Childhood obesity prevention intervention: Exploring food preferences and physical activity self-efficacy

Hannah Ostrander
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Childhood obesity prevention intervention: 
Exploring food preferences and physical activity self-efficacy 

by 

Hannah LaVonne Ostrander 

A thesis submitted to the graduate faculty 
in partial fulfillment of the requirements for the degree of 
MASTER OF SCIENCE 

Major: Diet and Exercise 

Program of Study Committee: 
Lorraine Lanningham-Foster, Major Professor 
Ruth Litchfield 
Catherine Strohbehn 

Iowa State University 
Ames, Iowa 
2014 

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ABSTRACT

BACKGROUND: Overweight and obese children and adolescents are at greater risk for being overweight or obese as adults as well as developing one or more chronic diseases. Approximately one third (31.8%) of children in the United States are either overweight or obese (16.9% being obese). The causes of obesity are complex and multifactorial, an interaction between biological, psychological, and environmental factors. Physical activity and dietary habits are two major contributing modifiable factors in determining one’s health and weight status. Interventions are needed to help curb the obesity epidemic by working toward improving the health status of children and adolescents.

METHODS: The Immersion in Wellness program was conducted during summer 2012 at the Iowa 4H Center in Madrid, Iowa. The goal of this program was to fully immerse campers in a five-day wellness program to help foster sustainable, healthy lifestyle changes that youth campers could take home with them. The entire efforts of this project were directed towards childhood obesity prevention through fun and interactive lessons. Intervention campers received nutrition, physical activity, gardening, and culinary education during their five-day immersion experience. Control campers participated in the traditional camp schedule and did not receive any of the educational lessons.

RESULTS: Results indicated that campers were more likely to choose and report positive feedback on more recognizable menu alterations (main entrée and vegetable items). Campers were also choosing items of direct exposure (main entrée and vegetable items offered at their table) rather than indirect exposure (fruit offered on the salad bar). Campers with increased self-efficacy were significantly more physically active (total time, P<0.000 and METs, P<0.000).
The level of physical activity self-efficacy in intervention campers increased from baseline to 6-months post \((P<0.05)\), and there was not a change in self-efficacy in control campers. Self-efficacy \((P<0.000)\), pooled efficacy \((P<0.000)\), and activity options \((P<0.01)\) had a greater influence on physical activity than both parental proxy \((P<0.05)\) and home environment \((NS)\).

**CONCLUSION:** Overall, direct exposure was a key aspect of campers’ food choices and preferences. Also if offered an item, children were likely to try it and typically liked it as well. Participation in the Immersion in Wellness program was associated with improved physical activity self-efficacy. Childhood obesity prevention programs that directly expose children to a variety of food choices and also support activity, by providing a variety of physical activity options and focus on increasing self-efficacy, may positively influence child health.
CHAPTER 1 – INTRODUCTION

Thesis Organization

This thesis starts with a camp overview describing the Immersion in Wellness Research Program. Next the research overview states the purpose for the research projects described in each manuscript. After that, a literature review focusing on childhood obesity and physical activity is included. Two separate manuscripts follow the literature review. The final section contains overall conclusions, tables and figures, and appendices.

Camp Overview

Iowa State University, funded by the Wellmark Foundation, developed the Immersion in Wellness experience for summer campers at the 4H camp in Madrid, Iowa. The Immersion in Wellness program provided campers with the opportunity to be fully immersed in many aspects of wellness. Campers experienced positive, life-long, wellness behaviors that they could take home and share with their families. Nutrition, physical activity, culinary, and gardening behaviors were examined for both short-term and longer effects.

The Immersion in Wellness camp project received Iowa State University Institutional Review Board approval for all intervention procedures and methods of data collection (Appendix A). The goal was to fully immerse campers in a five-day wellness program to help foster sustainable, healthy lifestyle changes in youth. The entire efforts of this project were directed towards childhood obesity prevention. Intervention campers received nutrition, physical activity, gardening, and culinary education during their five-day immersion experience which incorporated fun, interactive activities. Intervention campers also received take-home kits to
encourage and influence their home environment with what they learned and experienced during their immersion experience at camp. Control campers participated in the traditional camp schedule and did not receive any of the educational lessons or take-home kits.

Subjects

Campers enrolled in the Everything Camp (9-14 year olds), including Operation Military Camp, and Counselors in Training Camp (16-18 year olds) were invited to participate in this program. Only the campers enrolled in the Immersion in Wellness research study (those whose parents signed consent forms, campers signed assent forms, and completed surveys), participated in the data collection process. There were three intervention and three control weeks (each one-week long) during summer 2012. The Everything Campers and Counselors in Training Campers who chose to attend camp during one of the six designated program weeks had the opportunity to enroll in the project. Participants did not know whether they were in the control or intervention group at the time of enrollment. A total of seventy-seven participants (33 male and 44 female; 72 between 9-15 years old, 5 between 16-18 years old) enrolled in the Immersion in Wellness program during summer 2012.

Procedures

All members of the research team received training regarding proper data collection procedure and ethical considerations in research involving human subjects protection. The research team consisted of Iowa State University professors, undergraduate, and graduate students. All registered campers received information regarding the Immersion in Wellness program and pre-camp surveys in the mail prior to camp. During camp check-in, additional
Campers were recruited for enrollment. Recruitment consisted of one-on-one discussions with a research team member or by reading a cover letter explaining the immersion project.

At the time of enrollment parents signed consent forms, campers signed assent forms, and pre-surveys were completed. Information regarding food allergies and physical activity restrictions was also collected from each camper. As compensation for filling out the surveys, all campers (control and intervention) received $40 at the end of their week at camp and an additional $25 after returning their completed 6-month follow-up surveys in the mail. Take-home kits were given to intervention campers on their last day at camp, which consisted of: food safe cutting boards, paring knife, an Iowa State Extension cookbook (Healthy and Homemade), vegetable scrub brush, two thermometers (refrigerator and meat), pedometer, garden journal, and an array of physical activity and nutrition handouts related to their education lessons provided throughout the week (Appendix F).

Surveys

Campers participating in the study completed extensive surveys regarding their home environment, self-efficacy, fruit and vegetable knowledge, and physical activity. These surveys were administered in person at camp check-in (pre-surveys) and six months following camp by mail (follow-up surveys). Intervention campers completed the same set of surveys at the end of their camp experience to assess knowledge gained during their five-day immersion experience (post-surveys); control campers did not receive this set of surveys.

Campers were asked to fill out the camper survey independently while their parents could assist them in filling out the Physical Activity (Appendix C) and Home Environment (Appendix D) surveys. The camper survey was comprised of three sections regarding fruit and vegetable
knowledge, food preferences, and both forms of efficacy (self- and proxy-) (Appendix E). Fruit and vegetable knowledge was assessed using a modified version of a survey published by Struempler and Raby (2005), fruit and vegetable preferences were assessed using a survey published by Domel et al. (1993) and efficacy (self-efficacy and parent proxy) for physical activity and fruit and vegetable intake was assessed using a survey also published by Domel et al. (1996).

The Youth/Adolescent Activity Questionnaire developed by the Harvard School of Public Health (2005) and was used to assess physical activity duration. The Physical Activity survey measured time performing various activities (swimming, walking, playing basketball, etc.) throughout each of the four seasons (Appendix C). The Home Environment Survey assessed availability of physical activity items at home, utilization of activity options available, food availability and consumption (Appendix D). The “America on the Move” survey, published by Catenacci and Wyatt (2007) was used to assess availability of physical activity items at home and the Youth/Adolescent Frequency Questionnaire, published by Rockett et al. (1997) was used to assess food availability and consumption.

**Intervention**

One aspect of the Immersion in Wellness program was the Immersion in Nutrition and Physical Activity Education. Each day intervention campers received one education lesson taught by Iowa State University graduate students. The content of the lessons was based on social marketing theory and were modified from lessons originally developed by Iowa State University Food Science and Nutrition undergraduate students in a community nutrition class. Lessons included information regarding: MyPlate, saturated verses unsaturated fats, portion
control, fruit and vegetable consumption, and physical activity recommendations. With each lesson, the campers were able to participate in some sort of hands on experience. For example, with the “Portion Distortion” lesson campers were able to make homemade ice cream by tossing a grocery sack, filled with ice and a zip-lock bag containing the ice cream ingredients, back and forth with a partner. However they were only given one serving: half of a cup. Also, campers were engaged in active learning, like running while wearing a pedometer, as frequently as possible.

Another aspect of the program was the Immersion in Culinary Skills experience. Each day intervention campers received one culinary skills lesson developed and taught by an Iowa State University undergraduate culinary intern. During the culinary sessions, campers were taught knife safety skills, proper food handling and sanitation, Mise en Place, and how to cut and prepare raw fruits and vegetables. The purpose of the culinary lessons was to increase the likelihood that campers would try new foods and increase their preferences for those foods by involvement. For instance, during one of the culinary sessions, the campers cut up fresh vegetables from the camp garden, which were used to make homemade salsa for that evening’s meal.

Master gardeners from Iowa State Extension assisted with the Immersion in Gardening experience. A garden was built at the 4H camp between the cafeteria and camp pool in a large, open field. The purpose of the garden was for the campers to learn basic gardening skills and origin of produce items, increase physical activity, and increase their desire to consume fruits and vegetables. The Immersion in Gardening experience included planting and harvesting vegetables, composting, weeding, and caring for the garden. Campers were able to learn many
aspects of planning, starting, and caring for a home garden. At the end of the week, campers were given plants and composting starter sets to take home.

Lastly, there was also an Immersion in a Health Promoting Environment. This aspect of the program included alterations of the camp menus to incorporate not only healthier, nutrient-dense food options, but also fresh produce harvested and prepared in the gardening and culinary sessions. Feedback regarding campers’ food preferences, choices, and perceptions’ of health was collected regarding the intervention menu alterations. Campers were exposed to healthier snack options in the camp store, which were offered at lower prices than the traditional camp snacks. Also, campers had the opportunity and encouragement to be active throughout each of the Immersion sessions.

**Research Overview**

Research was conducted on children’s food preferences, choices, and perception of health and the relationships between self-efficacy, parent, and home environment influences with children’s physical activity behavior. The purpose of the research conducted on children’s food preferences, choices, and perception of health was to obtain feedback from the summer campers about the food they were choosing and consuming during lunch at camp. The knowledge gained from this research was intended to aid in future menu planning, hypotheses formulation, and larger research projects. Research conducted over food consumption and feedback was gathered during intervention weeks of the Immersion in Wellness Research Program during summer 2012.

The purpose of the research conducted on the relationships between self-efficacy and home environment with children’s physical activity behavior was to gain knowledge and understanding on how to better promote healthy lifestyle changes for children regarding physical
activity. We wanted to explore what factors may influence the type and amount of child physical activity. Data was collected over three intervention and three control weeks during summer of 2012. Food preferences and physical activity in children, in regards to childhood obesity prevention intervention strategies, are the focus of the following two manuscripts.

**Literature Review**

**Childhood Obesity Overview**

Childhood obesity rates have almost tripled since 1980, but in recent years there has been no significant increase (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010; Ogden, Carroll, Kit, & Flegal, 2014). Despite the leveling in prevalence, obesity still affects approximately 16.9% (12.5 million) of children and adolescents (2-19 years) in the United States (Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007; Ogden et al., 2014). An age and sex specific percentile of body mass index (BMI), which is calculated from height and weight measures, is used to classify childhood overweight and obesity. A BMI at the 85th-95th percentile classifies a child as being overweight and a BMI ≥95th percentile as obese (Ogden & Carroll, 2010).

Childhood obesity is more prevalent among minority and low-income groups. For example, obesity rates are greatest among Hispanic (22.4%) and non-Hispanic black children (20.2%) as compared to non-Hispanic white (14.1%) and non-Hispanic Asian children (8.6%) (Ogden & Carroll, 2010; Ogden et al., 2014). Socioeconomic status and obesity rates in children are positively associated. Fifteen percent of preschool-aged children (2-4 years) of low-income families are obese (Pan, Blanck, Sherry, Dalenius, & Grummer-Strawn, 2012).

Multiple studies have shown that children who are overweight or obese are at greater risk for both short- and long-term health consequences as well as remaining overweight into
adulthood. Overweight and obesity are both cardiovascular disease (CVD) risk factors and are positively associated with other CVD risk factors (Pan et al., 2012). Freedman et al. found that 70% of obese children have at least one CVD risk factor and 39% of obese children have more than one risk factor (Freedman et al., 2007). Those risk factors include hypertension, hypercholesterolemia, hyperlipidemia, metabolic syndrome, and impaired glucose tolerance or Type 2 Diabetes Mellitus (Freedman et al., 2007). Other health consequences include arthritis, lower quality of life, obstructive sleep apnea, polycystic ovary syndrome, orthopedic complications, fatty liver disease, and several types of cancer (Schwimmer, Burwinkle, & Varni, 2003).

The causes of obesity are complex and multifactorial, an interaction between biological and environmental factors. A positive energy balance, which is defined as an excess energy intake to energy expenditure ratio, ultimately leads to weight gain. There is a strong genetic component contributing to the development of obesity, which has been shown in multiple twin adoption studies (Stunkard, Harris, Pedersen, & McClearn, 1990). Other biological factors contributing to childhood obesity include genetic disorders and hormone imbalances, such as leptin, and insulin resistance (Farooqi & O’Rahilly, 2008). However, genetic-related and other biological factors were present before the drastic rise in childhood obesity in the 1980’s, indicating that these factors increase one’s susceptibility to obesity, but other factors also come into play (Ogden et al., 2012; O’Rahilly & Farooqi, 2008).

Some researchers have deemed the “Obesogenic” environment as the leading cause of childhood obesity in the United States (Chaput, Klingerberg, Astrup, & Sjodin, 2011). Present society promotes overconsumption through television, billboards, product packaging, and magazine ads. The Sesame Street Workshop study in 2005 showed how strong product
advertisement influences children’s food choices (Sesame Workshop, 2005). In this study 78% of preschoolers chose a Hershey’s chocolate bar over broccoli. However, by adding an Elmo sticker to the broccoli, 50% of the children then chose the broccoli over the chocolate bar, a 28% increase in choosing broccoli (Sesame Workshop, 2005). Often times high sugar cereals and prepackaged snack items target young children through the use of familiar animated characters and bright colors. Even grocery store shelf placement of these items is designed to target children, for more times than not, parents will buy the foods they think their child will eat (Glanz, Bader, & Lyer, 2012).

Advertising or marketing appears to be a strong influence on children’s food consumption, but simple exposure methods (whether the food is readily available and in sight) may also influence eating behavior in adults and children. Wansink, Painter, and Lee examined the influence of proximity and visibility on consumption volume (Wansink, Painter, & Lee, 2006). In this study, forty adult secretaries ate 2.2 more chocolate candies per day when they could visibly see the candy (clear verses opaque candy dish) and ate 1.8 more chocolate candies when the dish was placed on their desk (direct exposure) rather than two meters away (indirect exposure) (Wansink et al., 2006). This study suggests that proximity and visibility of food does influence consumption in adults. In children, there is also evidence that exposure/visibility as well as decisions of peers may influence children’s food consumption (Bevelander, Engels, Anschütz, & Wansink, 2013).

Another significant contributor to the “Obesogenic” environment is the decrease in physical activity. The modern way of living has become more sedentary. In children, increased time spent watching television and playing video games are two major factors to increased sedentary behavior. Additionally, modern sedentary activities promote overconsumption. On
average, children ages 8-18 years old spend at least 7.5 hours a day on electronic media (Keiser Family Foundation, 2010). According to the Centers for Disease Control and Prevention (CDC), most adolescents are not meeting the Physical Activity Guidelines for Americans. In 2007, only 18% of all 9-12 year old children were meeting the guidelines of 60 min/day of physical activity (U.S. Department of Health and Human Services, 2008). Environmental factors relating to obesity have become the foundation for many intervention programs. Summer jump-start camp programs for children focusing on weight loss have successfully shown short-term improvements in BMI, physical fitness, psychological outcomes, and blood pressure (Huelsing, Kanafani, Mao, & White, 2010; Parizkova, 2008; Sevinc et al., 2011; Werner, Teufel, Holtgrave, & Brown, 2012).

**Physical Activity Overview**

Physical activity throughout all stages of life is positively associated with many health benefits such as weight management and reduced risk of CVD, obesity, depression, osteoporosis, and Type 2 Diabetes Mellitus (Pan et al., 2012). Health and wellness of children and adolescents is of particular concern due to the carryover effect seen in adulthood. Physical activity guidelines typically include recommendations of frequency, intensity, time, and type of activity (FITT).

According to the Center for Disease Control and Prevention and the 2008 Physical Activity Guidelines for Americans, children should be participating in at least 60 minutes of physical activity each day including aerobic activity as well as muscle and bone strengthening activities at least three days per week (Centers for Disease Control and Prevention [CDC], 2011a; U.S. Department of Health and Human Services, 2008). The metabolic equivalent of task (MET) or metabolic equivalent is a measure of physiological energy cost to perform an activity.
One MET is equivalent to the amount of energy expended while at rest. A higher MET value will indicate greater energy expenditure. With exercise, a more intense activity will have a greater MET value. A MET value less than three corresponds with light intensity exercises, three to six METs indicates moderate intensity exercise, while a MET value greater than six corresponds with vigorous intensity exercise. Aerobic activities can be moderate (3-6 METs) to vigorous (>6 METs) intensity, with at least three days including the later of the two intensities (Haskell et al., 2007). Muscle and bone strengthening activities should also be performed at least three days per week (U.S. Department of Health and Human Services, 2008), and the type of physical activity performed should be age-appropriate for children and adolescents. Only 18% of all 9-12 year old adolescent children were meeting these guidelines in 2007 and 13.8% of all 9-12 year old adolescent children reported never participating in 60 minutes of physical activity in a day in 2011 (Centers for Disease Control and Prevention [CDC], 2011b).

There are many ways in which a child can become more physically active. In 2011 only 48.2% of adolescent children (9-12 years) participated in physical education (PE), and of those 48.2%, only 31.5% participated in daily PE (CDC, 2011b). Increasing PE participation is a prime example in which more children can meet physical activity guidelines. Research also shows that in 2011, 32.4% of 9-12 year olds watched three hours or more of television per day and 31.1% used the computer for three or more hours per day (CDC, 2011b). Decreasing sedentary behaviors such as television, video gaming, and computer use are other ways to increase physical activity.

Another factor associated with physical activity is level of self-efficacy. Greater self-efficacy is positively correlated and a determinant of increased physical activity from childhood into adolescents (Trost, Pate, Ward, Sauders, & Riner, 1999a; Trost, Pate, Ward, Sauders, &
Riner, 1999b, Craggs et al., 2011). Trost, Pate, Ward, Saunders, and Riner studied the psychosocial and environmental correlates of physical activity behavior in 198 sixth-grade youth (Trost et al., 1999a). Results showed physical activity self-efficacy was a clear predictor of objectively measured physical activity in both male and female youth (Trost et al., 1999a). Self-efficacy has been shown to be a clear correlate with physical activity level in the adult population as well (Booth, Owen, Bauman, Clavisi, & Leslie, 2000; Grembowski et al., 1993). As a key mediator of physical activity, self-efficacy can be used as a strategy to increase one’s level of physical activity, an effective intervention tool (Craggs, Corder, van Sluijs, & Griffin, 2011; Lubans, Foster, & Biddle, 2008).

Research shows through the Social Cognitive Theory, Theory of Personal Investment and Experiential Learning Theory that a greater self-efficacy as well as proxy-efficacy increases one’s persistence and capability to complete challenging tasks, including being more physically active (Grembowski et al., 1993; Tappe, 1991; Van der Bijl & Shortridge-Baggett, 2002). The Social cognitive theory consists of three models: personal, proxy and collective agency, which are used by an individual or group of individuals to make decisions (Bandura, 2001). An agency is any purposeful action, negative or positive (Bandura, 2001). Personal agency, also known as direct agency, leads to individual decision-making through self-efficacy, or belief in one’s “effectiveness or competency to perform a specific behavior successfully” (Grembowski et al., 1993). Proxy agency is the belief that a personal behavior or outcome will be achieved through the dependence on others (Bandura, 2001). One example of a proxy agency regarding physical activity is proxy-efficacy: confidence in one’s ability to get help from others in order to build a supportive environment for physical activity (Dzewaltowski et al., 2007). Collective agency requires a collaboration or group efforts to reach a common desirable outcome (Bandura, 2001).
The Model of Personal Investment expresses that one’s personal engagement or time invested in a behavior is defined by their meaning of that behavior. One’s subjective meaning of a behavior is developed as a result of interlaced factors related to the environment, person, and the behavior being defined. Perceived situation opportunities and climate are included in the environmental factors. Personal factors include for example self-efficacy, personal incentives, and personal barriers. (Tappe, 1991)

Experiential Learning Theory provides a holistic approach to learning and development (Kolb, & Boyatzis, 1999). It emphasizes the significance experiences plays while learning, which is a process of connecting experiences, not an outcome (Kolb & Boyatzis, 1999; Passarelli & Kolb, 2012). Kolb describes learning as the process whereby knowledge is created through the transformation of experience (Kolb, 1984). Youth positive self-efficacy is built through experiential skill development (Kolb et al., 1999, Baranowski, 1993). According to Vande Berg, Paige, & Lou (2012), learning through immersion, such as studying abroad, brings about new learning that would not have occurred in one’s current environment. Experiential learning shows skill development in adults as well. A study looking at effective nutrition intervention strategies in low-income adults suggest hands-on experiential learning to be an effective way to teach adults new food preparation skills (Franck, Vineyard, Olson, & Peterson, 2012).

Short-term summer intervention programs focusing on child weight loss have shown to be successful in improving BMI and physical fitness (Huelsing et al., 2010; Parizkova, 2008; Sevinc et al., 2011; Werner et al., 2012) However, the improvements gained in the summer months often reversed with the start of the school year (within three months) (Parizkova, 2008). The fluctuation of body weight and physical activity seen in children with changing seasons (summer to school year) is of concern due to carry over into adulthood. Adult health status is
influenced by unstable body weight, for weight fluctuation is associated with increased risk for cardiovascular disease, hypertension, depression, diabetes, and all-cause mortality rates (Bergin et al., 2012; Lee, Kawakubo, Miyamoto, & Sasaki, 1999). Research has shown that children are more physically active during the summer months compared to the school year and weekends compared to weekdays, indicating a need for intervention (Rowlands, Pilgrim, & Eston, 2009; von Hippel, Powell, Downey, & Rowland, 2007). Data is mixed as to whether overall weather patterns (or geographical location/climate) influence physical activity levels in adults in children (Chan, Ryan, & Tudor-Locke, 2006; Duncan, Hopkins, Schofield, & Duncan, 2008), however it is interesting to note that there are general patterns of overall lower levels of self-report exercise in the warmer southeastern United States compared with the more moderate northeast or Midwestern portion of the U.S. (Centers for Disease Control and Prevention, 2011c). In order to promote sustained behavior and knowledge changes, the Immersion in Wellness Program was designed to focus on lifestyle changes rather than weight loss. Focusing on all aspects of health and wellness is necessary to help bring about long-term lifestyle changes.

References


CHAPTER 2 - SUMMER IMMERSION IN WELLNESS RESEARCH
PROGRAM REPORT: FOOD PREFERENCES, CHOICES, AND
PERCEPTION OF HEALTH

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Abstract

The purpose of this study was to examine food preferences, choices, and perception of health of children using immediate response data collection to improve future menu planning and hypotheses formulation. A total of thirty-nine summer campers in a Midwest state participated in the Immersion in Wellness program. The program was designed to incorporate different aspects of wellness (health and nutrition, physical activity, gardening, and culinary skills) through interactive lessons and activities into the typical daily camp schedule. One aspect of this study focused on the campers’ feedback responses to offered foods, collected immediately after lunch on the food they had been offered. Participating campers were asked to fill out short survey “voting cards.” These short surveys were used to rank their food choices after having filled out the card through a fun, interactive voting board. Information was gathered for fruits and vegetables (over a three week period), and main entrée (over a 5-day period) during camp lunch. Results indicated that campers were more likely to choose and report positive feedback on more recognizable menu alterations (main entrée and vegetables). Campers were also choosing items of direct exposure (main entrée and vegetable items offered at their table) rather than indirect exposure (fruit offered on the salad bar). Overall, results indicated exposure was a key aspect of campers’ food choices. If offered an item, children were more likely try it and typically liked it as well.

Keywords: child nutrition, wellness, food choices
Introduction

Approximately one-third of children and adolescents are overweight or obese (31.8%); rates have more than doubled in children and tripled in adolescents in the past thirty years (1). The long-term impact of unhealthy childhood dietary habits contributes to the high prevalence of obesity among youth and adults (2,3). A child’s eating environment plays a major role in determining future dietary habits; generally parents are responsible for the environment provided to the child (4). Parents’ own eating habits, food preferences, and nutrition knowledge influence early learning of food and eating habits in their children (5). However, a child is not typically under the care of their parents every hour of every day. Many other caregivers contribute to the creation a child’s eating environment. Foodservice provided by schools and daycares has been a source of study in order to slow the epidemic of childhood obesity. They have also been key outlets for children’s dietary intake interventions (2).

Present society promotes overconsumption through television, billboards, product packaging, and magazine ads. The Sesame Street Workshop study in 2005 showed how strong product advertisement influences children’s food choices (6). In this study 78% of preschoolers chose a Hershey’s chocolate bar over broccoli. However, by adding an Elmo sticker to the broccoli, 50% of the children then chose the broccoli over the chocolate bar, a 28% increase in choosing broccoli (6). Often times high sugar cereals and prepackaged snack items target young children through the use of familiar animated characters and bright colors. Even grocery store shelf placement of these items is designed to target children, for more times than not, parents will buy the foods they think their child will eat (7).

A study conducted by Wansink, Painter, and Lee examined the influence of proximity and visibility on consumption volume (8). In this study, secretaries ate 2.2 more chocolate candies
per day when they could visibly see the candy (clear verses opaque candy dish) and ate 1.8 more chocolate candies when the dish was placed on their desk (direct exposure) rather than two meters away (indirect exposure) (8). This study suggests that proximity and visibility of food does influence consumption.

To sustain the structured physical activity and nutritional behaviors set by schools during the year (9), an Immersion in Wellness experience for summer youth campers was created. The purpose was to incorporate different aspects of wellness including health and nutrition, physical activity, and gardening, in the form of experiential learning opportunities to provide examples of positive, life-long, health behaviors campers could take home with them. The Immersion in Wellness program also included alterations to camp menu, culinary lessons, and opportunities for the campers to provide feedback of their personal wellness patterns and home environments via pre and post surveys.

A child’s environment more often than not extends beyond the home and school environment. Children participate in extracurricular activities, go to friends’ houses, and many children attend summer camp. For interventions based on an out-of-the-home experience for the child, research must rely on children’s self-reports, for the parents are not familiar with what their child is eating (2). Dietary 24-hour recalls and food frequency questionnaires have been shown to be inaccurate in school-age children due to inaccurate recall over time (2). The opportunity to give an immediate response may make it easier for children to give an honest answer on what they ate, the amount, preferences, and ultimately more accurate data (2). The purpose of this study was to examine food preferences, choices, and perceptions of health in children through immediate response data collection for future menu planning and hypotheses formulation.
Methods

Setting and Study Population

Campers enrolled in the Everything Camp (9-14 year olds), including Operation Military Camp, and Counselors in Training Camp (16-18 year olds) were invited to participate in this program. Only the campers enrolled in the Immersion in Wellness research study (those whose parents signed consent forms, campers signed assent forms, and completed surveys), participated in the data collection process. There were three intervention weeks (each one-week long) during the summer 2012. The Everything Campers and Counselors in Training Campers who chose to attend camp during one of the six designated program weeks had the opportunity to enroll in the project. Thirty-nine campers (37 campers 9-15 years old, 2 campers 16-18 years old) took part in the Rate Your Food data collection process.

Study Design

Investigators at Iowa State University developed the Immersion in Wellness experience for summer campers in a Midwest community. The collective efforts of this project were directed towards childhood obesity prevention. The Immersion in Wellness program provided intervention campers the opportunity to be fully immersed in many aspects of wellness including nutrition and physical activity interactive lessons, hands on culinary and gardening experiences, and exposure to healthful foods. The Immersion in Wellness program received Iowa State University Institutional Review Board approval for all intervention procedures and methods of data collection.

All members of the research team received training regarding proper data collection procedure and ethical considerations in research involving human subject. The research team
consisted of Iowa State University professors, undergraduate, and graduate students. All registered campers received information regarding the Immersion in Wellness program and pre-camp surveys in the mail prior to camp. During camp check-in, additional campers were recruited for enrollment. Recruitment consisted of one-on-one discussion with a research team member or by reading a cover letter explaining the immersion project.

At the time of enrollment, parents signed consent forms, campers signed assent forms, pre-surveys were completed, and all participants were assigned a subject number. Information regarding food allergies and physical activity restrictions was also collected from each camper. Campers participating in the study completed extensive surveys regarding their home environment, self-efficacy, fruit and vegetable knowledge, and physical activity. These surveys were administered in person at camp check-in (pre-surveys) and six months following camp by mail (follow-up surveys). Intervention campers completed the same set of surveys at the end of their camp experience to assess knowledge gained during their five-day immersion experience (post-surveys); control campers did not receive this set of surveys. All participants received monetary compensation for participation and completion of surveys.

One aspect of the Immersion in Wellness program was the Immersion in Nutrition and Physical Activity Education. Each day intervention campers received one education lesson taught by Iowa State University graduate students. The content of the lessons was based on social marketing theory and were modified from lessons originally developed by Iowa State University Food Science and Nutrition undergraduate students in a community nutrition class. Lessons included information regarding: MyPlate, saturated verses unsaturated fats, portion control, fruit and vegetable consumption, and physical activity recommendations. With each lesson, the campers were able to participate in some sort of hands on experience. For example,
with the “Portion Distortion” lesson campers were able to make homemade ice cream by tossing a grocery sack, filled with ice and a zip-lock bag containing the ice cream ingredients, back and forth with a partner. However they were only given one serving: half of a cup. Also, campers were engaged in active learning, like running while wearing a pedometer, as frequently as possible.

Another aspect to the program was the Immersion in Culinary Skills experience. Each day intervention campers received one culinary skills lesson developed and taught by an Iowa State University culinary intern. During the culinary sessions, campers were taught knife safety skills, proper food handling and sanitation, Mise en Place, and how to cut and prepare raw fruits and vegetables. The purpose of the culinary lessons was to increase the likelihood that campers would try new foods and increase their preferences for those foods by involvement. For instance, during one of the culinary sessions, the campers cut up fresh vegetables from the camp garden, which were used to make homemade salsa for that evening’s meal.

Master gardeners from Iowa State Extension assisted with the Immersion in Gardening experience. A garden was built at the camp between the cafeteria and camp pool in a large, open field. The purpose of the garden was for the campers to learn basic gardening skills and origin of produce items, increase physical activity, and increase their desire to consume fruits and vegetables. The Immersion in Gardening experience included planting and harvesting vegetables, composting, weeding, and caring for the garden. Campers were able to learn many aspects of planning, starting, and caring for a home garden. At the end of the week, campers were given plants and composting starter sets to take home.

Lastly, there was also an Immersion in a Health Promoting Environment. This aspect of the program included alterations made of the camp menus to incorporate not only healthier,
nutrient-dense food options, but also fresh produce harvested and prepared in the gardening and culinary sessions. Feedback regarding campers’ food preferences, choices, and perceptions’ of health was collected regarding the intervention menu alterations. The purpose of this research was to solicit feedback from the summer campers about the food they were choosing and consuming during lunch at camp and to use this knowledge for future menu planning and hypotheses formulation.

**Data Collection**

Immediate response method of data collection was used to collect data related to food consumption and preferences. It was demonstrated in previous studies that a shorter lapse of time between the time the children consume the food and the time they are asked to recall about that food paralleled with more accurate data (2). At the camp, meals were served “family style,” meaning platters of food were brought to each table of 5-6 campers for sharing. The campers were able to take as much of each item as they wished or pass on any item entirely. This allowed the campers to have more control over what foods they were choosing to eat and how much of each food they consumed.

In order to keep the data collection process fun for the campers, a “Rate Your Food” voting board was made. The voting board was two feet tall and four feet wide, had “L” shaped legs to stand upright on a table for display. It was divided into four sections, which were distinguished by four different bright colors. The sections were numbered 1-4, and contained phrases to correspond with ranking order such as “I loved it” printed on section one and “I did not like it” on section four. Each section also contained a narrow opening or “slot” where the
participants could cast their votes. On the back of the board were collection bags that were easily taken off to retrieve the voting cards.

Campers participating in the study had access to a personal envelope that contained three Rate Your Food voting cards. Each card was a different color (signifying main entrée, fruit, or vegetable item) but asked the same questions (Figure 1). Subject number was used to ensure participant confidentiality. The cards were completed by each participating camper immediately following lunch and used as voting cards in the Rate Your Food board slots. Voting cards were collected for data entry and analysis. The voting process was designed to encourage card completion.

Data Analysis

Survey data responses were first entered into an excel file. Next, the data were segmented and inductive coding procedures were used to code each question, mean coding processes were determined after examining the data. Positive responses were grouped and coded differently than negative responses. For example, the question, “How healthy is the main entrée item for me?” provided four possible answers (see Figure 1). The first two answers, “it is very healthy for me” and “it is mostly healthy for me” were grouped and coded as positive responses. The last two answers provided for this question, “it is a little healthy for me” and “it is not healthy for me at all,” were grouped and coded as negative responses.

Data were analyzed by each week individually and all three weeks together by type of menu item (main entrée, vegetable, and fruit). Menu alterations were intended to be consistent throughout the three weeks of data collection. However, due to several factors, a different menu was used each week, with week two being the only week that followed the intended menu
(Table 1). For this reason, main entrée data were analyzed for week two only. All three weeks of main entrée data could not be combined, because week one and week three entrée items offered were not comparable. The vegetable and fruit data were analyzed for all three weeks combined because vegetables and fruit were consistently offered each day during all three weeks of data collection. Statistical procedures were conducted using JMP software (JMP, version 9.0.0 SAS, Cary, NC), contingency tables and mosaic plots were generated.

Results

Main Entrée Items

During week two intervention, main entrées were chosen most frequently of the three types of food items (47/54 data points, Figure 2). Of those 47 choosing the main entrée, 87% reported that they would select the item again. Every camper (100%) chose the grilled chicken breast on whole grain bun and beef taco on a whole grain tortilla of week two (Figure 3). Only two campers (4%) did not choose the Cuban pork sandwich and chicken Caesar wrap, and three campers (6%) did not choose the grilled chicken vegetable stir-fry.

Not only did all of the campers choose the grilled chicken breast on whole grain bun and beef taco on a whole grain tortilla, all of them reported positive responses (loved it or liked it) towards the item (100%, as seen in Figure 4). The grilled chicken vegetable stir-fry and chicken Caesar wrap had the least amount of positive responses as well as the greatest number of negative (it was alright or didn’t like it) responses (Figure 4).
Vegetable and Fruit Items

Analysis of vegetable item selection from all three weeks combined, showed that overall 69% of the campers said they chose vegetables and at least 50% of the campers chose vegetables on most days of the week (Figure 2 and Figure 5). Tuesday had the most campers that chose the vegetable (Figure 5), the highest consumption rate (Figure 6), and the greatest number of positive (loved it or liked it) responses (Figure 7). The majority of the campers said they would eat the vegetable items again (71%).

Most of the campers reported that the vegetable items being offered were healthy for them (data not shown). During week two, 76% of campers reported positive responses (very healthy or mostly healthy) when asked “how healthy is the vegetable item for me?” During week two, 17% of the vegetable voting cards were non-responsive (N/A) to this question. However, during week one, 65% of the responses to this question were positive, with 19 non-responses. Week three had 44% positive responses and 5 counts as non-responses.

Nearly all of the data collected on the “fruit cards” had non-responsive answers (N/A, data not shown). The fruit provided at lunch was not placed on the campers’ tables but served away from the dining tables, near the tray return, on the salad bar. Many campers were unaware that there was fruit available as an option at lunch.

Discussion

The main entrée data for week two (the only week that utilized the original intervention menu plan), showed the chicken vegetable stir fry and chicken Caesar wrap had the least “love it” responses. Both of these items contained visible, large pieces of vegetables in the main entrée. This may have affected campers’ perception of the item because the vegetables were not
“hidden” in the stir fry or wrap (10). In contrast, the grilled chicken breast on a whole grain bun and beef taco on a whole grain tortilla had the most “love it” responses, which may be due to the fact that the healthy ‘alteration’ of the food item (change to whole-grain items) was subtle (10). Exploratory research examining vegetable stealth in food indicated that popular food items, such as pizza, could have a healthy profile and still look and taste appetizing through the health-by-stealth approach (12).

Caton, Ahern, and Hetherington (2011) conducted research on seventy-five mothers introducing vegetables to their weaning infant (13). Results showed offering vegetables by stealth as a common, successful strategy (13). Plain white buns and flour tortillas were exchanged for a whole grain bun and tortilla, which may not have been a noticeable change for the campers. Food appearance has shown to be an important factor in child consumption in past research as well. A study conducted by Wansink (2013) looked at offering pre-sliced fruit rather than whole fruit items in school cafeterias, as a strategy to increase fruit consumption, and found a 71% increase in fruit sales compared to control schools (14). These findings suggested that when making changes to improve diet quality for children, food appearance should be considered as an important factor.

In regards to the vegetable data, on Tuesday, campers were most enthusiastic about the meal (highest rates of campers choosing the item, loving it, and reporting that they would choose it again). Two of the three weeks had a vegetable item offered on Tuesday that contained corn. Week one had corn salsa and week two had Mexicali corn. Corn may be favored because it is a more familiar vegetable to the campers or because corn is a starchier vegetable, which may be more palatable for many younger individuals. Friday had the lowest reports of ‘loved it’
responses. Two out of the three weeks offered steamed broccoli (week one and week three) as the vegetable on Friday.

These findings suggest that green vegetables may not be as familiar to campers, as palatable to younger individuals, or that they do not prefer steamed vegetables. Research has shown that Americans are not consuming enough fruits or vegetables, particularly dark green and orange vegetables (15). Vegetables are only served at 23% of American dinners, even though research has shown that meal taste expectation can be enhanced by the addition of a vegetable (16). Vegetable preparation and presentation can increase meal satisfaction, if done properly.

Although data demonstrated that exposure and appearance of foods may be related to children’s food choices, there are limitations to the current study that may have influenced the results. The campers may not have fully understood the voting card response process. Some campers may have been confused as to what item belonged to which category (color of card) on a given day. Rushed responses or non-responses, as well as peer influence could have been factors as well.

Exposure to a mixture of familiar and new foods that are appealing in overall appearance could be the main focus of future studies in getting more children to eat a wider variety of healthy foods. A child’s environment has an impact on whether or not they are exposed to healthy foods. Allowing children to eat “family style” along with their peers may also encourage children to make healthier choices. Peers influences can be either positive or negative. A study examining peer influences on child candy consumption found that children are susceptible to peer eating and there may be a greater influence when exposed to an over-eating peer (17).

Suggestions for future camp experiences include, keeping the menu consistent throughout the intervention weeks. This will allow for better analysis with consistent data. Cards should
include the specific menu item provided for each day or a menu sheet should be displayed by the cards that lists that day’s items for each category; “Today’s side item is ____,” etc. The menu sheet would allow quick alterations each day if the actual foods being offered were different than the original menu. If the items were listed on the voting cards, this would likely limit reporting error. However, the printing process of the cards may be more challenging in the foodservice setting.

Conclusions

In summary, the immediate response form of data collection for campers’ feedback of the noon-meals being offered at this summer camp was successful. Informative data were obtained that can be used in the short term to modify menu offerings. In the long term, the use of the immediate response method of data collection can be used on a larger scale to look at children’s food preferences, choices, and perceptions’ of health and to further examine the effects of food exposure. The data collected on the main entrée verses fruit items suggests that when children are directly exposed (family style table service) to a particular food item, they will most likely try it as compared to indirect exposure (a salad bar option). If foods are offered in a separate location, like the salad bar, children should be encouraged to visit the separate location to provide exposure to the food. In the present study, campers also reported liking or loving the items they tried as well. A little over fifty percent of campers chose the vegetable offered. It appeared that corn was favored over green vegetables like broccoli, which may be due to parents offering more starchy vegetables at home (such as corn and potatoes) rather than non-starchy vegetables like broccoli and carrots (11,14).
Exposure to foods could be the main focus in getting more children to eat a wider variety of foods. A child’s environment has a huge impact on whether or not they are directly exposed to healthful foods. Parents, schools, daycares, and summer camps are the environmental niches that most children receive their nutritional experiences, knowledge, perceptions, and habits (5).

References


CHAPTER 3 - OBESITY INTERVENTION PROGRAM INCREASES PHYSICAL ACTIVITY SELF-EFFICACY IN CHILDREN

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Abstract

Increasing a child’s physical activity self-efficacy is a successful strategy for increasing physical activity. The purpose of this study was to examine the relationship between efficacy and home environment influence on physical activity behaviors in children participating in a summer camp-based childhood obesity prevention program. Seventy-seven summer campers (9-18 years old) participated in the Immersion in Wellness Program, which was designed to incorporate different aspects of wellness (health and nutrition, physical activity, gardening, and culinary skills) in the form of interactive lessons and activities into a typical daily summer camp schedule. Campers (control and intervention) completed validated surveys (related to efficacy, home environment, and physical activity duration and intensity) during camp and 6-months after camp. Campers with increased self-efficacy were significantly more physically active (total time, \( P<0.0001 \) and METs, \( P<0.0001 \)). The level of physical activity self-efficacy in intervention campers increased from baseline to 6-months post (\( P<0.05 \)), and there was not a change in self-efficacy in control campers. Activity options available to the child had a greater influence on physical activity than both parent and home influences. Participation in the Immersion in Wellness program was associated with improved physical activity self-efficacy. Childhood obesity prevention programs that support a variety of activity options may positively influence physical activity self-efficacy.

Keywords: physical activity, self-efficacy, intervention, childhood obesity
Introduction

Physical activity is necessary for maintaining a healthy lifestyle. Being physically active helps reduce stress; risk for chronic health diseases such as CVD, obesity, and T2DM; and helps keep one’s mind and body fit, energized, and free from injury [1]. Children and adolescents should be participating in at least 60 minutes of physical activity each day in order to meet the 2008 Physical Activity Guidelines for Americans [2,3]. One way to categorize the intensity of energy expenditure is by using metabolic equivalents of task (METs), which is the physiological energy cost to perform an activity. Activities of greater physiological demand (greater energy expenditure) will have a greater MET value, indicating a more intense exercise. The physical activity performed by children and adolescents should be age-appropriate and include moderate (3-6 METs) to vigorous (>6 METs) intensity aerobic activity each day [4]. Muscle and bone strengthening activities should also be performed at least three days per week [3].

Only 18% of all 9-12 year old adolescent children met the physical activity guidelines in 2007 [5] and 13.8% of all 9-12 year old adolescent children reported never participating in 60 minutes of physical activity in 2011 [6]. The amount of physical activity children and adolescents achieve is of great concern due to the carry over effect seen in adulthood. Many factors affect the amount of physical activity children perform. Self-efficacy, parent-proxy (a child’s belief that his/her parents can help them to be physically active), and home environment are a few key factors. Past research has shown greater self-efficacy and proxy efficacy are positively correlated and a determinant of increased physical activity from childhood into adolescence and extends into adulthood [7,8,9,10]. However, the evidence in children is more limited and needs further investigation.
Trost, Pate, Ward, Saunders, and Riner studied the psychosocial and environmental correlates of physical activity behavior in 198 sixth-grade youth [8]. Results showed physical activity self-efficacy was a clear predictor of objectively measured physical activity in both male and female youth [8]. Self-efficacy has also been shown to be a clear correlate with physical activity level in the adult population [9,10]. As a key mediator of physical activity, self-efficacy can be used as a strategy to increase one’s level of physical activity, an effective intervention tool [7, 11].

Research shows through the Social Cognitive Theory and the Model of Personal Investment Model that a greater self-efficacy as well as proxy-efficacy increases one’s persistence and capability to complete challenging tasks, including being more physically active [10,12,13]. The Social cognitive theory consists of three models: personal, proxy and collective agencies, which are used by an individual or group of individuals to make decisions [14]. An agency is any purposeful action, positive or negative (14). Personal agency, also known as direct agency, leads to individual decision-making through self-efficacy, or belief in one’s “effectiveness or competency to perform a specific behavior successfully” [10]. Proxy agency is the belief that a personal behavior or outcome will be achieved through the dependence on others [14]. One example of a proxy agency regarding physical activity is proxy-efficacy: confidence in one’s ability to get help from others in order to build a supportive environment for physical activity [15]. Collective agency requires a collaboration or group effort to reach a common desirable outcome [14].

The Model of Personal Investment expresses that one’s personal engagement or time invested in a behavior is defined by their meaning of that behavior. One’s subjective meaning of a behavior is developed as a result of interlaced factors related to the environment, person, and
the behavior being defined. Perceived situation opportunities and climate are included in the
environmental factors. Personal factors include self-efficacy, personal incentives, and personal
barriers. [12]. As part of the Immersion in Wellness Program, physical activity self-efficacy and
proxy efficacy were evaluated as an intervention mediator for increasing physical activity
amount and intensity in children [6,11].

Methods

Investigators at Iowa State University developed the Immersion in Wellness experience
for summer campers in the Midwest. The Immersion in Wellness program provided campers
with the opportunity to be fully immersed in many aspects of wellness. Campers experienced
positive, life-long, wellness behaviors that they could take home and share with their families.
Nutrition, physical activity, culinary, and gardening behaviors were examined for both short-
term and longer effects.

The Immersion in Wellness camp project received Iowa State University Institution
Review Board approval for all intervention procedures and methods of data collection. The goal
was to fully immerse campers in a five-day wellness program to help foster sustainable, healthy
lifestyle changes in youth. The entire efforts of this project were directed towards childhood
obesity prevention. Intervention campers received nutrition, physical activity, gardening, and
culinary education during their five-day immersion experience which incorporated fun,
interactive activities. Intervention campers also received take-home kits to encourage and
influence their home environment with what they learned and experienced during their
immersion experience at camp. Control campers participated in the traditional camp schedule
and did not receive any of the educational lessons or take-home kits.
All members of the research team received training regarding proper data collection procedure and ethical considerations in research involving human subjects protection. The research team consisted of Iowa State University professors, undergraduate, and graduate students. All registered campers received information regarding the Immersion in Wellness program and pre-camp surveys in the mail prior to camp. During camp check-in, additional campers were recruited for enrollment. Recruitment consisted of one-on-one discussions with a research team member or by reading a cover letter explaining the immersion project.

At the time of enrollment parents signed consent forms, campers signed assent forms, and pre-surveys were completed. Information regarding food allergies and physical activity restrictions was also collected from each camper. All campers (control and intervention) received monetary remuneration for completing and returning the surveys. Take-home kits were given to intervention campers on their last day at camp, which consisted of: food safe cutting boards, paring knife, an Iowa State Extension cookbook (Healthy and Homemade), vegetable scrub brush, two thermometers (refrigerator and meat), pedometer, garden journal, and an array of physical activity and nutrition handouts related to their education lessons provided throughout the week.

**Setting and Study Population**

The Immersion in Wellness Program was held at a summer camp in a Midwest state during summer 2012. Campers (9-14 years old or 16-18 years old) enrolled in specific camps were invited to participate in this program. Only the campers enrolled in the Immersion in Wellness research study (those whose parents signed consent forms, campers signed assent forms, and completed surveys), participated in the data collection process. There were three
intervention and three control weeks (each one-week long) during summer 2012. Participants did not know whether they were in the control or intervention group at the time of enrollment. Seventy-seven campers participated in the research; thirty-nine campers participated in the intervention weeks (36 between 9-15 years old, 3 between 16-18 years old) and thirty-eight campers participated in the control weeks (36 between 9-15 years old, 2 between 16-18 years old).

**Intervention**

One aspect of the Immersion in Wellness program was the Immersion in Nutrition and Physical Activity Education. Each day intervention campers received one education lesson taught by Iowa State University graduate students. The content of the lessons was based on social marketing theory and were modified from lessons originally developed by Iowa State University Food Science and Nutrition undergraduate students in a community nutrition class. Lessons included information regarding: MyPlate, saturated verses unsaturated fats, portion control, fruit and vegetable consumption, and physical activity recommendations. With each lesson, the campers were able to participate in some sort of hands on experience. For example, with the “Portion Distortion” lesson campers were able to make homemade ice cream by tossing a grocery sack, filled with ice and a zip-lock bag containing the ice cream ingredients, back and forth with a partner. However they were only given one serving: half of a cup. Also, campers were engaged in active learning, like running while wearing a pedometer, as frequently as possible.

Another aspect of the program was the Immersion in Culinary Skills experience. Each day intervention campers received one culinary skills lesson developed and taught by an Iowa
State University undergraduate culinary intern. During the culinary sessions, campers were taught knife safety skills, proper food handling and sanitation, Mise en Place, and how to cut and prepare raw fruits and vegetables. The purpose of the culinary lessons was to increase the likelihood that campers would try new foods and increase their preferences for those foods by involvement. For instance, during one of the culinary sessions, the campers cut up fresh vegetables from the camp garden, which were used to make homemade salsa for that evening’s meal.

Master gardeners from Iowa State Extension assisted with the Immersion in Gardening experience. A garden was built at the 4H camp between the cafeteria and camp pool in a large, open field. The purpose of the garden was for the campers to learn basic gardening skills and origin of produce items, increase physical activity, and increase their desire to consume fruits and vegetables. The Immersion in Gardening experience included planting and harvesting vegetables, composting, weeding, and caring for the garden. Campers were able to learn many aspects of planning, starting, and caring for a home garden. At the end of the week, campers were given plants and composting starter sets to take home.

Lastly, there was also an Immersion in a Health Promoting Environment. This aspect of the program included alterations of the camp menus to incorporate not only healthier, nutrient-dense food options, but also fresh produce harvested and prepared in the gardening and culinary sessions. Feedback regarding campers’ food preferences, choices, and perceptions’ of health was collected regarding the intervention menu alterations. Campers were exposed to healthier snack options in the camp store, which were offered at lower prices than the traditional camp snacks. Also, campers had the opportunity and encouragement to be active throughout each of the Immersion sessions.
Surveys

Campers participating in the study completed extensive surveys regarding their home environment, efficacy, fruit and vegetable knowledge, and physical activity. These surveys were administered in person at camp check-in (pre-surveys) and six months following camp by mail (follow-up surveys). Intervention campers completed the same set of surveys at the end of their camp experience to assess knowledge gained during their five-day immersion experience (post-surveys); control campers did not receive this set of surveys.

Campers were asked to fill out the camper survey independently while their parents could assist them in filling out the Physical Activity and Home Environment surveys. The camper survey was comprised of three sections regarding fruit and vegetable knowledge, food preferences, and both forms of efficacy (self- and proxy-). Fruit and vegetable knowledge was assessed using a modified version of a survey published by Struempler and Raby (2005), fruit and vegetable preferences were assessed using a survey published by Domel et al. (1993) and efficacy (self-efficacy and parent proxy) for physical activity and fruit and vegetable intake was assessed using a survey also published by Domel et al. (1996).

The Youth/Adolescent Activity Questionnaire developed by the Harvard School of Public Health (2005) and was used to assess physical activity duration. The Physical Activity survey measured time performing various activities (swimming, walking, playing basketball, etc.) throughout each of the four seasons. The Home Environment Survey assessed availability of physical activity items at home, utilization of activity options available, of those items, food availability and consumption. The “America on the Move” survey, published by Catenacci and Wyatt (2007) was used to assess availability of physical activity items at home [12] and the
Youth/Adolescent Frequency Questionnaire, published by Rockett et al. (1997) was used to assess food availability and consumption.

**Data Analysis**

Physical activity duration and intensity (METs), efficacy, and home environment data were assessed using StatView Version 5, SAS Institute, Raleigh, NC, USA) [16,17]. Responses regarding specific physical activities were converted to time spent in each of those activities over the four seasons. Each activity was assigned a MET value using the Compendium of Daily Activities [18]. Total energy expenditure (MET-minutes) for these activities were estimated by multiplying the time in each activity by the MET value assigned. Estimates were added together to obtain total energy expenditure over the four seasons. Normal distribution of the physical activity data was confirmed using a Kolmogorov-Smirnov test. To compare influence of the overall intervention on physical activity between control and intervention (time and METs), individual t-tests were used. Differences between baseline (pre-surveys) and six-month (follow-up surveys) physical activity data, were tested for control and intervention groups separately using paired t-tests and analysis of variance. The significance level of individual comparisons were determined using a Bonferroni correction to give an overall significance of $P < 0.05$.

Efficacy survey data were divided into three separate measures self-efficacy, parent proxy, and pooled efficacy (self-efficacy and parent proxy combined). Home environment survey data were separated into data related to either home (items available to them) or activity options (utilization of those items). The data from each group were examined as averages of all question responses from a subject as well as grouped favorable/unfavorable responses. In this manner, the data could be examined as either continuous or categorical variables.
signed rank tests were used for paired data, comparing baseline and six-months post data. Mann-Whitney U tests were used for unpaired data, comparing control verses intervention data. Statistical significance was set at P < 0.05.

All five variables (self-efficacy, parent proxy, pooled efficacy, home, and activity options) represented in question average response and number of favorable responses, were examined as possible correlates to both physical activity represented time and in METs. Initial correlations were tested using the Spearman correlation coefficient, which is appropriate for categorical, nonparametric data. Significant factors were added into a general linear model to examine either transformed or untransformed categorical data as dummy variables in a simple or multiple regression. Here a Pearson correlation coefficient was used to test for significant correlation of physical activity to the model, which is appropriate for categorical, parametric data. To correct for model complexity, the Akaike information criterion (AIC) was computed to compare simple and multifactor linear models. The model with the lowest AIC was considered to be the most likely fit among models predicting the same dependent variable. The Delta Akaike information criterion (Δ AIC) was calculated and used as a tool for simple comparison between models.

Results

There were no significant differences between physical activity (duration or intensity) and home environment (home or activity options) for either the control or the intervention groups between baseline and six-month follow-up data. There was, however an increase in physical activity self-efficacy, both in question average response and number of favorable responses in the intervention group that was not observed in the control group (Table 2). These differences
were evident in self-efficacy questions (average response, P = 0.022; favorable response, P = 0.042) and to pooled efficacy questions (average response, P = 0.029; favorable response, P = 0.012).

There were strong correlations between efficacy (self-efficacy, parent proxy, and pooled efficacy) and physical activity (time and METs) as well as between activity options and physical activity (time and METs) in both question average response and number of favorable responses (Table 3). The self-efficacy questions were a much stronger correlate to physical activity than parent proxy questions. Home question data had no correlation with physical activity (Table 3).

Attempts to correlate the data through a simple linear model were statistically significant (Figures 8 & 9; Table 3), but examination of the residuals demonstrated that an increase in the number of favorable responses to efficacy questions (while excluding choice questions) might be better modeled through an exponential fit (Table 4). Finally, a multiple regression was tested using activity options and efficacy as correlates to physical activity. Physical activity in terms of METs and duration were significantly correlated to a multiple linear model including activity options and either self-efficacy or pooled efficacy questions (Table 5, Figures 10).

**Discussion**

Self-efficacy has been shown to have a strong positive affect on physical activity in children [8, 11]. Results of the current research agreed with past research, for participants with greater overall self-efficacy were also more physically active (in total duration and MET-minutes) than those with lower overall self-efficacy [7,8,20]. A study conducted by Trost, Pate, Ward, Saunders, and Riner examined the psychosocial and environmental correlates of physical
activity behavior in 198 sixth-grade youth [8]. Results showed physical activity self-efficacy was a clear predictor of objectively measured physical activity in both male and female youth [8].

Intervention campers reported an increase in physical activity efficacy that was significantly different from pre-camp participation to 6-months post camp (self-efficacy average response, $P = 0.022$; self-efficacy favorable response, $P = 0.042$; pooled efficacy average response, $P = 0.029$; pooled efficacy favorable response, $P = 0.012$). Participants with greater confidence in themselves were more likely to choose to be physically active, regardless of their surrounding influences. Research has shown that youth positive self-efficacy is built through experiential skill development [21,22]. These results agree with research conducted by Vande Berg, Paige, & Lou (2012), who’s results suggested experiential learning through immersion brings about new learning that would not have occurred in one’s current environment [23].

For both control and intervention campers, parent proxy was not as strongly related to physical activity (average response vs MET, $P = 0.01$; favorable response vs MET, $P = 0.001$; average response vs time, $P = 0.025$; favorable response vs MET, $P = 0.01$) and home questions had no statistically significant influence on physical activity in children participating in the Immersion in Wellness Program. Intervention campers had greater self-confidence in their abilities to perform and succeed in a task and were more likely to be physically active, with or without the influence of their parents or environment. This suggests that child obesity prevention interventions should focus on increasing physical activity self-efficacy related to activity options. Children can learn to be more physically active by their sense of empowerment and confidence, independent of parent or home environment influence.

There are limitations to the current study that may have influenced the results. Child recall capabilities are always a concern; however, this is less of a concern when comparing pre-
surveys and 6-month post-surveys, for their capacity to recall would not have significantly changed. Another limitation while working with self-report data includes increased likelihood to over-report physical activity [8]. Also, parents were allowed to assist their child with the home environment surveys, increasing the accuracy of the responses and helping decrease child recall bias. Seasonal differences may have also influenced the responses to the surveys, but the overall design of the physical activity survey was intended to minimize this influence.

**Conclusion**

In summary, self-efficacy was positively associated with physical activity level in children for both physical activity duration and intensity. Self-efficacy related to physical activity options had the greatest relationship with physical activity. Physical activity was also related to parent-proxy, but this relationship was not as strong. Home environment did not have a significant effect on physical activity in the children participating in the Immersion in Wellness Program. For these reasons, childhood obesity prevention programs focused on increasing physical activity level in children should incorporate ways to increase self-efficacy through increased physical activity options. For example, providing children with a variety of activities that they can choose from rather than limiting the number of activities or assigning activities, may be an effective way to increase the level of physical activity, and ultimately help prevent obesity for children.
References


CHAPTER 4 - OVERALL CONCLUSIONS

Physical activity and dietary habits are two major contributing modifiable factors in determining one’s health and weight status. Interventions are needed to help curb the obesity epidemic by working toward improving the health status of children and adolescents. The goal of the Immersion in Wellness research project was to fully immerse youth campers in a five-day wellness program to help foster sustainable, healthy lifestyle changes that campers could take home with them. Intervention campers received nutrition, physical activity, gardening, and culinary education during their five-day immersion experience, while control campers participated in the traditional camp schedule.

Research was conducted on children’s food preferences, choices, and perception of health and the relationships between self-efficacy, parent, and home environment influences with children’s physical activity behavior. The purpose of the research conducted on children’s food preferences, choices, and perception of health was to obtain feedback from the summer campers about the food they were choosing and consuming during lunch at camp. The knowledge gained from this research was intended to aid in future menu planning, hypotheses formulation, and larger research projects. The purpose of the research conducted on the relationships between self-efficacy and home environment with children’s physical activity behavior was to gain knowledge and understanding on how to better promote healthy lifestyle changes for children regarding physical activity. We wanted to explore what factors may influence the type and amount of child physical activity.

Direct exposure was a key aspect of campers’ food choices and preferences. Also if offered an item, children were likely to try it and typically liked it as well. Results indicated that
Campers were more likely to choose and report positive feedback on more recognizable menu alterations (main entrée and vegetable items). Campers were also choosing items of direct exposure (main entrée and vegetable items offered at their table) rather than indirect exposure (fruit offered on the salad bar). Results suggest campers were more in favor of starchy vegetables rather than green vegetables and main entrée items that did not contain any visible vegetables.

Physical activity data results showed that campers with increased self-efficacy were significantly more physically active and the level of physical activity self-efficacy in intervention campers increased from baseline to 6-months post. This change was not seen in self-efficacy of control campers. Self-efficacy and activity options had a greater influence on physical activity than both parental proxy and home environment.

Direct exposure to foods could be the main focus in getting more children to eat a wider variety of foods. A child’s environment has a huge impact on whether or not they are directly exposed to healthful foods. Parents, schools, daycares, and summer camps are the environmental niches that most children receive their nutritional experiences, knowledge, perceptions, and habits. Childhood obesity prevention programs focused on increasing physical activity level in children should incorporate ways to increase self-efficacy through increased physical activity options. For example, providing children with a variety of activities that they can choose from rather than limiting the number of activities or assigning activities, may be an effective way to increase the level of physical activity, and ultimately help prevent obesity for children.
### Tables

Table 1. Menu items offered at lunch for the three intervention weeks.

<table>
<thead>
<tr>
<th>Day of the Week</th>
<th>Week Number</th>
<th>Main Entrée</th>
<th>Fruit</th>
<th>Vegetable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>1</td>
<td>Beef Stroganoff</td>
<td>Watermelon</td>
<td>Raw Broccoli</td>
</tr>
<tr>
<td>Tuesday</td>
<td>1</td>
<td>Beef Tacos</td>
<td>Peaches (canned)</td>
<td>Corn Salsa</td>
</tr>
<tr>
<td>Wednesday</td>
<td>1</td>
<td>Chicken Caesar Wrap</td>
<td>Watermelon</td>
<td>Snap Peas</td>
</tr>
<tr>
<td>Thursday</td>
<td>1</td>
<td>Tatar Tot Casserole</td>
<td>Pears (canned)</td>
<td>Carrots</td>
</tr>
<tr>
<td>Friday</td>
<td>1</td>
<td>Chicken Patty</td>
<td>Watermelon</td>
<td>Steamed Broccoli</td>
</tr>
<tr>
<td>Monday</td>
<td>2</td>
<td>Grilled Chicken Breast on Whole Grain Bun</td>
<td>Watermelon</td>
<td>Steamed Broccoli</td>
</tr>
<tr>
<td>Tuesday</td>
<td>2</td>
<td>Beef Tacos on Whole Grain Tortilla</td>
<td>Cut fruit salad and dip</td>
<td>Mexicali Corn</td>
</tr>
<tr>
<td>Wednesday</td>
<td>2</td>
<td>Cuban Pork Sandwich</td>
<td>Strawberries</td>
<td>Steamed Carrots</td>
</tr>
<tr>
<td>Thursday</td>
<td>2</td>
<td>Grilled Chicken Vegetable Stir Fry</td>
<td>Pineapple and Melon Salad</td>
<td>Snap Peas</td>
</tr>
<tr>
<td>Friday</td>
<td>2</td>
<td>Chicken Caesar Wrap</td>
<td>Watermelon</td>
<td>Steamed Peas</td>
</tr>
<tr>
<td>Monday</td>
<td>3</td>
<td>Soft Shell Taco</td>
<td>Melon</td>
<td>Salsa</td>
</tr>
<tr>
<td>Tuesday</td>
<td>3</td>
<td>Chicken Noodle Soup</td>
<td>Peaches (canned)</td>
<td>Raw Vegetables</td>
</tr>
<tr>
<td>Wednesday</td>
<td>3</td>
<td>Hamburger on a Bun</td>
<td>Melon</td>
<td>Raw Vegetables</td>
</tr>
<tr>
<td>Thursday</td>
<td>3</td>
<td>Brats on a Bun</td>
<td>Pears (canned)</td>
<td>Raw Vegetables</td>
</tr>
<tr>
<td>Friday</td>
<td>3</td>
<td>Baked Penne Pasta</td>
<td>Fruit Salad</td>
<td>Steamed Broccoli</td>
</tr>
</tbody>
</table>
Table 2. Physical activity pooled efficacy and self-efficacy in the intervention group from baseline (pre-survey) to six-month post-camp (follow-up survey).

<table>
<thead>
<tr>
<th>Question</th>
<th>Average Response Pre</th>
<th>Post</th>
<th>P (Linear)</th>
<th>Number of Favorable Responses Pre</th>
<th>Post</th>
<th>P (Linear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled Efficacy</td>
<td>1.45 ± 0.44</td>
<td>1.55 ± 0.30</td>
<td>0.022</td>
<td>8.86 ± 2.02</td>
<td>9.55 ± 0.91</td>
<td>0.042</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>1.40 ± 0.47</td>
<td>1.56 ± 0.32</td>
<td>0.022</td>
<td>4.45 ± 1.04</td>
<td>4.86 ± 0.35</td>
<td>0.042</td>
</tr>
</tbody>
</table>

Intervention and control group data were examined as averages of all question responses from a subject as well as grouped favorable/unfavorable responses. In this manner, the data could be examined as either continuous or categorical variables. Data were tested using paired t-tests, analysis of variance, and the significance level of individual comparisons were determined using a Bonferroni correction to give an overall significance of P < 0.05.
Table 3. Spearman correlation between physical activity and efficacy/home environment measures, represented by average question response as well as the number of favorable responses.

<table>
<thead>
<tr>
<th></th>
<th>Q. Average(^a) v MET(^b)</th>
<th>Q. Average(^a) v Time</th>
<th># Favorable v MET(^b)</th>
<th># Favorable v Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rho</td>
<td>P</td>
<td>rho</td>
<td>P</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.492</td>
<td>&lt; 0.000</td>
<td>0.493</td>
<td>&lt; 0.000</td>
</tr>
<tr>
<td>Parent Proxy</td>
<td>0.313</td>
<td>&lt; 0.01</td>
<td>0.299</td>
<td>&lt; 0.025</td>
</tr>
<tr>
<td>Pooled Efficacy</td>
<td>0.494</td>
<td>&lt; 0.000</td>
<td>0.481</td>
<td>&lt; 0.000</td>
</tr>
<tr>
<td>Home</td>
<td>0.052</td>
<td>NS</td>
<td>0.069</td>
<td>NS</td>
</tr>
<tr>
<td>Activity Options</td>
<td>-0.324</td>
<td>&lt; 0.01</td>
<td>-0.330</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

Abbreviations: MET, Metabolic Equivalent Task; P, P-value; rho, Spearman correlation coefficient; Q. Average, Question Average Response
\(^a\)Physical activity duration; \(^b\)Physical activity intensity

Intervention and control group data were examined as averages of all question responses from a subject as well as grouped favorable/unfavorable responses. In this manner, the data could be examined as either continuous or categorical variables. All five variables (self-efficacy, parent proxy, pooled efficacy, home, and activity options), represented in question average response and number of favorable responses, were examined as possible correlates to both physical activity, represented time and in METs. Initial correlations were tested using the Spearman correlation coefficient, which is appropriate for categorical, nonparametric data.
**Table 4.** Linear and exponential regression: Physical activity and efficacy/home environment measures.

<table>
<thead>
<tr>
<th></th>
<th>Q. Average(^a) v MET(^b)</th>
<th>Q. Average(^a) v Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R linear P linear P exp</td>
<td>R linear P linear P exp</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.512 &lt; 0.000 &lt; 0.000</td>
<td>0.513 &lt; 0.000 &lt; 0.000</td>
</tr>
<tr>
<td>Parent Proxy</td>
<td>0.299 &lt; 0.025 NS</td>
<td>0.293 &lt; 0.025 NS</td>
</tr>
<tr>
<td>Pooled Efficacy</td>
<td>0.494 &lt; 0.000 &lt; 0.000</td>
<td>0.491 &lt; 0.000 &lt; 0.000</td>
</tr>
<tr>
<td>Home</td>
<td>0.097 NS NS</td>
<td>0.111 NS NS</td>
</tr>
<tr>
<td>Activity Options</td>
<td>-0.387 &lt; 0.001 &lt; 0.003</td>
<td>-0.407 &lt; 0.001 &lt; 0.025</td>
</tr>
</tbody>
</table>

Abbreviations: MET, Metabolic Equivalent Task; exp, exponential; P, P-value; Q. Average, Question Average Response
\(^a\)Physical activity duration; \(^b\)Physical activity intensity

Intervention and control group data were examined as averages of all question responses from a subject as well as grouped favorable/unfavorable responses. In this manner, the data could be examined as either continuous or categorical variables. Significant factors were added into a general linear model to examine either transformed or untransformed categorical data as dummy variables in a simple or multiple regression. Pearson correlation coefficient was used to test for significant correlation of physical activity to the model, which is appropriate for categorical, parametric data.
**Table 5.** Multiple regression compared to simple regression: Physical activity and efficacy/activity options.

<table>
<thead>
<tr>
<th></th>
<th>Q. Average(^a) v MET(^b)</th>
<th>Q. Average(^a) v Time</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>P(SE)</td>
<td>P(Choice)</td>
<td>AIC (ΔAIC)</td>
<td>R</td>
<td>P(SE)</td>
</tr>
<tr>
<td>SE x Options</td>
<td>0.573</td>
<td>&lt; 0.000</td>
<td>&lt; 0.025</td>
<td>1341.9 (0)</td>
<td>0.584</td>
<td>&lt; 0.000</td>
</tr>
<tr>
<td>Pooled x Options</td>
<td>0.554</td>
<td>&lt; 0.000</td>
<td>&lt; 0.025</td>
<td>1344.2 (2.3)</td>
<td>0.563</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SE (simple)</td>
<td>0.512</td>
<td>&lt;0.000</td>
<td>N/A</td>
<td>1346.6 (4.7)</td>
<td>0.513</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Pooled (simple)</td>
<td>0.494</td>
<td>&lt;0.000</td>
<td>N/A</td>
<td>1348.4 (6.5)</td>
<td>0.491</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Options (simple)</td>
<td>-0.387</td>
<td>N/A</td>
<td>&lt;0.001</td>
<td>1356.7 (14.8)</td>
<td>-0.407</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Abbreviations: SE, Self-efficacy; Options, Activity Options; Pooled, Pooled Self-efficacy; MET, Metabolic Equivalent Task; AIC, Akaike information criterion, ΔAIC, Delta Akaike information criterion; P, P-value

\(^a\)Physical activity duration; \(^b\)Physical activity intensity

Intervention and control group data were examined as averages of all question responses from a subject as well as grouped favorable/unfavorable responses. In this manner, the data could be examined as either continuous or categorical variables. To correct for model complexity, the Akaike information criterion (AIC) was computed to compare simple and multifactor linear models. A multiple regression was tested using activity options and efficacy as correlates to physical activity.
Figures

1. Did you choose the [insert menu item]?  
   Yes or No
2. How much of the [insert menu item] did you eat?  
   a. “I didn’t eat any of it.”  
   b. “I tried it.”  
   c. “I ate some of it.”  
   d. “I ate half of it.”  
   e. “I ate most of it.”  
   f. “I ate it all.”
3. How much did you like the [insert menu item]?  
   a. “I loved it.”  
   b. “I liked it.”  
   c. “It was alright.”  
   d. “I didn’t like it at all.”
4. How healthy is the [insert menu item] for me?  
   a. “It is very healthy for me.”  
   b. “It is mostly healthy for me.”  
   c. “It is a little healthy for me.”  
   d. “It is not healthy for me at all.”
5. Would you choose the [insert menu item] again?  
   Yes or No

**Figure 1:** Voting card question shown were the same for all card colors. The food category (main entrée, fruit, vegetable, or side item) replaced the ‘[insert menu item]’ spaces for each card color.
Figure 2: Week two data, color of cards (type of food item) by “Did you choose the item?”

Figure 3: Main entrée data (purple cards) for week two, “Did you choose the main entrée?” by Day.
Figure 4: Main entrée data (purple cards) for week two, “How much did you like the main entrée?” by Day.

Figure 5: Green data for all three weeks, “Did you choose the vegetable?” by Day.
Figure 6: Green data for all three weeks, “How much did you eat the vegetable?” by Day.

Figure 7: Green data for all three weeks, “How much did you like the vegetable?” by Day.
**Figure 8:** Self-efficacy versus summed weekly activity level in MET-minutes for all seasons. Simple linear model of self-efficacy (average question response) and physical activity (MET-minutes over the four seasons) with a Pearson correlation coefficient ($R^2$).

**Figure 9:** Self-efficacy versus summed weekly activity level in minutes for all seasons. Simple linear model of self-efficacy (average question response) and physical activity (total time in minutes) with a Pearson correlation coefficient ($R^2$).

**Figure 10:** Scaled self-efficacy (self-efficacy and activity options) composite score (multiple linear regression model) versus summed weekly activity level in METs for all seasons. Multiple regression model of activity options and self-efficacy as correlates to physical activity.
APPENDIX A - IRB APPROVAL

Research Involving Humans (1-12)

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Date: 12/8/2011
To: Dr. Ruth Litchfield
1104 HNSB

From: Office for Responsible Research

Title: Immersion in Wellness at Iowa 4-H Center
IRB ID: 11-548

Approval Date: 12/9/2011 Date for Continuing Review: 12/8/2012
Submission Type: New Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 50), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- Retain signed informed consent documents for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- Stop all research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- Complete a new continuing review form at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.
- Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.
Email blast:

Greetings from the Iowa 4-H Center! NEW this summer is an opportunity for youth to have fun with food and physical activity during their camp experience. This camp experience is part of a research study and participants will receive up to a $65 camp scholarship. Participating youth will:

- care for the camp garden
- harvest garden produce
- handle produce in a safe manner
- prepare produce in a safe manner
- experience new physical activities

To learn more, visit [http://www.extension.iastate.edu/4h/center/](http://www.extension.iastate.edu/4h/center/).
APPENDIX B – INFORMED CONSENT AND ASSENT FORMS

Older youth assent and parental consent form

I. General Information About This Research Study

Study Title: “Immersion in Wellness at Iowa 4-H Center”

Name of Principal Investigator on This Study: Dr. Ruth Litchfield

Note to Parents:

The information in this form describes a research project that we are asking your child to take part in during his or her time at camp. The things your child will be asked to do are explained below, along with other important information about being a research participant. Please review this form carefully, and sign it if you agree that your child can take part in the study.

Your child also has an opportunity to choose whether or not to participate in the research. If your child is 16 or over, and able to read and understand the information in this form, please also ask that he or she read the form and sign it if they agree to take part in the study. A simplified version of this form is also included, which should be reviewed and signed by children who are under age 16.

A copy of the signed forms should be returned with the packet of camp materials. Please keep the second copy for your records.

A. Study Eligibility and Purpose

You are being asked to take part in this research study because we want to understand how immersion in a wellness program addressing diet and physical activity at camp helps children learn good nutrition and health practices and use these practices once they leave camp.

As you read this form describing the study, ask any questions you have. Take your time to decide. Feel free to discuss the study with your family, friends, and healthcare provider before you decide. You may stop participating at any time during the study, either at your request or your parent’s. If so, none of your current benefits, normal health care, or camp experience will be affected in any way. When you feel comfortable that all your questions have been answered, and you wish to take part in this study, sign this form in order to begin your participation. Your signature means you have been told about the study and what the risks to you are. Your signature on this form also means that you want to take part in this study.

If you are unclear about anything along the way, please ask until you feel you understand.

B. Number of Participants
The plan is to have 150 people take part in this study at the Iowa 4-H Center Camp.

C. Additional Information You Should Know

Wellmark Blue Cross and Blue Shield and Iowa State University are funding this study. Any costs of the study will be paid for by Wellmark Blue Cross and Blue Shield and Iowa State University. Individual subject data will not provided to Wellmark Blue Cross and Blue Shield, and all data collected for this study will be coded such that Wellmark Blue Cross and Blue Shield will not be able to associate any data to any subject.

2. What Will Happen to You While You Are in This Research Study?

If you agree for you to be in the study, you will be asked to participate in the following:

Screening (before camp)
You will complete the enrollment process at least two weeks before the study starts. Surveys to fill out and consent forms for you and your parents to sign will be included in the package of materials that must be returned before the beginning of camp. Demographic data will be collected from the health history and medical information forms (age, height, weight, physical restrictions, diet restrictions/allergies), which are required by the Iowa 4-H Center to attend camp. Before the beginning of camp you will be assigned to one of two groups. The first, or control group will be assigned to the standard camp experience. This camp will be conducted in the same manner as camps from the previous year. The second, or experimental group will attend camp that has been formatted to include a “Wellness Immersion” experience, where your will focus on concepts related to health and wellness through diet and physical activity.

Study protocol
Prior to the camp, at the end of the camp week, and six months after the camp you will be asked to complete surveys that will assess the home environment, your activity, and your knowledge of nutrition. If you are assigned to the control group, your camp experience will be similar to the experience of previous camps. If you are assigned to the experimental group, you will attend an immersion experience focusing on health and wellness. These will include modules on Nutrition Education, Gardening, Culinary Skills, Health Promoting Environments, and Physical Activity. During the camp, you will wear a small removable device on your ankle that will allow the investigators to determine the number of steps you have taken per minute throughout the week of camp.

3. How Long Will You Be in This Research Study?

You will be in this study for six months, including completing surveys before camp, the 1 week of camp and the follow-up surveys.

4. Why You Might Want To Take Part in This Research Study
This study will educate you about healthy eating habits and the knowledge necessary to have those habits in your life. You will also learn about foods and physical activity. You will participate in activities geared towards reinforcing the knowledge and healthy habits you may develop.

5. What Are the Risks of This Research Study?

You will not incur any risks greater than the minimal risks associated with attending summer camp. You will wear a small activity monitor on your ankle that may cause some minor discomfort.

6. What Other Choices Do You Have If You Don’t Take Part in This Research Study?

You will gain a camp experience whether or not you are enrolled in this study. You do not have to enroll in this study to attend this summer camp.

7. Are there Reasons You Might Leave This Research Study Early?

Taking part in this research study is your decision. You may decide to stop at any time. You should tell the researcher if you or your parents decide to stop your participation.

In addition, the researchers or Iowa State University may stop you from taking part in this study at any time:
- if it is in your best interest,
- if you do not follow the study rules,
- if the study is stopped.

8. Will You Need to Pay for Any of the Tests and Procedures?

You will not need to pay for any procedures which are done just for this research study. These procedures are:
- Completion of surveys
- Physical activity monitoring

However, your parents and/or your health plan will need to pay for all other tests and procedures that you would normally have as part of his/her regular clinical care.

9. Will You Be Paid for Participating in this Research Study?

If you complete this study, you will earn a scholarship that will be applied against camp costs. If you complete part of this study you will gain a partial scholarship as follows:
- $25 scholarship for returning preliminary surveys/materials
- $15 scholarship for completing surveys/materials at the end of the camp week
- $25 scholarship for completing six-month follow-up surveys/materials
10. What Are Your Rights if You Are in This Research Study?

Taking part in this research study will not change your rights and benefits. Taking part in this research study does not give you any special privileges. If you decide to not participate in this study, or stop in the middle of the study, no benefits are taken away from you. Specifically, you do not have to be in this research study to receive or continue to receive medical care or to participate in the 4-H camp.

You and your parents will be told of important new findings or any changes in the study or procedures that may affect you or your willingness to continue in the study.

11. What About Your Privacy?

Your privacy is important to us, and we want to protect it as much as possible. This information might be in different places but we will only disclose information that is related to this research protocol for the purposes listed below.

This information will be given out for the proper monitoring of the study, checking the accuracy of study data, analyzing the study data, and other purposes necessary for the proper conduct and reporting of this study. If some of the information is reported in published medical journals or scientific discussions, it will be done in a way that does not directly identify you.

If this information is given out to anyone outside of Iowa State University, the information may no longer be protected by federal privacy regulations and may be given out by the person or entity that receives the information. However, Iowa State University will take steps to help other parties understand the need to keep this information confidential.

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies, auditing departments of Iowa State University and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your child's records for quality assurance and data analysis. These records may contain private information.

Confidentiality of all records is strictly maintained by established procedures. The original study data are kept in the study facility and are entered into a computer by the primary investigator. Physical records are stored under lock and key and electronic records through security pass words. The primary investigator will review all data. Study records will not identify you by name, but using a number.

12. What Will Happen to Your Samples?

No samples or physical specimens will be taken during this study.
13. What is the Institutional Review Board (IRB) and How Does it Protect You?

The IRB reviews human research studies. It protects the rights and welfare of the people taking part in those studies. You may contact the IRB if you have questions about your rights as a participant or if you think you have been treated unfairly.

- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, Office of Responsible Research, (515) 294-3115, 1138 Pearson Hall, Ames, Iowa 50011.

14. Who Can Answer Your Questions?

Principal Investigator:
Dr. Ruth Litchfield
Phone: 515-294-9484

- Questions about the study tests and procedures
- Research-related injuries or emergencies
- Any research-related concerns or complaints

IRB Administrator
- Phone: 515-294-4566
- Rights of a research subject
- Use of protected health information
- Any research-related concerns or complaints

15. Summary and Enrollment Signatures

You have been asked to take part in a research study, at Iowa State University. The information about this study has been provided to you and your parents to inform you about the nature of this IRB approved study. Please sign and date below to show that you agree to take part in the research. Please do not sign unless you have read the entire packet of information. If you do not want to sign, you don’t have to, but you will not be able to participate in this study.

- Remember:

  - Joining the study is voluntary and you can still attend camp, even if you do not join the study.

  - Nobody will be mad if you choose not to join the study.

  - You can call the investigator and research staff at any time with any new questions or to tell them about side effects.
• You may stop being in the study at any time. Your parents may withdraw you from this study at any time.

(Date / Time) (Printed Name of Participant)

(Signature of Participant)

(Date / Time) (Printed Name of Parent/Guardian)

(Signature of Parent/Guardian)
Assent Form to Take Part in a Research Study

(Assent form for younger youth)

TITLE: “Immersion in Wellness at State 4-H Center”

PRINCIPAL INVESTIGATOR: Dr. Ruth Litchfield

ASSENT FORM

You are being asked to be in a research study. This research study lasts shortly before you start camp, while you are in camp, and then continues until 6 months after camp. You are being asked to take part in this research study because we want to understand how 4-H camp will teach you about healthy eating, food, and exercise.

Before you start the study, we will have you with help from your parents fill out paperwork that will tell us about you, where you live, how you eat, and how much you exercise.

While you are at camp, we will measure how much you move by putting a small step counter on your ankle. You can remove this monitor when you take a shower or go swimming. We will assign you to one of two groups. One of the groups will attend the regular 4-H camp. The other group will attend the same camp but will teach you a lot of information on growing food, how to eat healthy, how to cook, and will also give you lots of time to be physically active.

At the end of camp and six months after you went to camp we will ask you with help from your parents to fill out the same paperwork you filled out at the beginning of the study.

We will keep the information private that you give to us as part of being in the study. The study information is kept in the study office and is entered into a computer by the researcher. The electronic records on the computer are locked under security pass words. Any written records are stored under lock and key. Study records will not identify you by name, but using a number.

If you have any questions about this project you may call the researcher, Dr. Ruth Litchfield, at 515-294-9484. If you have questions about your rights as a research participant or think you have been treated unfairly, you can call the Institutional Review Board at Iowa State University at 515-294-4566. The Institutional Review Board is an office that helps protect people who join research projects.

If you do not want to be in this research project, you do not have to say yes or sign your name on this form. No one will be mad at you if you say no. You will still be able to go to camp if you do not want to be in this research project.

__________________________  _______________________
Assent by Child            Date

(Printed name of parent/guardian)
APPENDIX C – PHYSICAL ACTIVITY SURVEY

Activity Survey

MARKING INSTRUCTIONS

- Use a NO. 2 PENCIL only.
- Do not use ink or ballpoint pen.
- Darken in the circle completely.
- Erase cleanly any marks you wish to change.
- Do not make any stray marks on this form.

The RIGHT way to mark your answer.

The WRONG way to mark your answers!

People do lots of things that are called physical activities. People play, walk, take part in sports, and do many things that involve moving their body. We want to learn about your physical activities. We are going to ask you about the games you play, sports you take part in, and other exercise that you get. It is very important that you tell us about yourself honestly.

1. Do you have any health condition that limits your physical activity?
   - No
   - Yes
   If yes, please write the health condition here:

2. How many months of the year did you participate in team sports that practiced regularly (like swimming, gymnastics, field hockey, basketball)?
   a. During the 4th to 6th grade?
      - Never
      - 1-4 months of the year
      - 5-8 months of the year
      - 9-12 months of the year
   b. During the 7th to 12th grade?
      - Not in the 7th grade yet
      - Never
      - 1-4 months of the year
      - 5-8 months of the year
      - 9-12 months of the year

3. In school, how many times per week do you have gym or PE?
   - None
   - 1
   - 2
   - 3
   - 4
   - 5 or more
Please read the following example before answering the activity questions.

**EXAMPLE:**
If you were on a sports team during the winter that practiced 4 times a week and had one meet each week and during the summer you practiced with friends once a week, then your answer would look like this:

**Swimming**
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
<th>None/Zero</th>
<th>Less than 1 hr/wk</th>
<th>1/2 hr/wk</th>
<th>1-3 hr/wk</th>
<th>4-6 hr/wk</th>
<th>7-9 hr/wk</th>
<th>10+ hr/wk</th>
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4. **Not** including phys ed (gym), what have you done in the past **YEAR**?
Mark “None/Zero” for any season you did not do that activity.

**Baseball or Softball**
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
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</table>

**Basketball**
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
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</table>

**Biking**
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
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**Dancing or Aerobics**
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
<th>None/Zero</th>
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</table>

**Football**
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
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**Hard Work Outdoors** (like mowing the lawn, raking, gardening)
Did you do this activity over the past year?

- **NO** ☐  **YES** ☐ How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
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</tbody>
</table>
### Ice, Field, Street Hockey or Lacrosse
Did you do this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
<th>Name/Zero</th>
<th>Less than 1/2 hr/wk.</th>
<th>1-3 hr/wk.</th>
<th>4-6 hr/wk.</th>
<th>7-9 hr/wk.</th>
<th>10+ hr/wk.</th>
<th>10+ hr/wk.</th>
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</table>

### Running or Jogging
Did you do this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Swimming
Did you do this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

<table>
<thead>
<tr>
<th>Name/Zero</th>
<th>Less than 1/2 hr/wk.</th>
<th>1-3 hr/wk.</th>
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<td>Fall</td>
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### Rollerblading, Rollerskating, or Iceskating
Did you do this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Skateboarding
Did you do this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Soccer or Rugby
Did you this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Tennis or Other Racquet Sports
Did you this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Walking
Did you this activity over the past year?
- NO
- YES → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer
### Playing Outdoors (jump rope, kickball, dodgeball)

Did you do this activity over the past year?
- **YES** → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Gymnastics or Cheerleading

Did you do this activity over the past year?
- **YES** → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Strength Training Exercises (push-ups, lifting weights)

Did you do this activity over the past year?
- **YES** → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Volleyball

Did you do this activity over the past year?
- **YES** → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

### Martial Arts, Karate, or Wrestling

Did you do this activity over the past year?
- **YES** → How much did you do it EACH season?
  - Fall
  - Winter
  - Spring
  - Summer

**Did you do any other sports or activities that we haven't listed? (Please specify)**
  - Fall
  - Winter
  - Spring
  - Summer

---

#### 5. How many hours, Monday thru Friday, do you spend doing the following? (a **TOTAL** for the week)

<table>
<thead>
<tr>
<th>Activity</th>
<th>None</th>
<th>1-5 hr./wk.</th>
<th>6-10 hr./wk.</th>
<th>11-15 hr./wk.</th>
<th>16-20 hr./wk.</th>
<th>21-20 hr./wk.</th>
<th>21+ hr./wk.</th>
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<tbody>
<tr>
<td>Watching T.V.</td>
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<td>Watching DVDs or videos</td>
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<td>Reading/Homework</td>
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<tr>
<td>Nintendo/PlayStation/computer games</td>
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<td>Internet/Computers</td>
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</table>

#### 6. How many hours, Saturday and Sunday, do you spend doing the following? (a **TOTAL** for the weekend)

<table>
<thead>
<tr>
<th>Activity</th>
<th>None</th>
<th>1-5 hr.</th>
<th>6-10 hr.</th>
<th>11-15 hr.</th>
<th>16-20 hr.</th>
<th>21-20 hr.</th>
<th>21+ hr.</th>
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<tbody>
<tr>
<td>Watching T.V.</td>
<td></td>
<td></td>
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<tr>
<td>Watching DVDs or videos</td>
<td></td>
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<tr>
<td>Reading/Homework</td>
<td></td>
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<tr>
<td>Nintendo/PlayStation/computer games</td>
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<tr>
<td>Internet/Computers</td>
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</tbody>
</table>
APPENDIX D – HOME ENVIRONMENT SURVEY

What Physical Activity Items are Available in Your Home?

1. Please place a check beside the following items you have in or around your home.

   ___ Clothing appropriate for exercise  ___ Yard space
   (e.g. offers easy movement)  ___ Sidewalks
   ___ Walking/running/cross-training shoes  ___ Street lighting
   ___ Exercise equipment  ___ Pedestrian crossings
   (e.g. treadmill, weights, exercise ball,  ___ Bicycle lane
   exercise video)  ___ Nature trail
   ___ Recreational equipment  ___ Park
   (e.g. tennis racket, football, golf clubs,  ___ Recreation center
   kite, jump rope)  ___ Swimming pool
   ___ Bicycle  ___ Creek/river/lake
   ___ Boating equipment  ___ Public transportation
   (e.g. canoe, kayak)  (e.g. bus stop) within walking distance
   ___ A dog
   ___ Schedule of exercise classes held at
   the local recreation center
   ___ Calendar/notebook dedicated for an
   exercise log
   ___ Stairs

Please check the column that best describes you, your home, your choices.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Sometimes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Can you take advantage of the exercise benefits of staircases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in or close to your home? For example, can you walk upstairs</td>
<td></td>
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<tr>
<td>to get a drink of water even if there is a refrigerator in the</td>
<td></td>
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<tr>
<td>basement where you are working or watching television?</td>
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<tr>
<td>2. Do you have audio/video equipment available to help you</td>
<td></td>
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<tr>
<td>exercise? For example, do you watch exercise videos or listen</td>
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<tr>
<td>to a stereo while being active?</td>
<td></td>
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<tr>
<td>3. Do you minimize using energy saving devices so that you use</td>
<td></td>
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<tr>
<td>more energy doing the job by hand? For example, do you get</td>
<td></td>
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<tr>
<td>off the couch to change the channel on your television or turn off</td>
<td></td>
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<tr>
<td>the self-propel option on your lawn mower?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Yes</td>
<td>Sometimes</td>
<td>No</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----------</td>
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</tr>
<tr>
<td>4. Do you have yard space available for exercise? For example, do you garden, chop wood, or use the space for other forms of exercise?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Do you have farm 'chores' you perform on a regular basis? For example, feeding livestock, grinding feed, picking up rock.</td>
<td></td>
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<tr>
<td>6. Are there sidewalks around your home you can use to be active?</td>
<td></td>
<td></td>
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<tr>
<td>7. Are the sidewalks around your home in good condition? For example, is it easy to skate, bike, or walk on the sidewalks?</td>
<td></td>
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<tr>
<td>8. Is there adequate street lighting in your neighborhood?</td>
<td></td>
<td></td>
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<tr>
<td>9. Are there sufficient pedestrian crossings for busy streets in your neighborhood?</td>
<td></td>
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<tr>
<td>10. Do you feel safe walking in your neighborhood?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11. Are there adequate signs showing bicycle lanes and bicycle routes in your neighborhood?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Do you use nature trails close to your home for walking or bicycling?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13. Do you use a local recreation center and/or swimming pool?</td>
<td></td>
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<td></td>
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<tr>
<td>14. Do you use a local park, playground, and/or sports field for physical activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Do you use a creek, river, and/or lake close to your home for physical activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Do you travel to destinations in your neighborhood or in nearby neighborhoods by walking or bicycling?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Are you aware of the transit stops (e.g. bus) locations around your home?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Do you minimize using drive through services so that you use more energy getting out of your car? For example, do you wash your car by hand, walk inside to do banking and dry cleaning, and enter food restaurants rather than ordering from the car?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Do you have a friend, sibling, parent or pet that participates in physical activity with you?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# What Foods are in Your House?

1. Please check the items in the table below that you typically have in your **pantry or cupboard**. Ask an adult in your home to help you if you are not familiar with a food.

<table>
<thead>
<tr>
<th>Type of Food</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>Unsweetened whole grain cereal (i.e. Shredded Wheat, Cheerios), Whole wheat bread, Whole wheat noodles/pasta, Brown rice, Corn tortillas/Whole wheat tortillas, Sweetened whole grain cereal (Raisin Bran, Frosted Shredded Wheat), White bread, White noodles/pasta, White rice, Flour tortillas, Sweetened cereals (Fruit Loops, Cocoa Puffs), Breakfast pastries, Large muffins/bagels, Prepackaged rice dishes, Prepackaged pasta dishes, Doughnuts.</td>
</tr>
<tr>
<td>Fruits &amp; Vegetables</td>
<td>Unsweetened dried fruit, Canned fruit in juice, Low sodium vegetables, Canned/Baked beans, Vegetable juice, Sweetened dried fruit, Canned vegetables, Canned fruit in syrup, Vegetable snack chips.</td>
</tr>
<tr>
<td>Meat &amp; Protein</td>
<td>Canned tuna/salmon packed in water, Canned/Baked beans, Beef jerky, Pork rinds, Refried beans, Spam.</td>
</tr>
<tr>
<td>Dairy</td>
<td>Nonfat powdered milk, Skim evaporated milk, Soy milk, Rice milk, Powdered low fat/whole milk, Condensed/evaporated milk.</td>
</tr>
<tr>
<td>Fats</td>
<td>Olive oil, Canola oil, Peanut oil, Cooking spray, Soybean oil, Corn oil, Safflower oil, Lard, Shortening, Coconut oil (sometimes found in popcorn popping oil).</td>
</tr>
<tr>
<td>Beverages</td>
<td>Water, 100% fruit juice, Diet soda, Sports drinks, Unsweetened tea, Coffee, Regular Soda, Root Beer, Fruit punch, Sweetened tea.</td>
</tr>
<tr>
<td>Snacks</td>
<td>Whole grain crackers (i.e. Triscuits), Dried fruits, Unsalted nuts/seeds, Low fat microwave popcorn, Sea salt, Salted nuts/seeds, Crackers, Low fat granola bars, Pretzels, Flavored rice cakes, Trail mix, Potato chips, Candy bars, Granola bars, Fruit snacks, Butter/yellie popcorn, Cookies.</td>
</tr>
<tr>
<td>Condiments &amp; Preserves</td>
<td>Spices/pepper, Lime/lemon juice, Fish sauce, Mustard, Salte, Ketchup, Nut butters (e.g. peanut butter), Sugar free jam/jelly, Chocolate syrup, Pancake syrup, Regular jam/jelly.</td>
</tr>
</tbody>
</table>
2. Please check the items that you typically have in your refrigerator or freezer.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Items</th>
</tr>
</thead>
</table>
| **Fruits & Vegetables** | - Unsweetened frozen fruit  
- Frozen vegetables  
- Fresh fruits/vegetables  
- Vegetables with seasoning  
- Fruit cups with juice  
- Fruit in heavy syrup  
- Vegetables in high fat sauces |
| **Meat & Protein** | - Lean meat (poultry w/o skin, fish, canned fish tenderloin, round, roast, sirloin)  
- Eggs  
- Medium fat meat (poultry w/skin, ground beef, pork, fried fish)  
- High fat meat (sausage, bacon, ribs)  
- Hot dogs |
| **Dairy** | - Non/low fat milk  
- Low fat plain or Greek yogurt  
- Non/low fat sour cream  
- Cottage cheese  
- Whole milk  
- Low fat, sweetened yogurt  
- Skim milk  
- Full fat sour cream  
- Mozzarella cheese  
- Coffee creamers  
- Half & half/heavy cream  
- Full fat, flavored yogurt  
- Cheese (American, cheddar, Monterey jack, Swiss) |
| **Fats** | - Avocado  
- Light/zero trans fat free margarines  
- Low fat salad dressing  
- Vinaigrette salad dressings  
- Low fat sauces |
| **Snacks & Meats** | - Fruit ice (100% fruit or fruit juice)  
- Fresh salsa  
- Sugar free jello  
- Sorbet/fat reduced ice cream  
- Yogurt based ice creams  
- Popsicles  
- Low fat portion-controlled frozen meals  
- Sorbet/fat reduced ice cream  
- Yogurt based ice creams  
- Popsicles  
- Low fat portion-controlled frozen meals  
- Sorbet/fat reduced ice cream  
- Yogurt based ice creams  
- Popsicles  
- Low fat portion-controlled frozen meals |
| **Snacks & Meats** | - High fat, high calorie frozen meals  
- Ice cream  
- Whipping cream/Cool Whip  
- Full fat & sweetened frozen yogurt |
3. Check the statement that best describes the packaging and portion sizes of the foods you have in your home? Most snacks and higher calorie foods are in:

- Individual or single serving/small packages (i.e. single serving packages or bulk items repackaged into smaller portions)
- Regular or standard sized packages
- Bulk or family size packages for many items

Please check the column that best describes your family choices.

<table>
<thead>
<tr>
<th>Question</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are your nutritious foods, such as dried fruits and nuts, easier to access than less nutritious foods such as cookies, crackers, and cakes? For example, do you keep healthier foods stored in front of unhealthier foods in the refrigerator or pantry?</td>
<td></td>
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<tr>
<td>2. Do you keep fruits and vegetables prepared (washed and cut) so they are ready to eat? For example, are fruits and vegetables washed and on the countertop (if appropriate) rather than unwashed and in a refrigerator drawer?</td>
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<tr>
<td>3. Do you and your family have mealtimes away from a television where it is easier to pay attention to what and how much you are eating?</td>
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<tr>
<td>4. Do you control the portion size of your meals by serving individual plates from the kitchen rather than having large quantities of food readily accessible on the table?</td>
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<tr>
<td>5. Do you control your portion size of food when snacking? For example, do you put a small amount of potato chips in a bowl rather than eat straight from the package?</td>
<td></td>
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</tr>
<tr>
<td>6. What size plates does your family typically use for meals?</td>
<td>Salad Plate 7-9 in.</td>
<td>Average Plate 10-12 in.</td>
<td>Large Plate 13+ in.</td>
</tr>
<tr>
<td>7. What size glassware does your family use to drink sweetened beverages or juice?</td>
<td>4-6 oz.</td>
<td>7-8 oz.</td>
<td>9+ oz.</td>
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<tr>
<td>8. Do you use nonstick pans and cooking sprays rather than oils and other fats to cook your meals?</td>
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<tr>
<td>9. Do you use a kitchen scale, measuring cups or spoons so that you are better aware of portion sizes?</td>
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</tr>
<tr>
<td>Question</td>
<td>Always</td>
<td>Sometimes</td>
<td>Never</td>
</tr>
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</tr>
<tr>
<td><strong>10.</strong> Do you use your garden or a shared/community garden to grow fruits and vegetables during the growing season?</td>
<td></td>
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<tr>
<td><strong>11.</strong> Do you shop at a supermarket or farmers market, where plenty of fresh fruit and vegetables are available rather than a convenience store where these items may be limited?</td>
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<tr>
<td><strong>12.</strong> Do you make a list prior to going to the grocery store so that you are less likely to purchase unnecessary items?</td>
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<tr>
<td><strong>13.</strong> Do you utilize free membership benefits at your local supermarket so you can purchase healthier food at more affordable prices?</td>
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<tr>
<td><strong>14.</strong> Do you prepare more meals than you purchase? For example, do you cook at home more times a week than you buy prepackaged, takeout or restaurant meals?</td>
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</tbody>
</table>
MARKING INSTRUCTIONS
• Use a NO. 2 PENCIL only.
• Do not use ink or ballpoint pen.
• Darken in the circle completely.
• Erase cleanly any marks you wish to change.
• Do not make any stray marks on this form.

USE NO. 2 PENCIL ONLY

1. What is your AGE?
○ Less than 9  ○ 13
○ 9           ○ 14
○ 10          ○ 15
○ 11          ○ 16
○ 12          ○ 17
○ 18 or older ○ 18 or older

2. Are you:
○ Male
○ Female

3. Your Height
   FEET
   INCHES

4. Your Weight (lbs)
   ○ 0 - 1 years
   ○ 2 - 4 years
   ○ 5 - 9 years
   ○ 10+ years

Questionnaire refers to what you ate over the past 6 months.

5. Do you now take vitamins (like Flintstones, One-A-Day, etc.)?
○ No
○ Yes  If yes
a) How many vitamin pills do you take a week?
○ 2 or less
○ 3 - 5
○ 6 - 9
○ 10 or more
b) For how many years have you been taking them?

6. How many teaspoons of sugar do you add to your beverages or food each day?
○ None/less than 1 teaspoon per day
○ 1 - 2 teaspoons per day
○ 3 - 4 teaspoons per day
○ 5 or more teaspoons per day

7. Which cold breakfast cereal do you usually eat?
○ Never eat cold breakfast cereal

8. Where do you usually eat breakfast?
○ At home
○ At school
○ Don’t eat breakfast
○ Other

9. How many times each week (including weekdays and weekends) do you usually eat breakfast prepared away from home?
○ Never or almost never
○ 1 - 2 times per week
○ 3 - 4 times per week
○ 5 or more times per week
10. How many times each week (including weekdays and weekends) do you usually eat lunch prepared away from home?  
   - Never or almost never  
   - 1 - 2 times per week  
   - 3 - 4 times per week  
   - 5 or more times per week

11. How many times each week do you usually eat after-school snacks or foods prepared away from home?  
   - Never or almost never  
   - 1 - 2 times per week  
   - 3 - 4 times per week  
   - 5 or more times per week

12. How many times each week (weekdays and weekends) do you usually eat dinner prepared away from home?  
   - Never or almost never  
   - 1 - 2 times per week  
   - 3 - 4 times per week  
   - 5 or more times per week

13. How many times per week do you prepare dinner for yourself (and/or others in your house)?  
   - Never or almost never  
   - Less than once per week  
   - 1 - 2 times per week  
   - 3 - 4 times per week  
   - 5 or more times per week

14. How often do you have dinner that is ready made, like frozen dinners, Spaghetti-O's, microwave meals, etc.  
   - Never/less than once per month  
   - 1 - 2 times per week  
   - 3 - 4 times per week  
   - 5 or more times per week

15. How many times each week (including weekdays and weekends) do you eat late night snacks prepared away from home?  
   - Never/less than once per month  
   - 1 - 2 times per week  
   - 3 - 4 times per week  
   - 5 or more times per week

16. How often do you eat food that is fried at home, like fried chicken?  
   - Never/less than once per week  
   - 1 - 3 times per week  
   - 4 - 6 times per week  
   - Daily

17. How often do you eat fried food away from home (like french fries, chicken nuggets)?  
   - Never/less than once per week  
   - 1 - 3 times per week  
   - 4 - 6 times per week  
   - Daily

**Dietary Intake**

How often do you eat the following foods:

**Example:** If you drink one can of diet soda 2 - 3 times per week, then your answer should look like this:

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet soda (1 can or glass)</td>
<td>Never</td>
</tr>
<tr>
<td></td>
<td>1 - 3 cans per month</td>
</tr>
<tr>
<td></td>
<td>1 can per week</td>
</tr>
<tr>
<td></td>
<td>2 - 6 cans per week</td>
</tr>
<tr>
<td></td>
<td>1 can per day</td>
</tr>
<tr>
<td></td>
<td>2 or more cans per day</td>
</tr>
</tbody>
</table>
**BEVERAGES**

18. Diet soda (1 can or glass)
- Never/little less than 1 per month
- 1 - 3 cans per month
- 1 can per week
- 2 - 6 cans per week
- 1 can per day
- 2 or more cans per day

19. Soda - not diet (1 can or glass)
- Never/little less than 1 per month
- 1 - 3 cans per month
- 1 can per week
- 2 - 6 cans per week
- 1 can per day
- 2 or more cans per day

20. Hawaiian Punch, lemonade, Koolaid or other non-carbonated fruit drink (1 glass)
- Never/little less than 1 per month
- 1 - 3 glasses per month
- 1 glass per week
- 2 - 4 glasses per week
- 5 - 8 glasses per week
- 1 glass per day
- 2 or more glasses per day

21. Iced Tea - sweetened (1 glass, can or bottle)
- Never/little less than 1 per month
- 1 - 3 glasses per month
- 1 - 4 glasses per week
- 5 - 8 glasses per week
- 1 or more glasses per day

22. Tea (1 cup)
- Never/little less than 1 per month
- 1 - 3 cups per month
- 1 - 2 cups per week
- 3 - 6 cups per week
- 1 or more cups per day

23. Coffee - not decaf. (1 cup)
- Never/little less than 1 per month
- 1 - 3 cups per month
- 1 - 2 cups per week
- 3 - 6 cups per week
- 1 or more cups per day

24. Beer (1 glass, bottle or can)
- Never/little less than 1 per month
- 1 - 3 cans per month
- 1 can per week
- 2 - 6 cans per week
- 1 or more cans per week

25. Wine or wine coolers (1 glass)
- Never/little less than 1 per month
- 1 - 3 glasses per month
- 1 glass per week
- 2 - 4 glasses per week
- 1 or more glasses per day

26. Liquor, like vodka or rum (1 drink or shot)
- Never/little less than 1 per month
- 1 - 3 drinks per month
- 1 drink per week
- 2 - 4 drinks per week
- 1 or more drinks per week

**Example**: If you eat:
- 3 pats of margarine on toast
- 1 - 2 pats of margarine on sandwich
- 1 pat of margarine on vegetables
- 5 - 6 pats total all day

then answer this way:

**DAIRY PRODUCTS**

27. What **TYPE** of milk do you usually drink?
- Whole milk
- 2% milk
- 1% milk
- Skim/nonfat milk
- Don’t know
- Don’t drink milk

28. Milk (glass or with cereal)
- Never/little less than 1 per month
- 1 glass per week or less
- 2 - 6 glasses per week
- 1 glass per day
- 2 - 3 glasses per day
- 4+ glasses per day

29. Chocolate milk (glass)
- Never/little less than 1 per month
- 1 - 3 glasses per month
- 1 glass per week
- 2 - 6 glasses per week
- 1 - 2 glasses per day
- 3 or more glasses per day

**SERIAL #**
<table>
<thead>
<tr>
<th>30. Instant Breakfast Drink (1 packet)</th>
<th>31. Whipped cream</th>
<th>32. Yogurt (1 cup) - Not frozen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>1 - 3 times per month</td>
<td>1 - 3 cups per month</td>
</tr>
<tr>
<td>Once per week</td>
<td>Once per week</td>
<td>1 cup per week</td>
</tr>
<tr>
<td>2 - 4 times per week</td>
<td>2 - 4 times per week</td>
<td>2 - 6 cups per week</td>
</tr>
<tr>
<td>5 or more times per week</td>
<td>5 or more times per week</td>
<td>1 cup per day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 or more cups per day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>33. Cottage or ricotta cheese</th>
<th>34. Cheese (1 slice)</th>
<th>35. Cream cheese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>1 - 3 slices per month</td>
<td>1 - 3 times per month</td>
</tr>
<tr>
<td>Once per week</td>
<td>1 slice per week</td>
<td>Once per week</td>
</tr>
<tr>
<td>2 or more times per week</td>
<td>2 - 6 slices per week</td>
<td>2 or more times per week</td>
</tr>
<tr>
<td></td>
<td>1 slice per day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 or more slices per day</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>36. What TYPE of yogurt, cottage cheese &amp; dairy products (besides milk) do you use mostly?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonfat</td>
</tr>
<tr>
<td>Lowfat</td>
</tr>
<tr>
<td>Regular</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>37. Butter (1 pat) - NOT margarine</th>
<th>38. Margarine (1 pat) - NOT butter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 pats per month</td>
<td>1 - 3 pats per month</td>
</tr>
<tr>
<td>1 pat per week</td>
<td>1 pat per week</td>
</tr>
<tr>
<td>2 - 6 pats per week</td>
<td>2 - 6 pats per week</td>
</tr>
<tr>
<td>1 pat per day</td>
<td>1 pat per day</td>
</tr>
<tr>
<td>2 - 4 pats per day</td>
<td>2 - 4 pats per day</td>
</tr>
<tr>
<td>6 or more pats per day</td>
<td>6 or more pats per day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>39. What FORM and BRAND of margarine does your family usually use?</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Stick</td>
</tr>
<tr>
<td>Tub</td>
</tr>
<tr>
<td>Squeeze (liquid)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>40. What TYPE of oil does your family use at home?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola oil</td>
</tr>
<tr>
<td>Corn oil</td>
</tr>
<tr>
<td>Safflower oil</td>
</tr>
<tr>
<td>Olive oil</td>
</tr>
<tr>
<td>Vegetable oil</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
</tbody>
</table>

**MAIN DISHES**

<table>
<thead>
<tr>
<th>41. Cheeseburger (1)</th>
<th>42. Hamburger (1)</th>
<th>43. Pizza (2 slices)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 per month</td>
<td>1 - 3 per month</td>
<td>1 - 3 times per month</td>
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<tr>
<td>One per week</td>
<td>One per week</td>
<td>One per week</td>
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<tr>
<td>2 - 4 per week</td>
<td>2 - 4 per week</td>
<td>2 - 4 times per week</td>
</tr>
<tr>
<td>5 or more per week</td>
<td>5 or more per week</td>
<td>5 or more times per week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>44. Tacos/burritos (1)</th>
<th>45. Which taco filling do you usually have:</th>
<th>46. Chicken nuggets (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Beef &amp; beans</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 per month</td>
<td>Beef</td>
<td>1 - 3 times per month</td>
</tr>
<tr>
<td>One per week</td>
<td>Chicken</td>
<td>One per week</td>
</tr>
<tr>
<td>2 - 4 per week</td>
<td>Beans</td>
<td>2 - 4 times per week</td>
</tr>
<tr>
<td>5 or more per week</td>
<td></td>
<td>5 or more times per week</td>
</tr>
<tr>
<td>Item</td>
<td>Frequency Options</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Hot dogs (1)</td>
<td>- Never less than 1 per month</td>
<td></td>
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<tr>
<td></td>
<td>- 1 - 3 per month</td>
<td></td>
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<tr>
<td></td>
<td>- One per week</td>
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<td></td>
<td>- 2 - 4 per week</td>
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<tr>
<td></td>
<td>- 5 or more per week</td>
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<tr>
<td>Roast beef or ham sandwich (1)</td>
<td>- Never less than 1 per month</td>
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<td></td>
<td>- 1 - 3 per month</td>
<td></td>
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<td></td>
<td>- One per week</td>
<td></td>
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<tr>
<td></td>
<td>- 2 or more per week</td>
<td></td>
</tr>
<tr>
<td>Salami, bologna, or other deli meat sandwich (1)</td>
<td>- Never less than 1 per month</td>
<td></td>
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<tr>
<td></td>
<td>- 1 - 3 per month</td>
<td></td>
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<tr>
<td></td>
<td>- One per week</td>
<td></td>
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<tr>
<td></td>
<td>- 2 or more per week</td>
<td></td>
</tr>
<tr>
<td>Chicken or turkey as main dish (1 serving)</td>
<td>- Never less than 1 per month</td>
<td></td>
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<tr>
<td></td>
<td>- 1 - 3 times per month</td>
<td></td>
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<td></td>
<td>- Once per week</td>
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<td></td>
<td>- 2 - 4 times per week</td>
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<tr>
<td></td>
<td>- 5 or more times per week</td>
<td></td>
</tr>
<tr>
<td>Fish sticks, fish cakes or fish sandwich (1 serving)</td>
<td>- Never less than 1 per month</td>
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<td></td>
<td>- 1 - 3 times per month</td>
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<tr>
<td></td>
<td>- Once per week</td>
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<td>- 2 - 4 times per week</td>
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<td></td>
<td>- 5 or more times per week</td>
<td></td>
</tr>
<tr>
<td>Beef (steak, roast) or lamb as main dish (1 serving)</td>
<td>- Never less than 1 per month</td>
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<td></td>
<td>- 1 - 3 times per month</td>
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<tr>
<td></td>
<td>- Once per week</td>
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<td>- 2 - 4 times per week</td>
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<tr>
<td></td>
<td>- 5 or more times per week</td>
<td></td>
</tr>
<tr>
<td>Lasagna/baked ziti (1 serving)</td>
<td>- Never less than 1 per month</td>
<td></td>
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<tr>
<td></td>
<td>- 1 - 3 times per month</td>
<td></td>
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<td></td>
<td>- Once per week</td>
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<tr>
<td></td>
<td>- 2 or more times per week</td>
<td></td>
</tr>
<tr>
<td>Macaroni and cheese (1 serving)</td>
<td>- Never less than 1 per month</td>
<td></td>
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<tr>
<td></td>
<td>- 1 - 3 times per month</td>
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<td></td>
<td>- Once per week</td>
<td></td>
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<tr>
<td></td>
<td>- 2 or more times per week</td>
<td></td>
</tr>
<tr>
<td>Spaghetti with tomato sauce (1 serving)</td>
<td>- Never less than 1 per month</td>
<td></td>
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<tr>
<td></td>
<td>- 1 - 3 times per month</td>
<td></td>
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<tr>
<td></td>
<td>- Once per week</td>
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<td></td>
<td>- 2 - 4 times per week</td>
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<tr>
<td></td>
<td>- 5 or more times per week</td>
<td></td>
</tr>
</tbody>
</table>

Notes: The frequency options vary for each food item, with options ranging from "Never less than 1 per month" to "5 or more times per week." The table includes a variety of foods such as hot dogs, roast beef or ham, chicken or turkey, fish sticks, beef (steak, roast) or lamb, lasagna/baked ziti, macaroni and cheese, and spaghetti with tomato sauce.
### MISCELLANEOUS FOODS

#### 65. French toast (2 slices)
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 or more times per week

#### 66. Grilled cheese (1)
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 or more times per week

#### 67. Egg rolls (1)
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 or more times per week

#### 68. Brown gravy
- Never/less than 1 per month
- Once per week or less
- 2 - 6 times per week
- Once per day
- 2 or more times per day

#### 69. Ketchup
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 - 4 times per week
- 5 or more times per week

#### 70. Clear soup (with rice, noodles, vegetables) 1 bowl
- Never/less than 1 per month
- 1 - 3 bowls per month
- 1 bowl per week
- 2 - 6 bowls per week
- 1 or more bowls per day

#### 71. Cream (milk) soups or chowder (1 bowl)
- Never/less than 1 per month
- 1 - 3 bowls per month
- 1 bowl per week
- 2 - 6 bowls per week
- 1 or more bowls per day

#### 72. Mayonnaise
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 - 6 times per week
- Once per day

#### 73. Low calorie/fat salad dressing
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 - 6 times per week
- Once or more per day

#### 74. Salad dressing (not low calorie)
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 - 6 times per week
- Once or more per day

#### 75. Salsa
- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 - 6 times per week
- Once or more per day

#### 76. How much fat on your beef, pork, or lamb do you eat?
- Eat all
- Eat some
- Eat none
- Don’t eat meat

#### 77. When you have chicken or turkey, do you eat the skin?
- Yes
- No
- Sometimes
<table>
<thead>
<tr>
<th>78. Cold breakfast cereal (1 bowl)</th>
<th>79. Hot breakfast cereal, like oatmeal, grits (1 bowl)</th>
<th>80. White bread, pita bread, or toast (1 slice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 bowls per month</td>
<td>1 - 3 bowls per month</td>
<td>1 slice per week or less</td>
</tr>
<tr>
<td>1 bowl per week</td>
<td>1 bowl per week</td>
<td>2 - 4 slices per week</td>
</tr>
<tr>
<td>2 - 4 bowls per week</td>
<td>2 - 4 bowls per week</td>
<td>5 - 7 slices per week</td>
</tr>
<tr>
<td>5 - 7 bowls per week</td>
<td>5 - 7 bowls per week</td>
<td>2 - 3 slices per week</td>
</tr>
<tr>
<td>2 or more bowls per day</td>
<td>2 or more bowls per day</td>
<td>4+ slices per day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>81. Dark bread (1 slice)</th>
<th>82. English muffins or bagels (1)</th>
<th>83. Muffin (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 slice per week or less</td>
<td>1 - 3 per month</td>
<td>1 - 3 muffins per month</td>
</tr>
<tr>
<td>2 - 4 slices per week</td>
<td>1 per week</td>
<td>1 muffin per week</td>
</tr>
<tr>
<td>5 - 7 slices per week</td>
<td>2 - 4 per week</td>
<td>2 - 4 muffins per week</td>
</tr>
<tr>
<td>2 - 3 slices per day</td>
<td>5 or more per week</td>
<td>5 or more muffins per week</td>
</tr>
<tr>
<td>4+ slices per day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>84. Cornbread (1 square)</th>
<th>85. Biscuit/roll (1)</th>
<th>86. Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>1 - 3 per month</td>
<td>1 - 3 times per month</td>
</tr>
<tr>
<td>Once per week</td>
<td>1 per week</td>
<td>Once per week</td>
</tr>
<tr>
<td>2 - 4 times per week</td>
<td>2 - 4 per week</td>
<td>2 - 4 times per week</td>
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<tr>
<td>5 or more per week</td>
<td>5 or more per week</td>
<td>5 or more per week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>87. Noodles, pasta</th>
<th>88. Tortilla - no filling (1)</th>
<th>89. Other grains, like kasha, couscous, bulgur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>1 - 3 per month</td>
<td>1 - 3 times per month</td>
</tr>
<tr>
<td>Once per week</td>
<td>1 per week</td>
<td>Once per week</td>
</tr>
<tr>
<td>2 - 4 times per week</td>
<td>2 - 4 per week</td>
<td>2 or more times per week</td>
</tr>
<tr>
<td>5 or more times per week</td>
<td>5 or more per week</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>90. Pancakes (2) or waffles (1)</th>
<th>91. French fries (large order)</th>
<th>92. Potatoes - baked, boiled, mashed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>1 - 3 orders per month</td>
<td>1 - 3 times per month</td>
</tr>
<tr>
<td>Once per week</td>
<td>1 order per week</td>
<td>Once per week</td>
</tr>
<tr>
<td>2 or more times per week</td>
<td>2 - 4 orders per week</td>
<td>2 - 4 times per week</td>
</tr>
<tr>
<td></td>
<td>5 or more orders per week</td>
<td>5 or more times per week</td>
</tr>
</tbody>
</table>
### Fruits & Vegetables

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency Options</th>
</tr>
</thead>
</table>
| 93. Raisins (small pack) | - Never/less than 1 per month  
- 1 - 3 times per month  
- 1 per week  
- 2 - 4 times per week  
- 5 or more times per week |
| 94. Grapes (bunch) | - Never/less than 1 per month  
- 1 - 3 times per month  
- Once per week  
- 2 - 4 times per week  
- 5 or more times per week |
| 95. Bananas (1) | - Never/less than 1 per month  
- 1 - 3 per month  
- 1 per week  
- 2 - 4 per week  
- 5 or more per week |
| 96. Cantaloupe, melons (1/4 melon) | - Never/less than 1 per month  
- 1 - 3 times per month  
- 1 per week  
- 2 or more times per week |
| 97. Apples (1) or applesauce | - Never/less than 1 per month  
- 1 - 3 per month  
- 1 per week  
- 2 - 6 per week  
- 1 or more per day |
| 98. Pears (1) | - Never/less than 1 per month  
- 1 - 3 per month  
- 1 per week  
- 2 - 6 per week  
- 1 or more per day |
| 99. Oranges (1), grapefruit (1/2) | - Never/less than 1 per month  
- 1 - 3 per month  
- 1 per week  
- 2 - 6 per week  
- 1 or more per day |
| 100. Strawberries | - Never/less than 1 per month  
- 1 - 3 times per month  
- Once per week  
- 2 or more times per week |
| 101. Peaches, plums, apricots (1) | - Never/less than 1 per month  
- 1 - 3 per month  
- 1 per week  
- 2 or more per week |
| 102. Orange juice (1 glass) | - Never/less than 1 per month  
- 1 - 3 glasses per month  
- 1 glass per week  
- 2 - 6 glasses per week  
- 1 glass per day  
- 2 or more glasses per day |
| 103. Apple juice and other fruit juices (1 glass) | - Never/less than 1 per month  
- 1 - 3 glasses per month  
- 1 glass per week  
- 2 - 6 glasses per week  
- 1 glass per day  
- 2 or more glasses per day |
| 104. Tomatoes (1) | - Never/less than 1 per month  
- 1 - 3 per month  
- 1 per week  
- 2 - 6 per week  
- 1 or more per day |
| 105. Tomato/spaghetti sauce | - Never/less than 1 per month  
- 1 - 3 times per month  
- Once per week  
- 2 - 4 times per week  
- 5 or more times per week |
| 106. Tofu | - Never/less than 1 per month  
- 1 - 3 times per month  
- Once per week  
- 2 - 4 times per week  
- 5 or more times per week |
| 107. String beans | - Never/less than 1 per month  
- 1 - 3 times per month  
- Once per week  
- 2 - 4 times per week  
- 5 or more times per week |
<table>
<thead>
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<tbody>
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<td>○ Never/less than 1/month</td>
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<table>
<thead>
<tr>
<th></th>
<th>111. Corn</th>
<th>112. Peas or lima beans</th>
<th>113. Mixed vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Never/less than 1/month</td>
<td>○ Never/less than 1/month</td>
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<td>○ 1-3 times/month</td>
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<table>
<thead>
<tr>
<th></th>
<th>117. Yams/sweet potatoes (1)</th>
<th>118. Zucchini, summer squash, eggplant</th>
<th>119. Carrots, cooked</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Never/less than 1/month</td>
<td>○ Never/less than 1/month</td>
<td>○ Never/less than 1/month</td>
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<td>○ 1-3 times/month</td>
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<td>○ 5 or more times/week</td>
<td>○ 5 or more times/week</td>
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<table>
<thead>
<tr>
<th></th>
<th>120. Carrots, raw</th>
<th>121. Celery</th>
<th>122. Lettuce/tossed salad</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Never/less than 1/month</td>
<td>○ Never/less than 1/month</td>
<td>○ Never/less than 1/month</td>
</tr>
<tr>
<td></td>
<td>○ 1-3 times/month</td>
<td>○ 1-3 times/month</td>
<td>○ 1-3 times/month</td>
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<tr>
<td></td>
<td>○ Once/week</td>
<td>○ Once/week</td>
<td>○ Once/week</td>
</tr>
<tr>
<td></td>
<td>○ 2-4 times/week</td>
<td>○ 2-4 times/week</td>
<td>○ 2-4 times/week</td>
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<tr>
<td></td>
<td>○ 5 or more times/week</td>
<td>○ 5 or more times/week</td>
<td>○ 5 or more times/week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>123. Coleslaw</th>
<th>124. Potato salad</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Never/less than 1/month</td>
<td>○ Never/less than 1/month</td>
</tr>
<tr>
<td></td>
<td>○ 1-3 times/month</td>
<td>○ 1-3 times/month</td>
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<tr>
<td></td>
<td>○ Once/week</td>
<td>○ Once/week</td>
</tr>
<tr>
<td></td>
<td>○ 2 or more times/week</td>
<td>○ 2 or more times/week</td>
</tr>
</tbody>
</table>
Think about your usual snacks. How often do you eat each type of snack food.

**Example:** If you eat poptarts rarely (about 6 per year) then your answer should look like this:

- E3. Poptarts (1)
  - Never/less than 1 per month
  - 1 - 3 per month
  - 1 - 6 per week
  - 1 or more per day

---

### Snack Foods/Desserts

125. Fill in the number of snacks (food or drinks) eaten on school days and weekends/vacation days.

<table>
<thead>
<tr>
<th>Snacks</th>
<th>School Days</th>
<th>Vacation/Weekend Days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 126. Potato chips (1 small bag)

- Never/less than 1 per month
- 1 - 3 small bags per month
- One small bag per week
- 2 - 6 small bags per week
- 1 or more small bags per day

#### 127. Corn chips/Doritos (small bag)

- Never/less than 1 per month
- 1 - 3 small bags per month
- One small bag per week
- 2 - 6 small bags per week
- 1 or more small bags per day

#### 128. Nachos with cheese (1 serving)

- Never/less than 1 per month
- 1 - 3 times per month
- Once per week
- 2 or more times per week

#### 129. Popcorn (1 small bag)

- Never/less than 1 per month
- 1 - 3 small bags per month
- 1 - 4 small bags per week
- 5 or more small bags per week

#### 130. Pretzels (1 small bag)

- Never/less than 1 per month
- 1 - 3 small bags per month
- 1 small bags per week
- 2 or more small bags per week

#### 131. Peanuts, nuts (1 small bag)

- Never/less than 1 per month
- 1 - 3 small bags per month
- 1 - 4 small bags per week
- 5 or more small bags per week

#### 132. Fun fruit or fruit rollups (1 pack)

- Never/less than 1 per month
- 1 - 3 packs per month
- 1 - 4 packs per week
- 5 or more packs per week

#### 133. Graham crackers

- Never/less than 1 per month
- 1 - 3 times per month
- 1 - 4 times per week
- 5 or more times per week

#### 134. Crackers, like saltines or wheat thins

- Never/less than 1 per month
- 1 - 3 times per month
- 1 - 4 times per week
- 5 or more times per week
<table>
<thead>
<tr>
<th>135. Poptarts (1)</th>
<th>136. Cake (1 slice)</th>
<th>137. Snack cakes, Twinkies (1 package)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
</tr>
<tr>
<td>○ 1 - 3 poptarts per month</td>
<td>○ 1 - 3 slices per month</td>
<td>○ 1 - 3 per month</td>
</tr>
<tr>
<td>○ 1 - 6 poptarts per week</td>
<td>○ 1 slice per week</td>
<td>○ Once per week</td>
</tr>
<tr>
<td>○ 1 or more poptarts per day</td>
<td>○ 2 or more slices per week</td>
<td>○ 2 - 6 per week</td>
</tr>
<tr>
<td>○ 2 - 4 per week</td>
<td></td>
<td>○ 1 or more per day</td>
</tr>
<tr>
<td>○ 5 or more per week</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>138. Danish, sweetrolls, pastry (1)</th>
<th>139. Donuts (1)</th>
<th>140. Cookies (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
</tr>
<tr>
<td>○ 1 - 3 per month</td>
<td>○ 1 - 3 donuts per month</td>
<td>○ 1 - 3 cookies per month</td>
</tr>
<tr>
<td>○ 1 per week</td>
<td>○ 1 donut per week</td>
<td>○ 1 cookie per week</td>
</tr>
<tr>
<td>○ 2 - 4 per week</td>
<td>○ 2 - 6 donuts per week</td>
<td>○ 2 - 6 cookies per week</td>
</tr>
<tr>
<td>○ 5 or more per week</td>
<td>○ 1 or more donuts per day</td>
<td>○ 1 - 3 cookies per day</td>
</tr>
<tr>
<td></td>
<td>○ 4 or more cookies per day</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>141. Brownies (1)</th>
<th>142. Pie (1 slice)</th>
<th>143. Chocolate (1 bar or packet) like Hershey's or M &amp; M's</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
</tr>
<tr>
<td>○ 1 - 3 per month</td>
<td>○ 1 - 3 slices per month</td>
<td>○ 1 - 3 per month</td>
</tr>
<tr>
<td>○ 1 per week</td>
<td>○ 1 slice per week</td>
<td>○ 1 per week</td>
</tr>
<tr>
<td>○ 2 - 4 per week</td>
<td>○ 2 or more slices per week</td>
<td>○ 2 - 6 per week</td>
</tr>
<tr>
<td>○ 5 or more per week</td>
<td></td>
<td>○ 1 or more per day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>144. Other candy bars (Milky Way, Snickers)</th>
<th>145. Other candy without chocolate (Skittles) (1 pack)</th>
<th>146. Jello</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
</tr>
<tr>
<td>○ 1 - 3 candy bars per month</td>
<td>○ 1 - 3 times per month</td>
<td>○ 1 - 3 times per month</td>
</tr>
<tr>
<td>○ 1 candy bar per week</td>
<td>○ Once per week</td>
<td>○ Once per week</td>
</tr>
<tr>
<td>○ 2 - 4 candy bars per week</td>
<td>○ 2 - 4 times per week</td>
<td>○ 2 - 4 times per week</td>
</tr>
<tr>
<td>○ 5 or more candy bars per week</td>
<td>○ 5 or more times per week</td>
<td>○ 5 or more times per week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>147. Pudding</th>
<th>148. Frozen yogurt</th>
<th>149. Ice cream</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
</tr>
<tr>
<td>○ 1 - 3 times per month</td>
<td>○ 1 - 3 times per month</td>
<td>○ 1 - 3 times per month</td>
</tr>
<tr>
<td>○ Once per week</td>
<td>○ Once per week</td>
<td>○ Once per week</td>
</tr>
<tr>
<td>○ 2 - 4 times per week</td>
<td>○ 2 - 4 times per week</td>
<td>○ 2 - 4 times per week</td>
</tr>
<tr>
<td>○ 5 or more times per week</td>
<td>○ 5 or more times per week</td>
<td>○ 5 or more times per week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>150. Milkshake or frappe (1)</th>
<th>151. Popsicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Never/less than 1 per month</td>
<td>○ Never/less than 1 per month</td>
</tr>
<tr>
<td>○ 1 - 3 per month</td>
<td>○ 1 - 3 popsicles per month</td>
</tr>
<tr>
<td>○ 1 per week</td>
<td>○ 1 popsicle per week</td>
</tr>
<tr>
<td>○ 2 or more per week</td>
<td>○ 2 - 4 popsicles per week</td>
</tr>
<tr>
<td></td>
<td>○ 5 or more popsicles per week</td>
</tr>
</tbody>
</table>
152. Please list any other foods that you usually eat at least once per week that are not listed (for example, coconut, hummus, falafel, chilli, plantains, mangoes, etc.).

FOODS

a) __________________________
b) __________________________
c) __________________________
d) __________________________

HOW OFTEN?

a) __________________________
b) __________________________
c) __________________________
d) __________________________

THANK YOU FOR COMPLETING THIS SURVEY!
APPENDIX E – CAMPER SURVEY

Food can be put into 6 food groups. Think about what foods go into each group.

For questions 1-6, circle the food that does not belong in the food group listed.

1. **Grain group**
   - Waffle
   - Noodles
   - Apples
   - Oatmeal

2. **Vegetable group**
   - Broccoli
   - Carrot
   - Cabbage
   - Pear

3. **Fruit group**
   - Strawberries
   - Pineapple
   - Watermelon
   - Corn

4. **Meat group**
   - Turkey
   - Chicken
   - Potato
   - Ham

5. **Milk group**
   - Cheese
   - Cracker
   - Pudding
   - Yogurt

6. **Fat, oil, and sweets group**
   - Hamburger
   - Butter
   - Cupcake
   - Candy

Think about nutrients in foods.

For questions 7-11, put the letter next to each nutrient in the blank beside the correct food.

7. ______ Milk
   - a. Vitamin C

8. ______ Bread
   - b. Calcium

9. ______ Fruits and Vegetables
   - c. Protein

10. ______ Meat
    - d. Sugar

11. ______ Soft drink
    - e. Carbohydrates
Think about how nutrients work in your body.

For questions 12—15, put the letter next to each nutrient in the blank beside the correct job.

12. _____ Helps eyes see in the dark  a. Vitamin C
13. _____ Improves immunity (fewer cold symptoms)  b. Calcium
14. _____ Makes bones strong  c. Unsaturated Fat
15. _____ Makes blood healthier  d. Vitamin A
16. _____ Gives you energy  e. Carbohydrates

Food Preferences Questionnaire

We would like to know how much you like the following foods. Please put an “x” on the line below your response for each food. The responses are: I do not like this; I like this a little; I like this a lot.

<table>
<thead>
<tr>
<th>Foods</th>
<th>I do not like this</th>
<th>I like this a little</th>
<th>I like this a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 100% Orange juice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 100% Apple juice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 100% Grape juice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Other 100% juice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Bananas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Apples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Cantaloupe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Grapes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Oranges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Pears</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Plums</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Kiwi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Strawberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Raspberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foods</td>
<td>I do not like this</td>
<td>I like this a little</td>
<td>I like this a lot</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------------------</td>
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</tr>
<tr>
<td>15. Blueberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Pineapple</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Grapefruit</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>16. Fruit cocktail</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>17. Canned mandarin oranges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Canned peaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Canned pears</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Applesauce</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Watermelon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Raisins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Other dried fruit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Peaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Carrots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Celery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Spinach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. French fried potatoes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Potato salad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. Other white potatoes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Corn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Green peas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. Tomatoes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. Broccoli</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Lettuce</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. Green beans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. Cole slaw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. Beans (pinto, black eye peas,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pork 'n beans)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. Sweet potatoes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40. Cabbage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. Okra</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Think about your physical activity.**

**INSTRUCTIONS:** Read this information on physical activity, then answer questions 1-5 by filling in the circle that goes with your answer.

**Physical Activity** is any activity that increases your heart rate and makes you get out of breath some of the time.

**Physical Activity** can be done in sports, playing with friends, or walking to school. Some examples of physical activity are running, brisk walking, rollerblading, biking, skateboarding, dancing, swimming, soccer, basketball, football, and volleyball.

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all Sure</th>
<th>Somewhat Sure</th>
<th>Very Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How sure are you that you can do physical activity 30 minutes each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. How sure are you that you can be physically active no matter how busy your day is?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. How sure are you that you can be physically active no matter how tired you may feel?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. How sure are you that you can be physically active even if it is hot or cold outside?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. How sure are you that you can be physically active even if you have a lot of homework?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. How sure are you that you can get your parents to...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• help you plan to do your favorite physical activities?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• give you a ride to participate in a physical activity?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• find a place where you can be physically active?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• help you find different types of physical activities you can do?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• play outside with you, or do physical activity/sports with you?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Think about eating fruits and vegetables.

INSTRUCTIONS: Read this information on servings, then answer questions by filling in the circle that goes with your answer.

A serving of fruit is equal to:
- 1 medium-size piece of fresh fruit
- ½ cup of fruit salad
- ¼ cup of raisins, apricots or other dried fruit
- 6 oz. of 100% orange, apple, or grape juice
*(Do not count: fruit punch, lemonade, Gatorade, Sunny Delight or fruit drink)*

A serving of vegetables is equal to:
- 1 medium carrot or other fresh vegetable
- 1 small bowl of green salad
- ½ cup of fresh or cooked vegetables
- ¼ cup of vegetable soup
*(Do not count: French fries, onion rings, potato chips, or fried okra)*

<table>
<thead>
<tr>
<th>How sure are you that you can eat...</th>
<th>Not at all Sure</th>
<th>Somewhat Sure</th>
<th>Very Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. One serving (½ cup) of fruit each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Two servings (1 cup) of fruit each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Three servings (1 ¼ cups) of fruit each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. One serving (½ cup) of vegetables each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Two servings (1 cup) of vegetables each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Three servings (1 ¼ cups) of vegetables each day?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. How sure are you that you can get your parents to...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• buy fruit for snacks?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• fix your favorite vegetable dishes for dinner?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• keep 100% juice in the refrigerator?</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>• fix a fruit and vegetable snack?</td>
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How Many Fruits and Vegetables Should I Eat Everyday?

Cups of vegetables are recommended daily for 9-13 year olds.
Cups of fruits are recommended daily for 9-13 year olds.
Cups of vegetables are recommended daily for 14-18 year olds.
Cups of fruits are recommended daily for 14-18 year olds.

What Counts as a Cup?

1 Cup equals

1 small apple
1 large banana
1 large orange
1 medium pear
2 large plums
8 large strawberries
1 cup any chopped veggie
(broccoli, peas, green beans, etc.)
1 large bell pepper
2 stalks celery
1 medium potato
12 baby carrots
1 ear of corn
2 cups raw leafy greens
(spinach, romaine, etc.)

5 Fun and Easy Snacks

1. SMOOTHIE
Blend fruits, veggies, juice, and ice (yogurt optional). Freeze any extra in popsicle molds. Yum!

2. WRAP
Spread peanut butter or low fat cream cheese on a whole-wheat tortilla. Add chopped fruits or veggies and roll up. Enjoy!

3. PIZZA
Top a pita or whole wheat English muffin with tomato sauce, veggies, and cheese. Or top with low fat cream cheese, sliced fruit, and a drizzle of honey. Delicious!

4. TRAIL MIX
Mix unsalted nuts, chocolate chips, dried fruit (try cranberries, raisins, or apricots) and whole grain cereal. Dig in!

5. JABIRU
Layer yogurt or pudding and fruit. Top with granola or nuts. Tasty!

5 Things
YOU Can Do to Help Your Family Eat More Fruits and Vegetables

1. Help find new recipes that use fruits and vegetables to try at mealtime.
2. Help make a grocery list. Include your favorite fruits and vegetables and at least one new one each time you shop.
3. Have a contest with your family to see who can meet the daily fruit and vegetable recommendations. Winners get to choose their favorite fruit or vegetable! (Check out the camp blog to learn about adult recommendations for fruits and vegetables)
4. Offer to make your family a fun snack using fruits and vegetables.
5. Talk to your family about what you learned at camp. Teach them how fruits and vegetables can help them stay healthy.
Get Up and GO!

Walk Your Way to Fitness

What is a pedometer?
A pedometer is a small tool that counts your steps throughout the day. Adults need 10,000 steps and youth need 12,000 steps daily.

How do I wear it?
To open, hold the top of the clip with one hand and use your thumb to push the clip on the cover away from you. Clip the pedometer tightly on your waist (beltline) and directly above your knee, making sure it is level to the ground.

How do I use it?
Each day, press and hold the "reset" button to set the pedometer to zero.

How do I know if it is working?
Set the pedometer to 0 and count out 20 steps. If the display reads 20-21 steps, you have positioned the pedometer correctly. If the step count is more or less, adjust the pedometer toward your belly button or back toward your hip until a correct step count is reached.

Things to Remember
• Do not get your pedometer wet.
• Do not drop or throw your pedometer.

How do I get my family to take more steps?
• Park further away at the store.
• Walk in place while watching television.
• Take a walk before breakfast or after dinner.
• Walk while you are talking on the phone.
• Take the stairs instead of the elevator or escalator.
• Walk to work or school if nearby.
• Walk the dog.
• Walk to get the mail.

IOWA STATE UNIVERSITY
Extension and Outreach

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Fun for the Entire Family

Nearly half of American youth and adults are not physically active on a regular basis. The physical activity recommendation for youth is 60 minutes per day. This amount of physical activity would also help adults manage their weight and improve fitness.

How do I get my family to take more steps?
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• Take the stairs instead of the elevator or escalator.
• Walk to work or school if nearby.
• Walk the dog.
• Walk to get the mail.

Your daily 60 minutes of activity can be broken up throughout the day. Check out these examples:
• Kids: Play tag during your morning races for 20 minutes, take the dog for a walk when you get home from school for 30 minutes, play Wii boxing for 10 minutes in the evening.
• Parents: Walk for 20 minutes during your lunch break, do yard work for 10 minutes when you get home from work, go on a family bike ride or hike for the remaining 30 minutes.

Being active doesn’t have to be boring or repetitive. Find something that your entire family enjoys!

Set family goals for the week and display these goals for everyone to see.

The more physically active you are, the better you will feel and the healthier you will be!

Work on being more active throughout the entire day.

Active Indoors
• Use resistance bands while watching television.
• Dance to your favorite music.
• Play charades or Simon says.
• Try a new workout video.
• Personally deliver a message at work or school instead of emailing or calling.
• Clean the house for a garage sale.

Active Outside
• Plant a garden or do home repair activities.
• Walk to get the mail daily.
• Train together for a charity walk or run.
• Play croquet or badminton.
• Create a scavenger hunt.
• Play tag in the park.