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A Qualitative Analysis of Youth Feedback of Nutrition School Enrichment Kits in Lincoln, NE

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The qualitative analysis of the responses given by students participating in classrooms that used the Nutrition Education Program's (NEP) school enrichment kits was the primary focus of this research. Data was collected from the participants in written form. Three major themes appeared during analysis of the data, healthy eating habits, cleanliness and change. The theme of healthy eating habits is comprised of the following sub-themes: breakfast, nutrients, label reading, Food Guide Pyramid/MyPyramid and healthy snacks. Cleanliness is comprised of hand washing and food safety sub-themes. The change theme is made up of change in healthy eating habits, change in cleanliness and change in both healthy eating habits and cleanliness. The data suggests that participating students have made or intend to make changes regarding healthy eating habits and cleanliness, which is the goal of nutrition education. The students' responses indicate that the NEP school enrichment kits are effective in increasing the knowledge of students and promoting healthy lifestyle changes.

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CHAPTER I

INTRODUCTION

Obesity is growing at an alarming rate. This epidemic is happening right here in Nebraska where the percent of the state's population has shown a dramatic increase in the last 20 years. In 1987, less than 10 percent of Nebraskans were obese. In 2007, 26 percent of Nebraska's population was obese (Center for Disease Control and Prevention (CDC), 2009).

Numerous reasons for this dramatic rise in obesity have been hypothesized. Diseases such as polycystic ovarian syndrome (PCOS) and Cushing's disease have been shown to contribute to the rise in obesity in adults. Common medications like steroids and psychiatric medications have also been shown as a contributor to the obesity epidemic. Other factors that have been linked to the increase in obesity are genetics, metabolism and, simply, energy imbalance. Cultural ideologies, environmental situations, behaviors of individuals and socioeconomic status (SES) have also played a part in the dramatic jump in obesity. More specific indicators like high birth weight babies and babies whose mothers have gestational diabetes are more likely to add to the obese population (CDC, 2009).

Not only is obesity a major health problem, but obesity also leads to a number of co-morbidities. Obesity has been shown to be a factor in causing hypertension, osteoarthritis, non-insulin dependent diabetes mellitus (NIDDM), cerebral vascular accidents (CVA), cardiovascular disease (CVD), obstructive sleep apnea (OSA) and other respiratory problems. Gallbladder disease and breast, colon and endometrial cancers are also seen at higher rates in obese individuals. (CDC, 2009) Obesity and its related co-

morbidities have had a significant economic impact. According to NHANES 1999-2000 data, Nebraskans spent $494 million on obesity-related medical costs, while Nebraska's Medicare and Medicaid costs are $94 million and $114 million, respectively (CDC, 2009).

The general adult population is not the only cohort affected by obesity, but children and adolescents have seen similar increases in the rate of obesity. Children 2-5 years of age have seen their obesity rates increase to 12.4 percent in 2006 from 5.0 percent during 1980. An increase from 4.0 percent in 1980 to 17.0 percent in 2006 was seen in children 6-11 years of age. A similar trend was observed in adolescents 12-19 years of age; in 2006, the obesity rate was 17.6 percent compared to an obesity rate of 5.0 percent in 1980 (CDC, 2009). In adolescents, it was found in both males and females, that Mexican-Americans had the highest rate of obesity, followed closely by Non-Hispanic African-Americans and Non-Hispanic Whites had the lowest rate of adolescent obesity of the three ethnic groups (CDC, 2009).

Factors that contribute to childhood and adolescent obesity can be broken down into two major categories, behavioral and environmental. Behavioral factors include energy intake, physical activity and sedentary behavior. Energy intake in children and adolescents has exploded due to an increase in sweetened snacks, processed convenience foods, high caloric liquid drinks, high calorie snacks, larger portion sizes and an overall rise in eating away from home. Physical activity has been on the decline. Daily physical education participation has decreased 14 percent from 1991-2003. In combination with a decrease in physical activity, there has been a surge in sedentary behavior. Children and

adolescents ages 8-18 spend an average of three hours per day watching TV, DVD's, movies and playing video games (CDC, 2009).

Environmental factors are categorized in four main areas – within the home, childcare facilities, schools, and communities. Parent-child interactions are the focus within the home as there is a high probability that the child will adopt the dietary and physical activity behaviors of their parents. In childcare facilities, the focus is split between the parent(s) and childcare providers to promote a healthy lifestyle and proper dietary habits. It has been shown that 80 percent of children under 5 with a working mom spend an average of 40 hours per week at their childcare facility. Schools appear to be the ideal setting for nutrition and physical activity instruction. According to the Institute of Medicine (IOM), there are an increasing number of schools adding nutrition and activity instruction to their curriculums. Safe areas to be active along with a larger availability and access to affordable healthy food are the main focuses in communities (CDC, 2009).

Consequences of childhood and adolescent obesity include physical and psychological health. Physical health consequences include CVD risks, OSA, NIDDM, asthma and hepatic steatosis. In 5-17 year olds, 7 percent of obese children had at least one CVD risk factor, while 39 percent of obese children had 2 or more CVD risk factors. Psychological health factors include a poor social stigmatism and early discrimination. This can ultimately lead to low self-esteem that may produce lower performance in academics and social functioning. These lower levels of performance may not end with childhood and may linger into adulthood (CDC, 2009).

Purpose of the Thesis

The purpose of this thesis is to qualitatively analyze youth feedback from the Nutrition Education Program's (NEP) school enrichment kits Lincoln Public Schools (LPS) in grades 1-5 from the 2001-2009 school years. There is limited research on the topic of qualitative analysis of youth feedback in response to nutrition education programs. The research conducted for this thesis will contribute to filling this gap within the current research. Qualitative research of youth in nutrition education programs is vital as it allows the organizations providing youth nutrition education/outreach programs to determine if their target population is viewing and understanding the information in a manner that the organization had intended during the development of the education program.

Objectives

The objectives of this research are:

1. To determine if there are major themes or ideas from the NEP school enrichment kits that the students were able to re-iterate using their own words and/or expressions.
2. To determine if there are major themes or ideas from the NEP school enrichment kits that the students were able to apply in their lives outside of the classroom.

CHAPTER II

LITERATURE REVIEW

Expanded Food and Nutrition Education Program

The Expanded Food and Nutrition Education Program (EFNEP) is funded by the National Institute of Food and Agriculture (NIFA) which is a division of the United States Department of Agriculture (USDA). EFNEP is designed to help reduce obesity, improve nutrition and improve physical activity in limited-resource populations as these populations have a disproportional amount of obesity, poor nutrition, physical inactivity and overall poor health. EFNEP focuses on two major subsets within limited-resource audiences: low-income families with young children and low-income youth. EFNEP is currently operational in all 50 states and 6 territories. (United States Department of Agriculture (USDA) 2009)

EFNEP utilizes a research-based learning model. This allows EFNEP to efficiently and effectively reach and educate the targeted audience. Members of the targeted community are trained and supervised by the university-based and/or county-based EFNEP office(s). EFNEP educators have the ability to positively influence the targeted community by promoting and teaching the skills needed to make positive behavioral changes through hands-on and interactive teaching methods. EFNEP educators commit themselves to providing grounded education to a diverse, low-income population. (USDA, 2009)

Supplemental Nutrition Assistance Program

The Supplemental Nutrition Assistance Program (SNAP) is funded by Food and Nutrition Services (FNS), which is a subdivision of the USDA. SNAP participants must

meet the following main eligibility requirements: the gross income of a person or family must be no greater than 130% of poverty level, a person/family can have no more than $2,000 in countable resources or $3,000 in countable resources if they have a person at least 60 years old living in the household. The following are eligibility requirements for immigrants: have lived in the United States for at least 5 years or receiving disability-related assistance/benefits or is a child. (USDA, 2009)

Funds provided by SNAP can be utilized on any food item in order to help low-income families put an end to hunger. In addition to ending hunger in the low-income households, SNAP focuses on increasing the level of health and nutrition within the low-income population. SNAP benefits are based upon the number of family members and the income level of the household. The funds are placed on an electronic debit card (EBT) and can be used like cash at participating retailers. (Rida, 2006)

Supplemental Nutrition Assistance Program Education

Supplemental Nutrition Assistance Program Education (SNAP-Ed) is component of SNAP. SNAP-Ed is an educational program designed for people participating in SNAP or people who are eligible for SNAP. The information taught by SNAP-Ed educators is designed in a way that will allow participants to voluntarily adopt those nutrition-related behaviors that are associated with health and well-being for those on a limited budget. SNAP-Ed focuses their main attention to women and children because this is where SNAP will have the highest potential to impact nutrition-related behaviors. The format in which SNAP-Ed educates is a behavior-focused, science-based manner with a small number of set outcomes. (Food and Nutrition Services (FNS), SNAP-Ed, ND)

SNAP-Ed educates SNAP participants in order to provide them with the opportunity to choose and adopt a diet and lifestyle consistent with MyPyramid and the Dietary Guidelines for Americans. Food preparation and food safety are main objectives of the SNAP-Ed. Other objectives include fiscal responsibility/budgeting and physical activity. The goal of this education is to give the participants the ability to purchase healthy foods within their budget, prepare and serve well-balanced nutrient dense meals that are within the household's budget and increase physical activity to promote weight management and health. (Rida, 2006; FNS, SNAP-Ed, ND)

Nutrition Education Program

In Nebraska, EFNEP and SNAP-Ed are housed in one entity entitled the Nutrition Education Program (NEP). The goal of NEP is to teach knowledge and skills to limited resource families to increase behavioral changes needed for a healthy lifestyle for them and their families. (Doerneman, 2008)

National School Lunch Program

The National School Lunch Program (NSLP) is run by the USDA through FNS and has been in operation since 1946 when President Truman signed into law the National School Lunch Act. Public schools, non-profit private schools, and residential child care facilities are the three main locations where the NSLP is operated. NSLP is designed to provide eligible children nutritionally balanced meals for free or at a reduced cost on school days. To be eligible for free lunch, children must come from a household making less than 130% of poverty, while reduced lunch requires the children to come from a household making between 130-185% of poverty. After school snacks can be provided to children following the same financial guidelines. However, schools that have

50% or more of the student body qualifying for free or reduced lunch can provide all the after school snacks at activities for free. (USDA, 2008)

The number of participating children has grown substantially as has the cost of the program. In 2007, 30.5 million children utilized this program on a daily basis at a cost of $8.7 billion. In 1946, 7.1 million children used NSLP for a cost of $70 million. Specific regulations, not specific menus, are provided to participating schools and child care facilities. The regulations are that the meal must provide 33% of the RDA of calcium, protein, iron, calories, vitamin A and vitamin C, while being no more than 30% total fat and less than 10% saturated fat. (USDA, 2008)

In Nebraska, 239,956 children (39,096,842 meals) participated in NSLP in 2008. Participation has increased since 2004, when 225,506 children (36,295,113 meals) participated. Further growth is anticipated. (USDA, 2009)

School Breakfast Program

School Breakfast Program (SBP) is funded by FNS and may operate in public schools, nonprofit private schools and residential child care facilities. SBP was a pilot project from 1966-1975. In 1975, SBP became a permanent program which has the same financial eligibility requirements that NSLP does. Today, SBP is operational in almost 84,000 schools and child care facilities. Federal regulations require that 25% of the RDA of calcium, iron, protein, calories, vitamin A and vitamin C. The meal can contain no more than 30% of calories from fat and less than 10% saturated fat. (FNS, 2008)

In 2004, 8.9 million (1.52 billion meals) children were served through SBP nationally. In 2008, 10.6 million (1.81 billion meals) children were served through SBP nationally. 42,223 (7,048,711 meals) children in Nebraska participated in SBP during

2004. In 2008, the number of Nebraska children participating in SBP increased to 54,915 (9,078,622 meals). Further growth is anticipated (USDA, 2009).

Importance of Breakfast

The act of eating breakfast is linked with a healthier dietary pattern. Unfortunately, in adolescents, eating breakfast is declining. Eating breakfast is associated with higher academic outcomes (Berkey, Rockett, Gillman, Field, & Colditz, 2003).

The link between eating breakfast and overweight and obesity in children and adolescents is debated. There is evidence that for boys and girls that are overweight at baseline, skipping breakfast helps to lose weight and body fat. Evidence also exists that there is no association between eating breakfast and the weight of the child. Also existing in the literature is evidence that skipping breakfast is linked to weight gain. (Berkey et al, 2003, Speiser et al, 2005, Spear et al, 2007) Overweight and obese children and adolescents have been shown to skip breakfast, but consume larger meals the rest of the day when compared to their normal weight counterparts (Spear et al, 2007; Speiser et al, 2005).

Special Milk Program

The Special Milk Program is funded under FNS. The program is available to schools/child care institutions that do not participate in other federal meal programs like NSLP or SBP. Schools/child care institutions which participate in NSLP and/or SBP and offer half-day pre-kindergarten/kindergarten classes are eligible to participate in the Special Milk Program in order to have the ability to serve milk to those children that are unable to utilize the NSLP or SBP due to enrollment in the half-day curriculum. (USDA, 2008)

Schools/child care institutions that participate in the Special Milk Program are reimbursed by the USDA for each half-pint carton of milk sold to children [reimbursement is dependant upon a non-profit operation of the milk program]. The USDA reimbursed the net cost of each carton of milk 'sold' to a student that is eligible for free milk and $0.1825 for each carton of milk sold to a child that does not qualify for free milk during the 2008-2009 school year (USDA, 2008).

Milk provided through the Special Milk Program must be pasteurized and contain Vitamins A and D at levels required by the FDA. The milk may be whole milk, low-fat milk, skim milk and/or buttermilk (cultured). The milk must be fluid and may be flavored or unflavored (USDA, 2008).

In FY2007, the Special Milk Program cost $13.6 million. This cost is $1.8 million lower than the program cost during FY2000. During FY2007, 6300 schools, residential and non-residential childcare institutions and summer camps participated in the Special Milk Program (USDA, 2008).

Team Nutrition

Team Nutrition, a behavior-based and comprehensive program, is an USDA initiative whose goal is to increase the health of children through improvement of their physical activity and eating habits. The guidelines that Team Nutrition uses are MyPyramid and the Dietary Guidelines for Americans. Team Nutrition focuses on schools to help change students' behaviors by providing the following:

1. training/technical assistance to help make healthy and appealing meals – this training is provided to the children's nutrition food service personnel

2. nutrition education – interactive and comprehensive lessons for both child and parents; designed to increase skills and motivation
3. school and community support – done via school administrators and other school/community partners

(USDA, N.D.)

Summer Food Service Program

USDA's Summer Food Service Program (SFSP) was created to allow for low-income students to have a nutritious breakfast and lunch throughout the summer months when school is not in session. Although there are a high number of children that qualify for SFSP, the number that participates in SFSP remains low. Sponsors can combine nutritious meals with a summer activity or educational program. Sponsors may include schools, public agencies and private non-profit organizations.

Children 18 years of age and under are eligible for SFSP. Individuals that have physical and mental handicaps may also participate in SFSP if they participate in school program(s) for the disabled. There are three different types of SFSP sites. They are as follows with explanations of each type of SFSP site:

1. Open – an area or neighborhood in which at least half the children are eligible for free or reduced price school lunch (less than 185% of poverty level); all children will be able to eat for free and the sponsor will be reimbursed for each meal served
2. Enrolled – an activity program where children are enrolled and at least half of the enrolled children qualify for free or reduced price school lunch; all

enrolled children will be able to eat for free and the sponsor will be reimbursed for each meal served

3. Camp – any camp may participate in SFSP, but they will only be reimbursed for the meals they serve to children who qualify for free or reduced price school lunch

(USDA, 2009)

The participation rate in Nebraska has grown from FY04 through FY08. In FY04, 5,298 children per day and 36,295,113 total meals were served as part of SFSP. Total reimbursements from the USDA to the state of Nebraska in FY04 for meals served as part of SFSP was $698,209. In FY08, 7,534 children per day and 39,096,648 total meals were served due to SFSP. Total reimbursement from the USDA to the State of Nebraska in FY08 for meals served as part of SFSP was $1,382,930. (USDA, 2009)

4-H

The 4-H program was created by the Cooperative State Research Extension Education Services (CSREES) for youth development. 4-H uses an experiential teaching method that is research-based. 4-H helps develop life skills in all areas of life including nutrition. Children that have participated in 4-H programs have gained confidence and developed a positive self-image. 4-H aims to teach intellectual experiences, caring and compassion for the community, learning and applying new skills and living a healthy lifestyle. Each one of the aims is represented in a leaf of the 4-H program's logo of a four leaf clover. (Doerneman, 2008)

School Enrichment and Nutrition Intervention in Youth

A major program used by 4-H to reach and teach limited resource youth in their schools is called school enrichment. Low-income children are targeted by the EFNEP school enrichment programs. School enrichment programs are meant to enhance, not replace, the normal school curriculum through interactive lessons. The school enrichment lessons are a very common way to teach nutrition to children and are designed to be taught by the teachers, extension staff or volunteers. (Diem, 2001; Tochterman, Carroll & Steele, 2004)

A survey conducted by Diem indicated that 86% of all counties had a school utilizing school enrichment. According to the survey, schools and counties reported that lack of interest and time restraints as main reasons why schools did not participate in school enrichment. Diem's study reported that the three ways used by schools to evaluate the effectiveness in school enrichment were written evaluations from the students, written evaluations from the teachers and testing the students. These evaluations indicated that students had gained knowledge and skills in 82% of the participating schools. (Diem, 2001)

Tochterman, Carroll and Steele studied the effectiveness of a Colorado school enrichment program. The results of the study showed that participating youth increased their knowledge and skills. The study also indicated that school enrichment had a positive effect on the relationship between the student and the teacher. (Tochterman et al, 2004) There is little known about the nutrition component of school enrichment due to the high variability in curriculum between states. (Doerneman, 2008)

Components of Successful School-Based Nutrition Education Programs

Successful classroom-based nutrition education programs need to consider and take appropriate steps to ensure that needs/interests of the students, teachers and school are addressed and the goals of the program are relevant. Cultural sensitivity and prior knowledge of the children needs to be accounted for in order to have a successful nutrition education program for children. The materials and teaching methods used when educating children must be age-appropriate to ensure that they understand. Successful nutrition education programs for school-age children should strive for an increase in both knowledge and skills (Perez-Rodrigo & Aranceta, 2001).

Another prominent component to classroom-based nutrition education programs is the promotion of behavior change. Social cognitive theory (SCT) and experiential learning have been the basis for different studies, including the Delicious and Nutritious Garden by Heim, Stan & Ireland. The premise behind SCT is that the behaviors of the subjects are heavily influenced by their thoughts and beliefs and having experiences helps to positively influence the thoughts and beliefs of the subjects. SCT is also a popular theory to build an education program on due to its recognition of individual and environmental facets and its ability to aide in development of self-efficacy and decision making (Bandura, 1985; Heim, Stan & Ireland, 2009; Perez-Rodrigo & Aranceta, 2001).

The transtheoretical model, or stages of change, is another theory that is used as the framework for classroom-based nutrition education programs because of its ability to tailor education based upon the audience's readiness to change (Finckenor & Byrd-Bredbenner, 2000; Perez-Rodrigo & Aranceta, 2001). Other studies use a combination of behavior change theories as a foundation for their nutrition education programs, such as

the GIMME-5, because it can allow for the maximum number of perceived barriers to be discovered and addressed (Nicklas et al., 1997; Perez-Rodrigo & Aranceta, 1997; Perez-Rodrigo & Aranceta, 2001).

Outcomes of School-Based Nutrition Education Programs

Outcomes of school-based nutrition education programs are promising. Early research suggests that school-based nutrition education programs are not effective. One school-based program used the students' teachers to teach nutrition and healthy lifestyle throughout the school year. This program also had meetings throughout the year where parents of the students attended. The teachers had additional training for the nutrition education material. After the five year follow-up, the researchers concluded that this school-based nutrition education program did not help control the risk factors, such as unhealthy diets and lifestyles, causing obesity in the children due to a suggested high stability in diet and lifestyle, over time, that lead to weight gain. (Angelico et al, 1991).

Recent research indicates that school-based nutrition education programs are effective and may be maintained over time. One study showed that the knowledge of high fat foods increased as did the students intentions to pick healthier foods (DeVault, Kennedy, Hermann, Mwavita, Rask, & Jaworsky, 2009). Another study that used a novel nutrition education game as the intervention showed that students who played the game were significantly more likely to state that they were willing to try to eat a healthy diet or were already eating a healthier diet than the students who did not play the game (Lakshman, Sharp, Ong & Forouhi, 2010). Studies involving both school-based nutrition education and school-based gardens show positive effects on fruit and vegetable consumption and willingness to try novel fruits and vegetables (Parmer, Salisbury-

Glennon, Shannon & Struempler, 2009; McAlssee & Rankin, 2007; Heim, Stan, & Ireland, 2009). A study also showed that school-based programs may successfully be maintained over time given the proper resources and training (Hoelscher et al, 2004).

Qualitative Research – What is It?

The purpose of qualitative research is to research subjects in their natural setting and study the phenomena of events, not in objective numerical terms, but rather in terms of the meanings that the subjects give to the phenomena of events. Qualitative research preserves the intricacies of the subjects by utilizing a universal perspective. Qualitative research uses sound research methodologies and the results of qualitative research may be the answers to introductory questions so that quantitative studies may be developed (Byman, 2006; Cohen & Crabtree, 2008; Golafshani, 2003; Grypdonck, 2006; Harris et al., 2009; Whittemore et al., 2001).

Qualitative Research – How Is It Different from Quantitative Research?

Qualitative research differs greatly from quantitative research. Qualitative research tends to be inductive and the data collected is commonly text, audio and/or visual compared to the deductive and numerical data tendencies of quantitative research. Qualitative research usually occurs in natural settings rather than controlled settings and usually has a smaller number of subjects than quantitative research. Data in qualitative research tends to be analyzed as it is collected, which is in contrast to quantitative research where data is collected first, then analyzed (Harris et al., 2009). Overall, quantitative research is objective and seeks to be generalized, where qualitative research is subjective and more contextual (Whittemore, Chase, & Mandle, 2001).

The purpose of qualitative research is markedly different than quantitative research. Qualitative research is most commonly utilized for development of hypotheses and theories, intricate issues such as outcome reason(s), processes, humans and the interaction(s) between the three. Qualitative research tends to study objects/phenomena that are not well-known. Compare these characteristics to the common characteristics of quantitative research (testing hypotheses/theories, treatment/manipulation outcomes and the study of well-known objects/phenomena) and there is a stark contrast (Harris et al., 2009).

Quantitative and qualitative research does not vie against one another, but, rather, they complement one another (Golafshani, 2003; Grypdonck, 2006; Harris et al., 2009; Whittemore et a.l, 2001). In fact, mixed-methods research, which is a combination of quantitative and qualitative research, is becoming more popular due to the complementary nature of the two types of research (Bryman, 2006; Harris et al., 2009). Qualitative research is needed to apply quantitative research finding(s) and/or discussion(s) in a reasonable and appropriate manner. Appropriateness is defined as the treatment/intervention that provides the highest probability to have a desirable outcome at a reasonable cost for society. Qualitative research allows an individual's experiences to be accounted for, examined and researched. Qualitative research can determine the desirability of an outcome(s) that a specific intervention seeks to solve and may also allow the researcher to find clues on why the desirable or undesirable outcome(s) occurred (Grypdonck, 2006).

Qualitative Research – Validity and Reliability

Validity and reliability in qualitative research is an on-going debate (several studies; Golafshani, 2003; Grypdonck, 2006; Harris et al., 2009; Whittemore et al., 2001). Due to the vast differences between qualitative and quantitative research, it is extremely difficult to apply the same criteria utilized to determine validity in quantitative research (Whittemore, et al., 2001). Quantitative research terminology and their definitions are as follows:

Validity – the determination of whether the research measures what it is intended to measure (Golafshani, 2003)

Internal validity – the determination of how well-designed the study was, how well the study was performed and how confident one can conclude that the dependent variable was produced not from outside variables, but from the independent variable (Huitt, Hummel, & Kaeck, 1999)

External validity – the determination of whether the results of the research can be generalized in other settings and with other subjects (Huitt, et al., 1999)

Reliability – the determination of the consistency and accuracy of results over time and reproducibility of the results given similar conditions and methodology (Golafshani, 2003)

Several studies (Cohen & Crabtree, 2008; Golafshani, 2003; Grypdonck, 2006; Harris et al., 2009; Hoepfl, 1997; Malterud, 2001; Mays & Pope, 2000; Payne &

Williams, 2005; Whittemore et al., 2001) utilize the terminology/criteria developed by Lincoln and Guba in 1985 to help determine validity and reliability in qualitative research. One study declared that Lincoln and Guba's criteria is the gold standard to determine validity and reliability in qualitative research (Whittemore et al., 2001). The quantitative terminology has been converted to be more applicable to qualitative research. Internal validity was converted to credibility, external validity was converted to transferability, reliability was converted to dependability and objectivity was converted to confirmability (Lincoln & Guba, 1985; Whittemore et al., 2001).

Credibility is the representation of the existence of the multiple realities that are assumed by the researcher (Hoepfl, 1997). Sample size is of less importance to credibility in qualitative research than it is to internal validation in quantitative research. Credibility is based on the analytical skill of the researcher, the depth of the gathered information and the quality of the research design (Hoepfl, 1997; Patton, 1990; Payne & Williams, 2005). Credibility can be increased through techniques like triangulation, respondent validation and transparency of the researcher (Harris et al., 2009; Hoepfl, 1997; Lincoln & Guba, 1985; Patton, 1990; Safman & Sobel, 2004).

Transferability is to qualitative research as generalizability is to quantitative research. In qualitative research, it is hard to have a generalized statement because of the high variability between the research situation and the situation to which it is to be applied (Hoepfl, 1997; Lincoln & Guba, 1985; Payne & Williams, 2005). Therefore, transferability is unable to be stated by the researcher, but it is the researcher's duty to provide adequate information for the reader to determine if the findings can be applied to their situation, which would include items such as a detailed report on methodology,

sampling method, data sources/collection methods and analysis technique(s) (Harris et al., 2009; Hoepfl, 1997; Lincoln & Guba, 1985; Payne & Williams, 2005). One argument to bypass the concern of the inability to generalize qualitative research is to focus on the quality of the study of which the generalizations are to be based upon. If the study is of sound research design, then the question of the generalization of the findings should be negated and the possibility of generalization deemed plausible (Payne & Williams, 2005).

Dependability in qualitative research has not been a high focus area by qualitative researchers as they tend to focus more upon credibility and confirmability. There has been one idea to increase dependability – an audit performed by external reviewers to confirm the consistency of the research process and the research product (Hoepfl, 1997; Lincoln & Guba, 1985). Other ways to increase dependability is to have the collected data analyzed by two or three trained persons on an individual basis or by reviewing the data multiple times by the same analyst. There still may be bias in the interpretation of the data, but ensuring credibility and confirmability will reveal if any such biases exist (Harris et al., 2009).

Confirmability allows for the qualitative researcher to be as objective as possible in a subjective research field (Hoepfl, 1997; Lincoln & Guba, 1985). Being transparent as well as allowing access helps to increase confirmability. Transparency allows readers access to the original data, notes from the analysis of the data, products/notes from the synthesis and reconstruction of the data, process and methodological notes, personal notes from the researcher(s) and the preliminary development information of the data (Harris et al., 2009; Hoepfl, 1997; Lincoln & Guba, 1985; Safman & Sobel, 2004).

Confirmability requires a neutral researcher to provide accurate and unbiased results of subjective and possibly, value-based data (Hoepfl, 1997).

Qualitative Research – Data Analysis

Data analysis in qualitative research is conducted utilizing the numerous steps of content analysis. Content analysis is highly utilized in qualitative research (Hsieh & Shannon, 2005). Content analysis is comprised of organizing, classifying and summarizing the data. Description of the subjects, setting and context of the collected data is essential to content analysis. Content analysis includes the exploration of patterns, themes and possible meaning(s) of the phenomena to the subjects. The summarization of plausible answers to the research question(s), the generation of theories/hypotheses and the determination of what is reported are integral pieces of content analysis (Harris et al., 2009).

There are three major techniques to content analysis are conventional, directed and summative. The three different techniques have the similarity that they are all used to understand the collected data, but the three techniques differ in their approach to the development of codes and coding the data. Codes and the classification of codes are taken straight from the text data in the conventional technique. In the directed technique, codes and the classification of codes derived from a theory or theories and/or pertinent research findings. The summative technique requires counting/comparing keywords and/or content, which is then followed by the analysis/interpretation of the essential content in order to develop codes and the classification of codes (Hsieh & Shannon, 2005).

Qualitative Research – Programs Assisting with Data Analysis

Several computer software programs exist that help with analysis of the collected data. Programs such as ATLAS.ti, MAXQDA, NVIVO 8, QDA Miner 3.0, Qualrus and Transana are commonly utilized programs. Software programs, like the ones listed above, aid the researcher in coding, organizing, developing themes, and summarizing the data (Harris et al., 2009).

CHAPTER III

METHODOLOGY

Subjects

The subjects of this research study were first, fourth and fifth graders from Elliot, Hawthorn, Meadow Lane and Huntington elementary schools within the Lincoln Public Schools (LPS) district. These schools were selected as they meet the eligibility requirement of the USDA Supplemental Nutrition Assistance Program – Education (SNAP-Ed); have at least 50% of the student body eligible for the free or reduced price lunch program. The project received IRB approval based on the NEP Program IRB (Appendix A). The Nebraska Nutrition Education Program's (NEP) staff taught the first lesson on proper hand washing and the last lesson on healthy snacks. The school teachers taught the remainder of the content of the kit.

NEP School Enrichment Kit Organization/Procedures

The school enrichment kits were designed to be interactive and to be taught by the children's school teacher. Educational games, science experiments and hands-on activities were designed to reinforce the lessons, while allowing the children to be actively engaged and enjoying the lesson. The school enrichment kits contained optional activities to be performed if time allowed (Rida, 2006).

The school enrichment kits were utilized to teach nutrition to the children of LPS. There are specific kits for first, fourth and fifth grades. Each grade level kit had a specific theme. The first grade's kit is called "Healthy Me!" This kit focuses on why our bodies need food, how our bodies use food, how to choose healthy snacks and plan healthy meals. Activities included in the first grade NEP school enrichment kit are food

group puppets, moldy bread experiment, food pictures and the Dairy Council's "Chef Combo." "Rate That Plate" is the name of the fourth grade NEP school enrichment kit. Learning what nutrients are, learning to use the Food Guide Pyramid/MyPyramid, learning how eating healthy will make them feel, learning the importance of eating breakfast and learning how to properly handle foods are goals of the fourth grade kit. Activities included in the fourth grade NEP school enrichment kit are food safety bingo, building a Food Guide Pyramid and tic-tac-toe. The theme of the fifth grade kit is called "F.S.I – Food Science Investigator." The educational goals for the fifth grade NEP school enrichment kit are food safety, label reading and comparison, what nutrients are and why they are important and how to use the Food Guide Pyramid/MyPryamid to plan and eat a healthy diet. "Who wants to be a healthy snacker?," "BAC-attack," an apple experiment, making soda pop and a human pyramid are activities that are included in the fifth grade kit. Each lesson was designed to be utilized by the school teachers in 30-50 minute segments. NEP's school enrichment kit was designed to be completed in its entirety within three weeks (University of Nebraska-Lincoln (UNL), N.D.; Rida, 2006).

Data Collection

The data collected is qualitative. Students that were in the first, fourth and fifth grade classrooms that utilized the school enrichment kits were asked to report what they learned as well as what they enjoyed most about the school enrichment kits. The students then wrote that information in addition to whatever else they wanted to include about the school enrichment kits onto an unnamed, lined, apple-shaped paper (apples) (Appendix B), immediately upon completion of the final lesson contained in the school enrichment kits. Following the completion of the apples, the classroom teacher then returned them

by mail or hand-delivery to NEP or requested that the apples be picked up by staff. Once received by NEP, the apples were then sorted by school year (Rida, 2006). Nine-hundred three apples were returned and analyzed.

First grade data collection was halted after three years of collecting it. The responses provided by the first graders were extremely limited by the students' lack of writing ability and literacy level. The responses mainly said thank you for the school enrichment kits. Due to the delivery method(s) of the apples from the teachers to the NEP staff, the apples were unable to be sorted by grade level and school from which the apples came.

Data Analysis

The apples were entered verbatim with spelling/grammar mistakes included into a Microsoft Word 2003 document and saved as a rich-text format (.rtf) onto a flash drive. In order for the computer software to recognize words, the verbatim transcribed apples had to be corrected for spelling and grammar. Qualitative data analysis was preformed by utilizing the computer software Atlas.ti version 6.1.13 (Muhr, 2010). The Atlas.ti program tracks the different student-reported ideas in order to determine any categorical trends that may have occurred. Determining major themes within each of the occurring trends is also permitted by the Atlas.ti software.

CHAPTER IV

RESULTS

Two main themes emerged from the data – healthy eating habits and cleanliness. The common thread between both themes was the usage and effectiveness of the activities that helped teach and reinforce the nutrition kit lessons to participating children. This fact was substantiated by the students writing statements similar to these quotes "I thought it was fun to learn with the activities" and "I had lots of fun playing it, but at the same time I learned a lot! In my opinion, I think this activity kit is very helpful!" The lone teacher written response summed up the NEP nutrition kit and its effectiveness best by stating,

> "As a token of our appreciation, we decided to write to you about what we learned and enjoyed the past few weeks. As a teacher, I was very impressed with the interest my students expressed in looking at food labels! We took it to a level of bringing in labels from foods they eat at home! I was also impressed with the knowledge they gained from the video - the students understand cross-contamination! I was impressed. Thank you!"

Main Theme #1: Healthy Eating Habits

A main theme was healthy eating habits. Individual components of healthy eating that were commonly mentioned in the data formed sub-themes. The summation of the sub-themes created the main theme of healthy eating. Children that reported changing their eating habits tended to focus on a specific area, a sub-theme, rather than mentioning a broad overlaying subject area like the main theme of healthy eating habits. The main

theme of healthy eating habits was the product of combining the sub-themes of breakfast, nutrients, label reading, Food Guide Pyramid and healthy snacking.

Breakfast

The importance and role of eating breakfast was taught and reinforced to the fourth grade students through a video, which was part of the kit, titled "E.A.G.A.H.B.E.D.D.: Eat a Good and Healthy Breakfast Everyday Day." The video was enjoyable to the students as one student stated, "I liked watching E.A.G.A.H.B.E.D.D because it was very interesting." This statement reflected the views of a majority of the students that mentioned this video and breakfast. "I learned that if you don't eat breakfast, you won't feel so good and you can't learn," was what a student stated that they learned from watching the video. Viewing the video resulted in some students changing and/or attempting to change their breakfast eating habits as evidenced by the following quotes from the writings of the students: "And I will always E.A.G.A.H.B.E.D.D.!" and "What I learned was to always eat a healthy breakfast. What I'll remember the most about a healthy lifestyle is to always eat breakfast."

Nutrients

The six categories of nutrients, including specific nutrients within each main nutrient category, were discussed by the students. The lesson educated the students on the six nutrient categories and the role of each type of nutrient. "Which Nutrient Am I?" was the game that helped to teach the nutrient-focused lesson. Students summed this up by writing "I learned that there are six nutrients carbohydrates, proteins, fats, minerals, vitamins, and water" and

> "Proteins: nutrients needed for growth and to build and repair body cells. Carbohydrates: nutrients used by the body as its main source of daily energy. Fats: nutrients that provide large amounts of long lasting energy. Vitamins: nutrients found in small amounts in food needed by the body to grow and function."

Yet another student wrote,

> "I also learned about proteins, minerals, vitamins, carbohydrates, fats and water. Protein helps keep your muscles, skin, hair, and nails healthy. Minerals build new cells and control body processes. Vitamins help the body use carbohydrates, and fats and proteins help body systems function. Carbohydrates are the main source of energy. Fats help the body use vitamins and build tissue to protect important organs. Water dissolves some vitamins and helps bring nutrients to the cells in your body."

Other students wrote about specific vitamins and minerals "We learned all the vitamins and minerals like vitamin A, B, C, D and minerals like iron, calcium, sodium" and their roles "I learned vitamin A gives you good eye sight" and "I learned about how calcium makes strong bones and teeth." One student even noted a possible consequence of vitamin-deficiencies when that participant wrote "I learned that if you don't have enough vitamins you will get scurvy."

Label Reading

Label reading is an important skill in healthy eating habits. Not only is this an important skill alone, but it can also help to reinforce the nutrient lesson. The activity associated with this sub-theme was the use of cereal box labels, which many students

really enjoyed. The following statement summarizes a majority of the responses stating that they like this activity: "But my favorite activity was the cereal labels because it was fun to find out how many calories, fat calories, vitamin A, vitamin C, sugar and fiber a cereal box has." Students learned about how to read the ingredient list, percentage of daily value and grams of certain nutrients within the label. One student discussed using the food label to determine the serving size, proper storage, expiration date and if that food is a healthy choice or not by writing

> "it [food label] tells you everything in it, like how many grams of sugars and protein, the ingredients the percent vitamin D, Iron, calcium and other stuff in it. It tell how many ounces in each serving, it also have the expiration date, if it's after the time in the expiration date, don't eat it. It also tells you to keep it refrigerated or not. Don't believe when it says low fat, low fat and no fat have a big different. You can decide if it's healthy or not if it has too many sugar, it's not healthy, if it has a lot of protein, and it is healthy."

The students are taught that the ingredient list on the food label lists ingredients in order of predominance. One student wrote, "I learned how to read the ingredients. Because I know the first has more of it than any of them." Yet, another student's response talked about the importance of reading a food label if you have food allergies by saying "I need to look at food labels because I am allergic to foods such as wheat, rye, oats and barley."

MyPyramid/Food Guide Pyramid

Healthy eating habits are based upon balanced and proportionate intake of a variety of different foods within each food group, as recommended by USDA's

MyPyramid. Students participating in classes that used the nutrition kit prior to 2005 were taught from the Food Guide Pyramid. Post-2005 nutrition kit students were taught using MyPyramid. Associated with this lesson was sorting foods into the appropriate food group for both pre and post-2005. Pre-2005 students had the opportunity to create Food Guide Pyramids, which one student wrote "The food pyramid was fun to make." Students that learned from MyPyramid had the opportunity to go to www.mypyramid.gov and use the website and its activities to reinforce this information. A student using the Food Guide Pyramid stated what they learned and the importance of the knowledge by writing, "The food groups in the food pyramid are meat, dairy, fruit, vegetable, grain and you should eat sweets sparingly. You need to eat the five food groups because if you don't you will not have a healthy balanced diet." A post-2005 student wrote about how different foods fit into MyPyramid by stating the following, "Foods in different food groups are not alike and an egg is in the meat and beans group."

Healthy Snacking

The ability to choose and/or make a healthy snack allows a student to decrease calorie intake while increasing nutrition intake. The NEP nutrition kit taught the students how to make a healthy snack by teaching them to make either peanut butter balls or a 'yummy bug' depending upon the age group that was being taught. After the snack was made, the students were allowed to eat it. By making the snack recipes, the students discovered why it was a healthy choice as one student wrote,

> "I learned that peanut butter bites are low fat and nutritious also healthy snack to eat. And the peanut butter bite was packed with protein. Also its oatmeal is crunchy. Then the snack was packed with raisins, oatmeal,

> powder milk, and honey. And the snack was sweet but it's so healthy also you're eating four food groups."

Not only is it educating the student, but is also is indirectly educating the parents or guardians as the participants are taking the recipe home and teaching them to make the snack. This is evidenced by students writing,

> "Today I learned how to make the peanut butterballs. Now I can go home and make some for my family tonight. Or any other time I want. And I can teach my dad how to make them. I think they will like them very much"

and "I liked doing the healthy snack. Right when I got home told mom to do and we did." Another student stated "I will teach my mom the recipe for peanut butter rolls!**"**

An education game used in the kits called, "Who Wants to Be a Healthy Snacker" was enjoyed by the participants just as much as making a healthy snack. The game was modeled after the television show, "Who Wants to Be a Millionaire," and does not involve the creation and/or consumption of snacks or food. Many students described in detail what happened when they were playing this game and how much they enjoyed the game. A common sentiment among subjects was summed up by a student writing, "My favorite part of this health unit was when we played "who wants to be a healthy snacker." Not only did students enjoy this activity, but they also learned from it as evidenced by students writing, "Pretzels are better snacks than Cheetohs," "I learned to eat healthy snacks like grapes or apples" and "I learned that eating healthier snacks can make you healthier."

Main Theme #2: Cleanliness

The main theme of cleanliness is comprised of the sub-themes hand washing and food safety. Each of the sub-themes contained various focus areas. The theme of cleanliness does not improve the subjects' nutrition, but rather improves their general health by preventing disease and illness. The cleanliness theme also helps to prevent the spread of illness among the population.

Hand Washing

The proper technique of hand washing, the knowledge of when to wash ones hands and why it is important to wash ones hands are essential in preventing disease and illness. Two activities contained in the NEP nutrition kit were designed to educate the students on this information. Those activities are Glo Germ and the apple experiment.

The Glo Germ helped the students see how thoroughly they washed their hands, while allowing them to have fun learning. This activity was mentioned frequently throughout the written responses. The following three written responses are indicative of the students' enjoyment as well as the lessons learned from the Glo Germ activity. The first student wrote,

> "My favorite part was when was put on that lotion and it shown under that light then we washed our hands and then we put them under the light again and it showed if we washed our hands good enough."

Another stated that "the light and hand washing lesson was really really cool." The third student responded as follows,

> "teaching us to wash our hands and I remembered when you put that glow in the dark lotion it was fun because when we were done washing our

> hands and we looked under that purple light I got to see how much of those germs I had on my hands. I didn't like what I saw because it looked nasty."

This activity reinforced the importance of washing ones hands with warm water and soap for at least 20 seconds and getting under ones fingernails, between ones fingers and on the back of ones hands. "I learned that you should wash between your fingers and under your finger nails" and

> "thank you for showing us how to wash our hands. I still remember the rules. 1. wet your hands with hot water 2. use soap 3. scrub for 20 seconds 4. rinse 5. dry your hands 6. turn off the water with the towel you used."

During the discussion of this lesson, the students were also taught that they should dry their hands off with a paper towel and use that paper towel to turn off the water as well as open the door. **"**I learned about germs about take a paper towel and open a door with it." The Glo Germ activity increased the students' overall knowledge on hand washing, and ultimately their health, by teaching skills that will reduce illness.

Continuing with the theme of cleanliness, the students participated in the apple experiment that was designed to educate the students on the spread of germs carried on one's hands. This activity involved slicing two apples by students. One apple was sliced by students that did not wash their hands and another apple was sliced by students who did wash their hands. The students then observed the two different apples for a week and noticed the mold and rotting differences between the two. Students observed these differences between the two groups, **"**we watched apples rot on plates the unwashed apples rotted faster than the washed ones" and "We did an experiment with apples

(unwashed hands and washed) it was gross but our hypothesis matched our conclusion." Theoretically, the group that did not wash their hands prior to cutting the apple should have had more rot and mold growth than the group that washed their hands prior to cutting the apple. However, in the classrooms, this was not always the case. Nonetheless, the students made note of this and were sometimes confused by this, which is evidenced by students writing **"**I don't know why the non-washed hands are cleaner than the washed hands apples. Even though we washed our hands exactly how you told us to. But who knows." The students wrote the following about what they learned about when to wash their hands and possible consequences of not washing their hands, "I learned that washing your hands before you touch food is a good thing because in the experiment what happened to the unwashed hands was disgusting so you need to think of what you are putting in your body" and "Hand washing is a good way to stay healthy. Wash hands before and after handling food. Also wash your hands after you go to the bathroom!" Through participation in the apple experiment, the students increased their knowledge of when to should wash their hands and the possible consequences of not using hand washing.

Food Safety

The prevention of foodborne illness was one of the educational goals of the NEP school enrichment kit. Cross-contamination, proper cooking temperatures and general food safety are the key concepts of this portion of the NEP nutrition kit. This important information was taught using a video titled "Fight Bac!"

Cross-contamination can occur in numerous situations and this concept is intertwined with proper hand washing. Students wrote, "Don't wipe something and use it

again - wash it first." One way cross-contamination occurs is through the improper storage of foods. Several students described the proper technique of food storage. One student wrote the following, which is representative of all the other references to proper food storage, "I learned that meat juices can drip on fruits and you could get food poisoning. I will tell my parents to put the fruits on the top rack of the refrigerator and meats on bottom." Another way that students discussed that cross-contamination occurs is by using the same plate for raw meats as ready-to-eat foods, which is represented by the following student's statement, "I learned that if you put raw meat on a plate and put the cooked meat on the same plate, the raw meat juice will soak up on the cooked meat" and another student wrote, "I also learned to use a separate cutting board if you cut raw meat and then use it to cut fruits."

Failing to cook meats to the proper internal temperature increases the risk for foodborne illnesses. This risk is addressed in the NEP nutrition kit. "I learned that you have to cook your food at the right temperature," and "I learned that I have to cook food at proper temperatures" and "Don't eat food if it's not ready or the right temperature" are quotes that express the students' understanding of this concept.

Students were also taught about general food safety. Students showed they learned the basics of food safety, which is demonstrated by the following quote, "It really shows you that the way you store, cook, and prepare food is one of the most important things to do to keep us from getting sick." Other lessons learned by students are demonstrated by the following writing, "don't eat food that has sat out over night or meat that has sat out for more than 2 hours. Only thaw out food and meats in the fridge." A

student wrote the following that summarizes many of the food safety lessons learned in this unit,

> "I learned how not washing your hands can affect the food you eat. I didn't know not washing your hands could make you sick. I also learned how bacteria on foods can get you sick and I learned how to handle my foods. I should chill, cook, separate and wash my hands to keep bacteria away from my food."

One student talked about looking at canned goods for safety by writing, "and how to tell if there's botulism in your cans."

Main Theme #3: Change

Obtaining and/or increasing the students' knowledge of healthy eating habits and cleanliness were important goals of the NEP nutrition kit. The goal, ultimately, is the application of that knowledge into the students' daily lives. Students discussed changes that they have made and/or intend to make regarding healthy eating alone, cleanliness or healthy eating and cleanliness.

Change in Healthy Eating Habits

By participating in the lessons and activities contained within the NEP nutrition kit, the students learned about the importance of breakfast, healthy snacking, nutrients, MyPyramid/Food Guide Pyramid and label reading. The application of this knowledge into their daily lives is important. Students discussed the changes that were made, and/or will be made, in their beverage consumption habits, fast food consumption habits, MyPyramid/Food Guide Pyramid usage and label reading. Students also wrote about the impact that the changes have had on them.

A large group of students indicated that they have switched their beverage choices from regular soda pop to other beverages such as milk or water. This switch is important as it decreases the students' consumption of empty calories. Written statements such as, "What I learned from this experiment is to not drink a lot of pop or you might get a cavity. Now I think I am going to prefer water, 'no pop for me please!'" and "My favorite thing was when we made the pop. And when I saw all the sugar get put in the pop, I'm only going to drink one pop a week." One student not only changed his/her beverage consumption habits, but that student also saw the direct benefit from making that change by the end of the NEP nutrition kit. This student wrote, "I learned that there is a lot of sugar in soda. I found out since I haven't drank pop in three weeks, I lost 5 pounds."

Another group of students' writings indicates that changes in fast food consumption habits have been or will be made. One statement that suggests this is, "I learned that fast foods are fast to eat but it isn't healthy so I'm only going to eat fast foods when we're traveling or maybe I won't eat fast foods at all." One student connected how healthy eating relates to fast food consumption by writing, "and I learned why eating is healthy. Eating healthy keeps us from getting sick. Eating bad is when you eat fast food a lot. Now I eat healthy."

Increased knowledge and the ability to utilize the MyPyramid/Food Guide Pyramid recommendations to make healthy food choices is evident by these student writings, "I will change my eating habits by eating what the Food Guide Pyramid says to eat and not eat so many fats," and other student wrote, "I will follow the Food Guide Pyramid," and another wrote, "I am now going to read food labels now."

Specific changes that were made as a result of the NEP nutrition kit are visible in the following statements written by students:

- "Now I eat much better… I eat a lot of fruit and veggies now at lunch and dinner."
- "I'm eating healthier now; I have been drinking two glasses of milk in the morning now, and two glasses of milk after school."
- "I used to eat candy bars but now I eat apples oranges and pears."
- "I will eat more healthy foods by picking an apple instead of chips."

Other students indicated that they took the information home, shared it with their families and made changes. Those students wrote, "My parents, brother, and sisters all stopped drinking pop and stopped eating candy" and "The unit was awesome! My mom was impressed. It helped me eat less sugar." Finally, a student wrote, "I'm eating a lot healthier and I'm much happier," suggesting that the student associated the changes that he/she has made to the result of being happier.

Change in Cleanliness Habits

Through the students' participation in the lessons and activities contained in the NEP nutrition kit, students increased their knowledge of cleanliness. More specifically, the students learned about the importance of when and how to wash their hands and the importance of food safety including the prevention of cross contamination, proper food handling and storage and cooking temperatures. Applying this knowledge into their daily lives is important. Students discussed the changes that they made and/or intend to make in the areas of hand washing, cross contamination and general food safety.

Improved knowledge of the importance and technique, as well as the utilization of hand washing, are suggested by the following writings of the students:

- "I've been washing my hands better than I have before!"
- "I wash my hand all the time now."
- "And now I wash my hands more often."
- "I will try better to wash my hands."
- "From your presentation, I will pick up a pencil and open a door with a paper towel because I'm not sure they've been sanitized or clean."
- "I thought the hand washing thing was really cool. I have washed my hands a lot more carefully now."

One student demonstrated an increase in knowledge of proper food storage, preparation and food safety principles by writing,

> "I learned that always wash stuff off the counters and cutting boards before putting food on the counter and cutting boards. I also learned how long food should be out now I am more careful of how long I let food sit out,"

Another student displayed improved knowledge about the dangers of undercooked foods by writing, "And I should tell you that I will never take a runny egg never again!" Increased knowledge of general safe food handling is evidenced by a student writing, "I will keep this unit in mind when I'm at home when I'm about to handle food."

Changes in Healthy Eating Habits and Cleanliness

Participation in the NEP school enrichment kits resulted in changes or intended changes not only in healthy eating habits or cleanliness habits, but students wrote about

the changes that they had made or intended to make in both areas of healthy eating and cleanliness habits. Students either made in-depth statements or brief, to-the-point statements when discussing their changes or intended changes.

In-depth writings by the students about the changes that they have made and/or are going to make usually contained specific changes such as,

> "The things that I'm going to change about me are that I'm going to eat breakfast and drink milk every morning and I'm going to eat fruit and other healthy foods everyday and wash my hand for 20 seconds instead of 15,"

and

> "I wash my hands before I eat and I wash after. When I cut meats or make something I wash it. The pop we made was very gross. I read labels and I don't drink a lot of pop. I watch my sugars and sodium and also calories."

Other students focused on healthy eating, hand washing and food safety by writing,

> "I will eat breakfast every single day so that I can think in school and I will wash my hands before I eat so I don't get germs on my food and eat them and get sick and after something is out for a night and will not eat it,"

and

> "My life is changing cause I've been eat lot of fruit and less pop. I now know that they add to most sugar in pop I had lots of fun with the experiment. I wash my hands before I cut the fruit."

Students often did not elaborate, but were much broader in stating lifestyle changes that have and/or will occur. The following written statements are suggestive of this:

- "I will wash my hands and eat right."
- "From now and to ever I am going to wash my hands. For ever I am going to eat healthy food."
- "I will eat more veggies and fruits. I will wash my hands longer."
- "I am eating breakfast everyday and washing my hands everyday."
- "I've been watching my food choices a lot. I've also have watched my hand washing."

A few students appeared less confident in their ability to utilize these concepts outside of the classroom as by writing statements like, "I will try to eat a healthy breakfast."

A small group of students made statements that would have fit in changes to eating habits alone, changes to cleanliness alone and/or changes to both eating habits and cleanliness, but they added an additional element to their statement. One student discussed how they were going to try to pass the information onto others by stating, "I intend now to eat better food and wash my hands before my meals for 20 seconds every day and try to tell other people how to stay healthy." This is implicative that the information taught to the student would be disseminated to others in the community, which could ultimately increase the overall health of the community. A different student wrote, "I will try to wash my hands everyday, eat healthy foods, exercise and do other healthy things," indicating that he/she will not only change his/her eating and cleanliness habits, but he/she will also change his/her activity level and work on other lifestyle changes that promote health and reduce risk of disease. Another student described a

complete overhaul of his/her lifestyle as a result of participating in the lessons and activities contained in the NEP nutrition kit by writing,

> "My life has changed because all I used to do was sit on the couch and watch TV and eat chips. But now I know that I'm more active because I want to be in baseball and football… person then just sits and watch TV and eat you will get fat. So you should be more active. You can play a lot of sports to get fit and active. Because you won't get tired most easily and you will not be lazy."

CHAPTER V

DISCUSSION

A review of literature indicated that childhood and adolescent obesity rates in Nebraska have more than doubled in the past twenty years (CDC, 2009). Childhood and adolescent obesity rates in Nebraska and the United States are expected to continue to rise. Environmental and behavioral factors are the two major categories that can be attributed to childhood and adolescent obesity (CDC, 2009).

The Institute of Medicine (IOM) reported that the addition of nutrition and physical activity to school curriculums has increased (CDC, 2009). Additionally, the perceived self-efficacy of making dietary changes has an effect on childhood obesity levels (O'Dea & Wilson, 2006). The NEP nutrition school enrichment kit would be a cost-effective way, while also limiting the burden on the teachers, to increase the overall health and decision-making skills of a large number of children in a manner that the students enjoy and learn from. Numerous students in this research reported that they had fun due to the activities that were contained in the NEP school enrichment kits and that their participation in the activities helped to reinforce the lesson that they learned.

The purpose of this research was to determine what participating students learned by utilizing the NEP school enrichment kits by having the students reiterate, via writing on the apple sheets, in their own words. This research also aimed to determine what lessons the participating students were able to apply to their daily lives that they learned by participating in the NEP school enrichment kits.

Lessons Learned from the NEP School Enrichment Kits

Obesity rates in Nebraska youth ranging from 2-19 years of age have had a dramatic increase since 1980. Nebraska youth ranging from 2-19 years of age that are Mexican-American and Non-Hispanic African American backgrounds have higher rates of obesity compared to their Non-Hispanic White counterparts (CDC, 2009). The content contained within the NEP school enrichment kits focused on areas that would teach the students to make healthy decisions that affect not only their weight, but also their overall health. The lessons that the students wrote about learning included the importance of eating breakfast, the nutrients, how to read food labels, using the Food Guide Pyramid/MyPyramid, eating healthy snacks, hand washing and food safety.

There is an association between eating breakfast and school and academic performance. (Berkey et al, 2003). Students learned the importance of eating breakfast by participating in the activities contained in the NEP school enrichment kit. The breakfast activity provided a way for the students to easily remember the need to eat breakfast daily and why it is important. Students reported that eating breakfast was important for energy and good academic performance.

The nutrient lesson and its associated activities were important. This lesson educated students on the six macronutrients and their importance. Through this education, the students have a greater ability to make healthy decisions. The students may also be more likely to eat a more well-rounded diet and include more nutrient dense foods.

Closely related to the nutrient lesson were the lessons educating the students on how to read a food label and the proper usage of Food Guide Pyramid/MyPyramid

recommendations from the USDA. These important lessons provided the knowledge base that will allow students to make healthy food decisions like choosing more nutrient-rich foods in the proper quantities. Students that follow the guidelines by using the food labels may be more likely to be within normal body weight ranges and obtain adequate nutritional intake.

One of the causes of childhood obesity is the availability of high-caloric foods and the consumption of high-caloric foods by children (Spear et al, 2007; Speiser et al, 2005). The healthy snack lesson contained within the NEP school enrichment kits addressed this issue. Giving examples and encouraging students to make fun and easy snacks that are nutrient-rich and low calorie and discouraging high calorie, non-nutritious snacks may increase overall health and nutrition and decrease obesity in children. Many students stated that they wanted to continue to make the healthy snacks at home that were made as part of the NEP school enrichment kits. An activity that influenced many of the participating students was the lesson that included making soda pop. Students were amazed by how much sugar is contained in a single soda pop and how much sugar they would consume in a year if they drank a soda pop daily. Interestingly, many students believed that there was orange juice contained in orange soda pop and those students were amazed that orange soda pop was just carbonated water, sugar, flavoring and food coloring.

Proper hand washing reduces gastrointestinal illness-related absenteeism in elementary children (Master, Hess Longe & Dickson, 1997). The prevention of illness improves the overall health of the child, which, ultimately, allows for a higher nutritional

status and an increased ability to be physically active. Thus, hand washing is of high importance to a healthy child and may help the childhood obesity epidemic.

The food safety lesson built upon the hand washing lesson. It included learning about cross-contamination, proper internal temperatures of potentially hazardous foods, and proper storage of foods. By learning this, the participating students decreased their probability of obtaining a foodborne illness leading to an increased level of health. Food safety lessons were often shared at home by the students, which helps increase the level of health of the students' family.

Changes Due to the NEP School Enrichment Kits

Obesity-related healthcare costs in Nebraska are rising (CDC, 2009). Health changes that are made to reduce obesity and increase health will reduce the obesity-related costs in Nebraska. As a result of participating with the NEP school enrichment kits, students stated the changes that they have made and/or intend to make in several content areas.

Students made and/or intend to make changes related to their dietary habits. Several of the students stated that they have reduced their soda pop intake to once or twice a week or even less often. Other students expressed that they now drink water instead of soda pop. Reduction in soda pop consumption alone increases health and helps to manage weight. Numerous other students discussed changing snacking habits by choosing fruit instead of potato chips and choosing fruits and vegetables over candy bars. Yet other students reported increasing their milk consumption and adding vegetables to their meals at home. This is similar to the numerical results found by DeVault et al. in 2009.

Students who made changes noticed the effects more quickly than anticipated. The health effects noted were increased energy and happiness. Not only were the students affected, but their families were also affected. Students reported that their families ate less candy and drank less soda pop as they decreased their intakes. The carry-over effect to the families is important as one family making healthy changes may lead to other families making healthy changes. Also, having the entire family make the change may increase the likelihood of the student maintaining those changes.

Students discussed food safety and hand washing changes. These changes include the frequency that the student washes their hands and the technique that the student uses to wash their hands. Other changes that were a result of the NEP school enrichment kits were proper handling, cooking and storage of food to prevent cross-contamination and foodborne illnesses. As with the dietary changes, the food safety and hand washing changes were shared by several students with their families.

Finally, students discussed overall lifestyle changes as a result of their participation in the NEP school enrichment kits. A number of students stated that they were going to increase their physical activity time and decrease their sedentary time. This change will ultimately affect the student's weight and overall health.

CHAPTER VI

LIMITATIONS

There were limitations of this research project. One limitation was the possibility of the students being coached about what to write on their response apples by their teacher. This limitation was evidenced by numerous students writing the same response verbatim or extremely similar. Another possible limitation was the lack of writing ability and/or skills needed to fully express what the student learned as was evidenced several times by choppy incomplete thoughts in the students' responses. A minimal amount of writing space was given to the students, which reduced the amount that they were able to write and discuss. This limitation was seen in some of the apple responses when the subject stopped mid-sentence when they reached the end of the lined apple.

CHAPTER VII

CONCLUSIONS

Students were able to reiterate what they learned during their participation with the NEP school enrichment kits in writing. The concepts that the students learned were classified into themes. The students' writings also indicated that the lessons have been applied to their everyday lives or the students intend to apply the lessons to their daily lives.

CHAPTER VIII

IMPLICATIONS FOR FUTURE RESEARCH

Further research is needed in the content area of qualitative evaluation of nutrition education programs aimed at increasing the knowledge of school-aged children. Future qualitative research for this age group will further fill in the gap in the literature in this content area. To avoid the same limitations that this research project contains, I suggest that taped oral exit interviews be conducted. Future research in this subject may benefit from a mixed methods approach. This would allow for a comparison of the quantitative knowledge gain to the qualitative response given either verbally or written by the subject. The quantitative results could come from a pre-test/post-test, while the qualitative results would come from the analysis of the students oral, written and/or observed responses.

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Appendix A
University of Nebraska-Lincoln Institutional Review Board

University of Nebraska Lincoln

November 21, 2005

RESEARCH COMPLIANCE SERVICES
Institutional Review Board

Dr. Wanda Koszewski
Joan Sather
120C RLH
(0808)

IRB# 2005-10-035 EX

TITLE OF PROJECT: **Evaluation of the Expanded Food and Nutrition Education and Food Stamp Nutrition Education Program**

Dear Dr. Koszewski:

This letter is to officially notify you of the approval of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. This project has been approved by the Unit Review Committee from your college and sent to the IRB. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study. Your proposal seems to be in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as exempt.

Date of EX Review: **10/07/05**

You are authorized to implement this study as of the Date of Final Approval: **11/21/05.**
This approval is Valid Until: **11/20/06.**

This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board. For projects which continue beyond one year from the starting date, the IRB will request continuing review and update of the research project. Your study will be due for continuing review as indicated above. The investigator must also advise the Board when this study is finished or discontinued by completing the enclosed Protocol Final Report form and returning it to the Institutional Review Board.

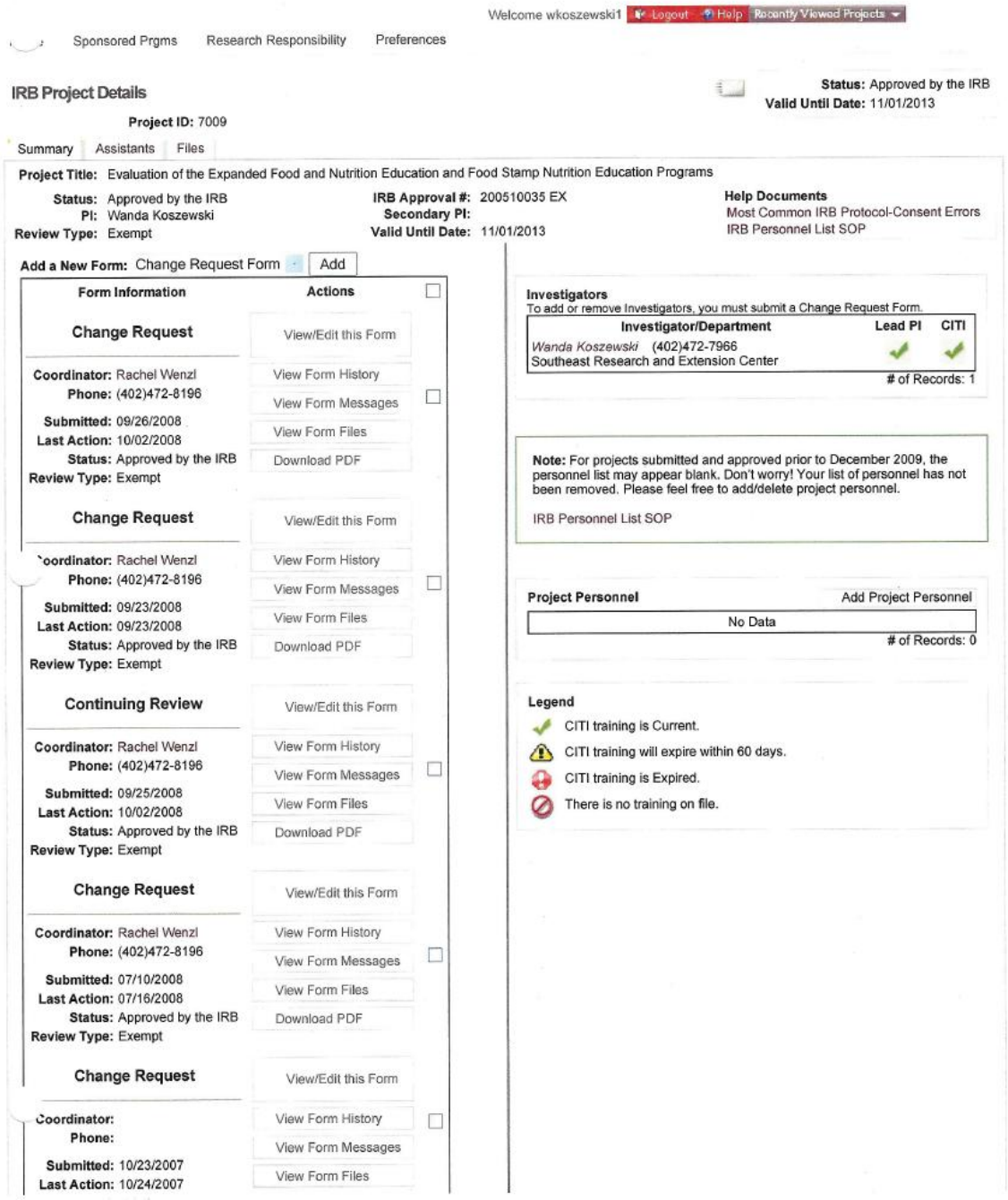
If you have any questions, please contact Shirley Horstman, IRB Administrator, at 472-9417 or email at shorstman1@unl.edu.

Sincerely,

Dan R. Hoyt, Chair
for the IRB

Shirley Horstman
IRB Administrator

cc: Faculty Advisor
Unit Review Committee



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IRB Project Details

Project ID: 7009

Status: Approved by the IRB
Valid Until Date: 11/01/2013

Summary Assistants Files

Project Title: Evaluation of the Expanded Food and Nutrition Education and Food Stamp Nutrition Education Programs

Status: Approved by the IRB
PI: Wanda Koszewski
Review Type: Exempt

IRB Approval #: 200510035 EX
Secondary PI:
Valid Until Date: 11/01/2013

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Most Common IRB Protocol-Consent Errors
IRB Personnel List SOP

Add a New Form: Change Request Form Add

Form Information	Actions
Change Request **Coordinator:** Rachel Wenzl **Phone:** (402)472-8196 **Submitted:** 09/26/2008 **Last Action:** 10/02/2008 **Status:** Approved by the IRB **Review Type:** Exempt	View/Edit this Form View Form History View Form Messages View Form Files Download PDF
Change Request **Coordinator:** Rachel Wenzl **Phone:** (402)472-8196 **Submitted:** 09/23/2008 **Last Action:** 09/23/2008 **Status:** Approved by the IRB **Review Type:** Exempt	View/Edit this Form View Form History View Form Messages View Form Files Download PDF
Continuing Review **Coordinator:** Rachel Wenzl **Phone:** (402)472-8196 **Submitted:** 09/25/2008 **Last Action:** 10/02/2008 **Status:** Approved by the IRB **Review Type:** Exempt	View/Edit this Form View Form History View Form Messages View Form Files Download PDF
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Change Request **Coordinator:** **Phone:** **Submitted:** 10/23/2007 **Last Action:** 10/24/2007	View/Edit this Form View Form History View Form Messages View Form Files

Investigators
To add or remove Investigators, you must submit a Change Request Form.

Investigator/Department	Lead PI	CITI
Wanda Koszewski (402)472-7966 Southeast Research and Extension Center	✓	✓

# of Records: 1

Note: For projects submitted and approved prior to December 2009, the personnel list may appear blank. Don't worry! Your list of personnel has not been removed. Please feel free to add/delete project personnel.

IRB Personnel List SOP

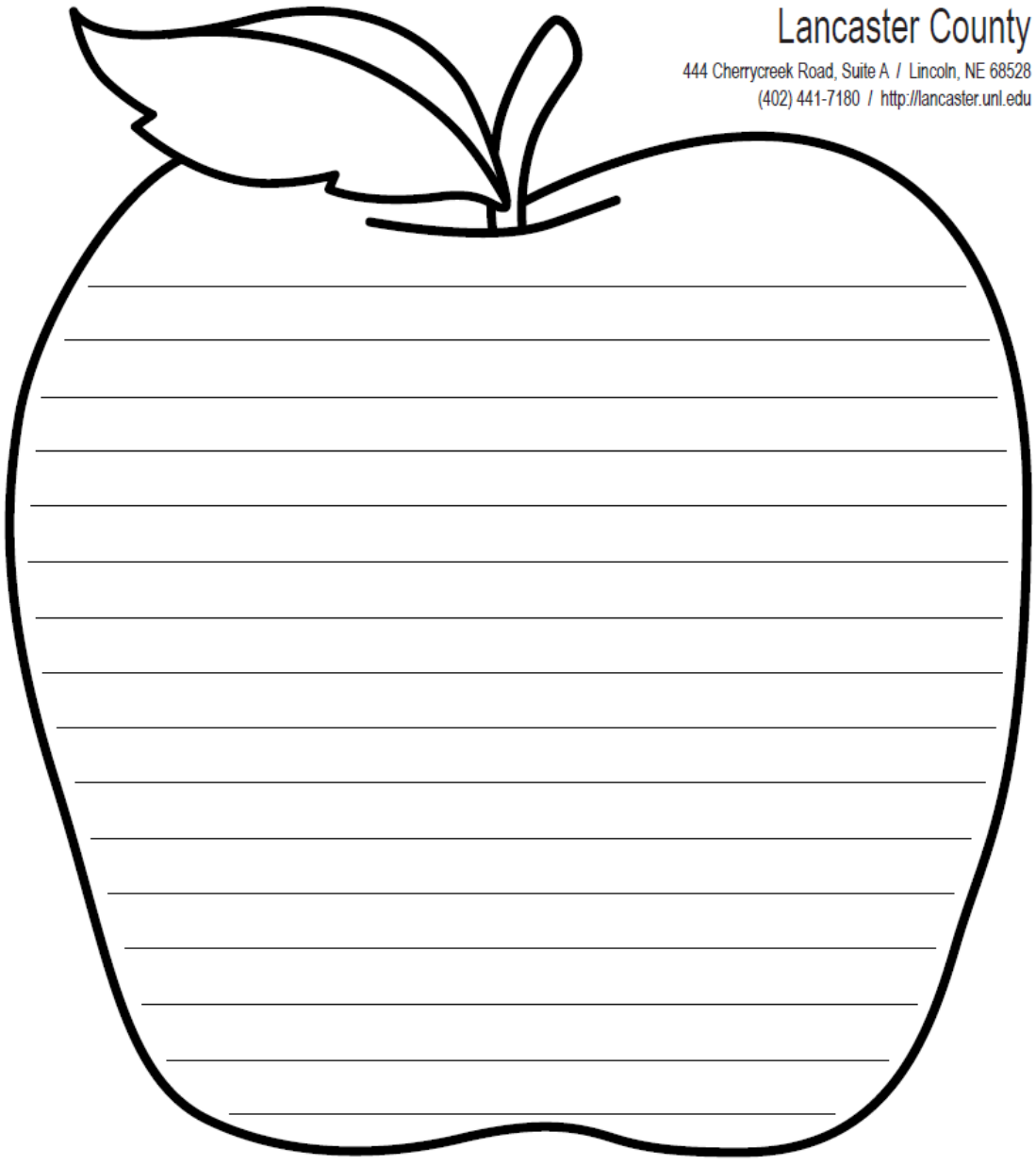
Project Personnel Add Project Personnel

No Data

# of Records: 0

Legend
- CITI training is Current.
- CITI training will expire within 60 days.
- CITI training is Expired.
- There is no training on file.

Appendix B
Data Collection Tool



Lancaster County
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This material was funded in part by USDA's Supplemental Nutrition Assistance Program and Expanded Food & Nutrition Education Program (EFNEP).
The Supplemental Nutrition Assistance Program provides nutrition assistance to people with low income.
It can help you buy nutritious foods for a better diet.To find out more, call 1-800-430-3244.