP. Demographic data from the Family Records were collected only during the first administration. Subjects' names and contact information were not recorded or used in this study.

The Intervention

During the main test phase, subjects were taught by 22 PAs in small groups or in individual sessions using the Healthy Futures curriculum. The Healthy Futures curriculum is a 10-lesson series that is usually delivered to participants by PAs, many of whom are indigenous to the target population. The PAs were selected from all six Virginia Cooperative Extension districts, including the northwest, southwest, southeast, northeast, northern, and the central districts. There were five PAs from the southwest, one PA from the northwest, three PAs from the central, four PAs from the northern, five PAs from the northeast, and four PAs from the southeast district. Each PA recruited/enrolled three to four subjects, which was originally expected to total around 78-104 subjects. The goal was to have at least 75 subjects that completed the study in order to obtain quality results.

The intervention consisted of an 11 to 13-week period (during February-April, 2006). There were two pre-assessment sessions about a week apart (during first half of February, 2006). The seven assigned Healthy Futures lessons were taught over seven to ten weeks (during February-April, 2006). The post assessment took place one to two weeks following the last class (during mid-April, 2006). Incentives for subjects who finished the study included a food and refrigerator thermometer set and a Wal-Mart Gift Certificate for \$15.

According to the goals for adult participants in the 2005 FSNE plan, eight to twenty contact hours was expected to be sufficient to achieve behavior change in participants of nutrition education interventions; hence seven to ten weeks was believed to be an adequate amount of time to determine impact in subjects (22) using the FNPC.

Lessons 1 through 4 were covered with all subjects, while the remaining lessons were covered as follows:

- Half of the groups were taught Lesson 5 (on cancer prevention), Lesson 7 (on reducing fat intake), and Lesson 9 (on fruits, vegetables, and grains), in addition to Lessons 1 - 4.
- The other groups, were taught Lesson 6 (on preventing cardiovascular disease and diabetes), Lesson 8 (on increasing fiber intake), and Lesson 10 (on calcium, milk, and your health), in addition to Lessons 1 - 4.

Subjects were divided into different groups in order to reduce time consumption of the study while covering all lessons, as well as to accommodate their different living locations. Furthermore, it was believed that a shorter lesson series would result in fewer drop-outs. This arrangement allowed for the basic first four lessons to be covered with all participants, followed by three additional lessons. Since most of the lesson concepts addressed in the instrument are repeated in more than one lesson, it was believed that this arrangement would allow for all the subjects to be exposed to information that is addressed by all instrument items.

Statistical Analysis

These comparisons were made with statistical analysis:

1. Responses to FNPC items in the dietary quality domain were compared to responses obtained by 24-hour recall. ERS4 was used to transcribe responses on the 24-hour food recall into numeric values for food group intake for statistical analysis (52).
2. FNPC items measuring food safety practices were compared to those obtained by the Food Handling and Eating Preference Questionnaire developed by Kendall et al. (designated as the Kendall FHQ; 44).
3. Checklist items in the physical activity domain (vigorous and light activity) were compared to those obtained by the previously validated International Physical Activity Questionnaire, Short Version (designated as the Craig IPAQ; 43).

4. The newly developed FNPC was tested for test-retest reliability and internal consistency to determine if it yielded a Cronbach alpha and Pearson Correlation Coefficient of 0.70 or higher for dietary quality, physical activity, and food safety.
5. EFNEP and SCNEP participants in the Healthy Futures curriculum were evaluated to determine if skill and behavior change was detected by the new FNPC.
6. Comparisons of responses in the physical activity, food safety, and dietary quality domains were made of non-Hispanic black and non-Hispanic white races by observing internal consistency reliability and validity scores.

For purposes of data entry and analysis, responses on assessment instruments were assigned a numeric value and were matched with the subject's ID number. Data were recorded in an Excel database and analyzed by using the Statistical Analysis System (SAS) Version 9.1 (47) and Minitab Version 14.2 (48). Responses on the various instruments were analyzed to determine reliability and validity, and whether or not behavior change had occurred due to participation in Healthy Futures.

To analyze the instrument for test-retest reliability, the same instrument had been administered twice with time elapsing between each administration. Results were then analyzed to determine how closely the responses matched. For internal consistency, items in each domain were analyzed to determine if they correlated with each other. Criterion-related validity (concurrent validity) was tested by comparing responses on three domains of the FNPC against responses on instruments that has been previously validated. One of the coefficients that are used in validity testing is the Spearman Correlation Coefficient because it is useful in the situation where there are three or more conditions that need to be analyzed. It also does not use the actual observed data, but the ranks of the data and does not require the assumption that the relationship between variables are linear. Correlations are between -1 and 1 with -1 being the

weakest correlation and 1 being the strongest correlation so a strong correlation would be considered very valid unless otherwise noted through the field and type of research (27, 35).

A Spearman Correlation Coefficient was used for testing validity of the food safety and physical activity domains of the FNPC against results of the Kendall FHQ and the Craig IPAQ. Spearman was also used for testing the dietary quality domain of the FNPC to determine its overall validity score. The mean scores were used to analyze each food group and nutrition behavior as well as determine behavior change from pre-assessment to post-assessment. The following table lists the instruments that were used as gold standards for various domains of the FNPC.

Table 4. FNPC Domains, Question Items, and Instruments Used as Gold Standards

Domain and FNPC Item Numbers	FNPC Item Descriptor	Instrument used as a “gold standard”
Physical Activity Domain:		International Physical Activity Questionnaire – Short Version. Identified as Craig IPAQ
2	Body size/shape keeps me from participating in physical activity	
3	Exercises 30 minutes per day	
45	Ready to be physically active	
Food Safety Domain:		Kendall Food Handling and Eating Preference Questionnaire Identified as Kendall FHQ
14	Washing hands	
15	Washing hands after raw meat	
16	Use meat thermometer	
17	Refrigerate or freeze foods within 2 hours	
18	Thaw frozen meat at room temperature	
50	Eat undercooked hamburgers	
51	Check temperature of refrigerator	
Dietary Quality Domain:		24 hour food recall
4	Variety of foods based on MyPyramid	
5	Breakfast from 3 of 5 food groups	
6	Fruits and vegetables take up half of plate	
12	“super-size” portion	
13	Read food labels for less fat	

23	Eat no more than 6 ounces of meat
24	Eat low-fat foods
25	Eat fried foods
26	Trim fat from meat and chicken
27	Eat fruits and vegetables with the skin on
28	Eat dried beans and peas
29	Eat 6 ounces of breads, cereals, rice and pasta
30	Read food labels for whole grain foods
31	Choose high-fiber foods
32	Eat 1 ½ - 2 cups fruit
33	Eat 2 - 2 ½ cups vegetables
34	New ways of preparing vegetables and fruits
35	Eat 3 ½ - 4 ½ cups of fruits and vegetables
36	Eat deep yellow or dark green vegetables
37	Eat whole wheat bread
38	Drink/eat 3 cups or equivalent of dairy
39	Drink regular soda pop
40	Drink/use low-fat or skim milk
44	“plate method”
46	Food and nutrition needs
49	Buy foods from all 5 major food groups
54	Eat or serve bacon, sausage, or other fatty meat
55	Alcoholic drinks

Item Deletion: After reliability testing, deletion of items was conducted based on observation of eigenvectors for each item. Those that had a low score compared to the rest of the items in that domain were deleted. Eigenvectors are useful in determining the overall characteristic of a particular correlation and how it relates to others in the correlation matrix. It was expected that deletion of the low scoring item would increase the overall reliability score for that domain. In this study, FNPC items that had an eigenvector of $< .10$ in absolute value on one or both pre-administrations of the instrument were deleted. It was expected that item deletion, based on low eigenvectors, would also allow for more accurate validity testing. At the end of the study, low

eigenvector scores were used to make decisions on item deletion, so that the number of items in the FNPC could be reduced from 55 to 30 as recommended by pilot-study participants. The < .10 threshold was selected by the researchers and the statistician after observation of all the eigenvectors and how each one affected the correlation matrix for their designated domain.

Scoring the Kendall FHQ, Craig IPAQ, and the Food and Nutrition Practice Checklist (FNPC).

When scoring the instruments, a simple mean of the item responses was calculated for the physical activity score and the food safety score since all items in those instruments had a 5-point Likert scale. However, the response categories in the FNPC varied requiring special manipulation of responses. Items that had a 3-point Likert were recoded as 2, 3, and 4 instead of 1, 2, and 3 to make them compatible with the 5-point scales. Items with 4-point responses were recoded as 1, 2, 4, and 5. With these adjustments, a mean score of these items was calculated.

When testing the FNPC for validity using "gold standards," the following comparisons were made for three domains of the FNPC:

- Physical Activity: Total minutes of activity collected with the FNPC were compared with minutes of activity collected with the Craig IPAQ. Since this was a skewed distribution, a Spearman correlation was used for the comparison.
- Food Safety: The number of "desirable food safety traits" recorded on the FNPC, as compared with the number on the Kendall FHQ, was used. "Never" and "sometimes" were counted as non-desirable responses. A Spearman correlation was used for this comparison because many of the variables were not normally distributed.
- Dietary Quality: In order to compare dietary quality assessed by the 24-hour dietary recall with that assessed by the FNPC, a single score for each participant had to be calculated on food intake reported on the 24-hour recall. This was done by calculating a modified Healthy Eating Index (HEI) score (53) for each participant based on servings of

food groups and other factors. ERS4 analysis of 24-hour recalls does not provide values on saturated fat, cholesterol, and sodium intake, which would have been desirable in comparisons of dietary quality between the 24-hour recall and the FNPC. However, both the 24-hour recall and the FNPC provided data on the number of servings of grains, fruits, dairy, meat, and vegetables along with total fat and variety. Variety was determined by counting the number of different food items eaten, as reported on the 24-hour food recall. Each component could be calculated on a scale ranging from zero to ten. A score of ten was given if the number of recommended servings for a food group or recommended levels of total fat or variety were met. If the recommended number of servings was exceeded, a score ten was given. If the amount of total fat intake exceeded the recommended level, a score of zero was assigned. If there were no servings of a particular food group, a score of zero was assigned. If scores were in between zero and the recommended amount, they were adjusted according to the number of servings consumed. These components were then added to determine the overall modified-HEI score. The highest possible score was 70. A score > 50 would be considered a “good diet”, 30 - 50 would be considered as diet that “needs improvement”, and <30 would be considered a “poor diet”.

Method of Comparing the FNPC with Gold Standards: Comparisons of certain domains of the FNPC against previously validated instruments were conducted to establish criterion-related validity of the FNPC (8). For dietary quality items in the FNPC, the 24-hour food recall was used as a “gold standard”. For FNPC items measuring physical activity, the Craig IPAQ (43) was used to test for validity. The Kendall FHQ was used (44) to test the validity of the food safety domain of the FNPC.

24-Hour Food Recall. The 24-hour food recall, which is included in the EFNEP/SCNEP Family Record, was administered three times to each subject, twice at pre-intervention and once at post-intervention. Interviews involving the 24-hour recalls consisted of either face to face individual or small group interviews and responses were recorded manually by the PAs. Before the study began, PAs were given special instruction on administering the 24-hour food recalls in individual and group setting. They were urged to follow instructions described in Appendix B (Instructions for collection 24-hour food recalls) to minimize errors and increase reliability of interviewing. Appropriate food models and other props were used to help participants recall amounts of foods consumed.

Craig International Physical Activity Questionnaire (IPAQ). The Craig IPAQ (short version) was used for validity testing of the FNPC physical activity domain. The Craig IPAQ contains seven questions that assess physical activity and inactivity of subjects. The instrument had been extensively tested for reliability and validity across 12 countries at 14 different sites with various income levels and had produced results suggesting that the questionnaire is an acceptable measurement for use in many settings, in different languages, and among diverse populations. Four different versions of the IPAQ have been validated previously, but only the seven-item short version (43) was used in the current study. It contains questions related to a subject's physical activity in the previous seven days). PAs administered this instrument one time at pre-intervention and once at post-intervention.

Kendall Food Handling Questionnaire (FHQ). The Food Handling and Eating Preferences Questionnaire is a behavior assessment instrument that has been tested and shown to be reliable and valid (44). The items are grouped into five sections based on five pathogen control factors. The five major sections contain a varying number of checklist items. Only Sections 1-4 were

used in the current study, as Section 5 did not relate to concepts taught in the Healthy Futures Curriculum. The sections used in this study were as follows:

Section 1: Contains eight checklist items about general practices in food safety, such as washing hands and other activities related to cross-contamination of bacteria.

Section 2: Begins with the question, “Do you refrigerate the following foods within 2 hours of preparing and serving?”, followed by a list of three foods (cooked rice, fried chicken, and refried or cooked beans), to which the subject responded by checking “yes” or “no.”

Section 3: Contains four checklist items that consist of different undercooked foods, with the general question asking, “Do you eat the following foods?” to which subjects checked “yes” or “no”.

Section 4: Begins with the instruction, “For each question below, please check what you usually do”. There are five questions, four dealing with use of a thermometer and one on preparing food if sick, to which subjects responded by checking “yes” or “no.”

CHAPTER 4

Results

Participant Demographics

Eighty-four eligible participants from the Expanded Food and Nutrition Education Program (EFNEP) and the Smart Choices Nutrition Education Program (SCNEP) were enrolled in the study. Of these, 73 subjects completed the study including pre-assessment, intervention, and post-assessment, representing an 87% completion rate. Among the 73 subjects, all were female, 34 (46.6%) non-Hispanic white, 36 (49.3%) non-Hispanic black, and three (4.1%) Asian or Pacific Islander. Fifty-nine (80.8%) subjects participated in at least one food assistance program, such as Women, Infants, and Children/Commodity Supplemental Food Program (CSFP), the Food Stamp program, Commodities, Head Start, Child Nutrition, and the Temporary Assistance for Needy Families (TANF) program. The mean age for the subjects was 35.1 years old, with a range of 20 to 60. Fifteen subjects (20.6%) were from southwest Virginia, seven (9.6%) from northwest, 11 (15.1%) from central, seven (9.6%) from northern, 18 (24.88%) from northeast, and 15 (20.6%) from southeast (based on the six Extension districts). Forty-one (56.2%) lived in urban areas, while 32 (43.8%) were from rural areas. Thirty-nine (53.4%) subjects participated in individual lessons and 34 (46.6%) in a group setting. Nearly equal numbers of individuals completed the two different sets: There were 37 (50.7%) subjects who received lessons 1-4, 5, 7, and 9 (set A) of Healthy Futures and 36 (49.3%) who received lessons 1-4, 6, 8, and 10 (set B).

Reliability

To assess reliability the Food and Nutrition Practice Checklist (FNPC) was tested for both internal consistency, using the Cronbach coefficient, and test-retest reliability, using Pearson Correlation. Results of both tests are listed in Table 5. These types of tests were conducted to determine if items were correlated with each other and if the results of the first administration of the FNPC were consistent with the second administration, respectively. In session 1 of the pre-

assessment, physical activity items in the FNPC had a low Cronbach coefficient (0.41) and the same was true of the food safety domain (0.46). A high Cronbach alpha was achieved during pre-session 1 for dietary quality (0.89). During session two of the pre-assessment, physical activity items in the FNPC were a little higher ($\alpha=0.50$), while food safety was lower ($\alpha=0.32$). For dietary quality, the Cronbach coefficient was just as high as during the first session at 0.88.

Table 5 shows results of testing the FNPC domains for test-retest reliability. Data from pre-session 1 and two of the FNPC were used, with subjects not having been exposed to the Healthy Futures lessons. The time between the two administrations of the instrument was approximately one week. A Pearson correlation coefficient of 0.70 was used as the cut-off, above which the domain was considered to have acceptable test-retest reliability. A value of 0.70 is considered to be a standard for reliability instrument testing (27, 35). Results indicated that the physical activity and dietary quality domains of the FNPC had acceptable test-retest reliability coefficients of 0.77 and 0.87, respectively. On the other hand, the food safety domain had a Pearson Correlation Coefficient of 0.51, which was below the cut-off point indicating that it did not have acceptable reliability scores.

Table 5. Results of Reliability Testing of the Food and Nutrition Practice Checklist (FNPC)

FNPC Pre-assessment	Cronbach Alpha Coefficient (Session 1)	Cronbach Alpha Coefficient (Session 2)	Pearson Correlation Coefficient
Physical Activity	0.41	0.50	0.77
Food Safety	0.46	0.32	0.51
Dietary Quality	0.89	0.88	0.87

Item Deletion

To determine which items should be included or deleted in the validity evaluation, eigenvector analysis was utilized. Deletion of items was based on observation of the eigenvector for each item that had a low score compared to other items in that domain. Data from these analyses are shown in Tables 6, 7, and 8. Items that had an eigenvector of less than .10 in absolute value in one or both pre-administrations of the instrument were deleted.

As seen in Table 6, eigenvectors for all items in the physical activity domain were above the .10 cut-off for deletion. Therefore, all three items in this activity domain were retained for further analysis.

Table 6. Internal Consistency Reliability Scores for Physical Activity

Question Number	Descriptors	Pre-session 1 Eigenvector Scores	Pre-session 2 Eigenvector Scores
2	Body size or shape keeps from participating in physical activity	0.485438	0.406287
3	Exercises 30 minutes per day	0.574971	0.581915
45	Ready to be physically active	0.658604	0.704490

Cronbach Alpha pre-session 1= 0.41; Cronbach Alpha pre-session 2= 0.50; Overall Alpha with Deleted Items= N/A

As a result of having eigenvectors below .10, two items were deleted from the food safety domain of the seven total (Table 7). Items Q50 (eat undercooked hamburgers) and Q51 (check temperature of refrigerator) were deleted because they had low eigenvectors in both of the pre-session administrations of the FNPC. After deleting the two items, the Cronbach alpha for the food safety domain increased to 0.60 for both pre-intervention measurements. One other question on thawing frozen meat (Q 18) had an eigenvector of 0.101026 during pre-session two, equal to the threshold, but for pre-session 1, the eigenvector was 0.388509, which correlated with the rest of the eigenvectors for food safety. The alpha without this item was 0.50. As a result, the item was retained for further analysis.

Table 7. Internal Consistency Reliability Scores for Food Safety

Question Number	Indicators	Pre-session 1 Eigenvector Scores	Pre-session 2 Eigenvector Scores
14	Washing hands	0.488093	0.426401
15	Washing hands after raw meat	0.553389	0.394868
16	Use meat thermometer	0.270659	0.592420
17	Refrigerate or freeze foods within 2 hours	0.443290	0.450382
18	Thaw frozen meat at room temperature	<i>0.388509</i>	<i>0.101026</i>
50	Eat undercooked hamburgers	0.168476	-0.043135
51	Check temperature of refrigerator	-0.080253	0.310467

Italicized eigenvector score represents low scoring item that was kept for validation.

Bolded eigenvector score represents deleted item

Cronbach Alpha pre-session 1= 0.46; Cronbach Alpha pre-session 2= 0.3; Overall Alpha with Deleted Items= 0.60

As shown in Table 8, nine items in the dietary quality domain had eigenvectors below .10 and were omitted from further analysis: Q12 (eating “super size” portions), Q23 (eating no more than six ounces of meat per day), Q27 (eating fruits and vegetables with the skin on, Q28 (eating dried beans and peas), Q29 (eating 6 ounces of breads, cereals, rice, and pasta, Q40 (drinking/using low fat or skim milk), Q49 (buying foods from all 5 major food groups), Q54 (eating or serving bacon, sausage, or other fatty meat), and Q55 (drinking alcoholic beverages. These deletions resulted in the Cronbach coefficient increasing to $\alpha=0.90$ for both the first and second pre-intervention administrations of the FNPC.

Deletion of the 11 items, as described above, would reduce the length of the FNPC from 55 to 44 items. Taking in consideration all items that were evaluated, no items were deleted for physical activity; two were deleted of seven for food safety and nine of 28 for dietary quality. There were 17 other questions in the FNPC that were not tested for reliability or validity which included the domains of food purchasing and disease prevention (See FNPC-44 Items in Appendix C).

Table 8. Internal Consistency Reliability Scores for Dietary Quality

Question Number	Indicators	Pre-session 1 Eigenvector Scores	Pre-session 2 Eigenvector Scores
4	Variety of foods based on MyPyramid	0.204522	0.136313
5	Breakfast from 3 of 5 food groups	0.131938	0.136025
6	Fruits and vegetables take up half of plate	0.232948	0.256848
12	“super-size” portion	0.071219	0.167421
13	Read food labels for less fat	0.247301	0.239926
23	Eat no more than 6 ounces of meat	0.159480	0.041554
24	Eat low-fat foods	0.251727	0.231908
25	Eat fried foods	0.117942	0.134845
26	Trim fat from meat and chicken	0.192272	0.202901
27	Eat fruits and vegetables with the skin on	0.180532	0.087747
28	Eat dried beans and peas	0.060382	0.071757
29	Eat 6 ounces of breads, cereals, rice and pasta	0.075621	0.205488
30	Read food labels for whole grain foods	0.278260	0.287035
31	Choose high-fiber foods	0.267547	0.265002
32	Eat 1 ½ - 2 cups fruit	0.244881	0.211224
33	Eat 2 - 2 ½ cups vegetables	0.274242	0.279781

34	New ways of preparing vegetables and fruits	0.265589	0.211754
35	Eat 3 ½ - 4 ½ cups of fruits and vegetables	0.215146	0.204732
36	Eat deep yellow or dark green vegetables	0.189855	0.270097
37	Eat whole wheat bread	0.171149	0.215238
38	Drink/eat 3 cups or equivalent of dairy	0.195335	0.189115
39	Drink regular soda pop	0.171919	0.199186
40	Drink/use low-fat or skim milk	0.082025	0.169536
44	“plate method”	0.175773	0.146159
46	Food and nutrition needs	0.204734	0.155535
49	Buy foods from all 5 major food groups	0.155251	0.032853
54	Eat or serve bacon, sausage, or other fatty meat	0.015418	0.069600
55	Alcoholic drinks	-0.026318	0.064928

Bold eigenvector score represents deleted item.

Cronbach Alpha pre-session 1= 0.89; Cronbach Alpha pre-session 2= 0.88; Overall Alpha with Deleted Items= 0.90

Validity

To test criterion-related validity of three domains of the FNPC, including physical activity, food safety, and dietary quality, data from these domains were compared with data obtained on the 73 subjects with other previously-validated instruments. All responses, as outlined in methods, were coded to allow for these analyses and Spearman Correlation Coefficients were calculated. Responses to all three items in the Physical Activity domain of the FNPC were compared with total number of activity minutes in the Craig International Physical Activity Questionnaire (IPAQ). The overall Spearman Correlation Coefficient obtained was 0.28. The Kendall Food Safety and Handling Questionnaire (FHQ) was used to validate the food safety domain of the FNPC. The total scores for both instruments yielded an overall Spearman Correlation Coefficient of 0.34.

For dietary quality, items from the FNPC were compared with 24-hour food recalls components that were converted to HEI scores. The dietary quality domain of the FNPC compared with HEI scores yielded a Spearman Correlation Coefficient of 0.20.

Sensitivity to Change

To explore the “sensitivity” of the domains in assessing changes in behaviors, post-intervention scores from the FNPC were compared with pre-session 1 scores. Table 9 shows the results of testing the FNPC domains of physical activity, food safety, and dietary quality for sensitivity to change. All

items, regardless of eigenvector scores, were included in this analysis. Results showed that the FNPC was sensitive to change in all three domains, indicating that the FNPC was able to detect behavior change made by subjects as a result of participating in the Healthy Futures program.

Table 9. Behavior Changes from Pre to Post-Intervention Detected by the FNPC

Domains	Pre-Test* Mean±SD	Post-Test Mean±SD	p-value
Physical Activity	1.1 ± 0.9	1.5 ± 0.8	<.0001
Food Safety	2.4 ± 0.6	2.8 ± 0.6	<.0001
Dietary Quality	2.7 ± 0.7	3.1 ± 0.6	<.0001

*SD= Standard Deviation

*Pre-test data were collected from pre-session 1

P-values are based on paired t-tests with significance considered p<.05

As seen in Table 10, the physical activity mean score of 1.1 at pretest and 1.5 at post-test indicated very low physical activity among subjects, although statistically significant change was achieved in the intervention. In general, subjects reported that their body size did not deter them from engaging in physical activity (Q2), with almost half of subjects selecting “never” or “seldom” as their response. More people reported exercising for 30 minutes a day (Q3) after the intervention than before, along with more of them intending to be more active (Q45). At post-assessment, 30.1% reported being physically active on a regular basis compared to only 16.4% at pre-session 1.

Table 10. Participants’ Self-reported Physical Activity Behaviors

Questions and Responses	Pre-Test* N (%)	Post-Test N (%)
Body size or shape keeps from participating in physical activity (Q 2)		
Never (1)	22 (30.1)	28 (38.4)
Seldom(2)	17 (23.3)	10 (13.7)
Sometimes(3)	16 (21.9)	17 (23.3)
Most of the time(4)	13 (17.8)	13 (17.8)
Always(5)	5 (6.9)	5 (6.9)
How often exercise for 30 minutes per day (Q 3)		
Never (1)	17 (23.3)	5 (6.9)
Seldom(2)	18 (24.7)	10 (13.7)
Sometimes(3)	22 (30.1)	25 (34.3)
Most of the time(4)	11 (15.1)	24 (32.9)
Always(5)	5 (6.9)	9 (12.3)
How ready to be physically active (Q 45)		
Haven’t thought about changing(1)	7 (9.6)	7 (9.6)
Plan a change in next 6 months(2)	25 (34.3)	7 (9.6)
Plan to change this month(3)	9 (12.3)	10 (13.7)
Recently starting doing(4)	20 (27.4)	25 (34.3)
Do this regularly(5)	12 (16.4)	22 (30.1)

*Pre-test data were collected from pre-session 1

Table 11 presents results of comparisons for pre and post-intervention data on participants' food safety behavior as reported on the FNPC. By comparing the responses for each question from pre-session 1 to post-assessment, subjects showed that in general they improved their food safety practices for every measured behavior. For example, 61.6% of subjects stated that they never used a meat thermometer during pre-session 1 (Q 16), but at post-assessment 35.6% reported never using a meat thermometer and 78.1% reported always washing their hands at pre-session 1 (Q 14), while 90.4% reported washing their hands before handling food at post assessment. Overall, the mean food safety score was higher than the physical activity score at pre- and post-assessment.

Table 11. Participants' Self-reported Food Safety Behaviors on the FNPC

Questions and Responses	Pre-Test*	Post-Test
How often:	N (%)	N (%)
Wash hands before eating (Q 14)		
Never (1)	0	0
Seldom(2)	2 (2.7)	0
Sometimes(3)	3 (4.1)	1 (1.4)
Most of the time(4)	11 (15.1)	6 (8.2)
Always(5)	57 (78.1)	66 (90.4)
Wash hands after handling raw meat (Q 15)		
Never (1)	0	0
Seldom(2)	1 (1.4)	1 (1.4)
Sometimes(3)	1 (1.4)	0
Most of the time(4)	11 (15.1)	6 (8.2)
Always(5)	60 (82.2)	66 (90.4)
Use meat thermometer (Q 16)		
Never (1)	45 (61.6)	26 (35.6)
Seldom(2)	11 (15.1)	13 (17.8)
Sometimes(3)	11 (15.1)	14 (19.2)
Most of the time(4)	3 (4.1)	9 (12.3)
Always(5)	3 (4.1)	11 (15.1)
Refrigerate or freeze foods within 2 hours (Q 17)		
Never (1)	5 (6.9)	2 (2.7)
Seldom(2)	3 (4.1)	2 (2.7)
Sometimes(3)	13 (17.8)	7 (9.6)
Most of the time(4)	26 (35.6)	22 (30.1)
Always(5)	26 (35.6)	40 (54.8)
Thaw frozen meat at room temperature (Q 18)		
Never (1)	1 (1.4)	24 (32.9)
Seldom(2)	15 (20.6)	12 (16.4)
Sometimes(3)	12 (16.4)	20 (27.4)
Most of the time(4)	18 (24.7)	10 (13.7)

Always(5)	11 (15.1)	6 (8.2)
Eat undercooked hamburgers (Q 50)		
False/No(1)	71 (97.3)	73 (100.0)
True/Yes(2)	2 (2.7)	0
Check temperature of refrigerator (Q 51)		
False/No(1)	48 (65.7)	28 (38.4)
True/Yes(2)	25 (34.3)	45 (61.6)

*Pre-test data were collected from pre-session 1

Table 12 presents data regarding change from pre to post-intervention specific aspects of dietary quality based on 24-hour food recalls. Results based on calculation of Healthy Eating Index Scores (HEI) showed significant overall improvement from pre to post-intervention ($p < .0001$). The mean HEI score was 43.9 at post-assessment, representing an increase of 2.1 points from the first pre-intervention assessment. Fruit, vegetable, milk, and fat intakes improved. However, it was noted that intake of the Grain and Meat Groups decreased from pre to post-intervention. Overall, responses on dietary quality questions of the FNPC demonstrated the highest pre-assessment and post-assessment mean scores of all three domains.

Table 12. Dietary Changes from Pre- to Post-Intervention Based on 24-Hour Recalls

Category	Pre-Test* Mean±SD	Post-Test Mean±SD	p-value
Grains	7.2 ± 2.9	7.0 ± 3.0	<.0001
Vegetable	6.1 ± 3.9	6.7 ± 3.8	<.0001
Fruit	3.8 ± 4.4	4.3 ± 4.4	<.0001
Milk	4.9 ± 3.9	5.7 ± 3.8	<.0001
Meat	8.2 ± 2.8	8.0 ± 2.8	<.0001
Total Fat	3.4 ± 2.9	3.9 ± 3.3	<.0001
Variety	8.2 ± 2.8	8.2 ± 2.8	0.1768
Overall modified HEI score	41.8 ± 12.0	43.9 ± 13.7	<.0001

*SD= Standard Deviation

*Pre-test data were collected from pre-session 1

P-values are based on paired t-tests with significance considered $p < .05$

Table 13 presents details of subjects' responses on the intakes of recommended servings of different food groups on the FNPC. Results showed that while changes were reported, there was no change in meat intake using the FNPC. Similar to the 24-hour recall, subjects also decreased their intake in the grains group while increasing their intake in fruits and vegetables. For instance, 60.4 % of subjects reported "sometimes," "seldom," or "never" in response to the item on eating no more than

6 ounces of meat per day (Q 23) during pre-session 1 compared to 60.3% during post-assessment. For the grains group, 43.8% reported (most of the time and always) eating 6 ounces of breads, cereals, rice, and pasta per day (Q 29) during pre-session 1 and 42.5% during post-assessment. Percentages increased from 26.0% (pre-session 1) to 43.9% (post-assessment) of subjects reporting desirable behaviors for eating 3 ½ - 4 ½ cups of fruits and vegetables per day (Q 35).

Table 13. Participants' Pre and Post-Intervention Intakes of Food Groups as Reported on the FNPC

Questions and Responses	Pre-Test* N (%)	Post-Test N (%)
Eat no more than 6 ounces of meat per day (Q 23)		
Never(1)	5 (6.9)	6 (8.2)
Seldom(2)	14 (19.2)	7 (9.6)
Sometimes(3)	25 (34.3)	31 (42.5)
Most of the time(5)	20 (27.4)	23 (31.5)
Always(2)	8 (11.0)	6 (8.2)
Eat 6 ounces of breads, cereals, rice and pasta per day (Q 29)		
Never(1)	2 (2.7)	1 (1.4)
Seldom(2)	15 (20.6)	7 (9.6)
Sometimes(3)	24 (32.9)	33 (45.2)
Most of the time(4)	22 (30.1)	25 (34.3)
Always(5)	10 (13.7)	6 (8.2)
Eat 1 ½- 2 cups of fruit per day (Q 32)		
Never(1)	7 (9.6)	3 (4.1)
Seldom(2)	12 (16.4)	10 (13.7)
Sometimes(3)	23 (31.5)	17 (23.3)
Most of the time(4)	19 (26.0)	30 (41.1)
Always(5)	12 (16.4)	12 (16.4)
Eat 2-2 ½ cups of vegetables per day (Q 33)		
Never(1)	6 (8.2)	3 (4.1)
Seldom(2)	13 (5.5)	7 (9.6)
Sometimes(3)	20 (27.4)	15 (20.6)
Most of the time(4)	27 (37.0)	36 (49.3)
Always(5)	7 (9.6)	10 (13.7)
Eat 3 ½ - 4 ½ cups of fruits and vegetables per day (Q 35)		
Never(1)	4 (5.5)	1 (1.4)
Seldom(2)	21 (28.8)	13 (5.5)
Sometimes(3)	29 (39.7)	26 (35.6)
Most of the time(4)	16 (21.9)	24 (32.9)
Always(5)	3 (4.1)	8 (11.0)

*Pre-test data were collected from pre-session 1

Table 14 presents data on subjects' responses to items on the FNPC that are related to following principles in the 2005 Dietary Guidelines for Americans. Again, improvements were seen in all areas, although change was minimal for some items. For example, 42.5% of subjects reported

desirable responses for the item on eating a variety of foods based on MyPyramid (Q 4) compared to 63.1% during the post-assessment. For the item on eating dried beans and peas (Q 28), 17.8% selected “most of the time” or “always” for pre-session 1 compared to 27.4% for the post-assessment.

Table 14. Participants’ Responses on the FNPC Items Related to Dietary Guidelines for Americans

Questions and Responses	Pre-Test* N (%)	Post-Test N (%)
Eat a variety of foods based on MyPyramid (Q 4)		
Never(1)	8 (11.0)	2 (2.7)
Seldom(2)	6 (8.2)	2 (2.7)
Sometimes(3)	27 (37.0)	23 (31.5)
Most of the time(4)	21 (28.8)	35 (48.0)
Always(5)	10 (13.7)	11 (15.1)
Eat low-fat foods (Q 24)		
Never(1)	14 (19.2)	8 (11.0)
Seldom(2)	18 (24.7)	9 (12.3)
Sometimes(3)	23 (31.5)	34 (46.6)
Most of the time(4)	15 (20.6)	18 (24.7)
Always(5)	3 (4.1)	3 (4.1)
Eat dried beans and peas (Q 28)		
Never(1)	12 (16.4)	11 (15.1)
Seldom(2)	25 (34.3)	11 (15.1)
Sometimes(3)	21 (28.8)	30 (41.1)
Most of the time(4)	11 (15.1)	16 (21.9)
Always(5)	2 (2.7)	4 (5.5)
Choose high-fiber foods (Q 31)		
Never(1)	21 (28.8)	11 (15.1)
Seldom(2)	18 (24.7)	8 (11.0)
Sometimes(3)	22 (30.1)	28 (38.4)
Most of the time(4)	7 (9.6)	20 (27.4)
Always(5)	5 (6.9)	6 (8.2)
Eat deep yellow or dark green vegetables (Q 36)		
Never(1)	3 (4.1)	3 (4.1)
Seldom(2)	12 (16.4)	7 (9.6)
Sometimes(3)	28 (38.4)	25 (34.3)
Most of the time(4)	23 (31.5)	30 (41.1)
Always(5)	7 (9.6)	7 (9.6)
Eat whole wheat bread (Q 37)		
Never(1)	17 (23.3)	7 (9.6)
Seldom(2)	15 (20.6)	10 (13.7)
Sometimes(3)	16 (21.9)	18 (24.7)
Most of the time(4)	10 (13.7)	17 (23.3)
Always(5)	15 (20.6)	20 (27.4)
Drink/eat 3 cups or equivalent of dairy per day (Q 38)		
Never(1)	5 (6.9)	3 (4.1)
Seldom(2)	14 (19.2)	13 (18.6)
Sometimes(3)	27 (37.0)	22 (30.1)
Most of the time(4)	17 (23.3)	21 (28.8)
Always(5)	10 (13.7)	13 (18.6)

*Pre-test data were collected from pre-session 1

Table 15 and 16 present data gathered at pre and post-intervention by use of the FNPC on a wide range of behaviors, such as label reading, food purchasing patterns, and behaviors related to eating a balanced diet that contributes to weight control and disease prevention. Subjects' responses on the FNPC indicated that they improved on most of these behaviors as a result of the intervention. For example, 34.3% of subjects reported that fruits and vegetables take up half of their plate "most of the time" during pre-session 1 and 53.4% at post-assessment. Other behaviors that had substantial improvement included reading labels for less fat, reading food labels for whole grains, trimming fat from meat and chicken, eating vegetables and fruit with skin on, eating 6 ounces of bread, cereal, rice, and pasta, and trying new ways to prepare fruits and vegetables. For example, 23.5% reported desirable behavior during pre-test for reading food labels for less fat (Q13) compared to 45.2% at post-test. There was a slight increase in subjects reporting that they bought foods from all 5 major food groups (Q49) from pre-test (82.2%) to post-test (91.8%).

Table 15. Participants' Pre- and Post-Intervention Responses to Items on the FNPC that Assessed Label Reading and Food Purchasing Patterns

Questions and Responses	Pre-Test* N (%)	Post-Test N (%)
Read food labels for less fat (Q 13)		
Never(1)	14 (19.2)	7 (9.6)
Seldom(2)	17 (23.3)	10 (13.7)
Sometimes(3)	19 (26.0)	22 (30.1)
Most of the time(4)	14 (19.2)	21 (28.8)
Always(5)	9 (12.3)	12 (16.4)
Read food labels for whole grain foods (Q 30)		
Never(1)	25 (34.3)	10 (13.7)
Seldom(2)	18 (24.7)	13 (20.6)
Sometimes(3)	17 (23.3)	23 (31.5)
Most of the time(4)	5 (6.9)	20 (27.4)
Always(5)	7 (9.6)	7 (9.6)
Buy foods from all 5 major food groups (Q 49)		
False/No(1)	12 (16.4)	5 (6.9)
True/Yes(2)	60 (82.2)	67 (91.8)

*Pre-test data were collected from pre-session 1

Table 16. Participants' Responses to Other Dietary Behaviors Assessed by the FNPC

Questions and Responses	Pre-Test* N (%)	Post-Test N (%)
Breakfast includes foods from 3 food groups (Q 5)		
Never(1)	8 (11.0)	6 (8.2)
Seldom(2)	17 (23.3)	6 (8.2)
Sometimes(3)	27 (37.0)	27 (37.0)
Most of the time(4)	17 (23.3)	25 (34.3)
Always(5)	4 (5.5)	9 (12.3)
Fruits and vegetables take up half of plate (Q 6)		
Never(1)	7 (9.6)	0
Seldom(2)	11 (15.1)	7 (9.6)
Sometimes(3)	21 (28.8)	19 (26.0)
Most of the time(4)	25 (34.3)	39 (53.4)
Always(5)	9 (12.3)	8 (11.0)
Choose "super-size" portion (Q 12)		
Never(1)	24 (32.9)	32 (43.8)
Seldom(2)	23 (31.5)	24 (32.9)
Sometimes(3)	20 (27.4)	9 (12.3)
Most of the time(4)	4 (5.5)	6 (8.2)
Always(5)	1 (1.4)	2 (2.7)
Eat fried foods (Q 25)		
Never(1)	2 (2.7)	2 (2.7)
Seldom(2)	19 (26.0)	29 (39.7)
Sometimes(3)	25 (34.3)	27 (37.0)
Most of the time(4)	22 (30.1)	11 (15.1)
Always(5)	5 (6.9)	3 (4.1)
Trim fat from meat and chicken (Q 26)		
Never(1)	11 (15.1)	5 (6.9)
Seldom(2)	13 (20.6)	4 (5.5)
Sometimes(3)	16 (21.9)	19 (26.0)
Most of the time(4)	12 (16.4)	16 (21.9)
Always(5)	21 (28.8)	28 (38.4)
Eat fruits and vegetables with skin on (Q 27)		
Never(1)	5 (6.9)	3 (4.1)
Seldom(2)	5 (6.9)	2 (2.7)
Sometimes(3)	21 (28.8)	17 (23.3)
Most of the time(4)	26 (35.6)	37 (50.7)
Always(5)	14 (19.2)	14 (19.2)
Try new ways of preparing vegetables and fruits (Q 34)		
Never(1)	16 (21.9)	5 (6.9)
Seldom(2)	8 (11.0)	8 (11.0)
Sometimes(3)	32 (43.8)	32 (43.8)
Most of the time(4)	12 (16.4)	16 (21.9)
Always(5)	4 (5.5)	11 (15.1)
Drink regular non-diet soft drinks (Q 39)		
Never(1)	14 (19.2)	17 (23.3)
Seldom(2)	19 (26.0)	22 (30.1)
Sometimes(3)	13 (20.6)	18 (24.7)
Most of the time(4)	11 (15.1)	4 (5.5)
Always(5)	16 (21.9)	11 (15.1)

Drink/use low-fat or skim milk(Q 40)		
Never(1)	21 (28.8)	16 (21.9)
Seldom(2)	12 (16.4)	11 (15.1)
Sometimes(3)	10 (13.7)	10 (13.7)
Most of the time(4)	11 (15.1)	19 (26.0)
Always(5)	18 (24.7)	15 (20.6)
Use “plate method” (Q 44)		
Not very much(1)	40 (54.8)	10 (13.7)
Somewhat(2)	23 (31.5)	33 (45.2)
Very much(3)	10 (13.7)	29 (39.7)
Food and nutrition needs are being met (Q 46)		
Strongly disagree(1)	6 (8.2)	3 (4.1)
Disagree(2)	16 (21.9)	9 (12.3)
Agree(3)	39 (53.4)	44 (60.3)
Strongly Agree(4)	9 (12.3)	13 (24.5)
Eat or serve bacon, sausage, or other fatty meat (Q 54)		
20 and up(1)	8 (11.0)	5 (6.9)
11-20(2)	4 (5.5)	3 (4.1)
1-10(3)	51 (69.9)	52 (71.2)
None(4)	9 (12.3)	13 (5.5)
Drink alcoholic beverages (Q 55)		
20 and up(1)	3 (4.1)	1 (1.4)
11-20(2)	3 (4.1)	1 (1.4)
1-10(3)	14 (19.2)	15 (20.6)
None(4)	52 (71.2)	55 (75.3)

*Pre-test data were collected from pre-session 1

Reliability and Validity by Race

The white and black race groups' were compared on their FNPC responses by comparing their internal consistency reliability scores and validity scores for the three domains (physical activity, food safety, and dietary quality).. The internal consistency for non-Hispanic whites was $\alpha = 0.38$ for physical activity, $\alpha = 0.32$ for food safety, and $\alpha = 0.88$ for dietary quality. For non-Hispanic blacks, internal consistency was $\alpha = 0.44$ for physical activity, $\alpha = 0.70$ for food safety, and $\alpha = 0.93$ for dietary quality. The Spearman Correlation Coefficient for non-Hispanic white was 0.56 for physical activity, 0.11 for food safety, and 0.20 for dietary quality. For non-Hispanic blacks, Spearman Correlation Coefficient was 0.03 for physical activity, 0.60 for food safety, and 0.20 for dietary quality. Overall, the results were comparable, although higher reliability and validity scores were observed in almost all cases for non-Hispanic Blacks.

CHAPTER 5

Discussion and Conclusions

Discussion and Conclusions

The results of this study highlight several important findings about the Food and Nutrition Practice Checklist instrument. First, it was found to be reliable in the physical activity and dietary quality domains by having test-retest reliability scores that were greater than .70. Due to possible measurement instability however, food safety measures were not considered reliable. Several studies indicate that an instrument must be reliable first in order for it to be considered valid (16, 27).

Regarding validity testing, all three domains had relatively low Spearman Correlation scores (Physical Activity = 0.28; Food Safety = 0.34; Dietary Quality = 0.20). The dietary quality domain demonstrated the lowest correlation with the 24-hour recall, which was used as the gold standard in this study.

In terms of its relevance to different ethnicities, the FNPC was found to have higher levels of reliability and validity for non-Hispanic blacks than whites. The reliability and validity scores for both groups in dietary quality were acceptable indicating that it may be appropriate for both ethnicities. Still, it cannot necessarily be concluded that the instrument is culturally appropriate without further research.

Regarding sensitivity to change, results indicated that the FNPC can be used for program evaluation since it detected behavior change. More items might need to be deleted through further testing, expert panel discretion, or researcher discretion in order for it to be shortened to 30 questions as recommended by the pilot-test subjects. EFNEP/SCNEP workers also stated that an

instrument of 55 items would be too cumbersome for use with a limited-literacy population, such as that targeted by EFNEP and FSNE.

Some of the differences in reliability scores between the domains may be attributed to the number of questions. For example, dietary quality had an overall acceptable Cronbach alpha and Pearson Correlation coefficient with a total of 28 variables, whereas physical activity and food safety had low scores for both tests of reliability, with only three and seven items, respectively. When an indicator has a low number of variables, it tends to have a lower reliability score (16).

Another contributing factor to the reliability scores could be that to some questions on the FNPC there were a large number of responses in one or two response categories at both pre and post-assessment, with little change achieved. These questions included: Q12 - “super-size” portion; Q23 – eat no more than 6 ounces of meat per day; Q27 – eat fruits and vegetables with skin on; Q28 - eat dried beans and peas; Q29 - eat 6 ounces of breads, cereals, rice and pasta per day; Q40 - drink/use low-fat or skim milk; Q49 - buy foods from all 5 major food groups; Q50 - eat undercooked hamburgers; Q51 - check temperature of refrigerator; Q54 - eat or serve bacon sausage or other fatty mea; and Q55 - drink alcoholic beverages.

The achievement of low validity scores may have been due to misperception of what was being asked in some items. Also, limitations in the analysis and scoring of 24-hour recalls may have contribution to a low validity scores for dietary quality. Particularly, one question on super-size portions (Q 12) scored poorly because the ERS4 analysis of 24-hour recalls did not analyze for super-size portions. Also, ERS4 does not specifically analyze for intake of certain dietary factors, such as intake of sodium, whole grains, dried beans and peas that are addressed in the FNPC.

Items in the FNPC domain for physical activity did not correlate well with the IPAQ possibly due to a major difference between the two instruments on questions asked. The physical activity domain included questions on body size/shape related to being active and intent to become more active, neither of which was addressed by the IPAQ. The only question in the FNPC that was similar to IPAQ questions was Q3 – “How often do you exercise for a total of 30 minutes each day”. In contrast, the IPAQ questions consisted of levels of physical activity and amount of time spent on physical activity. Since only question 3 of the FNPC was closely related to the IPAQ questions suggests that a different gold standard instrument might have achieved better results. Unfortunately, no other physical activity instrument was found in the literature that had been adequately tested. Another solution might be to add additional or different questions on physical activity to the FNPC.

Regarding the low validity score achieved by the dietary quality domain, there were questions on consuming specific amounts of food, such as “six ounces of meat” or “six ounces of breads, etc.” If a subject did not have a good sense of how ounces translate to serving sizes of meats and bread/cereals, it would be difficult for them to accurately report this information. As a result, these questions would either need to be omitted from the FNPC, or participants in programs would need to be educated on how to judge ounces of foods in the Meat and Bread/Cereal Groups.

For validity analysis, challenges also existed in establishing a cut-off point for item deletion. It was determined a priori that deletion of items after reliability testing would be based on low eigenvectors for those items compared to other items in that domain. Deleting items with low eigenvectors was expected to increase the overall scores for that domain. Since it was observed that eigenvector scores less than 0.10 in absolute value were among the lowest scores

in all three domains in comparison to other scores in that domain, the cut-off point of 0.10 was chosen as the cut-off for both pre-session measurements in determining which items to delete. This also included any score that may have been average or high in one assessment session, but was below this cut off in another session. However in one case, the deletion of Q18 on thawing frozen meat at room temperature did not increase the alpha for the food safety domain when it was deleted (alpha without Q18 was 0.50). So it was decided by the researchers to retain it for further analyses. For purposes of reducing the number of total questions in the FNPC from 44 to 30, a higher eigenvector score would need to be utilized as the cut-off for deletion.

Although Spearman Correlations were low for the physical activity and food safety domains, they can still be considered to have criterion-related validity because they were sensitive to changes in reported behavior. Furthermore, the seemingly low correlations of 0.28 (physical activity), 0.34 (food safety), 0.20 (dietary quality) might be viewed as showing acceptable validity. Other reports in the literature have shown that these are average levels that are achieved with some other validation studies (23, 43).

For instance, Murphy et al. (23) used Spearman Correlation Coefficient to determine validity between food behavior checklist items, serum carotenoid levels, and mean intakes of 24-hour recalls. Results showed that correlations for each item averaged between 0.20 and 0.36 for both serum levels and 24-hour recalls, but these were considered unsuccessful by investigators in comparison to items that achieved correlations that were > 0.40 . Craig et al. (43) used Spearman Correlation Coefficient to determine validity between the long and short International Physical Activity Questionnaires (IPAQ) and the CSA accelerometer. Results showed that the short form achieved a coefficient of 0.30 which was deemed acceptable for use among various audiences

and can be compared to the 0.28 that the FNPC received for physical activity when validated against the short-form of IPAQ.

One of the main strengths of the current study was the high retention and completion rate among participants: There was only 11 drop-outs due to changing residency, scheduling conflicts, or incomplete data. The study sample also proved to be similar to the total EFNEP and SCNEP population in Virginia (49, 50) based on percentages of race, age, and geographical location.

Sensitivity to Change. The findings demonstrated that subjects had improved their food safety practices from pre-session 1 to post-assessment. However, the change in responses may also be a reflection of the knowledge that they have gained after exposure to Healthy Futures, rather than actual behavior change. Self-reported dietary quality scores and servings of different food groups also did not take into account individual responses on 24-hour recalls. Therefore, while improvements were seen in dietary quality with the FNPC, consideration should be given to the possibility that scores may not fully reflect dietary quality, only “perceptions” of dietary quality and number of servings.

Despite its low overall score based on Spearman coefficients, dietary quality may be considered to have an acceptable criterion-related validity score because the FNPC was able to detect change among subjects due to its comparison with the 24-hour food recalls. Spearman Correlation Coefficient analysis was used since it is used frequently in validity testing (27, 35). There was a decrease in grains and meat which may have indicated that other food groups (vegetables, fruits, and milk) were increased as intake of grains and meats increased. However, it should be noted that grains and meat were the highest mean scores at both pre and post-intervention, which indicated that subjects were meeting their needs in those food groups even

before the intervention. That being true, further increase on intake of these groups would not be expected.

Scores for total fat intake indicated that more subjects had $\geq 30\%$ energy from fat at post-intervention as compared with $\geq 45\%$ energy from fat at pre-intervention. This indicates a major improvement in calorie balance regarding to fat intake as a result of the intervention. The variety score did not change possibly because subjects had previously reported eating a variety of foods. The overall post-intervention HEI score of 43.9 indicates that subjects' diet "need improvement". The overall modified post-intervention HEI scores in the current study are similar to scores of subjects that participated in the nationwide Healthy Eating Index study in 1999-2000 (53).

Since an analysis was not done to determine the validity on individual items in the FNPC, it is not clear as to which questions had better or worse reliability and validity. However, questions could be retested or individually evaluated by the researcher and expert panel members, based on eigenvectors and experience of EFNEP/SCNEP workers, to determine which questions should be deleted or retained for future use of the FNPC for program evaluation.

When assessing the comparisons between black and white races, non-Hispanic blacks demonstrated higher reliability scores than non-Hispanic whites, but the reason for this is not clear. The reason might be determined by conducting future focus groups with non-Hispanic black participants. On the other hand, non-Hispanic whites had a higher validity score for physical activity than non-Hispanic blacks. Both groups had the same validity score for dietary quality. Since the validity for the both groups on dietary quality was 0.20, which is the same score for overall dietary quality for the instrument, the FNPC can be viewed as equally culturally sensitive for whites and blacks in the dietary quality domain. Plus, acceptable reliability scores were achieved for dietary quality for both race groups. However, it should be noted that there

are few reports in the literature on analyzing instruments for cultural sensitivity or appropriateness.

Limitations

While there are several strengths to this study, there are also several limitations. First, there were 22 PAs involved in collecting data and teaching lessons. This could have led to a difference in teaching methods that affected presentation of the material and topics in a consistent manner, as well as a difference in how instruments were administered.

Secondly, there were some missing values in the data. During the first pre-session, all 73 subjects completed the FNPC, but during the second pre-session, only 86% (n=63) of subjects responded to the FNPC, which necessitated that analyses be adjusted for each type of test and domain.

Thirdly, the FNPC was lengthy, which may have resulted in participants not giving thoughtful responses to all items (8, 18). Since subjects had to complete five instruments during pre-assessment and four instruments during post-assessment, the number of items that had to be answered may have been overwhelming for many subjects. This indicates that testing of several different domains, using different gold standard instruments at one time with limited-literacy subjects, is not the best way to proceed. The respondent burden of a large number of questions in addition to responding to a 24-hour recall may have caused subjects to give less attention and care when answering questions. There were also a considerable number of specific directions there were asked to follow for each instrument. Further consideration should be given to re-designing the FNPC to measure fewer, but sufficient, numbers of items for each domain in order to yield overall acceptable internal consistency. Finally, no comparison of scores were made with subjects on age, Extension district regions, rural/urban areas, teaching style

(individual/group setting), sets A and B of Healthy Futures, and participation in food assistance programs.

Future Research

Future research should include re-testing the FNPC by splitting the domains into different testing periods instead of testing all three domains at the same time. This may increase the power of the study while producing more credible findings. Testing for validity for individual items as well as overall validity will help determine item deletion. The instrument should be tested among other races and Latino/Hispanic groups (who speak English). Construct validity should also be tested since the FNPC was developed based on concepts of Healthy Futures and would assist in detecting individual items that may need to be deleted due to its poor validity score. Testing of the food buying and chronic disease prevention domains would be good to test in a future study as well, if “gold standards” can be identified.

Applications. The results from this study will be useful as a reference for similar studies in the future. The FNPC could be used to detect behavior change among low-income participants in nutrition education programs, particularly where ERS4 or NEERS5 are used as the evaluation system since FNPC items were mostly derived from the ERS4 checklist databank. Data entry and analysis would be easier in future use of this instrument in states where these evaluation programs are used. The methodology used for development and testing of the FNPC may be useful for other researchers in designing instruments to measure behavior change among low-income audiences, or other populations.

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APPENDICES

Appendix A

**Expert Panel Members for Study to Develop and Validate an Assessment
Instrument for the Healthy Futures Curriculum**

Panel Member	Position	Healthy Futures Lesson Assignment	Completion date and Comments
Susan O'Brien suobrien@vt.edu	SCBEP PA Accomack County	1. Committing to a Healthy Lifestyle	
Judy Midkiff, MS jmidkiff@vt.edu	Area Coordinator, NW	2. Choosing Healthy Foods 4. Keeping Food Safe	
Joan Wages, MS jwages@vt.edu	Food/Nutrition Agent, Patrick	3. Stretching Food Dollars & Food Stamps 7. Cut the Fat for Better Health	
Mary Ann McFarland, RD mamcfar@vt.edu	Area Coordinator SW	5. Preventing Cancer with Good Nutrition & Healthy Habits 10. Calcium, Milk and Your Health	
Viola Holmes, MS, RD vholmes@vt.edu	Food/nutrition Agent- Albermarle & Charlottesville	6. Preventing Cardiovascular Diseases and Diabetes 8. Fiber Facts and Food Sources	10-17-05
B. Carol Haynes haynes04@vt.edu	PA – Franklin Co.	9. Fruits, Vegetables and Whole Grains Too	10-14-05

**Concepts Taught in Healthy Futures Curriculum
of Primary Importance in Assessment of Impacts
Identified by Expert Panel (10-25-05)**

Chapter 1: Committing to Healthy Lifestyles

- a. Healthy lifestyle practices include eating nutritious food, getting physical activity, adequate sleep, and regular checkups.
- b. Continued periods of stress can cause harmful effects on our health.
- c. It is important to get moderate physical activity every day to maintain a healthy lifestyle.

Lesson 2: Choosing Healthy Foods

- a. Consume a variety of foods.
- b. Consume breakfast which includes at least 3 food groups.
- c. Understand which products are whole grain and consume these foods so that at least half of the grains consumed are whole grain.

Lesson 3: Stretching Your Food Dollars

- a. Buying healthy foods can save you money in the long run.
- b. Planning ahead is key to using your food resource money wisely. Or
Narrower: Planning meals ahead of time will help you save money.
- c. The unit pricing labels found on grocery shelves can help you determine the best buy.

Lesson 4: Keeping Food Safe

- a. Control the temperatures of all foods (cold foods <41 degrees and hot foods cooked to appropriate temperatures)
- b. Thaw foods safely.
- c. Utilize proper hand-washing techniques.

Lesson 5: Preventing Cancer with Good Nutrition & Healthy Habits

- a. EFNEP and SCNEP participants will know the seven warning signs of cancer and take appropriate medical action.
- b. EFNEP and SCNEP participants will implement at least one lifestyle habit to reduce cancer risk.
- c. EFNEP and SCNEP participants can identify at least three foods that can fight cancer and incorporate these into their diets.

Lesson 6: Preventing Cardiovascular Disease and Diabetes

- a. Participants need to know the 2 main dietary risk factors associated with heart disease: too much fat & too many calories.
- b. Participants should know that in order to prevent getting Type II DM, they should: lose weight if they need to or maintain their weight, participant in regular physical activity, decrease their fat and total calorie intake.
- c. Participants should be able to identify non-dietary risk factors associated with both CVD & DM: tobacco use, heredity, stress, excessive ETOH consumption

Lesson 7: Cut the Fat for Better Health

1. Too much saturated fat can raise “bad” blood cholesterol levels and increase risk for heart disease.
2. Changing the way you prepare food can help you reduce fat in your diet.
3. To identify hidden sources of fat, read food labels on packaged foods.

Lesson 8: Fiber Facts and Food Sources

- a. Participants should be familiar with reasons why high fiber foods are important for health: health of GI Tract, weight maintenance/loss, colon cancer risk reduction.
- b. Participants should know the major types of foods that provide fiber: whole grain breads and cereals, fruits, vegetables, legumes, nuts and seeds.
- c. Participants should understand how to select a whole grain bread or cereal product when shopping (a whole grain is listed first & a one-ounce serving gives at least 2 grams fiber).

Lesson 9: Fruits, Vegetables and Grains

- a. An individual’s risk of cancer is greatly influenced by the foods we choose and the method in which we prepare them.
- b. To maintain a healthy body fruits, vegetables and whole grains must be a part of our daily good intake..
- c. Vitamins and nutrients received directly from the food source are of greater value to our bodies, versus trying to supplement with synthetic forms such as pills.

Lesson 10: Calcium, Milk, and Your Health

- a. EFNEP and SCNEP participants will identify at least three methods to prevent osteoporosis and incorporate these methods into their lifestyles.
- b. EFNEP and SCNEP participants can describe calcium as a nutrient and list three or more functions of calcium in their bodies.
- c. EFNEP and SCNEP participants can identify and incorporate into their diets three or more excellent or good sources of calcium.

Concepts Taught in Healthy Futures Curriculum Specific Behaviors and ERS4 Items

Chapter 1: Committing to Healthy Lifestyles

- a. Healthy lifestyle practices include eating nutritious food, getting physical activity, adequate sleep, and regular checkups.
- b. Continued periods of stress can cause harmful effects on our health.
- c. It is important to get moderate physical activity every day to maintain a healthy lifestyle.

Specific Measurable Behaviors	Rank	ERS4 Checklist Item # and Wording of ERS question
When choose foods, consider nutritious choices		
Make effort to get adequate physical activity		
Get adequate sleep		
Control stress level		
Make effort to stop smoking/reduce # cigarettes		
Reduce number alcoholic drinks per week to 7 or less		
Check with doctor before long-term use of over-the-counter medications and herbals		

Lesson 2: Choosing Healthy Foods

- a. Consume a variety of foods.
- b. Consume breakfast which includes at least 3 food groups.
- c. Understand which products are whole grain and consume these foods so that at least half of the grains consumed are whole grain.

Specific Measurable Behaviors	Rank	ERS4 Checklist Item # and Wording of ERS Question
Eat variety of foods from all food groups		
Read food labels to choose healthy foods		
Consider long-term health, when choosing foods		
Eat breakfast with foods from at least 3 of 5 food groups		
Eat equivalent of 2 cups fruits daily		
Eat equivalent of 2 ½ cups vegetables daily		
Eat deep yellow or dark green vegetables several times a week		
Use "plate method" to judge healthy portions of food groups (meat, vegetables/fruits, bread/cereals/starches).		

Lesson 3: Stretching Your Food Dollars

- a. Buying healthy foods can save you money in the long run.
- b. Planning ahead is key to using your food resource money wisely. Or
Narrower: Planning meals ahead of time will help you save money.
- c. The unit pricing labels found on grocery shelves can help you determine the best buy.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording of ERS Question
Plan meals/snacks ahead of time based on nutrition and best buys for the week		
Make a grocery list and stick to it		
Cook most foods from scratch - limit use of fast foods and convenience foods		
Choose convenience foods based on near equal cost and nutrition value as those made at home		
Buy the store or generic brands of staple foods		
Use unit prices on store shelves to select best food buys		

Lesson 4: Keeping Food Safe

- a. Control the temperatures of all foods (cold foods <41 degrees and hot foods cooked to appropriate temperatures)

- b. Thaw foods safely.
- c. Utilize proper hand-washing techniques.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Practice personal hygiene: • Wash hands in soap/warm water before handling food • Cover nose/mouth with tissue if cough or sneeze		
Cook foods adequately: Such as cooking meats to recommended temperatures		
Avoid cross-contamination: • Use soap/warm water, to wash knives, surfaces where meat, poultry, or fish has touched • Keep raw meat separated from other foods.		
Keep foods at a safe temperature: • Check refrigerator to insure <41 degrees F. • Check freezer to insure at 0 degrees F.		
Thaw foods safely in refrigerator (not at room temp.)		

Lesson 5: Preventing Cancer with Good Nutrition & Healthy Habits

- a. Seven warning signs of cancer and appropriate action to take if they are present
- b. Implementation of lifestyle habits to reduce cancer risk.
- c. Foods that fight cancer –Making them a part of daily food intake.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Watch for warning signs of cancer and tell doctor if present		
Stop smoking or reduce number of cigarettes smoked		
Avoid excessive exposure to sun and tanning beds		
Get at least 30 minutes physical activity on most days		
Increase intake of fruits, vegetables, whole grains and other high fiber foods		
Decrease intake of high fat foods		
Lose weight or don't gain more, if overweight		

Lesson 6: Preventing Cardiovascular Disease and Diabetes

- a. Dietary risk factors associated with heart disease: too much fat & too many calories.
- b. To reduce risk of getting Type 2 diabetes, lose weight or stop gaining weight, get regular physical activity, decrease fat and calorie intake.
- c. Non-dietary risk factors associated with both CVD and Diabetes: tobacco use, heredity, stress, excessive alcohol consumption

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Get at least 30 minutes physical activity on most days		
Decrease intake of foods high fat, saturated fat, trans-fat		
Lose weight if overweight or avoid gaining more		
Reduce fat/calorie intake: • Modify recipes to reduce fat and calories • Reduce portion size of high-fat/high-calorie foods		
Stop smoking or reduce use of tobacco products		
Reduce alcoholic drinks to 7 or less per week		
Take action to control stress		
Take action to keep blood pressure at healthy level		

Lesson 7: Cut the Fat for Better Health

1. Too much saturated fat can raise “bad” blood cholesterol levels and increase risk for heart disease.
2. Changing the way you prepare food can help you reduce fat in your diet.
3. To identify hidden sources of fat, read food labels on packaged foods.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Choose lean cuts of beef and pork and limit portion size		
More often choose fish and poultry (without skin) and dried beans/peas as main dish		
Modify recipes to reduce fat/calorie level		
Substitute Canola or Olive oil for animal fats and solid shortening, margarine, and butter		
Trim fat and skin from meat and poultry before cooking		

Lesson 8: Fiber Facts and Food Sources

- High-fiber foods and importance to health: healthy GI Tract, weight maintenance/loss, colon cancer risk reduction.
- Major sources of fiber: whole grain breads and cereals, fruits, vegetables, legumes, nuts and seeds.
- Ability to identify whole grain bread or cereal products a whole grain is listed first and a 1-ounce serving provides at least 2 grams fiber).

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Eat recommend amount vegetables, and choose leafy greens often		
Eat recommended amount fruits and eat with peeling		
Eat dried beans and peas for main dish several times a week		
Eat more whole grains and high fiber cereals		
Check labels to identify whole grains and fiber level		
Eat nuts and fruit for dessert instead of sweets		

Lesson 9: Fruits, Vegetables and Grains

- High intake of fruits and vegetables is associated with low cancer risk.
- For best health, increase intake of fruits, vegetables and whole grains.
- Vitamins and nutrients received directly from the food source are of greater value to our bodies, versus trying to supplement with synthetic forms such as pills.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Eat 2 cups or equivalent of fruits every day		
Eat 2 ½ cups or equivalent in vegetables every day		
Cook vegetables/fruits in small amount water and do not over-cook		
Eat raw fruits with skin		
Choose wide range of colors in vegetables/		
When serving your plate, fill half with fruits/vegetables		

Lesson 10: Calcium, Milk, and Your Health

- Osteoporosis can be prevented with several lifestyle changes
- Calcium and vitamin D are very important nutrients with many functions.
- re excellent or good sources of calcium.
- We need to insure adequate of calcium and vitamin D

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Increase milk and milk products to 3 cups or more		
Increase non-dairy sources of calcium		
Insure adequate amounts of Vitamin D (fortified milk or at least 15 minutes sun exposure daily)		
Drink milk as beverage instead of sodas, etc.		
Choose low-fat or skim milk and reduced-fat cheeses		
Increase physical activity to reduce osteoporosis risk		
When selecting calcium supplement, choose one that is well-absorbed and contains Vitamin D		

Concepts Taught in Healthy Futures Curriculum Specific Behaviors and ERS4 Items 2

Chapter 1: Committing to Healthy Lifestyles

- a. Healthy lifestyle practices include eating nutritious food, getting physical activity, adequate sleep, and regular checkups.
- b. Continued periods of stress can cause harmful effects on our health.
- c. It is important to get moderate physical activity every day to maintain a healthy lifestyle.

Specific Measurable Behaviors	Rank	ERS4 Checklist Item # and Wording of ERS question
When choose foods, consider nutritious choices		(004) Are food and nutrition needs being met? (011) Do you trim the fat before cooking? (012) Do you eat foods without adding salt? (018) & (CA046) Do you eat low-fat foods? (CA043) Do you buy food products low in salt? (IN121) How often do you eat fried foods? (IN112) Do you drink 6 cups of water? (CA044) Do you drink regular soda everyday? (IN103) How often do you consume caffeine? (CA047) Do you use lower fat milk? (CA049) Do you eat whole wheat bread? (MA004) Do you eat mostly low-fat foods? (WI106) Do you add salt to food? (MA003) & (VA113) Do you eat 3 or more servings of vegetables? (NY103) Do you eat 5 or more servings? (MA002) & (VA114) Do you eat 2 more servings of fruits?
Make effort to get adequate physical activity		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
Get adequate sleep		Not available
Control stress level		Not available
Make effort to stop smoking/reduce # cigarettes		(IN105) Do you use tobacco during pregnancy? (IN106) Does second-hand smoke affect pregnancy? (IN107) Are you in smoky areas during pregnancy? (NY121) How much do you smoke?
Reduce number alcoholic drinks per week to 7 or less		(IN109) Do you use alcohol during pregnancy? (TEMP11) Did you use alcohol before this program?
Check with doctor before long-term use of over-the-counter medications and herbals		(IN110) Do you use over-the-counter medications?

Lesson 2: Choosing Healthy Foods

- a. Consume a variety of foods.
- b. Consume breakfast which includes at least 3 food groups.
- c. Understand which products are whole grain and consume these foods so that at least half of the grains consumed are whole grain.

Specific Measurable Behaviors	Rank	ERS4 Checklist Item # and Wording of ERS Question
Eat variety of foods from all food groups		(IA102) Do your meals consist of a variety of foods? (PA074) Have you thought about buying various foods? (PA075) Will you buy a variety of foods in 6 months? (PA076) Will you buy a variety of foods in 1 month? (PA077) & (PA078) Do you buy foods from all food groups?
Read food labels to choose healthy foods		(001) Do you read labels for salt/sodium content? (002) Do you read food labels for fat content? (CA043) Do you buy food products low in salt?

Consider long-term health, when choosing foods		(004) Are food and nutrition needs being met? (IA112) What is your health in general? (IN117) Are you getting enough folate? (IN108) Do your health choices affect your child's? (PA080) Does health depend on self care? (PA082) Do you eat what is recommended? (PA083) Are you more concerned about what you eat? (VA119) Do health problems limit foods you eat?
Eat breakfast with foods from at least 3 of 5 food groups		Not available
Eat equivalent of 2 cups fruits daily		(VA114) Do you eat 2 more servings of fruits? (WI105) Do you serve more than one fruit each day? (CA048) Do you eat more than one kind of fruit? (005) Do you serve more than one kind of fruit?
Eat equivalent of 2 ½ cups vegetables daily		(006) Do you serve more than one kind of vegetable? (CA041) Do you eat more than one kind of vegetable? (VA113) Do you eat 3 or more servings of vegetables?
Eat deep yellow or dark green vegetables several times a week		Not available
Use "plate method" to judge healthy portions of food groups (meat, vegetables/fruits, bread/cereals/starches).		Not available

Lesson 3: Stretching Your Food Dollars

- Buying healthy foods can save you money in the long run.
- Planning ahead is key to using your food resource money wisely. Or
Narrower: Planning meals ahead of time will help you save money.
- The unit pricing labels found on grocery shelves can help you determine the best buy.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording of ERS Question
Plan meals/snacks ahead of time based on nutrition and best buys for the week		(HI108) Do you inventory food supply? (027) Do you use coupons when you shop? (028) Do you check grocery stores sales ads?
Make a grocery list and stick to it		Not available
Cook most foods from scratch - limit use of fast foods and convenience foods		(013) & (WI103) Do you make main dishes from scratch? (CA051) Do you eat in a restaurant? (PA089) How often do you cook from scratch?
Choose convenience foods based on near equal cost and nutrition value as those made at home		(CA051) Do you eat in a restaurant? (WY101) How often do you super-size?
Buy the store or generic brands of staple foods		(HI105) Do you divide food money weekly? (HI106) Does your food budget last the whole month?
Use unit prices on store shelves to select best food buys		(027) Do you use coupons when you shop? (028) Do you check grocery stores sales ads? (HI105) Do you divide food money weekly? (HI106) Does your food budget last the whole month?

Lesson 4: Keeping Food Safe

- Control the temperatures of all foods (cold foods <41 degrees and hot foods cooked to appropriate temperatures)
- Thaw foods safely.
- Utilize proper hand-washing techniques.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Practice personal hygiene: • Wash hands in soap/warm water before handling food • Cover nose/mouth with tissue if cough or sneeze		(017) Do you wash hands before eating? (CO001) & (PA088) Do you wash hands before food preparation? (CO002) Do you wash hands after playing with pet? (CO003) Do you wash hands after handling raw meat? (CO004) Do you bandage cuts before food preparation? (CO005) Do you prepare foods while ill?
Cook foods adequately: Such as cooking meats to recommended temperatures		(CO006) Do you use a food thermometer? (CO111) Do you eat raw seafood? (CO112) Do you eat raw fish?

		(CO113) Do you eat undercooked hamburgers? (CO114) Do you eat undercooked eggs? (CO115) Do you eat raw sprouts? (CO116) Do you eat homemade cookie dough? (CO117) Do you drink untreated water? (CO118) Do you drink raw, unpasteurized milk/juices? (OR121) How thoroughly do you cook meat? (OR122) Do you drink pasteurized milk or juices? (IN124) Do you heat until steaming hot? (IN122) Do you eat raw hot dogs or lunchmeat? (IN113) Do you use a meat thermometer? (IN118) Are you preventing Listeria? (IN100) Do you eat soft cheeses during pregnancy? (PA072) Do you spoon feed baby from baby food jar? (VA122) How do you reheat leftovers?
Avoid cross-contamination: • Use soap/warm water, to wash knives, surfaces where meat, poultry, or fish has touched • Keep raw meat separated from other foods.		(O16) Do you wash utensils and surfaces? (HI107) Do you wipe up spills right away? (IN115) Do you store raw meats at bottom of fridge? (IN119) Are you avoiding cross contamination? (VA121) How do you store raw meat in refrigerator?
Keep foods at a safe temperature: • Check refrigerator to insure <41 degrees F. • Check freezer to insure at 0 degrees F.		(CO006) Do you use a food thermometer? (CO007) How do you store eggs? (CO008) How do you refrigerate cooked rice? (CO009) How do you refrigerate fried chicken? (CO110) How do you refrigerate beans? (IN113) Do you use a meat thermometer? (IN114) Do you use a refrigerator thermometer? (IN116) Do you chill foods after serving? (VA123) How do you store hot foods in refrigerator? (VA124) Do you check temperature of refrigerator? (VA125) How quickly do you store cold/frozen foods?
Thaw foods safely in refrigerator (not at room temp.)		(WI108) Do you thaw meat at room temperature?

Lesson 5: Preventing Cancer with Good Nutrition & Healthy Habits

- Seven warning signs of cancer and appropriate action to take if they are present
- Implementation of lifestyle habits to reduce cancer risk.
- Foods that fight cancer –Making them a part of daily food intake.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Watch for warning signs of cancer and tell doctor if present		Not available
Stop smoking or reduce number of cigarettes smoked		(IN105) Do you use tobacco during pregnancy? (IN106) Does second-hand smoke affect pregnancy? (IN107) Are you in smoky areas during pregnancy? (NY121) How much do you smoke?
Avoid excessive exposure to sun and tanning beds		Not available
Get at least 30 minutes physical activity on most days		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
Increase intake of fruits, vegetables, whole grains and other high fiber foods		(CA049) Do you eat whole wheat bread? (VA115) You eat 6 or more servings of breads/cereal? (MA003) & (VA113) Do you eat 3 or more servings of vegetables? (MA002) & (VA114) Do you eat 2 more servings of fruits?
Decrease intake of high fat foods		(002) Do you read food labels for fat content? (015) Do you serve fatty meats? (018) Do you eat low-fat foods? (MA004) Do you eat mostly low-fat foods?

Lose weight or don't gain more, if overweight		Not available
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Lesson 6: Preventing Cardiovascular Disease and Diabetes

- Dietary risk factors associated with heart disease: too much fat & too many calories.
- To reduce risk of getting Type 2 diabetes, lose weight or stop gaining weight, get regular physical activity, decrease fat and calorie intake.
- Non-dietary risk factors associated with both CVD and Diabetes: tobacco use, heredity, stress, excessive alcohol consumption

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Get at least 30 minutes physical activity on most days		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
Decrease intake of foods high fat, saturated fat, trans-fat		(002) Do you read food labels for fat content? (018) & (CA046) Do you eat low-fat foods? (011) Do you trim the fat before cooking? (MA004) Do you eat mostly low-fat foods?
Lose weight if overweight or avoid gaining more		Not available
Reduce fat/calorie intake: • Modify recipes to reduce fat and calories • Reduce portion size of high-fat/high-calorie foods		(015) Do you serve fatty meats? (018) & (CA046) Do you eat low-fat foods? (CA042) Do you take skin off chicken before eating? (011) Do you trim the fat before cooking? (MA004) Do you eat mostly low-fat foods?
Stop smoking or reduce use of tobacco products		(IN105) Do you use tobacco during pregnancy? (IN106) Does second-hand smoke affect pregnancy? (IN107) Are you in smoky areas during pregnancy? (NY121) How much do you smoke?
Reduce alcoholic drinks to 7 or less per week		(IN109) Do you use alcohol during pregnancy? (TEMP11) Did you use alcohol before this program?
Take action to control stress		Not available
Take action to keep blood pressure at healthy level		(001) Do you read labels for salt/sodium content? (012) Do you eat foods without adding salt? (CA043) Do you buy food products low in salt? (WI106) Do you add salt to food?

Lesson 7: Cut the Fat for Better Health

- Too much saturated fat can raise “bad” blood cholesterol levels and increase risk for heart disease.
- Changing the way you prepare food can help you reduce fat in your diet.
- To identify hidden sources of fat, read food labels on packaged foods.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Choose lean cuts of beef and pork and limit portion size		(015) Do you serve fatty meats?
More often choose fish and poultry (without skin) and dried beans/peas as main dish		(011) Do you trim the fat before cooking? (CA042) Do you take skin off chicken before eating? (VA116) Do you eat 2 or more servings of meat group?
Modify recipes to reduce fat/calorie level		(018) & (CA046) Do you eat low-fat foods? (MA004) Do you eat mostly low-fat foods? (IN121) How often do you eat fried foods?
Substitute Canola or Olive oil for animal fats and solid shortening, margarine, and butter		(002) Do you read food labels for fat content?
Trim fat and skin from meat and poultry before cooking		(011) Do you trim the fat before cooking? (CA042) Do you take skin off chicken before eating?

Lesson 8: Fiber Facts and Food Sources

- High-fiber foods and importance to health: healthy GI Tract, weight maintenance/loss,

- colon cancer risk reduction.
- b. Major sources of fiber: whole grain breads and cereals, fruits, vegetables, legumes, nuts and seeds.
- c. Ability to identify whole grain bread or cereal products a whole grain is listed first and a 1-ounce serving provides at least 2 grams fiber).

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Eat recommend amount vegetables, and choose leafy greens often		(MA003) & (VA113) Do you eat 3 or more servings of vegetables? (WI113) Do you serve 2 or more kinds of vegetables? (NY103) Do you eat 5 or more servings? (NY106) Do vegetables spoil before use? (WI104) Do you serve more than one vegetable a day?
Eat recommended amount fruits and eat with peeling		(MA002) & (VA114) Do you eat 2 more servings of fruits? (WI105) Do you serve more than one fruit each day?
Eat dried beans and peas for main dish several times a week		Not available
Eat more whole grains and high fiber cereals		(CA049) Do you eat whole wheat bread? (VA115) You eat 6 or more servings of breads/cereal?
Check labels to identify whole grains and fiber level		Not available
Eat nuts and fruit for dessert instead of sweets		(MA002) & (VA114) Do you eat 2 more servings of fruits? (WI105) Do you serve more than one fruit each day? (005) Do you serve more than one kind of fruit?

Lesson 9: Fruits, Vegetables and Grains

- a. High intake of fruits and vegetables is associated with low cancer risk.
- b. For best health, increase intake of fruits, vegetables and whole grains.
- c. Vitamins and nutrients received directly from the food source are of greater value to our bodies, versus trying to supplement with synthetic forms such as pills.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Eat 2 cups or equivalent of fruits every day		(MA002) & (VA114) Do you eat 2 more servings of fruits? (WI105) Do you serve more than one fruit each day?
Eat 2 ½ cups or equivalent in vegetables every day		(MA003) & (VA113) Do you eat 3 or more servings of vegetables? (WI113) Do you serve 2 or more kinds of vegetables? (NY103) Do you eat 5 or more servings? (NY106) Do vegetables spoil before use? (WI104) Do you serve more than one vegetable a day?
Cook vegetables/fruits in small amount water and do not over-cook		(NY102) Do you prepare fruits/veggies differently? (NY107) Do you have time to prepare vegetables?
Eat raw fruits with skin		Not available
Choose wide range of colors in vegetables/ fruits		(005) Do you serve more than one kind of fruit? (006) Do you serve more than 1 kind of vegetable? (CA048) Do you eat more than one kind of fruit? (VA114) Do you eat 2 more servings of fruits? (VA113) Do you eat 3 or more servings of vegetables? (WI113) Do you serve 2 or more kinds of vegetables? (NY100) Do you offer 5 fruits/vegetables? (NY104) Do you serve a variety of fruits/vegetables? (WI105) Do you serve more than one fruit each day? (WI104) Do you serve more than one vegetable a day?
When serving your plate, fill half with fruits/vegetables		(005) Do you serve more than one kind of fruit? (006) Do you serve more than 1 kind of vegetable? (WI113) Do you serve 2 or more kinds of vegetables? (NY100) Do you offer 5 fruits/vegetables? (WI105) Do you serve more than one fruit each day? (WI104) Do you serve more than one vegetable a day?

Lesson 10: Calcium, Milk, and Your Health

- a. Osteoporosis can be prevented with several lifestyle changes
- b. Calcium and vitamin D are very important nutrients with many functions.
- c. re excellent or good sources of calcium.

d. We need to insure adequate of calcium and vitamin D

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Increase milk and milk products to 3 cups or more		(VA117) Do you eat 2-3 servings of dairy group?
Increase non-dairy sources of calcium		Not available
Insure adequate amounts of Vitamin D (fortified milk or at least 15 minutes sun exposure daily)		Not available
Drink milk as beverage instead of sodas, etc.		(CA044) Do you drink regular soda everyday? (IN103) How often do you consume caffeine? (IN109) Do you use alcohol during pregnancy? (TEMP11) Did you use alcohol before this program? (OR122) Do you drink pasteurized milk or juices? (CO118) Do you drink raw, unpasteurized milk/juices?
Choose low-fat or skim milk and reduced-fat cheeses		(CA047) Do you use lower fat milk?
Increase physical activity to reduce osteoporosis risk		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) Do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
When selecting calcium supplement, choose one that is well-absorbed and contains Vitamin D		Not available

Concepts Taught in Healthy Futures Curriculum (11/18/05)

Specific Behaviors and ERS4 Items

Chapter 1: Committing to Healthy Lifestyles

- a. Healthy lifestyle practices include eating nutritious food, getting physical activity, adequate sleep, and regular checkups.
- b. Continued periods of stress can cause harmful effects on our health.
- c. It is important to get moderate physical activity every day to maintain a healthy lifestyle.

Specific Measurable Behaviors	Rank	ERS4 Checklist Item # and Wording of ERS question
When choose foods, consider nutritious choices		(004) Are food and nutrition needs being met? (IN121) How often do you eat fried foods? (IN112) Do you drink 6 cups of water?
Make effort to get adequate physical activity		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
Get adequate sleep		Not available
Control stress level		Not available
Make effort to stop smoking/reduce # cigarettes		(IN105) Do you use tobacco during pregnancy? (IN106) Does second-hand smoke affect pregnancy? (IN107) Are you in smoky areas during pregnancy? (NY121) How much do you smoke?
Reduce number alcoholic drinks per week to 7 or less		(IN109) Do you use alcohol during pregnancy? (TEMP11) Did you use alcohol before this program?
Check with doctor before long-term use of over-the-counter medications and herbals		(IN110) Do you use over -the-counter medications?

Lesson 2: Choosing Healthy Foods

- a. Consume a variety of foods.
- b. Consume breakfast which includes at least 3 food groups.
- c. Understand which products are whole grain and consume these foods so that at least half of the grains consumed are whole grain.

Specific Measurable Behaviors	Rank	ERS4 Checklist Item # and Wording of ERS Question
Eat variety of foods from all food groups		(IA102) Do your meals consist of a variety of foods? (PA074) Have you thought about buying various foods? (PA075) Will you buy a variety of foods in 6 months? (PA076) Will you buy a variety of foods in 1 month? (PA077) & (PA078) Do you buy foods from all food groups?
Read food labels to choose healthy foods		(001) Do you read labels for salt/sodium content? (CA043) Do you buy food products low in salt?
Consider long-term health, when choosing foods		(IA112) What is your health in general? (PA080) Does health depend on self care? (PA082) Do you eat what is recommended? (PA083) Are you more concerned about what you eat? (VA119) Do health problems limit foods you eat?
Eat breakfast with foods from at least 3 of 5 food groups		Not available
Eat equivalent of 2 cups fruits daily		(MA002) & (VA114) Do you eat 2 more servings of fruits?
Eat equivalent of 2 ½ cups vegetables daily		(006) Do you serve more than one kind of vegetable? (CA041) Do you eat more than one kind of vegetable? (VA113) Do you eat 3 or more servings of vegetables?0060
Eat deep yellow or dark green vegetables several times a week		Not available
Use "plate method" to judge healthy portions of food		Not available

groups (meat, vegetables/fruits, bread/cereals/starches).		
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Lesson 3: Stretching Your Food Dollars

- Buying healthy foods can save you money in the long run.
- Planning ahead is key to using your food resource money wisely. Or
Narrower: Planning meals ahead of time will help you save money.
- The unit pricing labels found on grocery shelves can help you determine the best buy.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording of ERS Question
Plan meals/snacks ahead of time based on nutrition and best buys for the week		(HI108) Do you inventory food supply? (027) Do you use coupons when you shop? (028) Do you check grocery stores sales ads?
Make a grocery list and stick to it		Not available
Cook most foods from scratch - limit use of fast foods and convenience foods		(013) & (WI103) Do you make main dishes from scratch? (CA051) Do you eat in a restaurant? (PA089) How often do you cook from scratch?
Choose convenience foods based on near equal cost and nutrition value as those made at home		(CA051) Do you eat in a restaurant? (WY101) How often do you super-size?
Buy the store or generic brands of staple foods		(HI105) Do you divide food money weekly? (HI106) Does your food budget last the whole month?
Use unit prices on store shelves to select best food buys		(027) Do you use coupons when you shop? (028) Do you check grocery stores sales ads? (HI105) Do you divide food money weekly? (HI106) Does your food budget last the whole month?

Lesson 4: Keeping Food Safe

- Control the temperatures of all foods (cold foods <41 degrees and hot foods cooked to appropriate temperatures)
- Thaw foods safely.
- Utilize proper hand-washing techniques.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Practice personal hygiene: <ul style="list-style-type: none"> Wash hands in soap/warm water before handling food Cover nose/mouth with tissue if cough or sneeze 		(017) Do you wash hands before eating? (CO001) & (PA088) Do you wash hands before food preparation? (CO002) Do you wash hands after playing with pet? (CO003) Do you wash hands after handling raw meat? (CO004) Do you bandage cuts before food preparation? (CO005) Do you prepare foods while ill?
Cook foods adequately: Such as cooking meats to recommended temperatures		(CO111) Do you eat raw seafood? (IN113) Do you use a meat thermometer? (CO006) Do you use a food thermometer? (CO113) Do you eat undercooked hamburgers? (CO114) Do you eat undercooked eggs? (CO116) Do you eat homemade cookie dough? (IN124) Do you heat until steaming hot?
Avoid cross-contamination: <ul style="list-style-type: none"> Use soap/warm water, to wash knives, surfaces where meat, poultry, or fish has touched Keep raw meat separated from other foods. 		(016) Do you wash utensils and surfaces? (HI107) Do you wipe up spills right away? (IN115) Do you store raw meats at bottom of fridge? (IN119) Are you avoiding cross contamination? (VA121) How do you store raw meat in refrigerator?
Keep foods at a safe temperature: <ul style="list-style-type: none"> Check refrigerator to insure <41 degrees F. Check freezer to insure at 0 degrees F. 		(CO007) How do you store eggs? (IN114) Do you use a refrigerator thermometer? (IN116) Do you chill foods after serving? (VA124) Do you check temperature of refrigerator? (VA125) How quickly do you store cold/frozen foods?
Thaw foods safely in refrigerator (not at room temp.)		(WI108) Do you thaw meat at room temperature?

Lesson 5: Preventing Cancer with Good Nutrition & Healthy Habits

- Seven warning signs of cancer and appropriate action to take if they are present
- Implementation of lifestyle habits to reduce cancer risk.

c. Foods that fight cancer –Making them a part of daily food intake.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Watch for warning signs of cancer and tell doctor if present		Not available
Stop smoking or reduce number of cigarettes smoked		(IN105) Do you use tobacco during pregnancy? (IN106) Does second-hand smoke affect pregnancy? (IN107) Are you in smoky areas during pregnancy? (NY121) How much do you smoke?
Avoid excessive exposure to sun and tanning beds		Not available
Get at least 30 minutes physical activity on most days		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
Increase intake of fruits, vegetables, whole grains and other high fiber foods		(CA049) Do you eat whole wheat bread? (006) Do you serve more than 1 kind of vegetable? (CA048) Do you eat more than one kind of fruit?
Decrease intake of high fat foods		(018) Do you eat low-fat foods?
Lose weight or don't gain more, if overweight		Not available

Lesson 6: Preventing Cardiovascular Disease and Diabetes

- Dietary risk factors associated with heart disease: too much fat & too many calories.
- To reduce risk of getting Type 2 diabetes, lose weight or stop gaining weight, get regular physical activity, decrease fat and calorie intake.
- Non-dietary risk factors associated with both CVD and Diabetes: tobacco use, heredity, stress, excessive alcohol consumption

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Get at least 30 minutes physical activity on most days		(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) Do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
Decrease intake of foods high fat, saturated fat, trans-fat		(CA046) Do you eat low-fat foods?
Lose weight if overweight or avoid gaining more		Not available
Reduce fat/calorie intake: • Modify recipes to reduce fat and calories • Reduce portion size of high-fat/high-calorie foods		(MA004) Do you eat mostly low-fat foods?
Stop smoking or reduce use of tobacco products		(IN105) Do you use tobacco during pregnancy? (IN106) Does second-hand smoke affect pregnancy? (IN107) Are you in smoky areas during pregnancy? (NY121) How much do you smoke?
Reduce alcoholic drinks to 7 or less per week		(IN109)Do you use alcohol during pregnancy? (TEMP11) Did you use alcohol before this program?
Take action to control stress		Not available
Take action to keep blood pressure at healthy level		(001)Do you read labels for salt/sodium content? (012) Do you eat foods without adding salt? (CA043) Do you buy food products low in salt? (WI106)Do you add salt to food?

Lesson 7: Cut the Fat for Better Health

- Too much saturated fat can raise “bad” blood cholesterol levels and increase risk for heart disease.
- Changing the way you prepare food can help you reduce fat in your diet.
- To identify hidden sources of fat, read food labels on packaged foods.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Choose lean cuts of beef and pork and limit portion size		(015) Do you serve fatty meats?
More often choose fish and poultry (without skin) and dried beans/peas as main dish		(CA042) Do you take skin off chicken before eating? (VA116) Do you eat 2 or more servings of meat group?
Modify recipes to reduce fat/calorie level		(MA004) Do you eat mostly low-fat foods?
Substitute Canola or Olive oil for animal fats and solid shortening, margarine, and butter		(002) Do you read food labels for fat content?
Trim fat and skin from meat and poultry before cooking		(011) Do you trim the fat before cooking? (CA042) Do you take skin off chicken before eating?

Lesson 8: Fiber Facts and Food Sources

- High-fiber foods and importance to health: healthy GI Tract, weight maintenance/loss, colon cancer risk reduction.
- Major sources of fiber: whole grain breads and cereals, fruits, vegetables, legumes, nuts and seeds.
- Ability to identify whole grain bread or cereal products a whole grain is listed first and a 1-ounce serving provides at least 2 grams fiber).

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Eat recommend amount vegetables, and choose leafy greens often		(MA003) & (VA113) Do you eat 3 or more servings of vegetables?
Eat recommended amount fruits and eat with peeling		(MA002) & (VA114) Do you eat 2 more servings of fruits?
Eat dried beans and peas for main dish several times a week		Not available
Eat more whole grains and high fiber cereals		(VA115) You eat 6 or more servings of breads/cereal?
Check labels to identify whole grains and fiber level		Not available
Eat nuts and fruit for dessert instead of sweets		(005) Do you serve more than one kind of fruit?

Lesson 9: Fruits, Vegetables and Grains

- High intake of fruits and vegetables is associated with low cancer risk.
- For best health, increase intake of fruits, vegetables and whole grains.
- Vitamins and nutrients received directly from the food source are of greater value to our bodies, versus trying to supplement with synthetic forms such as pills.

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Eat 2 cups or equivalent of fruits every day		(WI105) Do you serve more than one fruit each day?
Eat 2 ½ cups or equivalent in vegetables every day		(NY103) Do you eat 5 or more servings? (NY106) Do vegetables spoil before use? (WI104) Do you serve more than one vegetable a day?
Cook vegetables/fruits in small amount water and do not over-cook		(NY102) Do you prepare fruits/veggies differently? (NY107) Do you have time to prepare vegetables?
Eat raw fruits with skin		Not available
Choose wide range of colors in vegetables/ fruits		(NY104) Do you serve a variety of fruits/vegetables?
When serving your plate, fill half with fruits/vegetables		(WI113) Do you serve 2 or more kinds of vegetables? (NY100) Do you offer 5 fruits/vegetables?

Lesson 10: Calcium, Milk, and Your Health

- Osteoporosis can be prevented with several lifestyle changes
- Calcium and vitamin D are very important nutrients with many functions.
- re excellent or good sources of calcium.
- We need to insure adequate of calcium and vitamin D

Specific Behaviors to measure	Rank	ERS4 Checklist Item # and Wording
Increase milk and milk products to 3 cups or more		(VA117) Do you eat 2-3 servings of dairy group?
Increase non-dairy sources of calcium		Not available
Insure adequate amounts of Vitamin D (fortified milk or at least 15 minutes sun exposure daily)		Not available
Drink milk as beverage instead of sodas, etc.		(CA044) Do you drink regular soda everyday? (IN103) How often do you consume caffeine?
Choose low-fat or skim milk and reduced-fat cheeses		(CA047) Do you use lower fat milk?

Increase physical activity to reduce osteoporosis risk	(LA095) Do you exercise 30 minutes a day? (UT100) How physically active are you? (WI114) Are you physically active? (WY102) Does physical appearance limit exercise? (ME001) Are you ready to be physically active? (VA120) Do you exercise for a total of 30 minutes? (MA001) Are you active on 4 or more days a week?
When selecting calcium supplement, choose one that is well-absorbed and contains Vitamin D	Not available

Traliece, Unless otherwise noted, use the Version of the checklist item that you have typed in *Italics* (i.e the USER Text Version). For exceptions, I have highlighted the version I want you to use in this Blue color. If nothing is highlighted in blue, just used the Italicized USER Text as it is. In cases where there were two User Text versions, I have deleted the one that I don't want you to use.
 Dr. Cox

**Checklist Items for Concepts Taught in Healthy Futures Curriculum
 Matching ERS4 Items and New FBC Items (Revised and Shortened on 12-16-05)**

Lesson 1: Committing to Healthy Lifestyles

- a. Healthy lifestyle practices include eating nutritious food, getting physical activity, adequate sleep, and regular checkups.
- b. Continued periods of stress can cause harmful effects on our health.
- c. It is important to get moderate physical activity every day to maintain a healthy lifestyle.

Specific Measurable Behaviors	ERS4 Checklist Item # and Wording of ERS question	Response Categories
Take responsibility for health & self-care	(PA080) To what extent does your health depend on your self care? <i>To what extent do you feel your health depends on how you take care of yourself?</i>	1=Not very much; 2=Somewhat; 3=Very much) [4 not used]
When choose foods, consider nutritious choices	(004) To what extent are your food and nutrition needs being met? <i>How much do you agree with this statement? "My food and nutrition needs are being met"</i>	1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree
Make effort to get adequate physical activity	(WY102) How often does physical appearance stop you from exercising? <i>How often does self-consciousness about your body size or shape keep you from participating in physical activity?</i> (ME001) Are you ready to be physically active? <i>How ready are you to make changes in your lifestyle to be physically active most days?</i> (VA120) How often do you exercise for 30 minutes in a day? <i>How often do you exercise for a total of 30 minutes each day?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always 1=Haven't thought about changing; 2=Plan a change in next 6 months; 3=Plan to change this month; 4=Recently starting doing 5=Do this regularly 1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Control stress level	New FBC Item To what extent are you able to control your stress level?	1=Not very much; 2=Somewhat, 3=Very much [4 not used]
Make effort to stop smoking/reduce # cigarettes	ERS item in Lesson 5	
Reduce number alcoholic drinks per week to 7 or less	ERS item in Lesson 6	

Lesson 2: Choosing Healthy Foods

- Consume a variety of foods.
- Consume breakfast which includes at least 3 food groups.
- Understand which products are whole grain and consume these foods so that at least half of the grains consumed are whole grain.

Specific Measurable Behaviors	ERS4 Checklist Item # and Wording of ERS Question	Response Categories
Eat variety of foods from all food groups	(IA102) How often do your meals consist of a variety of foods? <i>How often do you make meals that include a variety of foods based on the food guide “My pyramid”?</i> (PA077) & (PA078) Do you buy foods from all food groups? <i>PA77-When you do your grocery shopping now, do you try to buy foods from all the different food groups?</i>	1=Never, 2=Seldom, 3 =Sometimes, 4=Most times, 5=Always 1= Yes, 2 =No
Read food labels to choose healthy foods	ERS Items are in Lesson 6	
Consider long-term health, when choosing foods	(PA082) How often do you eat foods recommended in a food guide, such as MyPyramid? <i>If qualified health professionals recommend eating certain foods, how likely are you to try them?</i>	1=Not very much; 2=Somewhat; 3=Very much [4 not used]
Eat breakfast with foods from at least 3 of 5 MyPyramid food groups	New FBC Item: How often do you eat breakfast consisting of foods from at least 3 food groups?	1=Never, 2=Seldom, 3=Sometimes, 4=Most times, 5=Almost always
Eat equivalent of 2 cups fruits daily	ERS Items in Lesson 9	
Eat equivalent of 2 ½ cups vegetables daily	ERS Items in Lesson 9	
Eat deep yellow or dark green vegetables several times a week	New FBC Item in Lesson 9	
Use “plate method” to judge healthy portions of food groups (meat, vegetables/fruits, breads/cereals/starches).	New FBC Items: • To what extent do you know how to use the “plate method” to determine healthy food portions? • When you fill your plate, how often does half the food consist of fruits and vegetables?	1=Not very much; 2=Somewhat; 3=Very much [4 not used] 1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always

Lesson 3: Stretching Your Food Dollars

- Buying healthy foods can save you money in the long run.
- Planning ahead is key to using your food resource money wisely. Or
Narrower: Planning meals ahead of time will help you save money.
- The unit pricing labels found on grocery shelves can help you determine the best buy.

Specific Behaviors to measure	ERS4 Checklist Item # and Wording of ERS or Other Questions	Response Categories
Budgets and uses food money or food stamps so they last for the entire month	(HI106) How often does your food money or food stamps last for the whole month? <i>I make my food budget last for the whole month.</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Plan meals/snacks ahead of time based on nutrition and best buys for the week	(HI108) How often do you check foods on hand before grocery shopping? <i>I inventory my food supply before going food shopping.</i> (028) How many times during the month do you check grocery ads to find sales on food items you need? <i>How many times during the month do you check grocery ads to find sales on food items you need?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always Enter a value between 0 and 10
Make a grocery list and stick to it	New FBC Item How often do you make a grocery list and stick to it.	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Cook most foods from scratch - limit use of fast foods and convenience foods	(013) & (WI103) How often do you make main dishes from scratch? <i>WI103-How often do you make main dishes from scratch?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Choose convenience foods based on near equal cost and nutrition value as those made at home	(CA051) Do you eat in a restaurant? <i>How many times a week do you eat in a restaurant?</i> (WY101) How often do you buy or eat super-size portions of food? <i>When you have the option of getting a 'super-sized' portion of food or beverage, how often do you order it?</i>	Enter a value between 0 and 25 1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Comparison shopping at grocery store to choose best buys. Buy the store or generic brands of a staple food.	New FBC Item How often do you compare prices of different brands or forms of a food to choose the best buy?	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always

Lesson 4: Keeping Food Safe

- a. Control the temperatures of all foods (cold foods <41 degrees and hot foods cooked to appropriate temperatures)
- b. Thaw foods safely.
- c. Utilize proper hand-washing techniques.

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories	Put X for 6 most important
Practice personal hygiene: <ul style="list-style-type: none"> • Wash hands in soap/warm water before handling food • Cover nose/mouth with tissue if cough or sneeze 	(CO001) & (PA088) Do you wash hands before food preparation? <i>PA0 88-How often do you wash your hands in warm soapy water before preparing food?</i> (CO003)How often do you wash hands after handling raw eat? <i>After working with raw meat or chicken or seafood, I wash my hands with soap and warm running water before cooking.</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always 1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Cook foods adequately: Such as cooking meats to recommended temperatures	(IN113) How often do you use a meat thermometer? <i>How often do you use a meat thermometer to measure the doneness of meat?</i> (CO113) Do you eat undercooked hamburgers? <i>Do you eat rare hamburger?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always 1=yes, 2-no	
Avoid cross-contamination:	(016) How often you wash cooking utensils and surfaces after raw meat has touched them? <i>Do you wash in hot soapy water, utensils and surfaces that have touched raw poultry or meat before using them again?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Keep foods at a safe Temp: <ul style="list-style-type: none"> • Check refrigerator to insure <41 degrees F. 	(VA124) Do you check the temperature of refrigerator? <i>Do you regularly check the temperature of your refrigerator to see if it is 40 degrees or below?</i>	1 = True (Yes); 2=No (False)	
Store food safely	(IN116) How often do you refrigerate foods within 2 hours after a meal? <i>How often do you refrigerate or freeze foods within 2 hours after serving?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Thaw frozen foods in refrigerator, not at room temperature	(WI108) How often do you thaw meat at room temperature? <i>How often do you thaw frozen meat at room temperature?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	

Lesson 5: Preventing Cancer with Good Nutrition & Healthy Habits

- a. Seven warning signs of cancer and appropriate action to take if they are present
- b. Implementation of lifestyle habits to reduce cancer risk.
- c. Foods that fight cancer –Making them a part of daily food intake.

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories
Watch for warning signs of cancer and tell doctor if present	New FBC Item Do you know the warning signs of cancer?	1=yes, 2=no
Stop smoking or reduce number of cigarettes smoked	(NY121) How many cigarettes do you smoke per day? <i>How many cigarettes do you usually smoke in a day?</i>	1-none; 2-less than 10; 3- 10-20; 4 -more than 20
Get at least 30 minutes physical activity on most days	Questions in Lesson 1	
Increase intake of fruits, vegetables, whole grains and other high fiber foods	ERS Items in Lesson 8 and Lesson 9	
Decrease intake of high fat foods	ERS item in lesson 7	
Lose weight or don't gain more, if overweight	New FBC Items in Lesson 6	

Lesson 6: Preventing Cardiovascular Disease and Diabetes

- a. Dietary risk factors associated with heart disease: too much fat & too many calories.
- b. To reduce risk of getting Type 2 diabetes, lose weight or stop gaining weight, get regular physical activity, decrease fat and calorie intake.
- c. Non-dietary risk factors associated with both CVD and Diabetes: tobacco use, heredity, stress, excessive alcohol consumption

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories
Get at least 30 minutes of physical activity on most days.	ERS items listed for Lesson 1	
Decrease intake of foods high in fat saturated fat, trans fat.	ERS items listed for Lesson 7	
Lose weight or don't gain more, if overweight	<p>New FBC Item How often do you try to maintain a healthy weight?</p> <p>To what extent have you been able to avoid gaining more weight?</p>	<p>1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always</p> <p>1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always</p>
Reduce alcoholic drinks to 7 or less per week.	<p>(TEMP11) Did you use alcohol before this program?</p> <p>Before you enrolled in this program, how many times a week did you drink alcohol?</p> <p>New FBC Item How many times a week do you drink an alcoholic beverage? (Circle one)</p>	<p>1=Never; 2=1 Time; 3=1 to 3 Times; 4=4 to 6 Times; 5=7 or More Times</p>
Take action to control stress.	Question listed in Lesson 1	
Take action to keep blood pressure at a healthy level.	<p>(001) Do you read labels for salt/sodium content?</p> <p><i>In the last month, how often did you read food labels to select foods with less salt or sodium?</i></p> <p>(012) Do you eat foods without adding salt?</p> <p><i>How often during the last week have you eaten food without adding salt at the table?</i></p>	<p>1=Never, 2=Seldom, 3=Sometimes, 4=Most of time, 5=Always</p> <p>1=Never, 2=Seldom, 3=Sometimes, 4=Most of time, 5=Always</p>

Lesson 7: Cut the Fat for Better Health

- a. Too much saturated fat can raise “bad” blood cholesterol levels and increase risk for heart disease.
- b. Changing the way you prepare food can help you reduce fat in your diet.
- c. To identify hidden sources of fat, read food labels on packaged foods.

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories
Choose lean cuts of beef and pork and limit portion size	(015) Do you serve fatty meats? <i>How many times during a two week period do you serve bacon, sausage, or other fatty meats?</i>	Enter a number between 0 and 42
More often choose fish and poultry (without skin) and dried beans/peas as main dish	(VA116) Do you eat 2 or more servings (6 ounces) of meat group? <i>Do you eat 2 or more servings of meats, poultry, fish, dry beans, eggs, or nuts each day (i.e. total of 6 ounces)?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Modify recipes to reduce fat/calorie level	(MA004) Do you eat mostly low-fat foods? <i>Do you currently eat mostly low-fat foods every day (raw or prepared fruits, vegetables without butter or other fat)?</i> (IN121) How often do you eat fried foods? <i>How often do you eat fried foods?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always 1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Check food labels to help reduce intake of total fat, saturated fat, and trans fat.	(002) How often do you read food labels for fat content? <i>In the past month, how often did you read food labels to select foods with less fat?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Trim fat and skin form meat and poultry before cooking	(011) Do you trim the fat before cooking? <i>How often do you trim fat from meat (such as beef, chicken, or pork) before cooking or eating?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always

Lesson 8: Fiber Facts and Food Sources

- a. High-fiber foods and importance to health: healthy GI Tract, weight maintenance/loss, colon cancer risk reduction.
- b. Major sources of fiber: whole grain breads and cereals, fruits, vegetables, legumes, nuts and seeds.
- c. Ability to identify whole grain bread or cereal products a whole grain is listed first and a 1-ounce serving provides at least 2 grams fiber)

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories
Eat recommend amount vegetables, and choose leafy greens often	ERS Items in Lesson 9	
Eat fruits and vegetables with the peeling	New FBC Item How often do you eat fruits and vegetables with the skin (or peeling)?	1=Never, 2=Seldom, 3=Sometimes, 4=Most of time, 5=Always
Eat dried beans and peas for main dish several times a week	New FBC Item How often do you eat dried beans and peas at least 3 times per week?	1=Never, 2=Seldom, 3=Sometimes, 4=Most of time, 5=Always
Eat more whole grains and high cereals	(VA115) You eat 6 or more servings of breads/cereal (at least 6 ounce)? <i>Do you eat 6 or more servings of breads, cereals, rice and pasta in a day (about 6 ounces)?</i>	1=Never, 2=Seldom, 3=Sometimes, 4=Most of time, 5=Always
Check labels to identify whole grains & fiber	New FBC Item How often do you check food labels to choose whole grain foods? How often do you make an effort to choose high-fiber foods?	1=Never, 2=Seldom, 3=Sometimes, 4=Most of time, 5=Always 1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always

Lesson 9: Fruits, Vegetables and Grains

- a. High intake of fruits and vegetables is associated with low cancer risk.
- b. For best health, increase intake of fruits, vegetables and whole grains.
- c. Vitamins and nutrients received directly from the food source are of greater value to our bodies, versus trying to supplement with synthetic forms such as pills.

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories	Place X by 6 most important
Eat 2 cups or equivalent of fruits every day	(MA002) & (VA114) Do you eat 2 or more servings (about 2 cups) of fruits? <i>MA002-Do you currently eat 2 or more servings of fruit every day? This includes fresh, frozen, canned, and 100%fruit juice.</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Eat 2 ½ cups or equivalent in vegetables every day	(MA003; VA113) Do you eat 3 or more servings of vegetables (about 2 ½ cups)? <i>MA003-Do you currently eat 3 or more servings of vegetables every day, including fresh, frozen, canned, and 100% juice?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Cook vegetables/fruits in small amount water and do not over-cook	(NY102) Do you prepare fruits & vegetables differently? <i>Do you try new ways of preparing vegetables and fruits?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Eat raw fruits with skin	New item in lesson 8		
Choose a variety and range of colors in vegetables/ fruits	(NY100) Do you offer 5 fruits & vegetables? <i>How often are 5 servings of fruits and vegetables offered to your family, to eat each day?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
When serving your plate, fill half with fruits/vegetables	Items in Lesson 2		
Eat deep yellow or dark green vegetables several times a week	New FBC Item: How often do you eat deep yellow or dark green vegetables at least 3 times a week?	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Increase intake of whole grains and other high fiber foods	(CA049) Do you eat whole wheat bread? <i>When you eat bread, do you eat whole wheat bread?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always	
Eat fruits and vegetables with peeling	Items in Lesson 8		

Lesson 10: Calcium, Milk, and Your Health

- a. Osteoporosis can be prevented with several lifestyle changes
- b. Calcium and vitamin D are very important nutrients with many functions.
- c. re excellent or good sources of calcium.
- d. We need to insure adequate of calcium and vitamin D

Specific Behaviors to measure	ERS4 Checklist Item # and Wording	Response Categories
Increase milk and milk products to 3 cups or more or equivalent per day	(VA117) Do you eat 2-3 servings of dairy group? <i>Do you consume 3 servings of milk, yogurt, and cheese each day (equivalent of 3 cups milk)?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Increase non-dairy sources of calcium	New FBC Item How often do you eat foods other than milk that are good sources of calcium?	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Drink milk as beverage instead of sodas, etc.	(CA044)Do you drink regular soda everyday (i.e. non-diet soft drinks containing sugar)? <i>Do you drink regular soda (soda that is not diet) every day?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Choose low-fat or skim milk and reduced-fat cheeses	(CA047) Do you use lower fat milk? <i>Do you use low-fat (2%), very low-fat (1%) or nonfat milk?</i>	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always
Increase physical activity to reduce osteoporosis risk	ERS items in Lesson 1	
When selecting calcium supplement, choose one that is well-absorbed & contains Vitamin D	New FBC Item How often do you take a calcium supplement daily that contains Vitamin D.	1=Never; 2=Seldom; 3=Sometimes; 4=Most of time; 5=Always

Appendix B

Instructions to Area Coordinators on Recruiting PAs

Date: Thu, 27 Oct 2005 15:35:20 -0400

From: "Ruby H. Cox" <rubycox@vt.edu>

Subject: PAs for Study to Dev. Healthy Futures Assess. Checklist

X-Sender: rubycox@pop.vt.edu

To: mamcfar@vt.edu, mmcferre@vt.edu, jmidkiff@vt.edu, bebrown3@vt.edu, veclark@vt.edu, mecutlip@vt.edu, vanessa@vt.edu, rubycox@vt.edu

Cc: traliece@vt.edu, suobrien@vt.edu (Susan), jmidkiff@vt.edu (Judy), jwages@vt.edu (Joan), mamcfar@vt.edu (Mary Ann), vholmes@vt.edu (Viola), haynes04@vt.edu (Carol), traliece@vt.edu, rubycox@vt.edu, dwalden@vt.edu, eheidt@vt.edu

Hello Everyone.,

In a discussion yesterday with the Expert Panel that was meeting on the study that me and my graduate student are doing to developed a validated Food Behavior Checklist for Healthy Futures, we discussed further how to accomplish the intervention phase. That phase will consist of a 11 to 13-week period (during January-March, 2006), as follows:

1. 2 pre-assessment sessions about a week apart: 1st session, take 24 hour recall and administer new Healthy Futures FBC; 2nd session administer 24 hr. recall, new FBC, and two other previously-validated instruments (will probably need to be done in early January, 2006)
2. Teaching of 7 assigned Healthy Futures Lessons - preferably over 7 to 10 weeks (during last part of January - mid-March)
3. Post-Assessment session in which all instruments and a 24-hour recall are administered. Should be about a week following last class.

Because of the high commitment on part of clients and urgency of getting all this done so that Traliece Bradford can graduate, we made this decision. Instead of only 6 PAs working recruiting/teaching 12 to 15 clients, we want to change to this plan.

- A. Recruit a much large number of EFNEP and SCNEP Adult PAs to recruit/teach only 3 to 4 clients each.
- B. This recruitment and teaching should be done on an individual basis, probably in the home. But could be in a community center or public location.

Therefore, I need your help in recruiting the following numbers of PAs per District for this study:

Southwest - 5 PAs

Northwest - 2 PAs

Central - 4 PAs

Northern - 6 PAs

Northeast - 6 PAs.

Southeast - 4 PAs (especially form urban areas).

TOTAL = 27

With this many PAs, I need Area Coordinators to actually contact the PAs and get their agreement to participate.

Incentives:

- 1) For PAs, will provide a generic P141. Area Coordinators can personalize it to give PAs credit for exceptional work.
- 2) For clients who finish everything, PAs should give them a thermometers set and a pedometer. Also I plan to provide WalMart Gift Certificates for them for about \$25. However, I have to check and make sure it is legal to use overhead funds for this. I would do this for PAs too, but I don't think I can legally do it.

Since we are without the NW and Central Area Coordinators, I am asking Viki to take care of all the counties she formerly supervised. I am asking Deborah Walden to give me recommendations for the Central District/Lower NW counties , based on PAs who do well in completing their records and reaching their case load numbers. Thanks for your help on this.

Ruby

*Ruby H. Cox, Professor
State EFNEP/SCNEP Coordinator
Department of Human Nutrition, Foods & Exercise, VPI&SU
Phone: 540-231-9429; Fax: 540-231-7576
E-Mail: rubycox@vt.edu
<http://www.ext.vt.edu/healthyfutures/>*

1-16-06

Instructions for PAs on Pre and Post Assessment and Intervention (e-mail message).

Hello Everyone,

Attached are the 3 pre/post assessment forms for the Bradford Study on the Food and Nutrition Practice Checklist (FNPC).

Please note that the *Informed Consent form* was sent to you last week. If you did not receive it, let me know.

Hopefully your clients can complete the attached Questionnaires themselves. However, feel free to to complete it by interviewing the client if they do not ready and write very well. **Here is the plan**

Between now and February 3:

Conduct the following sessions with your study participants

Pre-Session 1: Client needs to complete the following

- a. Informed Consent (read, sign and date). Leave the list of Researcher Addresses and Phone numbers with the client.
- b. Family Record, including 24 hour recall
- c. Complete the Food and Nutrition Practice Checklist (FNPC) for the first time

Pre-Session 2 - 1 week after Session 1, Client should complete

- a. Another 24-hour recall
- b. Another copy of FNPC (be sure to date and note that this is the 2nd copy)

VERY important: You, the PA will need to assign an ID number to each client, based on last number assigned to prior homemakers by ERS4. Write this ID number on all forms completed on that client. Make a copy of forms and keep copy for your use. Send originals to

Traliece Bradford

State EFNEP/SCNEP Office

101 Wallace Annex (0228)

Blacksburg, VA 24061

Intervention period: between February 6 and March 31, teach your 7 assigned Healthy Futures lessons (see attached table). Note: You will be sent some more information this week about the Healthy Futures lessons. You will be provided with a CD with updated visuals in the form of PowerPoint Presentations, along with scripts for going through these new visuals. These have been updated with MyPyramid.

Post-Assessment Session: Between March 31 and April 7, administer all forms and questionnaires again as the post-assessment.

- a. 24-hour Recall (Use Back of Family Record)
- b. FNPC
- c. Food Safety Questionnaire
- d. International Physical Activity Questionnaire

Very Important. Although the FNPC has 55 questions, it took clients at a Pilot Test only 10 to 15 minutes to complete it. In the end, that checklist will contain only 30 questions, but we need this study to determine which questions to keep.

Send me an e-mail, if you have questions. Also, we plan to hold a telephone conference with you on either January 24 or 25, so you can ask questions then

Ruby Cox

Ruby H. Cox, Professor, R.D.

Extension Nutrition Specialist, EFNEP/SCNEP

Department of Human Nutrition, Foods & Exercise, VPI&SU

Phone: 540-231-9429; Fax: 540-231-7576

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<http://www.ext.vt.edu/healthyfutures/>

Slightly Revised on 1-6-06

Tasks and Timeline for Program Assistant Involvement in Study **“Developing and Testing a Food and Nutrition Practice Checklist (FNPC) for Use in Basic Nutrition and Disease Prevention Programs for Limited Resource Adults”**

27 EFNEP and SCNEP Program Assistants (PAs) have been recruited to help with data collection and to conduct the intervention in this study.

Tasks to be carried out by PAs:

Note: PAs cannot do these tasks until Ruby Cox sends them the appropriate forms. She hopes to do this by Mid-January, 2006. Needed documents will be sent to PAs as e-mail attachments. Before sending out the Informed Consent Form and other study forms, Ruby and Traliece must receive approval of the study from the VT Board on Use of Human Subjects in Research.

1. Recruit 4 adult females who are also eligible for enrollment into EFNEP or SCNEP, with at least 3 clients finishing the study. (Send an e-mail to rubicox@vt.edu if you want to enroll more than 4.

Eligibility Criteria:

- a. Be a female between 20 and 60 years of age
 - b. Have a family income no higher than 185% poverty (may or may not be on Food Stamps)
 - c. Be either Black or White, but not Latino or Hispanic (Reason: Materials will not be translated into Spanish or any other language for this study).
 - d. Be willing to have a PA work with them in an individual or small group setting, over a 10 to 12-week period, and commit to attending 10 sessions: 3 sessions
2. **What to say to potential participants:**
During recruitment, PAs should explain to potential participant that this is a study to test a *Food and Nutrition Practice Checklist (FNPC)*, to see how well it works in measuring behavior change made by EFNEP and SCNEP Participants. It is a test of the instrument, not a test of the participant' knowledge or ability. PAs can tell the person that this FNPC will be revised based on what they tell us. Their opinions are very valuable to us. After the FNPC has been tested and finalized, it will be used in future years, throughout Virginia. It may also be shared with people in other states. **The participant's name and information will be kept confidential.**

For performing this important service, participants will be given a \$15 gift certificate from Wal-Mart and a free pedometer and set of thermometers (food and refrigerator). The gift certificate will only be given only to those who complete all sessions, including the final set of forms after classes have ended (**early in April, 2006**).

3. Have participant read Informed Consent Information (or read it to them) and have them sign it.
4. Meet with participants two times, about 1 week apart, **BEFORE BEGINNING** nutrition classes and again **ONE WEEK after end of classes** and complete instruments below as both “Pre-Assessment” and “Post-Assessment.” If participants can read and write well, they can be allowed to fill out forms themselves (self-administered). If not,

the PA should fill out forms for them in an interview process.

- a. ***EFNEP/SCNEP Family Record*** should be completed by usual process, so that the person can be enrolled in one of these programs. Also, provide a copy of first page and the 24 hour recall to state EFNEP/SCNEP office for use in this study. **However, for Additional FBC Questions DO NOT use FBC Version A, B, or C. Instead, use only the new FNPC described in Item C below.**
 - b. **24-hour Food Recall:** Will need to collect two recalls, one week apart BEFORE classes begin and one recall a week after end of classes.
 - c. ***Food and Nutrition Practice Checklist (FNPC)***: New instrument being developed for this study. To be used in future with EFNEP and SCNEP clients going through Healthy Futures Curriculum. To be completed **twice** as pre-assessment and **once** at end of classes as the post-assessment. It will be in form of a checklist similar to other behavior checklists that we use in EFNEP and SCNEP. This should be done at same time that 24 hour recalls are completed.
 - d. ***Food Handling Questionnaire*** (16-item checklist by Pat Kendall, who is a Colorado Extension Specialist). To be completed **ONCE** before classes begin and **ONCE** after classes end.
 - e. ***International Physical Activity Questionnaire (IPAQ)***; contains 7 questions requiring only checking answers or filling in numbers). To be completed **ONCE** before classes begin and **ONCE** after classes end.
5. Teach a series **SEVEN** pre-assigned Healthy Futures Lessons, about 1 week between lessons. It is recommended that this be done individually and made as convenient for participants as possible. However, all 4 participants can be taught in a group, if PA can arrange it.
It is hoped that these lessons can begin about 2nd week of February and end by March 31, 2006.
6. Mail Xerox copy of Family Record and **ORIGINAL** copies of all other forms to:
Miss Traliece Bradford
101 Wallace Annex, Virginia Tech (0228)
Blacksburg, VA 24061
- Pre-Assessment forms and signed Informed Consent Forms should be mailed to above address, once all are completed on participants, **BEFORE** lessons are taught. Post-Assessment forms should be mail to Miss Bradford as soon as they have been completed, a week **AFTER** all 7 lessons are taught.
7. At the time that post-assessment forms are completed, thank Participants (who have completed all parts of study) and give them a \$15 WalMart Gift Card, as well as a pedometer and set of thermometers (food and refrigerator listed on the EFNEP/SCNEP Publication List). You may decide to give the pedometer and thermometers when they best fit into lessons. (Gift cards will be provided to Area Coordinators, who will provide them to PAs involved in this study).

8. Have participants sign and date a list that they have received the gift certificate (university requires that this be kept on file at the state office for 3 years). This list should be mailed with post-assessment forms to Traliece Bradford. (address above).

Timeframe for Above Tasks to Be Completed (New dates established as of 1-5-06)

1. **By January 17, 2006** have 4 participants recruited with Informed Consent Form and Family Record (Pub 360-090) completed – **except DO NOT use FBC Version A, B, or C**. Send an e-mail to Traliece Bradford at: traliece@vt.edu with names of your participants as soon as have all 4 participants recruited (copy to rubbycox@vt.edu).
2. **By February 6, 2006:** Have All Pre-Assessment forms completed as described above in Section 4, and send copy of completed forms to Traliece Bradford (send the original copy of FNPC).
3. **By week of February 6th 2006** (after completing pre-assessment forms): begin teaching pre-assigned *Healthy Futures* lessons (either Set A or B).
4. **Between February 6 and April 7, 2006:** teach all 7 *Healthy Futures* lessons, trying to stay on a schedule of meeting with participants once every week (this 9 week period allows for some rescheduling for inclement weather).
5. **Between April 6 and 14, 2006: complete all forms listed in Section 4 above as a post-assessment, about one week after end of lessons. Distribute Wal-Mart gift cards to participants who have completed everything. Have them sign a list that they received the gift card.**
6. **By April 17, 2006,** mail all completed instruments to Traliece Bradford.

If you have questions, please send an email to rubbycox@vt.edu or call Ruby Cox at: 540-231-9429. (Ruby will be available for phone calls only until January 27. After that, send her an e-mail).

Before end of January, Ruby will be available at the following times to answer questions by phone (if necessary) about this study:

Tuesday thru Friday, Jan. 10 – 13, 2006

Monday thru Tuesday, Jan. 16 – 17, 2006

Monday thru Friday, Jan. 23 - 27, 2006

Bradford Study on Food and Nutrition Practice Checklist (FNCP) Timeline Chart

(Check-off or Date in Blocks Upon Completion of each Criteria)

PART 1

Complete by:		FEBRUARY 3, 2006		
Pre-session 1				
Client Name		Informed consent	Family Record, including 24 hr recall	FNPC Checklist
Pre-session 2				
Client Name	Physical Activity Questionnaire	Food Handling	Another 24 hr recall <small>(write the food recalls on both, but only code one from either Pre-session 1 or 2)</small>	FNPC Checklist

PART 2

Dates:		February 6 – March 31					
Intervention Period: TEACH 7 LESSONS (Healthy Futures)							
Client Name	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7

PART 3

Dates		March 31 – April 7 (administer all forms and questionnaires again as post-assessment)		
Post Assessment Session:				
Client Name	Physical Activity Questionnaire	Food Handling	Post 24 hr recall	FNPC Checklist

PROCEDURES FOR COLLECTING 24-HOUR FOOD RECALLS **(Revised 1-09-06)**

When taking a 24-hour recall, it is important for the interviewer to follow certain procedures to insure the following:

- That all foods and beverages consumed are listed.
- That amounts of foods are as accurate as possible.
- That homemaker is not influenced to say he/she ate foods that were not eaten.

The techniques in this first section are written specifically for individual interviews. On page 4, you will find a section titled "Ways to Alter Food Recall Techniques to Accommodate a Group Setting." Please use that section when completing recalls in a group setting.

Setting the stage for the interview

The following steps will help in eliciting truthful and complete information:

1. Explain to homemaker that you need to know only what she/he actually ate. She/he should not feel embarrassed about any food, as there are no "good" or "bad" foods. No one eats just the right foods all the time.
2. Do not express in words or facial expressions either approval or disapproval of foods which homemaker mentions.
3. Do not ask leading questions that would lead homemaker to feel she/he "should" have had a certain item and, thus, say she/he did.

During the food recall interview

1. Use your FOOD RECALL KIT to determine the amounts of foods consumed. (Food Recall Kit described below under "24-Hour Food Recall Kit"). Homemakers may not be able to give amounts of ingredients in their portions of mixed dishes, salads and casseroles. If a home recipe was used, obtain a copy. If food was eaten in a restaurant, record the name or type of restaurant.
2. Start with the most recent meal or snack that the homemaker consumed. Work backwards to cover all foods and beverages eaten or drunk in the last 24 hours.
3. First, get a complete list of all foods eaten without trying to determine amounts. Use the following types of probes to find **what foods** were eaten:
 - A. The first type of probing is related to time.
Examples:
"At what time was this? Did you eat or drink anything before or after that?"
"What did you have at that time?"
"At what time did you go to bed?"
 - B. The second type of probe is related to the homemaker's activities.
Examples:
"What did you do this morning?"
"While you were working around the house, did you take a break to have something to eat or drink?"

"Did you watch TV last night? When you watched TV, did you eat anything?"
"Did you have anything to drink with this?"

- C. The third type of probe tries to get more complete information about foods already reported.

Examples:

"Do you remember anything else that you ate or drank with this food?"

"What else did you have at this meal?"

"Was the (bread, vegetable) eaten plain or did you put something on it?"

"Did you have anything in your coffee?"

"Did you have a second helping?"

4. Second, after the homemaker names all foods, go back over the lists to get additional descriptions and **amounts** of the food. Also determine if all of the food was eaten or if some was left on the plate.

To get more information on the type of food:

- A. Encourage the homemaker to describe foods as clearly as possible. The interviewer may have to restate questions to get more information.
- B. Describe combination dishes carefully. Mixtures such as sandwiches, soups, stew, pizza, casseroles, etc. can be prepared in many ways.
- C. Ask to see packages, if available, on pre-packaged foods, and record brand name and other pertinent information.

To determine the amount of food eaten:

- A. Amounts of a food may be given in:
1. NUMBERS, such as eggs, donuts, apples
 2. SHAPES, such as a pat of butter, stalk of celery, slice of pie (or the shapes included at the end of this section)
 3. DIMENSIONS, such as size cornbread, cake, etc. show with a ruler
 4. VOLUME, such as liquids, cooked vegetables, pudding, ice cream
 5. WEIGHT, such as meat, cheese, candy bar, (3 oz. meat = size of deck of cards, or palm of woman's hand)
- B. In determining amounts, use food models, measuring cups, measuring spoons, ruler, raw rice, beans, etc. in Food Recall Kit. Have homemaker show you how much she/he had by pouring raw rice or dry beans on a plate or by identifying some item in your Recall Kit. A ruler can also be used to show size of certain items.
- C. When appropriate, ask homemaker to bring in the serving container (bowl, cup, glass, etc.) that was used and determine the amount it holds by using rice and a standard measuring cup.
5. If nutrition questions are being asked by the homemaker during the time the recall is being

taken, ask homemaker if you may answer them later when you have completed the recall.

6. After the homemaker has given a recall of foods and amounts for the entire 24 hours, read the list back to him/her and ask homemaker to tell you anything else that he/she may have forgotten before.
7. Thank the homemaker for his/her cooperation. Do not comment on the recall at this time, unless homemaker asks a specific question. **Wait and address deficiencies, excesses, etc. when lessons are taught** that deal with that area of the diet.

Ways to Alter Food Recall Techniques to Accommodate a Group Setting

Large group settings present a special challenge when collecting food recalls. Unless volunteers or others are available to assist, it is usually necessary to have homemakers to record their own food recalls. The following techniques are suggested:

1. Set the stage for obtaining the recalls similar to those listed above in section entitled "Setting the Stage for the Interview."
2. Distribute forms and explain that (**after you have finished the instructions**) you want each person to record everything he or she ate or drank between the time they came to this meeting and a specified time on the previous day, to cover 24 hours. Be sure group members understand the time frame to use in recording their food intake.
3. Explain that group members should do this task with as little talk as possible, except to ask questions of group leader. This will allow group members to concentrate and not be influenced by what others are saying.
4. Distribute copies of the Family Record each will use. With an overhead or large poster show them a replica of the 24 hour recall form in the Family Record and discuss and demonstrate how they should record foods. Ask them to write names of foods on far left side of each line and record **only one food per line**. Demonstrate on an overhead transparency of the 24-hour recall, or the laminated poster, using a non-permanent marker (kind that you can wipe off with damp cloth).
5. Explain that you will lead group members through 5 steps in recording the foods they have eaten or beverages they have drunk. These steps are often referred to as "passes" or stages and are as follows:
 - 1st Pass: Have them record only the names of foods eaten or beverages drunk, by placing each food on separate line of form, without giving any description of each food (demonstrate how to do this on overhead or laminated poster).
 - 2nd Pass: Have them go back through each section and record any foods they may have missed, such as beverages or bread, or snacks between meals. These should be recorded on separate lines below all the other foods, as they need to be coded separately. Also, indicate which meal or snack they go with, since they will be recorded in a different place.
 - 3rd Pass: Now have them go back to each meal or snack and add any condiments, dressings, spreads, or fat they added at the table, such as salad dressing, ketchup, mayonnaise, mustard, jelly, syrup, sugar and cream, or creamer added to coffee or tea.
 - 4th Pass: Have them go back and describe how foods were cooked or prepared, especially meats, such as fried, grilled, baked, stewed, or raw. Also, list type of bread eaten, such as white, whole grain, cornbread, and type of milk, such as skim, 1%, 2%, or whole milk.
 - 5th Pass: Have them record the serving size of all foods, by using visuals you have provided, as follows:

- A. For participants' use in determining serving sizes of foods on their 24-hour recall, place the items in your Food Recall Kit in view of all. Make sure each item is labeled clearly with the serving size or the amount food or beverage the container would hold if it were filled with food or beverage. You will need to have a complete set of props for about every 5 to 7 people in the group. Depending on the average size of your groups, you may need to have more than one set of the 24-hour recall props and visuals.
- B. In addition, you might want to prepare a permanent display of food serving sizes (using Dairy Council cardboard food models or food shapes from the 24-Hour Recall Kit below) on a light-weight, bi-fold poster display board. Such boards can be purchased at an office supply store. They are made of a type of compressed styrofoam material that is fairly durable, but very light in weight.

Some items to display on poster:

8 oz. glass of milk or water	4 oz. glass of juice
1 serving (1/2 cup) cooked vegetable/fruit	1 cup of raw vegetable
3 oz. serving hamburger or other lean meat	1 cup cereal
1 slice bread or medium roll or biscuit	1 med. piece fruit
Food shapes from 24-hour Recall Kit	

Go over the various serving sizes and how to record portions of servings.

Demonstrate on a the laminated poster or overhead transparency sections of food recall, with examples of how foods are to be recorded.

6. As participants are writing down their food intake, watch for anyone who may need help because they cannot see well or cannot read or write. Urge participants to call on you for help if they are having difficulty determining how to describe a food or serving size.

You may have to help some people complete their recalls by doing an individual interview, so you might be prepared by always having a volunteer or another PA or Extension person go with you when you are going to collect recalls on a large group.

7. When everyone is finished, collect recalls and thank group members for their cooperation.

24-Hour Food Recall Kit

Purpose of the FOOD RECALL KIT: To assist paraprofessional/interviewer in taking the food recall and estimating the amounts more accurately.

The Food Recall Kit should contain the following items:

- Cup - One 8-oz. plastic measuring cup
- Bowls - 2 different shapes - each holding 2 cups
- Small sauce dish - about 1/2 cup
- Standard measuring spoons:
 - 1 tablespoon
 - 1 teaspoon
 - 1/2 teaspoon
 - 1/4 teaspoon
- Plastic sandwich bags (baggie) containing the following measures of dry beans or dry pasta, such as macaroni: 1 1/2 cup, 1 cup, 3/4 cup, 2/3 cup, 1/2 cup, 1/3 cup, 1/4 cup, 1/8 cup (same as 2 tablespoons).

It works best to have the baggies clearly labeled with the serving size, using self-stick labels typed in large lettering (i.e. done on the computer by a secretary). Make labels more durable, by covering them with a piece of Scotch tape after they have been attached to the baggie.
- As an alternative to have serving sizes pre-measured in sandwich bags, you can have the following:
 - Plastic Container of 2 to 3 cups dry macaroni (with tight fitting lid)
 - Plastic Container of 2 to 3 cups dried beans (with tight fitting lid)
 - Client would pour onto a paper plate, beans or macaroni to illustrate their serving size of vegetable or other food. Then it would be poured into a 2-cup measuring cup to determine the amount.
- To reduce the weight of the Food Recall Kit, dry cereal may also be placed in tightly covered plastic container or plastic bag for use in determining size of servings.
- Plastic ruler - 6" works well and may be less cumbersome than a 12" ruler.

10 Food Shapes on cardboard or plastic as shown below

<u>Item</u>		<u>Example of Food</u>
<u>Identification</u>	<u>Size</u>	<u>To Be Measured</u>
A	1" square	Cheese, fudge
B	2" square	Brownies, Cornbread
C	1/16 layer cake	Cake
D	1/12 layer cake	Cake
E	1/8 of a 9" pie	Pie, quiche
F	1/7 of a 9" pie	Pie, quiche
G	1/6 of a 9" pie	Pie, quiche
H	3" square	Sheet cake, Cornbread
I	4" circle	Danish, pancake
J	1/4 of 12" pizza	Pizza

Additional shapes of various cuts of meats, each about 3 ounces of cooked, edible portion (master copy can be obtained from the Area EFNEP/SCNEP Program Support Technician in your district.

Compiled by: Ruby H. Cox, Ph.D., R.D, Professor and Extension Nutrition Specialist
(Revised 1-09-06)

Appendix C



DATE: January 6, 2006

MEMORANDUM

TO: Ruby H. Cox Human Nutrition, Foods, & Exercise 0228
Traliece Bradford

FROM: David Moore

SUBJECT: **IRB Expedited Approval:** "Development and Testing of a Food and Nutrition Practice Checklist (FNPC) for Use with Basic Nutrition and Disease Prevention Education Programs" IRB # 06-007

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective January 6, 2006.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/20/07) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File

Department Reviewer: Kathy Hosig

Client Informed Consent for Research Involving Human Subjects

Title of Project: Development and Testing of a Food and Nutrition Behavior Checklist for Use with a Basic Nutrition and Disease Prevention Curriculum

Those Conducting the Study:

Traliece Bradford, Virginia Tech Graduate Student
Dr. Ruby H. Cox, Professor and Faculty Member

Phone: 540-231-2488
Phone: **1-888-814-7627 (toll-free)**



Dear _____
(Name of Participant)

You are invited to take part in a study to develop and test an assessment tool for use in the Expanded Food and Nutrition Education Program (EFNEP) and the Smart Choices Nutrition Education Program (SCNEP). This tool is in the format of a food and nutrition practice checklist (FNPC). If you are willing to be involved in this study after reading this entire document, you will be asked to sign your name at the end of the document. **The purpose of this informed consent is to protect you and your rights. It does not obligate you to continue to be a part of this study, or to do anything that you do not wish to do.**

I. Purpose of Research

The purpose of the study is to develop and test an assessment tool for use with food and nutrition education programs. In the future, the FNPC will be used throughout Virginia to measure behavior changes of participants in the Healthy Futures lesson series. The FNPC will be tested against three other behavior assessment tools that were designed by other nutrition professionals. To do this, we will ask study participants to provide information for completing all four assessment tools, before and after they take part in a series of 7 Healthy Futures lessons

Results will be used to help us learn whether or not the Healthy Futures lessons are effective with EFNEP and SCNEP participants. The main goal of these programs is to help participants make healthy nutrition and lifestyle choices.

II. Study Procedures

1. This study will include 80 to 90 women, from across Virginia, who are between 20 and 50 years of age. Participants have been selected from Non-Latino, White and Black race/ethnic groups, whose native language is English.
2. You have been asked to participate based on the following:
 - A. You are a current participant in either EFNEP or SCNEP.
 - B. You are between the ages of 20 and 50 years.
 - C. You represent either an urban or rural area of Virginia.
 - D. You are Black or White, but not Latino or Hispanic.

3. As a participant, you will be asked to complete the following activities:
 - A. Participate in 7 Healthy Futures Lessons over 7 to 9 weeks, taught by an EFNEP/SCNEP program assistant (PA). The PA will meet with you, at your convenience, either individually or in a small group.
 - B. Provide information to the PA to complete the follow assessment tools about your food and nutrition practices and skills. These will be completed before and after the series of lessons:
 - a. 24-hour food recall
 - b. Healthy Futures Food and Nutrition Practice Checklist (FNPC)
 - c. Physical Activity Questionnaire
 - d. Food Safety Questionnaire.
4. Dr. Ruby Cox or Miss Traliece Bradford will be available to answer questions. To get answers to your questions, call this Toll Free number, anytime day or night:

1-888-814-7627

Leave a message with your name, telephone number, and a time you can be reached by phone. Mention that you are in the “Bradford Study.” Either Dr. Cox or Miss Bradford will return your call.

III. Risks

There are no perceivable risks associated with participation in this study.

IV. Benefits of the Study

Advantages to you will include:

- A. Learning skills necessary to make positive behavior changes toward a healthy lifestyle;
- B. Gaining knowledge on the risk factors of different chronic diseases and what you can do about them;
- C. Learning ways to stretch food dollars;
- D. Receiving a free pedometer and set of food/refrigerator thermometers.

There is no promise of benefits being made to encourage you to participate in this study.

V. Confidentiality

- A. Only you, the study leaders, and the EFNEP/SCNEP Program Assistant (PA) will be allowed to see your personal information.
- B. The researchers WILL NOT release individual information to anyone other than the above stated individuals, without your written consent.
- C. Overall results will be combined in a report for others to see. Participants’ names, addresses, or other identifying information will not be revealed in these reports.

VI. Compensation

Incentives for those who finish the study will include a free pedometer, used for measuring steps when walking for exercise, and a Wal-Mart Gift Certificate for \$15.

VII. Freedom to Withdraw

You are free to withdraw from this study at any time without penalty. If at anytime you feel uncomfortable with a question, you do not have to answer that question.

VIII. Approval of Research

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University (Virginia Tech) and the Department of Human Nutrition, Foods and Exercise (HNFE).

IX. Subject's Responsibilities

I voluntarily agree to participate in this study. I have the following responsibilities:

- A. I will answer the questions as accurately and honestly as possible.
- B. If I do not understand a question or directions, I will ask the Investigator or PA or call the phone numbers provided for help.
- C. I will be available and participate in 7 lessons that will be scheduled with me.

X. Subject's Permission

I have read and understand the Informed Consent and conditions of this study. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this study.

If I participate, I may withdraw at anytime without penalty. I agree to follow, to the best of my ability, the instructions provided to me in this study.

Signature of Participant

Date

Signature of Program Assistant

Date

If I have any questions about this research study or its conduct, I may contact:

Traliece Bradford
Investigator, Virginia Tech

(540) 231-2488
Phone

Ruby H. Cox, PhD
Professor-HNFE
203 Wallace Annex (0228)
Virginia Tech
Blacksburg, VA 24061

1-888-814-7627
Toll-Free Line

David M. Moore
Chair, IRB
Office of Research Compliance
Research & Graduate Studies
Virginia Tech

(540) 231-4991
Phone

Virginia Cooperative Extension

EFNEP and SCNEP Programs

EFNEP AND SCNEP FAMILY RECORD

(Use with Older Homemakers/Individuals)

REPRINTED 2005

PUBLICATION 360-095

Complete on each family at ENTRY into EFNEP/SCNEP and again at EXIT. Program Assistant should fill in shaded items.

1. PA's Name & ID#:		2. Check: ENTRY _____ EXIT _____							
3. Unit ID: _____	5. Enrolled in EFNEP before? (circle Yes OR No) Yes No	7. Age: _____	8. Sex: Female _____ Male _____						
4. Homemaker's ID: _____	6. If Yes, did you receive a Certificate of Completion? Yes No Group Name: _____								
Homemaker (First) (MI) (Last) a) Name _____ b) Street _____ c) City _____ Zip _____ d) Phone _____		*10. Chronic Diseases/Conditions (Check those that apply) <input type="checkbox"/> Diabetes (sugar) <input type="checkbox"/> High Blood Pressure <input type="checkbox"/> Heart Disease <input type="checkbox"/> Osteoporosis <input type="checkbox"/> High Cholesterol/Triglycerides <input type="checkbox"/> Overweight <input type="checkbox"/> Other _____							
11. Race: Check the category you identify with 1-00 <input type="checkbox"/> White (non-Hispanic) 2-00 <input type="checkbox"/> Black (non-Hispanic) 3-00 <input type="checkbox"/> Am Indian/Alaskan Native 4-00 <input type="checkbox"/> Hispanic 5-00 <input type="checkbox"/> Asian or Pacific Islander		12. Place of Residence: circle number 1 Farm 2 Towns under 10,000 & rural non-farm 3 Towns & Cities 10,000 to 50,000 4 Suburbs of Cities over 50,000 5 Central Cities over 50,000	13. Total Household Income Last Month: \$ _____ Homemaker works outside home Yes No						
14. Household Members: Children by Age List First Name of Children (through Age 19)		Age (Years)	15. Number of Other Adults in Household _____ (do not count Homemaker)						
1.			16. Lesson type (Check one): 1 <input type="checkbox"/> Group 3 <input type="checkbox"/> Both 2 <input type="checkbox"/> Individual 4 <input type="checkbox"/> Other Total number of lessons recieved (AT EXIT): _____						
2.									
3.									
4.									
5.									
6.									
7.									
		17. SUBGROUP CODES: (see page 3)							
		<table border="1"> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table>							

18. Entry Date:	Complete this section only when homemaker graduates or drops from program	
19. Programs/agencies from which Family received assistance at ENTRY: (Circle YES or NO)	20. Exit Date:	22. Did your family get help from one or more of programs below, due to referral or suggestion by EFNEP/SCNEP Program Assistant? Yes ___ No ___ If YES, check all that apply: <input type="checkbox"/> WIC <input type="checkbox"/> Food Stamps <input type="checkbox"/> Commodities (TEFAP) <input type="checkbox"/> Head Start <input type="checkbox"/> Child Nutrition <input type="checkbox"/> AFDC/TANF <input type="checkbox"/> Other _____
	21. Exit Reason: (circle)	
WIC/CSFP Yes No	1 Educational Objective Met	
Food Stamps Yes No	2 Returned to School	
Commodities (TEFAP) Yes No	3 Took Job	
Head Start Yes No	4 Family Concerns	
Child Nutrition Yes No	5 Staff Vacancy	
AFDC/TANF Yes No	6 Moved	
Other Yes No	7 Lost Interest	
(Food Stamp Eligible/but not receiving)	8 Other	
Any other benefits: _____		



FOOD PRACTICE CHECKLIST

Date Taken:	Check if answers were written in by Program Assistant <input type="checkbox"/>	Check One	Entry <input type="checkbox"/>	Exit <input type="checkbox"/>	Other <input type="checkbox"/>	No. ____
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This is a survey about ways you plan and fix foods for your family. As you read each question, think about the recent past. This is not a test. There are no wrong answers. If you do not have children, just answer the questions for *yourself*. For these questions, think about how you usually do things.

Please put a check [✓] in the box that best answers each question.	(1) Never	(2) Seldom	(3) Some-Times	(4) Most of the time	(5) Almost Always
(1) How often do you plan meals ahead of time?					
(2) How often do you compare prices when you buy food?					
(3) How often do you run out of food before the end of the month?					
(4) How often do you shop with a grocery list?					
(5) This question is about <i>meat</i> and <i>dairy</i> foods: How often do you let these foods sit out of the refrigerator for more than two hours?					
(6) How often do you thaw frozen food at room temperature?					
(7) When deciding what to eat, how often do you think about healthy food choices?					
(8) How often have you prepared foods without adding salt?					
(9) How often do you use the "Nutrition Facts" on the food label to make food choices?					
(10) How often do you eat something in the morning within 2 hours of waking up?					

ATTACH ADDITIONAL CHECKLIST, IF USED

SUBGROUP CODES

A	EFNEP Participant	R	Household Receives Food Stamps
B	FSNEP (SCNEP) Participant	S	Participant Not Receiving Food Stamps
O	Taught with SCYF Newsletter	T	Participant is non English speaking
P	Taught with Internet Lessons	U	Participant has a chronic disease or condition
Q	Participant involved in gardening	V	Participant has job outside home

Food and Nutrition Practice Checklist (FNPC)-Used in Main Study

A Checklist for Use with Basic Nutrition and Disease Prevention Programs

Participant's Name & ID#: _____ Unit Name & ID # _____ Date form completed: _____	Check One: Pre _____ Post _____ Check (✓) if answers were recorded by: Participant ___ PA ___ Volunteer ___ Other ___ Who? _____
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These questions are about ways you select, prepare, and handle foods for yourself and family members and about healthy lifestyle practices. As you read each question, think about the recent past. This is not a test. **There are no wrong answers.** Please answer each question as honestly as you can.

Check (✓) the box for the answer that best applies to you.	Never (1)	Seldom (2)	Some- times (3)	Most of time (4)	Always (5)
1. How often do you find yourself thinking about how well you take care of your health? (PA080)					
2. How often does your body size or shape keep you from participating in physical activity? (WY102)					
3. How often do you exercise for a total of 30 minutes each day? (VA120)					
4. How often do you make meals that include a variety of foods based on "MyPyramid"? (IA102)					
5. How often do you eat foods for breakfast from at least 3 of the 5 food groups?					
6. How often do fruits and vegetables make up at least half of the food on your plate?					
7. How often do you check foods on-hand before going to the grocery store? (HI108)					
8. How often do you make a grocery list and stick to it?					
9. How often does your food money or food stamps last for the whole month? (HI106)					
10. How often do you make main dishes from scratch? (WI103)					
11. How often do you compare prices of different brands of a food to choose the best buy?					
12. How often do you order a "super-size" portion of food or beverage? (WY101)					
13. How often do you read food labels to select foods with less fat? (002)					

Check (✓) the box for the answer that best applies to you.	Never (1)	Seldom (2)	Some- times (3)	Most of time (4)	Always (5)
14. How often do you wash your hands in warm soapy water before preparing food? (PA088)					
15. How often do you wash your hands with soap and warm water right after handling raw meat? (CO003)					
16. How often do you use a meat thermometer to check how done meat is? (IN113)					
17. How often do you refrigerate or freeze foods within 2 hours after serving? (IN116)					
18. How often do you thaw frozen meat at room temperature? (W1108)					
19. Are you trying to reach or stay at a healthy weight?					
20. How often have you been able to avoid gaining more weight?					
21. How often do you read food labels to select foods with less salt or sodium? (001)					
22. How often have you eaten food without adding salt at the table? (012)					
23. How often do you eat no more than 6 ounces of meat in a day? (VA116)					
24. How often do you eat mostly low-fat foods? (MA004)					
25. How often do you eat fried foods? (IN121)					
26. How often do you trim fat from meat and chicken before cooking or eating? (011)					
27. How often do you eat fruits and vegetables with the skin on?					
28. How often do you eat dried beans and peas?					
29. How often do you eat 6 ounces of breads, cereals, rice and pasta in a day? (VA115)					
30. How often do you check food labels to choose whole grain foods?					
31. How often do you make an effort to choose high-fiber foods?					

For these questions, think about how you usually do things. Check (✓) the box under the response that applies to you.	Never (1)	Seldom (2)	Some- times (3)	Most of time (4)	Always (5)
32. How often do you eat at least 1 ½ to 2 cups fruit in a day? (This includes 100% fruit juice). (MA002)					
33. How often do you eat 2 to 2 ½ cups vegetables every day? (This includes 100% vegetable juice) (MA003)					
34. Do you try new ways of preparing vegetables and fruits? (NY102)					
35. How often are do you eat at least 3 ½ to 4 ½ cups of fruits and vegetables each day? (NY100)					
36. How often do you eat deep yellow or dark green vegetables?					
37. When you eat bread, do you eat whole wheat bread? (CA049)					
38. How often do you drink/eat 3 cups of milk or yogurt in a day or eat cheese to equal each cup or milk? (VA117)					
39. How often do you drink regular soda pop (that is not diet or sugar-free)? (CA044)					
40. How often do you drink/use low-fat or skim milk? (CA047)					
41. How often do you take a daily calcium supplement that contains Vitamin D?					
For these questions, think about how often you do certain things. Check (✓) the box under the answer that applies to you.	Not very much	Some- what	Very Much		
42. Are you able to control your stress level?					
43. Do you eat foods recommended in a food guide, such as <i>MyPyramid</i> ? (PA082)					
44. Do you know how to use the “plate method” to determine healthy food portions?					

For this question, think about how these actions apply to you. Check (✓) the box under the answer that applies to you.	Haven't thought about changing (1)	Plan a change in next 6 months (2)	Plan to change this month (3)	Recently starting doing (4)	Do this regularly (5)
45. How ready are you to be physically active about every day? (ME001)					

	Strongly Disagree	Disagree	Agree	Strongly Agree
46. How much do you agree with this statement? <i>My food and nutrition needs are being met.</i> (004)				
CIRCLE the answer that best describes the number of times you do this.	Circle number or check a category to show number of times			
47. How many cigarettes do you smoke in a day ? (NY121)	None	Less than 10	10 to 20	More than 20
48. How many times during a month do you check grocery ads to find sales on food items that you need? (028)	None	1 to 3 times	4 to 7 times	8 to 10 times
For these questions, check (✓) the box under the answer that applies to you.	YES or <u>True</u>	NO or <u>False</u>		
49. When grocery shopping, do you buy foods from all 5 major food groups? (PA077)				
50. Do you eat undercooked hamburgers? (CO113)				
51. Do you regularly check the temperature of your refrigerator to see if it is 40 degrees or below? (VA124)				
52. Do you know any of the warning signs of cancer?				
For these questions, write in the <u>number</u> of times per month you do this.	<u>Number</u>			
53. How many times a month do you eat out? e.g. food not cooked at home) (CA051)				
54. How many times a month do you eat or serve bacon, sausage, or other fatty meats? (015)				
55. How many alcoholic drinks did you have this past month? (If none, put 0)				

Thank You for Completing this Questionnaire

Date Completed _____
Check one: Pre _____ Post _____

International Physical Activity Questionnaire (IPAQ-Short Version)

Participant's Name and ID# _____

County/City of Residence: _____ PA's Name: _____

Dear Study Participant:

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work and as part of your house and yard work. Also include your activities in getting from place to place, for recreation in your spare time, for exercise, and for participation in a sport.

First think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities? like heavy lifting, digging, aerobics, or fast bicycling?
_____ **days per week**

If **NO** vigorous physical activities, **Skip to question 3**

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?
_____ **hours per day**
_____ **minutes per day**
_____ **Don't know/Not sure**

Second, think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.
_____ **days per week**

If NO moderate physical activities, **Skip to question 5**

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

- _____ **hours per day**
- _____ **minutes per day**
- _____ **Don't know/Not sure**

Third, think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

- _____ **days per week**

If you did **NO** walking, **Skip to question 7**

6. How much time did you usually spend **walking** on one of those days?

- _____ **hours per day**
- _____ **minutes per day**
- _____ **Don't know/Not sure**

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

- _____ **hours per day**
- _____ **minutes per day**
- _____ **Don't know/Not sure**

This is the end of the questionnaire. Thank you for participating.

Date Completed: _____
 Check one: Pre _____ Post _____

Food Handling Questionnaire

Participant Name and ID# (ID provided by PA) _____

County/City of Residence _____ PA's Name _____

1. In this first section, there are questions about ways you eat or fix food. It is not a test. 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.						
b. After playing with a pet and before getting a snack, I wash my hands with soap and warm running water.						
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.						
d. I thoroughly rinse fresh vegetables under running water before eating them raw.						
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.						
f. I wash my hands with soap and warm running water after working with raw meat, chicken, or seafood and before I continue cooking.						
g. When I cook fish, I check that the flesh flakes easily with a fork before serving.						
h. I store eggs at room temperature.						

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

- | | <u>YES</u> | <u>NO</u> |
|----------------------------|--------------------------|--------------------------|
| 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. Do you eat the following foods?

- | | <u>YES</u> | <u>NO</u> |
|--------------------------|--------------------------|--------------------------|
| a. Rare hamburger | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Eggs with runny yolks | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Raw fish | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Homemade cookie dough | <input type="checkbox"/> | <input type="checkbox"/> |

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

- | | <u>YES</u> | <u>NO</u> |
|--|--------------------------|--------------------------|
| 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 temperature of refrigerator? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Do you use a thermometer to check 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 cooked 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"/> |

Thank you for completing this questionnaire.

44-Item Food and Nutrition Practice Checklist (FNPC) Revised 6-27-06

A Checklist for Use with Basic Nutrition and Disease Prevention Programs

Participant's Name & ID#: _____ Unit Name & ID # _____ Date form completed: _____	Check One: Pre _____ Post _____ Check (✓) if answers were recorded by: Participant ___ PA ___ Volunteer ___ Other ___ Who? _____
---	---

These questions are about ways you select, prepare, and handle foods for yourself and family members and about healthy lifestyle practices. As you read each question, think about the recent past. This is not a test. **There are no wrong answers.** Please answer each question as honestly as you can.

Check (✓) the box for the answer that best applies to you.	Never (1)	Seldom (2)	Some- times (3)	Most of time (4)	Always (5)
1. How often do you find yourself thinking about how well you take care of your health? (PA080)					
2. How often does your body size or shape keep you from participating in physical activity? (WY102)					
3. How often do you exercise for a total of 30 minutes each day? (VA120)					
4. How often do you make meals that include a variety of foods based on "MyPyramid"? (IA102)					
5. How often do you eat foods for breakfast from at least 3 of the 5 food groups?					
6. How often do fruits and vegetables make up at least half of the food on your plate?					
7. How often do you check foods on-hand before going to the grocery store? (HI108)					
8. How often do you make a grocery list and stick to it?					
9. How often does your food money or food stamps last for the whole month? (HI106)					
10. How often do you make main dishes from scratch? (WI103)					
11. How often do you compare prices of different brands of a food to choose the best buy?					
12. How often do you read food labels to select foods with less fat? (002)					

Check (✓) the box for the answer that best applies to you.	Never (1)	Seldom (2)	Some- times (3)	Most of time (4)	Always (5)
13. How often do you wash your hands in warm soapy water before preparing food? (PA088)					
14. How often do you wash your hands with soap and warm water right after handling raw meat? (CO003)					
15. How often do you use a meat thermometer to check how done meat is? (IN113)					
16. How often do you refrigerate or freeze foods within 2 hours after serving? (IN116)					
17. How often do you thaw frozen meat at room temperature? (W1108)					
18. Are you trying to reach or stay at a healthy weight?					
19. How often have you been able to avoid gaining more weight?					
20. How often do you read food labels to select foods with less salt or sodium? (001)					
21. How often have you eaten food without adding salt at the table? (012)					
22. How often do you eat mostly low-fat foods? (MA004)					
23. How often do you eat fried foods? (IN121)					
24. How often do you trim fat from meat and chicken before cooking or eating? (011)					
25. How often do you check food labels to choose whole grain foods?					
26. How often do you make an effort to choose high-fiber foods?					
27. How often do you eat at least 1 ½ to 2 cups fruit in a day? (This includes 100% fruit juice). (MA002)					
28. How often do you eat 2 to 2 ½ cups vegetables every day? (This includes 100% vegetable juice) (MA003)					
29. Do you try new ways of preparing vegetables and fruits? (NY102)					

For these questions, think about how you usually do things. Check (✓) the box under the response that applies to you.	Never (1)	Seldom (2)	Some- times (3)	Most of time (4)	Always (5)
30. How often are do you eat at least 3 ½ to 4 ½ cups of fruits and vegetables each day? (NY100)					
31. How often do you eat deep yellow or dark green vegetables?					
32. When you eat bread, do you eat whole wheat bread? (CA049)					
33. How often do you drink/eat 3 cups of milk or yogurt in a day or eat cheese to equal each cup or milk? (VA117)					
34. How often do you drink regular soda pop (that is not diet or sugar-free)? (CA044)					
35. How often do you take a daily calcium supplement that contains Vitamin D?					
For these questions, think about how often you do certain things. Check (✓) the box under the answer that applies to you.	Not very much	Some-what	Very Much		
36. Are you able to control your stress level?					
37. Do you eat foods recommended in a food guide, such as <i>MyPyramid</i> ? (PA082)					
38. Do you know how to use the “plate method” to determine healthy food portions?					

For this question, think about how these actions apply to you. Check (✓) the box under the answer that applies to you.	Haven't thought about changing (1)	Plan a change in next 6 months (2)	Plan to change this month (3)	Recently starting doing (4)	Do this regularly (5)
39. How ready are you to be physically active about every day? (ME001)					
	Strongly Disagree	Disagree	Agree	Strongly Agree	
40. How much do you agree with this statement? <i>My food and nutrition needs are being met.</i> (004)					
CIRCLE the answer that best describes the number of times you do this.	Circle number or check a category to show number of times				
41. How many cigarettes do you smoke in a day ? (NY121)	None	Less than 10	10 to 20	More than 20	
42. How many times during a month do you check grocery ads to find sales on food items that you need? (028)	None	1 to 3 times	4 to 7 times	8 to 10 times	

For this question, check (✓) the box under the answer that applies to you.	YES or <u>True</u>	NO or <u>False</u>
43. Do you know any of the warning signs of cancer?		
For this question, write in the <u>number</u> of times <u>per month</u> you do this.	<u>Number</u>	
44. How many times a month do you eat out? e.g. food not cooked at home) (CA051)		

Thank You for Completing this Questionnaire

VITA

Traliece Nicole Bradford was born on March 11, 1981 in Monroe, Louisiana and was reared in New Orleans, Louisiana. She received a Bachelor of Science in Institutional Management/Food Production Management from Grambling State University in 2003. She will receive her Master of Science degree in Human Nutrition, Foods, and Exercise from Virginia Tech in the summer of 2006. Miss Bradford will attend the University of Houston Dietetic Internship in July 2006. After completing the dietetic internship, she plans to pursue a career in dietetics with an emphasis in public health and wellness.