

Nutritional Knowledge of Children and Parents Following Family-Based Intervention


By

Leah Karaliunas

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Ann Parsons, PhD

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**The Graduate School  
University of Wisconsin-Stout  
Menomonie, WI**

**Author:** Karaliunas, Leah C.

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**ABSTRACT**

Obesity is an epidemic in the United States, especially for children. The prevalence has nearly tripled for adolescents in the past two decades. Studies show that the family unit is an effective place for lifestyle changes. A six week educational family-based program consisting of ten group sessions incorporating nutrition education, nutritional behaviors and physical activity was conducted for Dunn County families who had children who were or at risk for obesity. Family members completed the Hearts 'n Parks survey which measures nutritional knowledge, behavior and intention as well as diversity in physical activity and attitude prior to and after the family-based program. This study evaluated the nutritional knowledge of families (17 children ages 6-12 years old and their parents) who participated in the program. Information for this study is restricted to pre- and post-analysis of nutrition knowledge of children and their parents.

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Results found nutritional knowledge did not differ between genders. Children's total nutritional knowledge did not differ by age, but there was a trend towards increased knowledge with increased age. Children's knowledge regarding a healthier breakfast tended to increase and parent's baseline nutritional knowledge tended to increase after the program. There is little to no correlation between parents' nutritional knowledge and their children's knowledge of nutrition.

The Graduate School  
University of Wisconsin Stout  
Menomonie, WI

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## Chapter I: Introduction

Overweight children report a quality of life similar to that reported by young cancer patients on chemotherapy (Thompsons & Shanley, 2004)! They have the same quality of life because they may miss a significant amount of school due to health related issues; fatigue easily, may have troubles playing sports, and many times will be teased by their peers.

Obesity has become an epidemic in the United States, especially for children. Approximately 10% of children two to five years of age and 15% of children six to eleven years are overweight (Ogden, Flegal, Carroll & Johnson, 2002). This prevalence has nearly tripled for adolescents in the past two decades. Risk factors like heart disease, high blood pressure, and high blood cholesterol will increase in children who are obese. Overweight and obesity are closely linked to type II diabetes mellitus. Previously this disease was considered an adult disease; however, its prevalence has increased dramatically among children and adolescents in the recent years (The Surgeon General's Call, 2007). There are many factors affecting the high obesity levels in our children.

When it comes to the obesity epidemic in this county, many factors need to be figured in when looking for a reason for the trend of children becoming more overweight. Many environmental factors play a part. Children today are spending less time being physically active due to physical activity programs being cut from school programs, more hours in front of television screens, viewing hundreds of advertisements for junk foods that are packaged and promoted for larger and larger serving sizes. Families also play a large role in a child's weight regulation.

Children spend a good part of their day at school. While they are there, they can eat anywhere from one to two meals. While at school children tend to be sitting in a desk or studying quietly. Along with many schools cutting physical activity programs due to budget cuts, children are becoming more sedentary more of the day.

With video games, portable video games, DVD players in vehicles, televisions and computers, a child could be in front of a screen for several hours a day, increasing the risk of a sedentary lifestyle. Watching television is not a high calorie burning activity; it takes time away from activities that are calorie burning and it is often accompanied by snacking on high-calorie foods (Bine & Levine, 2001). Also, a person burns fewer calories while watching television than sitting quietly (Neely, 2005).

Not only is watching television a low calorie burning activity, but it also allows a child to view hundreds of advertisements for foods that are high in sugar and fat. According to International Journal of Behavioral Nutrition and Physical Activity, the US food system is the second largest advertiser in the American economy and is a leading buyer of television, newspaper, magazine, billboard, and radio advertisements (Story & French, 2004). During certain times of the day, advertisements are geared directly toward children (Berg, 2004). These commercials will portray certain foods as hip and trendy. Companies do this with easily recognizable characters on labels that children come to identify with certain foods. This will have children wanting the foods with the bright colors and cartoon characters on the packaging.

There is another trend in this county; everything must be larger or bigger than past years. We see this with the size of cars, homes and, most of all with portion sizes of food. Cup holders in cars are being made bigger, cookbooks are changing the portion

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sizes a recipe yields and plates are being made bigger than in the past (Neumark-Sztainer, 2005). With portion sizes increasing in restaurants and cookbooks, families are consuming more calories than ever at every meal. The new trend in the food industry is to “biggy size” drinks and fries for a small fee. People perceive they are getting more for their money when a plate of food is served to them at a restaurant and it is big enough to feed three people. Another concept the food industry has marketed is all of the, “all you can eat” buffet restaurants. These are popping up in all parts of the county and the main objective is to eat as much as one can, to get more for the dollar (Berg, 2004).

Malnutrition is traditionally thought of as not receiving enough to eat over a certain period of time. Another form of malnutrition, however, is starting to surface in this country where people consume the correct amount of calories, but not from the appropriate food groups. This phenomenon shows up in many children who come from poor economic backgrounds. A person may be consuming the correct amount of calories, but if the calories are mostly from foods high in fat and sugar, one can still be malnourished. There is a perception in this country; foods of lesser nutritional values appear to be more affordable (Moore, 2007). An economic status of a family can be one of many aspects affecting the quantity and quality of food children are receiving in this country.

Children have a better sense of fullness than adults do. An infant who is breastfed will pull away when full (Buyken, Karaolis-Danckert, & Kramer, 2008). A mother will accept this, but when a bottle-fed infant has leftover formula in the bottle, the mother is more likely to want the child to finish it. The concept of letting children decide when they are full may be difficult for parents. At meal times, once able, children should be

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the ones choosing the amount of food that goes on their plates, from the food that is offered for that meal. This is called family style eating. Children are more likely to choose the amount of food appropriate for them if they are not forced to finish what is on their plate. Once children lose interest in the food in front of them and become bored with it, this is a good sign they are full.

Families are more likely to eat a nutritious meal when most or all of the family eats together according to Thompsons & Shanley (2004). Children learn by emulating the actions of their parents. If they see their parents eating fruits and vegetables at the family dinner table, they will want to follow their lead and will have a better chance to develop a taste for these types of foods. Also, including children in the preparation of foods is an important way to get them interested in trying new foods.

Obesity is an epidemic in young children today and because of this they may be the first generation not to outlive their parents. This goes against the belief of every generation having a longer life expectancy than the one before them. If changes are not made in life styles and attitudes toward obesity in this country, there are going to be more adults with health issues related to obesity later in life.

#### *Statement of the Problem*

Obesity is an ever-growing problem in this county, something needs to be done. Studies have shown multicomponent family-based intervention programs are recommended to help control this epidemic (Edmunds, Waters, & Elliott, 2001). Parents are better agents of change than children and can provide support children need when dealing with weight issues.

The purpose of this research is to measure nutritional knowledge of parents and children who are or at risk for obesity, between the ages of six to ten years of age. Data was collected from thirteen self-identified families in Dunn County, Wisconsin with children in public grade schools. The research was conducted from April through May of 2007.

#### *Research Questions*

1. Does nutritional knowledge differ between genders?
2. Does nutritional knowledge differ among the different age groups of children?
3. Does a child's baseline nutritional knowledge change after the family-based intervention program?
4. Does parent baseline nutritional knowledge change after the family-based intervention program?
5. Do parents' and children's baseline nutritional knowledge correlate?

#### *Definition of terms*

These are the main terms and their definitions that will be used in this document:

Body Mass Index (BMI) - Anthropometric measure, defined as weight in kilograms divided by the square of height in meters. This measure correlates closely with body density and thickness

Family counseling - behavioral counseling in which at least one family member accompanies the child.

Nutrition education - instruction focusing on knowledge of nutrient composition of foods, changes in dietary intake, and influencing food preferences.

Obesity - Having a BMI greater than 30 for adults. For children having a BMI-for-age that is equal or greater than the 95<sup>th</sup> percentile is considered to be overweight or obese.

#### *Assumptions*

The researcher assumes that participating parents and children completed surveys honestly. The researcher assumes families are attending due to motivation to learn and to achieve a better understanding of a healthier life style. The research will only be accurate and complete if families are willing to fully commit for the full duration of the program.

#### *Limitations*

Surveys may have been completed as to please the researchers and may not be totally honest. Children are difficult to survey because of limited attention spans or lack of understanding on what information is being asked. This study was conducted on a small sample and only reflects the results collected from them.

## Chapter II: Literature Review

This chapter will begin with a discussion of epidemiological features of obesity, the many possible causes of obesity in children, and the effects childhood obesity can have on a person later in life. It will conclude with the effects families, nutrition education and family-based intervention can have on childhood obesity.

### *Anthropometric measures of obesity*

To understand what is considered overweight or obese, one must know how it is measured. Body Mass Index is the recommended indicator for children and adults. Body Mass Index (BMI) is an anthropometric measure, defined as weight in kilograms divided by the square of height in meters. This measure correlates closely with body density and thickness (Lee & Nieman, 2007). For adults a BMI of 18.5 or less is considered underweight or malnourished. An 18.5-24.9 BMI score is considered a normal, healthy, sustainable weight. A BMI of 25.0-29.9 is considered overweight; 30.0-34.9 is Class I obesity; 35.0-39.9 is class II obesity and 40 or greater is class III obesity (Lee & Nieman, 2007) as seen in appendix A. However, in children and youth, BMI is based on growth charts for age and gender. This is referred to as BMI-for-age (Appendix B) which is used to assess underweight, overweight and risk for overweight. According to the Center for Disease Control and Prevention (CDC), a child with a BMI-for-age that is equal or greater than the 95<sup>th</sup> percentile is considered to be overweight. A child with BMI-for-age that is between the 85<sup>th</sup> and 95<sup>th</sup> percentile is considered to be at risk of being overweight (Committee on Prevention, 2005).

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### *Causes of childhood obesity*

Weight problems in children and adolescents can be caused by a number of factors. Many environmental factors are affecting the amount of activity a child will get. In today's society children are playing more video games and watching more television than ever (The Surgeon General's Call, 2007). Also, advertisements for many different types of foods are marketed towards children, portion sizes are bigger than ever and the foods and selections of food in school settings are contributing factors of obesity in this country.

The environment children grow up in can affect the weight of a child. In our country we are relying on the automobile more. Cities and neighborhoods are structured best for a person to drive. It may not be safe for children to ride their bikes because of lack of sidewalks or having to cross busy intersections. This is decreasing childrens' activity levels and increasing their BMI's (Okie, 2005).

Health experts are finding a direct link between gun violence and obesity in cities. The higher the incidents of gun violence, the higher the incidents of obesity in children and it is related to parents not feeling safe letting their child outside to play. In a city where violence is high, parents feel more secure with their children sitting safely inside watching television (Herscher, Tartamella, & Woolston, 2004).

In our society children have grown up playing video games, computer games and watching television on a daily basis. Between stationary televisions and computers in multiple rooms of their home, along with a variety of portable screen devices, children can literally be in front of a screen for most of the day. Another reason for an increase in television watching is the increase in channels available for a child to pick from. A child

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can find a cartoon to watch almost all times of the day (The Caribbean Food and Nutrition Institute, 2005) Today 43% of adolescents watch more than 2 hours of television each day (The Surgeon General's Call, 2007). Children today in this county spend up to 1,023 hours in front of a television a year. Watching television contributes to weight gain in three ways: 1) it is not a high caloric burning activity, 2) it takes time away from activities that are more caloric burning and 3) it is often accompanied by snacking on high-calorie foods (Bine & Levine, 2001).

Young children lack critical thinking skills, and this is why food companies will aim at them as their target audience (Berg, 2004). Marion Nestle, a nutrition professor, said it perfectly at the 2004 Summit on Obesity in Williamsburg, Virginia: "These companies are in business. They are not sitting around a table saying, 'let's see how we can make kids fat.' They are saying, 'How can we sell our product in a marketplace that is extremely competitive in which there is too much food around?'" Thirteen billion dollars a year is spent on bombarding children with foods ads. Children will see up to 40,000 advertisements a year on television alone (Berg, 2004). These advertisements highlight foods high in fat and calories according to a CBS news story (Russ, 2002). This money is considered well spent by advertisers. Advertising companies want kids to think they are supposed to have their own fun foods and not eat the same boring foods their parents do. They are doing this by adding easily recognizable characters on the labels, providing free toys with the foods and they steer clear of things that may be offensive to children, including fruits, vegetables and whole grains.

Along with the marketing techniques used by the food industry, there are other factors when a person looks at how much of a food one will consume. Portion sizes are

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larger than ever. Children are actually encouraged to overeat in our modern society. Restaurants are serving bigger portions, "all you can eat" buffets have become a trend and larger meals are being served. In restaurants, appetizers may be included in the price of the meal or a person is encouraged to order one. They can contain as many calories, or more, as the main course. Because restaurants and food companies keep marketing super sized portions, families are also increasing serving sizes in the home (Berg, 2004). For example new cookbooks are claiming the same amount of food produced from the recipe feeds fewer, car manufactures have increased the size of the cup holder in newer models of vehicles, larger plates, muffin tins, and pans are being sold, and fast food places are using larger cups and fry containers. Another example: the hamburgers sold in this country have increased from 5.7 ounces to 7.0 ounces, form 1977 to 1998. This is an increase in 97 calories (Neumark-Sztainer, 2005).

In 2000, 53.2 million students were enrolled in public, private, and secondary schools in the United States (Committee on Prevention, 2005) and in 2006, over 5 billion school lunches were served to children in the United States (USDA, 2006). This shows the large role schools play in foods children and adolescents consume on a daily basis and these foods affect a child's health status. Children spend up to eight hours a day in the school and can eat anywhere from one to two meals a day there. One fourth of a child's food consumption occurs in the school setting, and 50% should be burned off during that time (Berg, 2004). Unfortunately with the trend of reducing the time spent in physical education classes in the United States; children are given fewer opportunities to burn calories in the school setting.

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*Effects of childhood obesity*

Children and adolescents who are obese may have an array of health problems. Health problems associated with obesity may not show up right away, but more commonly, later in life. These problems can range from sleep apnea, asthma, elevated blood lipids and cholesterol, insulin resistance and type II diabetes mellitus (Herscher, Tartamella, & Woolston, 2004).

Sleep apnea is a common side effect of being significantly overweight. This is defined as a disruption in one's sleep patterns, when he or she stops breathing periodically. A person may awaken to restart breathing up to 100 times per night. This can lead to sleep deprivation and can also threaten one's life. This is a disorder that will worsen as a person ages according to Benedictis (2007). Sleep apnea can be brought on by an excessive amount of fat in the neck and throat. This causes a blockage of air into the lungs. A loss of ten percent of total weight can reduce sleep apnea (Benedictis, 2007).

There is a higher incidence of asthma in individuals who are obese than their leaner counterparts. Lungs of the obese tend to be underexpanded and this causes a person to take small breaths. These factors make it more likely airways will become narrower. Excessive weight can cause chronic low grade inflammation in a body. The inflammation appears to originate in fat tissue. Leptin, a pro-inflammatory hormone that is derived from fat tissue, is in higher levels in the blood of people who are obese. This inflammation can affect the smooth muscles in the airways, which can cause bronchial narrowing (Ford, 2005).

to fifteen percent can obtain substantial benefit. Patients will be advised to have a calorie-restricted diet and increase physical activity to achieve weight loss according to Daniels and Steinberger (2003).

*Effects of nutrition education on healthy behaviors*

Parents are one of the biggest role models and teachers in a child's life. They teach through their actions and pass their beliefs on to their children. If a healthy lifestyle is considered important to adults, then the chances are greater their children will live a healthier lifestyle long into adulthood.

Eating healthfully and consuming a balanced diet is something a child must learn throughout the years. Children need to be presented with new foods anywhere from 10 - 15 times before acceptance (Briley & Roberts-Gray, 2005). Exposing children to new and healthy foods should be part of nutrition education for a child and will empower children to consume a wide variety of foods. Trying one new food or a new recipe a week can help children become excited and open to new foods (Kosharek, 2006).

Teaching a child proper nutrition can be done in many settings, for examples childcare centers, as long as the parents are actively involved. As childcare is becoming the norm for American families, the American Dietetic Association sees this as a perfect setting to teach proper nutrition (Briley & Roberts-Gray, 2005). Teaching children at a young age about proper nutrition provides them with the tools for a healthy lifestyle that will last into adulthood. Parents should reinforce what is taught in the school and childcare setting and should continue the education at home.

### *Effects of family-based intervention programs*

Singling a child out because of weight or diet issues can have a negative effect on the child physically and mentally. Self-monitored strict dieting guidelines enforced onto children are not only ineffective but may be associated with future weight gain (Ritchie, Crawford, Hoelscher, & Sothorn, 2006). Children should not be put on a "diet", but should learn how to live a healthy lifestyle they can use and follow for the rest of their lives. This is why having a supportive environment where a child can learn healthy habits is imperative.

Families play a large role in the eating habits learned by children and the stigmas that can surround food. If a child is overweight or at risk for becoming overweight, educational programs that involve and teach the whole family are important and effective.

The American Dietetic Association reports there is sufficient evidence to recommend a multicomponent, family-based intervention for reducing weight in 5 to 12 year old children (Ritchie et al, 2006). These types of programs are important because they use family counseling techniques and parents become agents of change (Edmunds, Waters, & Elliott, 2001). Activity level and proper eating habits are formed early in life and carried into adulthood (He, 2006). Programs teaching healthy eating habits and encourage physical activities to parent and children can have a positive effect on the whole family.

A study, funded by the National Institute on Aging (NIA), a component of the National Institutes of Health (NIH), found a strong relationship within families and other social networks to have an influence on obesity. It found people with a strong social

connection, even living miles apart, can have a strong influence for developing obesity if one of the persons in the relationship is overweight or obese. The same study found if a child's sibling is obese, their chance for becoming obese is increased by 40% (Christakis & Fowler, 2007). This study shows the impact the role of a family can play on a child's weight and health status.

### Chapter III: Methodology

In this chapter there is a description of the subjects and the selection process. Also included are instrumentation and procedures for data collection. It concludes with limitations of the study.

#### *Subject selection and description*

Before data collection began, approval from the UW-Stout Institutional Review Board was received (Appendix C). All public grade schools in Dunn County, Wisconsin were contacted and asked to support the recruitment of families into the program. Schools were then given informational fliers to distribute to all children in grades second through fifth. (Appendix D). The letter asked for families with children between the ages of eight and ten for volunteer participation in the family-based intervention that occurred April-May of 2007. If families were interested, they were instructed to contact Jan Pejisa at Red Cedar Medical Center for more information. Families were then sent an informational packet (Appendix E) and a consent form (Appendix F). Returned and signed consent forms were locked in the Human Performance Lab in the UW-Stout Home Economics building. School counselors and teachers were also sent a letter (Appendix G) explaining the program and were asked for help identifying families that would benefit most from the program. Some of these families were contacted by Red Cedar Medical Center to inquire about interest in participation and permission to send an information packet and consent form.

### *Informed consent*

Informed consent was obtained from the parents or legal guardians of the participating children. Consent was also obtained for the other participating family member and the parents themselves.

### *Instrumentation*

To assess and measure nutritional knowledge, the Hearts 'n Parks pre-approved surveys for children and adults were used (Appendix H and I). This survey was adapted from a validated diet survey used for the Child and Adolescent Trial for Cardiovascular Health (CATCH) study (National Recreation and Park Association, 2004) supported by the National Heart, Lung and Blood Institute. Although only nutritional knowledge was analyzed and is reported for this thesis, the survey is broken down into categories related to nutrition knowledge, nutrition attitude, nutrition behavior, physical activity, and attitude toward physical activity. The child's survey includes questions regarding the child's diversity of physical activities; the adult survey has sections of knowledge regarding the causes of high blood pressure and behaviors affecting high blood pressure.

The child survey uses a series of pictures along with each question. This allows children between the ages of six and eleven years adequate opportunity to choose the answer they believe is correct. Each question "Which food is better for your health?" had two pictures, with the name of the food underneath. One was of a healthier food choice and one was of a "junk" food. The child was able to choose the one he/she thought was healthier and circle his/her answer.

Nutritional knowledge on the adult survey had the potential for thirty possible points for the healthiest answers. The nutritional knowledge section asked questions

about “Heart-healthy eating.” The first three questions addressed the issue of serving sizes. The next three questions looked at the main food groups and which ones are the best to incorporate into a healthy lifestyle. The last nine questions were true and false questions regarding healthy eating and losing weight.

Parents and children were separated while completing the surveys so parents were not able to influence their child’s answers. Children completed their surveys on their own and received aid from the research volunteers if they needed further clarification.

#### *Data collection*

The data collection took place from April 2007 through May 2007. The program contained ten group sessions. On the first session, the pre-survey was given to the participants to obtain true baseline knowledge. The adults were given the adult survey; children under the age of twelve were given the child survey. Family members between the ages of 13 and eighteen were given an adolescent survey. Only two participants were in this age group; their data is not included in this analysis.

Within these ten sessions, families participated in many different learning activities. The sessions started with a family meal, demonstrating the importance of the family table. They also listened to guest speakers on various health related issues which correlated to the nutrition education and nutritional behavior modification topics of the night. They concluded with a physical activity for the whole family to participate in, which could have been replicated and done in the home setting.

The post-survey was administered on the tenth and last session. This was the exact survey as the pre-survey and it was used to measure if there was change in nutritional knowledge after the program.

### *Data analysis*

Statistical analysis was done using Statistical Program for Social Sciences (SPSS version 14). Specific tests, as identified within the results, were run by Christine Ness and Susan Greene, research and statistical consultants for the University of Wisconsin - Stout.

Descriptive statistics (mean, standard deviation) were run to profile the difference between total nutritional scores among age groups and between genders of children. Values are stated as mean  $\pm$  standard deviation. A paired sample t-test was run to assess if a child's and parent's nutritional knowledge changed after the family based intervention program.

### *Limitations*

A major limitation of this study was the sample size. Low participation and the dropout rate from session one through session ten was high. Some of the families had to drive up to forty miles to get to Menomonie for the group sessions and some were not willing to do this twice a week, particularly on week days. The sample population also was not a perfect representation of the whole population as the group was very homogenous. All participants were white Caucasians and lived in rural Wisconsin towns.

Another limitation to this study was incomplete surveys. Also due to the dropout rate, several pre surveys did not have accompanying post- surveys and were unable to be analyzed.

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## Chapter IV: Results

This chapter includes the results of the study. It will look at the demographics of the participants and will discuss the findings in relation to research objectives.

### *Demographic Information*

Thirteen families from Dunn County, with children between the ages of 6-10 years of age, volunteered to participate for this research project. Within the children population, there were 35.3% (n=6) boys and 64.7% (n=11) girls and 35.3% (n=6) 6-7 year olds, 35.3% (n=6) 8-9 year olds and 29.4% (n=5) 9-10 year olds. Within the parent population they were all white females, with an age distribution between 31-40 years old (n=3) and 41-50 years old (n=5). This population had four high school graduates and four college graduates.

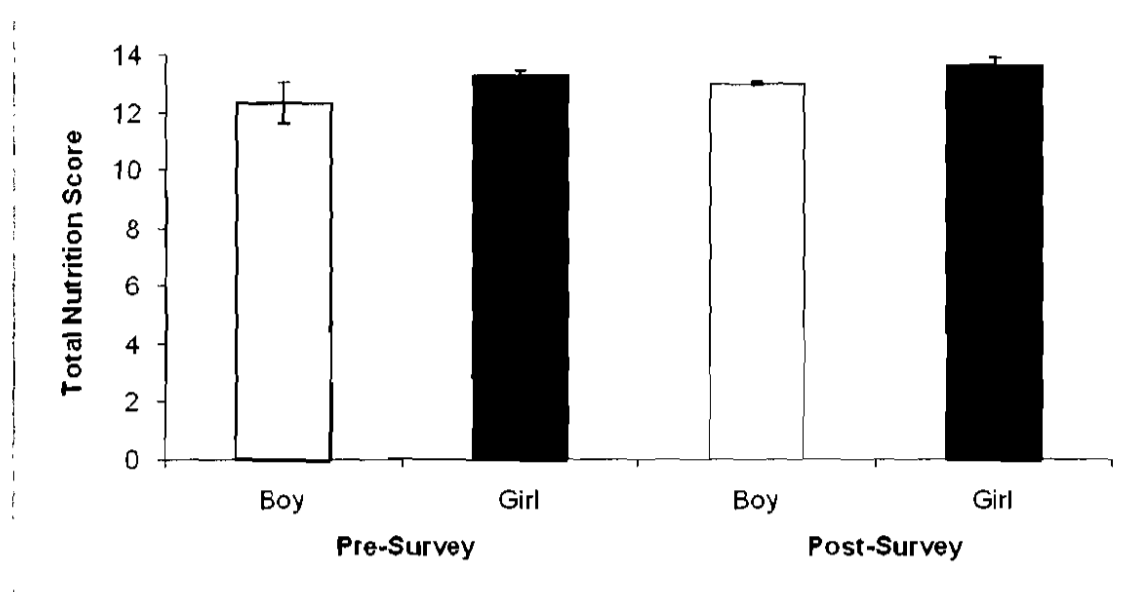
### *Research Objectives*

#### *Does nutritional knowledge differ between genders?*

Research objective 1 looked at the possible difference between genders of children and their nutritional knowledge. Scores for children had a potential for 14 points. As shown in figure 1 the girls had a mean total nutrition score of  $13.27 \pm 0.65$  for the pre-survey. Boys had a mean of  $12.33 \pm 1.75$  for pre-survey. For the post survey girls had a mean total score of  $13.60 \pm 0.55$ . Boys had a mean score of  $13.00 \pm 0.00$  for post-survey. Children's total nutritional scores were not statistically different between genders and within each gender for pre and post survey results.

Figure 1

*Nutritional score between genders of children: pre and post-survey*

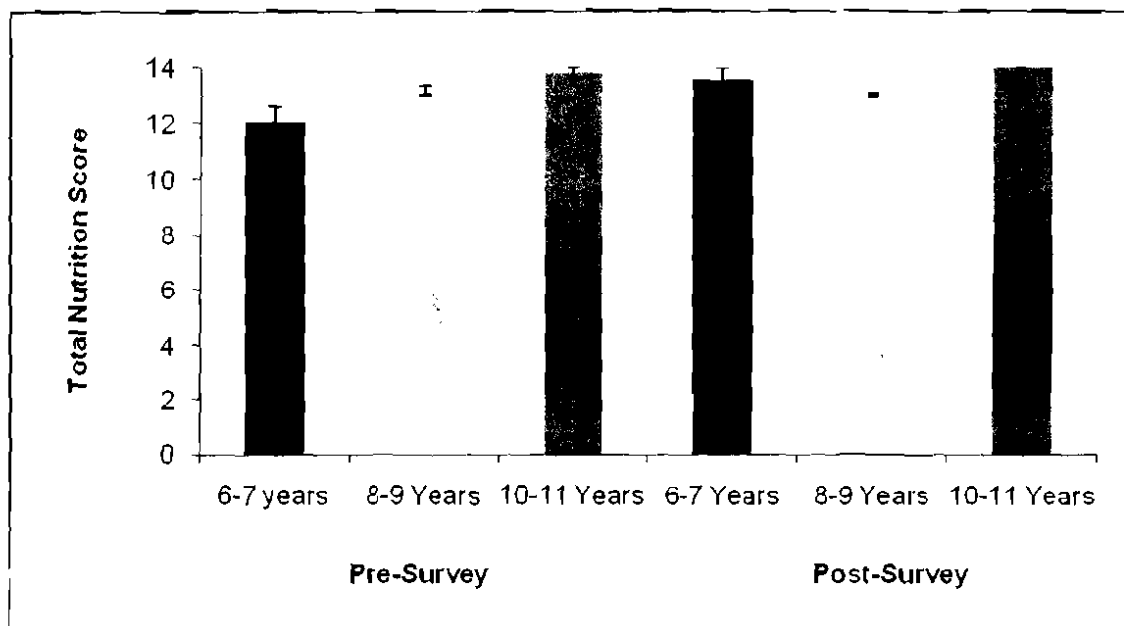


*Does nutritional knowledge differ among the different age groups of children?*

Research objective 2 looked at the possible differences among the age groups of children and nutritional knowledge pre and post intervention. As shown in figure 2 the age group of 6-7 years old had a pre survey mean score of  $12.00 \pm 1.55$ . They had a post survey mean score of  $13.50 \pm 0.71$ . The age group of 8-9 year olds had a pre survey mean score of  $13.17 \pm 0.41$ . They had a post survey mean score of  $13.00 \pm 0.00$ . The age group of 10-11 years old had a pre survey mean score of  $13.80 \pm 0.45$ . They had a post survey mean score of  $14.00 \pm 0.00$ . Kuskal-Wallis nonparametric test was run and did not indicate any statistical difference between means across and within age groups. Children's total nutritional knowledge did not differ by age, although there was a trend towards increased knowledge with increased age and a trend towards enhanced knowledge following the intervention for 6 to 7 years olds.

Figure 2

*Nutritional score among age groups of children: pre and post-survey*



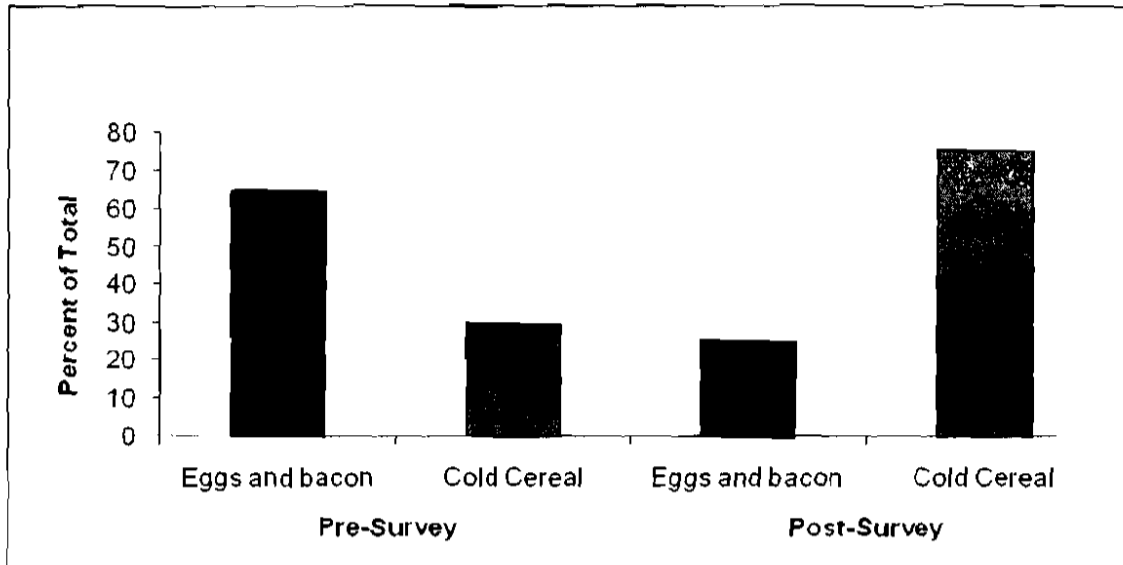
*Does a child's baseline nutritional knowledge change after the family-based intervention program?*

Objective 3 looked at the children's nutritional knowledge and if there was a change in their answers about which foods are better for their health, after the family-based intervention program. Of the seven questions used, only one had any variability in responses. The question asked "Which food was healthier for breakfast, eggs and bacon or cereal?" Mean differences were run and a paired t-test had a t-value of 1.58 and a p-value of 0.175. As figure 3 represents, prior to the intervention, 64.7% of the children chose the unhealthy choice, while after the intervention 25% of the children chose the unhealthy choice. There was a dropout rate of 10.3%. A total of 11 out of 16 children chose the unhealthy choice on the pre-survey and only 2 out of 8 chose the unhealthy

choice on the post-survey. This shows a trend that children's knowledge regarding a healthier breakfast increased after the intervention.

Figure 3

*Knowledge of healthy breakfasts: pre and post survey*



*Does parent baseline nutritional knowledge change after the family-based intervention program?*

Objective 4 looked at parent's nutritional knowledge and if it changed after the family-based intervention program. There were fifteen questions on the adult survey that looked at nutritional knowledge. Scores on pre-survey were  $21.53 \pm 1.78$  and for post-survey were  $21.00 \pm 1.41$  and a p-value of 1.000. This suggests that adult total nutritional scores were not statistically significant.

The question that stated "Would a  $\frac{1}{2}$  cup of lettuce count as a serving of vegetable?" had the most statistical significance. The correct answer to this specific question is "no," a  $\frac{1}{2}$  cup of lettuce does not count as a serving of vegetable. As figure 4

represents, on the pre-survey 26.3% of the parents answered this question incorrectly. After the family-based intervention program, only 12.5% of the parents answered incorrectly. Although not statistically significant ( $p$ -value = 0.197), there appears to be a trend towards increased knowledge for serving of leafy greens after the program.

Figure 4

*Parent pre and post survey nutritional score for the correct serving size of lettuce*

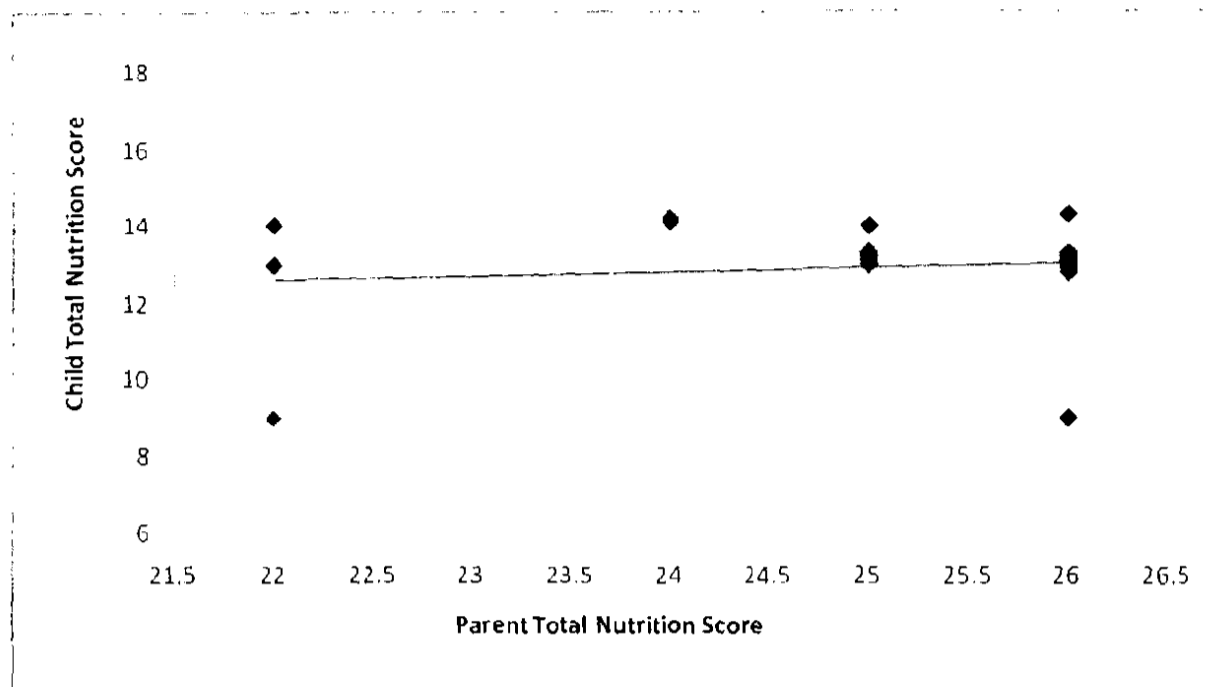


*Do parents' and children's baseline nutritional knowledge correlate?*

Research objective 5 looked at parents' and children's baseline nutritional knowledge prior to intervention and if they correlated. The equation for the correlation line is  $y = 0.11x + 10.16$ . This shows there is a slope of 0.11; and the  $R^2 = 0.00$ . Figure 5 shows there is no correlation between parents' nutritional knowledge and their children's knowledge of nutrition.

Figure 5

*Parent and child's baseline nutritional score correlation*



## Chapter V: Discussion

This chapter contains discussion about the limitations and findings of this study. It concludes with recommendations for future programming and nutrition education for families and children.

### *Limitations*

A major limitation of this study was the sample size. A low turnout rate and a high dropout rate hindered the results of the study despite recruitment efforts. More lead time to present the importance of reducing obesity may have provided more support for the program. Also, attending school board meetings and flyers distributed in the community to promote the program may have increased participation.

Another limitation may be the sensitive content of the program. Attending a program to decrease the risk of obesity or address weight issues in children may deter parents from participating. Parents may be afraid their child may become self-conscious about his/her weight or may be teased by their peers for attending. Parents may also be afraid their children may think they are implying they have a weight issue or are “fat” by participating.

### *Discussion*

This first objective analyzed in this study looked at whether gender plays a role in the amount of nutritional knowledge a child obtains. This study had six boys and eleven girls and found no statistical difference in the amount of baseline nutritional knowledge between genders. However, children of the same age and grade level are taught the same curriculum in schools and have about the same learning capacity. This would indicate children of the same age and grade level would have a similar amount of knowledge on a

---

certain topic, regardless of gender. A larger sample size may have produced different results.

Secondly, this study looked at if nutritional knowledge differs among the different age groups of the participating children. The study found children's total nutritional knowledge did not differ by age. However, and not surprisingly, there is a trend towards increased knowledge with increased age. The 6-7 year old age group had the greatest increase in knowledge after the intervention. Children in the 10-11 year age group had the highest overall nutrition score at the start of the program and did not greatly increase throughout the program. These results suggest that the best age group to focus nutrition programs on is the 6-7 year olds.

Results may have been different if there was a larger sample size. The children in the 10-11 year old age group could have been an exceptionally smart group of children which may have skewed the results. Also, the survey may have focused on foods that are popular among this age group and may not have provided enough challenging questions to test their real ability.

Thirdly, this study assessed children's nutritional baseline knowledge and if there was an increase after the family-based intervention. It found that they had a knowledge deficit in the area of healthier breakfast options. The question, "which food is better for your health: eggs and bacon or cold cereal?" found more children believe eggs and bacon are healthier options. This can be partially attributed to the beliefs that a warm breakfast is better for a person, that fresh foods that are not packaged or processed are better for a person or that the foods their grandparents eat are healthier than current breakfast food choices. The observed decrease in responses indicates an increase in baseline nutritional

knowledge in children in the area of healthier breakfast foods after the intervention. However, the sample size decreased from pre- and post-survey and cumulative values may not be accurate.

The fourth objective of this study looked at if there was an increase in parents' nutritional knowledge after the family-based intervention. Results showed the question asking "Would a ½ cup of lettuce count as a serving of vegetables?" had the most statistical significance. Before the program began, 26.3% of the parents answered the question incorrectly. This indicates a misconception of a proper serving size of leafy greens. For many vegetables, a proper serving size is a half of a cup, but for leafy greens it is one cup raw. After the intervention only 12.5% answered it incorrectly. This indicates an increase in baseline nutritional knowledge among parents for the proper serving sizes of leafy green vegetables.

The last objective of this study looked at parents' and children's baseline nutritional knowledge and if they correlated. No correlation between a parents' nutritional knowledge and their children's knowledge was found. This may be due to children having exposure to nutritional education outside the family environment. For example schools may have health classes that they attend on a regular basis, or as part of their lunch program, there may be posters or nutritional information about healthier food options offered for meals. Some reasons parents could have more nutritional knowledge may be due to the fact that they are older and have had more exposure to information. Another possible reason there was no correlation found between parents' and children's nutritional scores could be that the survey may have not been the best tool to determine a relationship. The correlation assumes that the survey questions determine a wide span of

nutritional knowledge. However, it is possible that the wording and content of questions provided only a small snapshot of nutritional knowledge and thus changes with a small sample size would not be easily ascertained.

#### *Recommendations*

Several recommendations can be made regarding how the study was conducted and its outcomes. First, if this program would be repeated, offering it at a different time of the year could be beneficial for sample size and retention of participants. When families were surveyed after the program about future participation in a similar program, many said the winter months were more available. Offering the program again in January, February or March may increase participation.

Secondly, family-based intervention programs are gaining support and have been shown to have the best potential for making lifestyle changes in families with children who are or at risk for becoming overweight (Ritchie et al, 2006). They help to provide an environment where the child can succeed. This is accomplished by improving the child's knowledge of proper nutrition and how to make healthier food choices and providing the parents the skills to implement a healthier lifestyle at home.

Thirdly, this is a program that needs follow up in six months to one year afterward. This would determine if a family made lifestyle changes that lasted. Also, there should be support groups for these families to check in with every month or so. Support groups offer families a place to exchange ideas of techniques that are working for them. They offer a safe place to communicate with others in their same position. These groups can increase the confidence families have when making lifestyle changes

(Ussher, Kirsten, Butow, & Sandoval, 2006). A type of program like this would be beneficial if it were offered throughout the state every year.

Other recommendations that could be made regarding the program is refining the assessment tool. The survey use of pictures to assess nutritional knowledge made it easy to administer to the child population, but it could have used additional questions to properly assess overall nutrition knowledge. Six questions are not enough to assess if a child knows healthy foods from junk foods. Some of the questions compared very different foods. For example the question asking which one is healthier, an orange or cookies may be easy for a child to determine. A question asking to pick the healthier food between an apple and apple sauce may give a better idea of a child's true nutritional knowledge. Also, the adult and child surveys should have some similar questions in the nutritional knowledge section which could be analyzed to determine correlation between adult and child knowledge. This would be beneficial for family based intervention programs to determine the impact parents have on the children.

Focusing nutrition education toward the 6-7 year old age group in school or a community setting could be beneficial. Their decision-making skills are developing. These are skills that will help them become a person able to make plans and act independently of parents and caregivers (Wood, 2007). This age group, according to the results presented here, has the best potential for learning proper nutrition with the hope that they will use it for the rest of their lives.

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Appendix A: Adult BMI Chart

Body Mass Index Table																														
	Normal					Overweight					Obese					Extreme Obesity														
BMI	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160
Height (inches)	Body Weight (pounds)																													
55	91	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
56	94	99	104	109	114	119	124	129	134	139	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239
57	97	102	107	112	117	122	127	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242
58	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245
59	104	109	114	119	124	129	134	139	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239	244	249
60	107	112	117	122	127	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242	247	252
61	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255
62	114	119	124	129	134	139	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239	244	249	254	259
63	117	122	127	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242	247	252	257	262
64	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265
65	124	129	134	139	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239	244	249	254	259	264	269
66	127	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242	247	252	257	262	267	272
67	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275
68	134	139	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239	244	249	254	259	264	269	274	279
69	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242	247	252	257	262	267	272	277	282
70	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285
71	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239	244	249	254	259	264	269	274	279	284	289
72	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242	247	252	257	262	267	272	277	282	287	292
73	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295
74	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	234	239	244	249	254	259	264	269	274	279	284	289	294	299
75	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242	247	252	257	262	267	272	277	282	287	292	297	302

Source: Adapted from CDC's Guidelines on Health Status, Physical and Functional Performance, and Obesity in Adults: The Evidence Base.

Appendix B: Center for Disease Control Growth Charts





Appendix C: IRB approval form



152 Voc Rehab Building

University of Wisconsin-Stout  
 P.O. Box 790  
 Menomonie, WI 54751-0790

715/232-1126  
 715/232-1749 (fax)  
<http://www.uwstout.edu>

**Date:** February 7, 2007

**To:** Ann Parsons  
 Leah Karaliunas  
 Diane Rasmussen  
 Wendy Knutson  
 Carolyn Barnhart

**From:** Sue Foxwell, Research Administrator and Human  
 Protections Administrator, UW-Stout Institutional  
 Review Board for the Protection of Human  
 Subjects in Research (IRB)

**Subject:** **Protection of Human Subjects**

Your project, "*Family-based Intervention to Reduce Childhood Obesity in Dunn County*," has been approved by the IRB through the expedited review process. The measures you have taken to protect human subjects are adequate to protect everyone involved, including subjects and researchers.

**Reviewer comment:** This research is extremely worth while for the community!

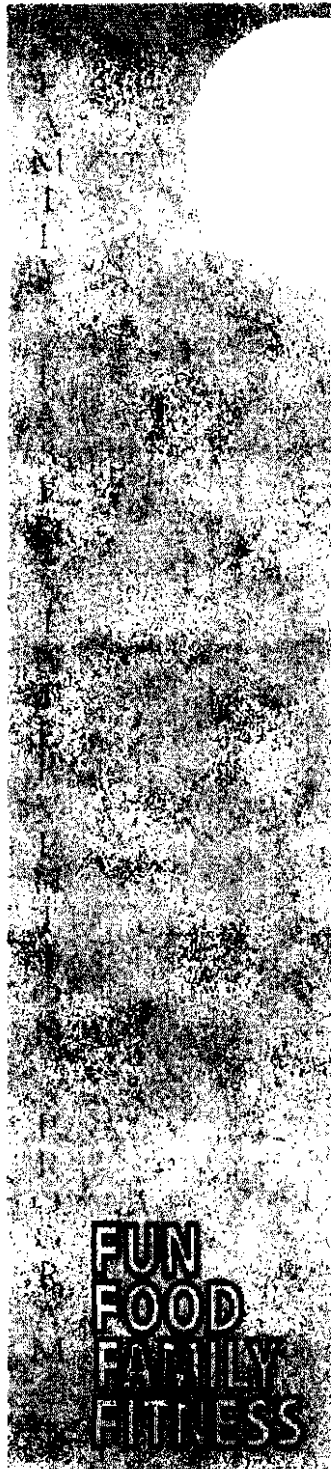
**Please copy and paste the following message to the top of your survey form before dissemination:**

**This research has been approved by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46.**

This project is approved through February 6, 2008 modifications to this approved protocol need to be approved by the IRB. Research not completed by this date must be submitted again outlining changes, expansions, etc. Federal guidelines require annual review and approval by the IRB.

Thank you for your cooperation with the IRB and best wishes with your project  
**\*NOTE: This is the only notice you will receive – no paper copy will be sent.**

Appendix D: Informational flier for recruitment



University of Wisconsin- Stout  
 Dunn County Health Department  
 Red Cedar Medical Center

Facility.

6 Week Program for the Entire Family  
 10 Sessions APRIL 2<sup>nd</sup> through May 9<sup>th</sup>  
 Time. 6 p.m. to 8 p.m.

Monday - April 2<sup>nd</sup>, 9<sup>th</sup>, 16<sup>th</sup>, 23<sup>rd</sup>, 30<sup>th</sup>  
 May 7<sup>th</sup>

Wednesday - April 18<sup>th</sup>, 25<sup>th</sup>  
 May 2<sup>nd</sup>, 9<sup>th</sup>

ENTIRE FAMILY ENCOURAGED TO ATTEND

Thank you for your interest!  
 If you want to participate  
 please send us your  
 application.

Jan Pejsa RNC  
 Education  
 Red Cedar Medical Center  
 2321 Stout Rd  
 Menomonie, Wisconsin 54751  
 1-715-233-7889  
 pejsa.jan@mayo.edu

PERKS & GIFTS INCLUDED: SNACKS, PEDOMETERS, & MORE!

Appendix E: Informational packet for families

## Consent to Participate in UW-Stout Approved Research Program

### **Title:**

Family-Based Program to Increase Nutritious Eating and Physical Activity

### **Investigators:**

A coalition composed of Red Cedar Medical Staff – part of Mayo Health Systems (RCMC), UW-Stout, and Dunn County Public Health Department (PHD)

### **Description:**

The family-based program has been created to benefit families in the Dunn county area. This program offers families fun activities promoting:

- Nutrition education
- Strategies for healthier eating
- Ways to increase physical activity in the home environment

### **Risks and Benefits:**

*Benefits* for all participants are:

- Opportunities to learn the advantages of healthy eating
- Ability to participate in supervised physical activity
- Having nutritious foods available
- Receiving skills and tools to use at home

There are *minimum risks* associated with this program. Participating families will be asked to fill out questionnaires and surveys related to:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Nutrition</li> <li>• Dietary habits</li> <li>• Lifestyle habits focusing on physical activity</li> <li>• Attitude</li> </ul> | <ul style="list-style-type: none"> <li>• Ability to incorporate healthy lifestyles into the family structure</li> <li>• Understanding of the eating relationship</li> </ul> |
|---|---|

Weight, height and body composition measurements will be taken for each family member. All measurements will be obtained while standing on a scale, in a *private setting*. Participants will only be asked to remove shoes and outer jacket (if wearing one). All data will be kept *confidential* in a secured area.

### **Special Populations:**

The program will include the participation of minors. Families who have children between the ages of eight to ten are asked to participate. The entire family will also be asked to participate no matter the age or number of other children.

**Time Commitment and Payment:**

Participation in this program will require and include the following:

- Ten support group sessions:
  - one to two hours in length
  - up to two sessions a week, over a six week period
- Two home visits with our staff joining the family during meal time.

NOTE: The families will be compensated with free handouts, new meal ideas, and new activities for the whole family to participate. Families that successfully complete every component of the program will receive a thank you gift, value of approximately \$50.<sup>00</sup>.

**Confidentiality:**

Your name will not be included on any data sheets. This informed consent sheet containing your name will not be kept with any of the other documents. You and your family will be given a unique identification code number by which all data collected will be identified by. The principle investigator and specified staff members will be the only ones with access to the decoding sheets that are to be kept in a locked space. Decoding and data sheets, stored in separate locations, will be retained for future studies.

**Right to Withdraw:**

Your participation in this study is entirely voluntary. You may choose not to participate in the study. Or should you choose to participate and later wish to withdraw, you may discontinue at that time. There will be no adverse consequences involved. You will be allowed to keep any materials given to you up to the point of discontinuing your participation.

**IRB Approval:**

This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and university policies.

If you have questions or concerns regarding this study please contact the Investigator. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator

**Investigator:**

Dr. Ann Parsons  
203J Science Wing  
University of WI-Stout  
Menomonie, WI 54751  
(715)232-2563  
[parsonsa@uwstout.edu](mailto:parsonsa@uwstout.edu)

**IRB Administrator:**

Sue Foxwell, Director, Research Service  
152 Vocational Rehabilitation Bldg.  
University of WI-Stout  
Menomonie, WI 54751  
(715)232-2477  
[foxwell@uwstout.edu](mailto:foxwell@uwstout.edu)

Appendix F: Informed consent

**Statement of Consent:**

By signing this consent form you and your dependent minor(s) agree to participate in the project entitled, Family-Based Program to Increase Nutritious Eating and Physical Activity.

\_\_\_\_\_

Name of 1<sup>st</sup> adult family member

\_\_\_\_\_

1<sup>st</sup> Adult family member Signature

\_\_\_\_\_

Date

\_\_\_\_\_

Name of 2<sup>nd</sup> adult family member

\_\_\_\_\_

2<sup>nd</sup> Adult family member Signature

\_\_\_\_\_

Date

**Participating Minors:**

Name	Age	Consent of Legal Guardian
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Appendix G: Letters to teachers and schools

February 12, 2007

Dear Councilors and Teachers,

Red Cedar Medical Center, the University of Wisconsin-Stout, Dunn County Public Health, and the Menomonie School District recently received a rural health grant entitled "Family-based interventions to reduce childhood obesity in Dunn County." The grant is approximately \$50,000. A grant of this size could do a lot for our community and we are excited to get started on this project. There will be no fees for the 20 families associated with this program. The focus of the program is on children ages eight to ten; however every family member will take part in the program. Opportunities the program will offer:

- In home one on one nutrition and meal preparation education
- A family interaction evaluation
- Evening group sessions; where families will gather further information, including a meal, guest speakers, and exercise time with trainers
- Community presentations
- Fun, Food, and Fitness activities in the schools

Although the program is in its preliminary stages, we feel communication with you is important. Within the next month we will be sending informational letters to families. We ask that you assist in identifying families with children ages eight to ten years old in your schools that could benefit greatly from this program.

I am working with Jan Pejsa, Red Cedar Medical Center; she will be the person collecting the names of families. If you have additional questions please contact me via email at [karaliunasl@uwstout.edu](mailto:karaliunasl@uwstout.edu).

Sincerely,

Leah Karaliunas  
Program Coordinator  
[karaliunasl@uwstout.edu](mailto:karaliunasl@uwstout.edu)

Jan Pejsa  
Community Education Coordinator  
715-233-2889  
[pejsa.jan@mayo.edu](mailto:pejsa.jan@mayo.edu)

Appendix H: Child survey

ID \_\_\_\_\_ DATE \_\_\_\_\_

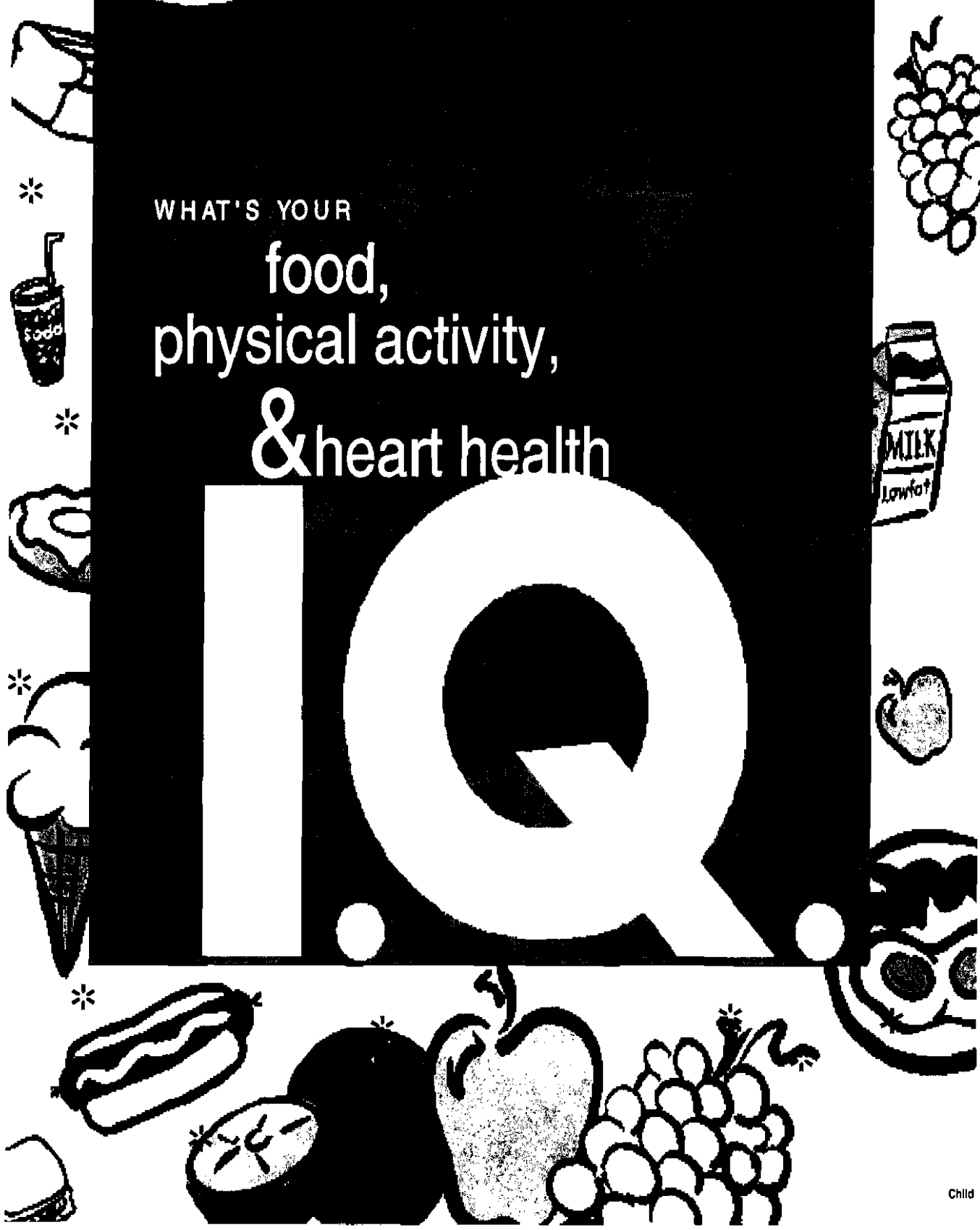
**Child**

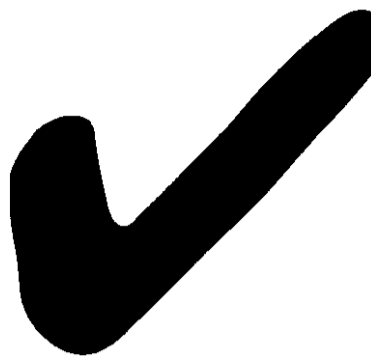
**PREQUESTIONNAIRE**

WHAT'S YOUR  
**food,**  
**physical activity,**  
**& heart health**

**Q**

**1**





Check the correct box!

1. Are you a...

Boy or  Girl ?

2. Your age is...

a. under 6 years old

b. 6 or 7 years old

c. 8 or 9 years old

d. 10 or 11 years old

# Which food

is better for your health?

Instructions: Circle one of the two foods that you think is better for your health.

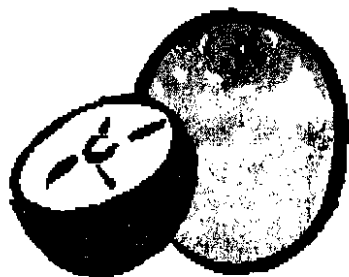


1.

Doughnut



Toast

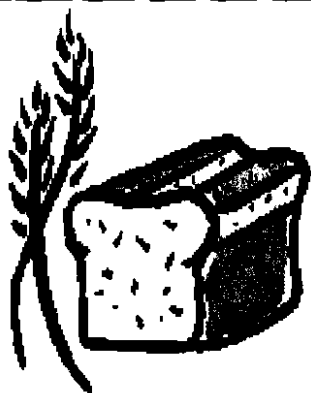


2.

Orange

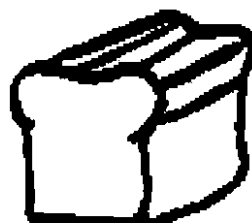


Cookies

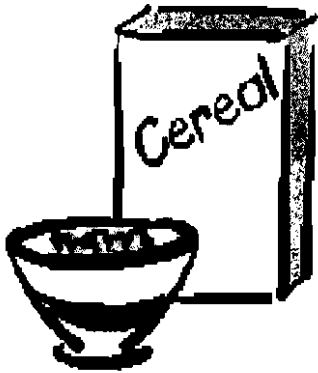


3.

Whole Wheat Bread



White Bread



4. Cold Cereal



Eggs and Bacon



5. Regular Milk



Low-fat or Fat-free Milk



6. Green Salad



French Fries



7. Grapes



Candy Bar

What foods  
**do you eat**  
 most of the time?

Instructions: Circle one of the two foods that you eat most often.



1. Baked Potato



French Fries



2. Fruit Juice



Soda



3. Cookies



Apple



4. Hot Dog

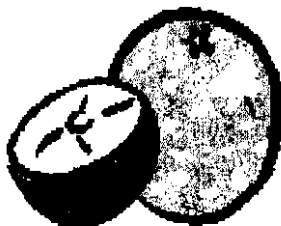


Sandwich with Lettuce & Tomato

---



5. Chocolate Cake



Orange

---



6. Ice Cream



Fresh Fruit Popsicle

---



7. Regular Milk

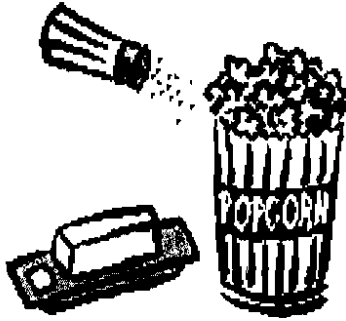


Low-fat or Fat-free Milk

# What would **you** do?

*Instructions: Answer each question by choosing one of the two foods.*

1. If you were at the movies, which one would you pick?

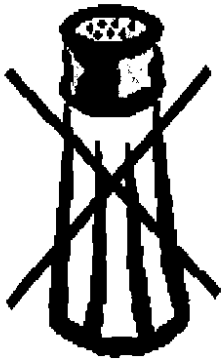


Popcorn with salt and butter

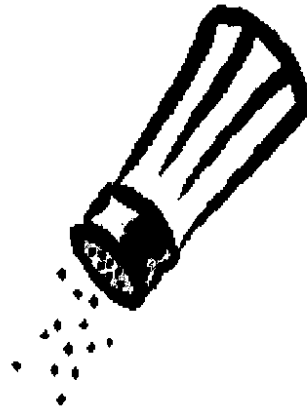


Popcorn without salt and butter

2. If you were going to eat your lunch, which would you do?



Eat the food without adding salt



Shake salt on the food before eating

3. Which food would you put on your hamburger?



Ketchup



Tomato

4. Which would you pick to drink?



Regular Milk



Low-fat or Fat-free Milk

---

5. Which food would you eat for a snack?



Candy Bar



Fresh Fruit

---

6. Which food would you choose for dinner?



Baked Potato



French Fries

---

7. Which would you order if you were going to eat at a fast food restaurant?



Hamburger



Green Salad

---

# Physical Activity and

# You!



*Please circle your answers.  
Remember there are no right or wrong answers.*

1. I would rather watch TV than play sports or be active.

Yes

No

Sometimes

2. People who play sports or are active seem to have a lot of fun doing it.

Yes

No

Sometimes

3. How do you feel about your ability to kick a ball hard and hit a target, like soccer?

Great

Okay

Not Good

4. How do you feel about your ability to run a long way without stopping?

Great

Okay

Not Good

5. How do you feel about your ability to hit a ball with a bat, like softball?

Great

Okay

Not Good

6. How do you feel about your ability to play many different games and sports?

Great

Okay

Not Good

# Things I like and things I do

This is something YOU'VE DONE in the past week.  
 This is something you would like to LEARN how to do.

	I like to do this	I've done this in the past week	I would like to learn how to do this
Games (tag, hopscotch, 4-square, dodgeball, kickball, etc.)			
Exercises (jumping jacks, running, etc.)			
Jump Rope			
Basketball			
Football			
Soccer			
Softball/Baseball			
Volleyball			
Swimming			
Tennis			
Biking			
Bowling			
Dancing			
Rollerskating, Rollerblading, Skateboarding			



## Appendix I: Adult survey

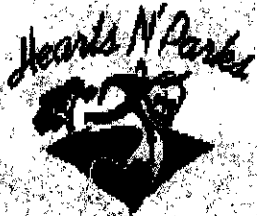
ID \_\_\_\_\_ DATE \_\_\_\_\_

# Adult

## PREQUESTIONNAIRE

WHAT'S YOUR  
food,  
physical activity,  
& heart health

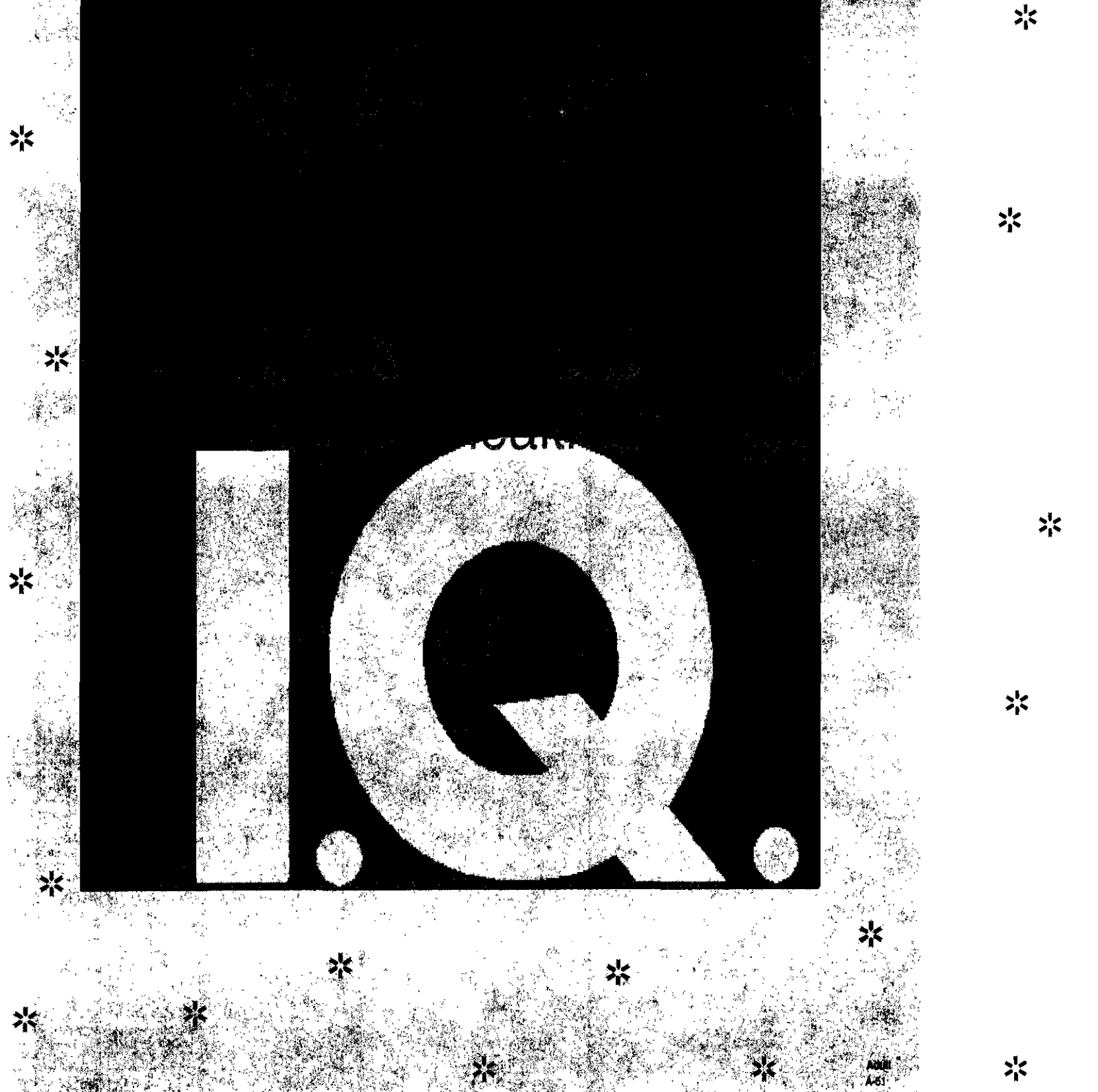
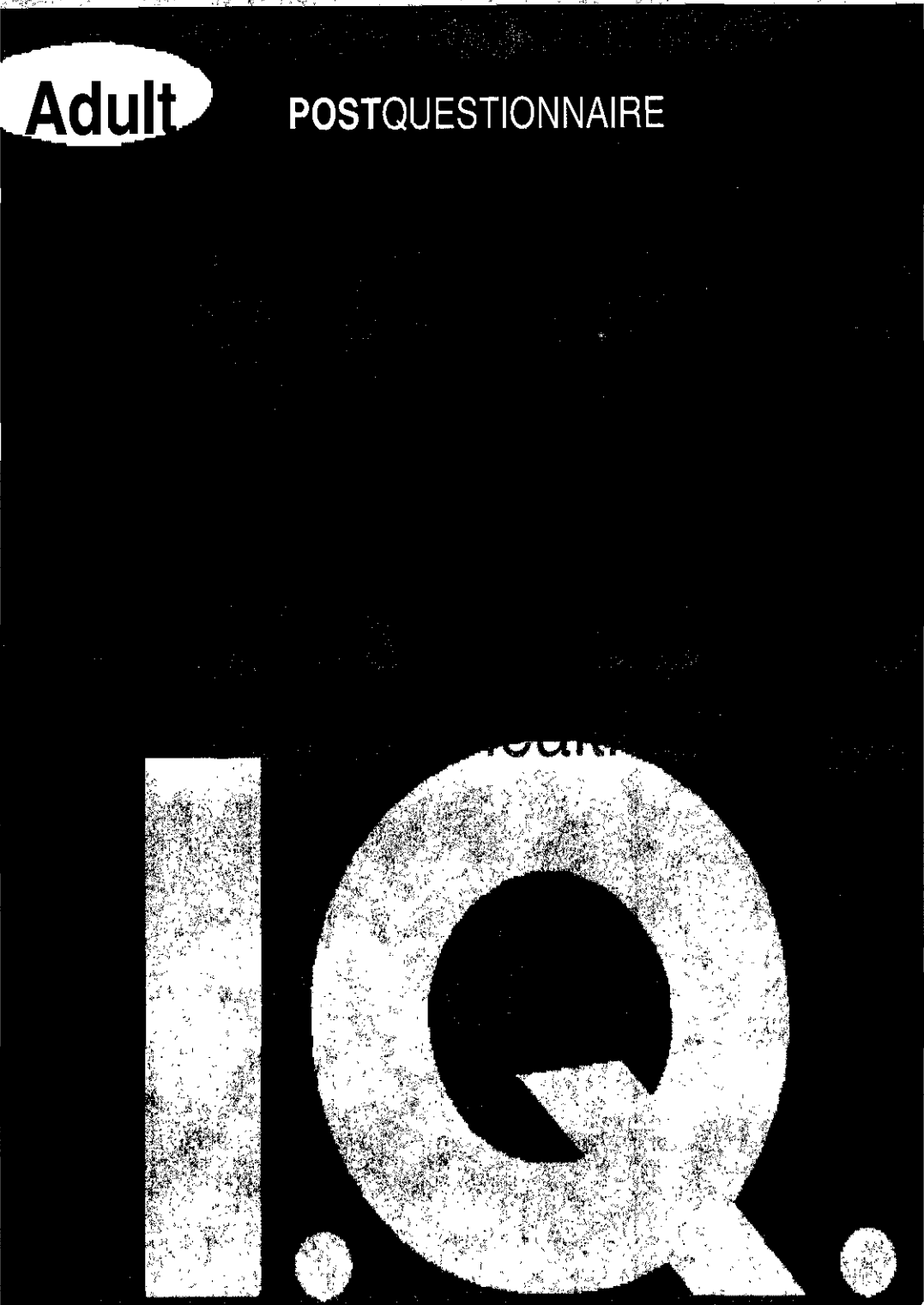




ID \_\_\_\_\_ DATE \_\_\_\_\_

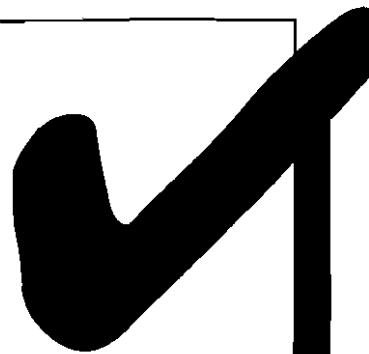
**Adult**

POSTQUESTIONNAIRE



Please tell us a little  
about yourself.

Check the correct box!



**1. Your gender:**     1 - Male             2 - Female

**2. What is your age group?**

- 1 - Under 21
- 2 - 21 - 30
- 3 - 31 - 40
- 4 - 41 - 50
- 5 - 51 - 60
- 6 - 61 - 70
- 7 - Over 70

**3. Are you...**

- 1 - White
- 2 - African American or Black
- 3 - Hispanic
- 4 - Asian or Pacific Islander
- 5 - American Indian or Alaska Native
- 6 - Other (specify: \_\_\_\_\_)?

**4. What is your highest level of education?**

- 1 - Less than High School
- 2 - High School Graduate
- 3 - Some College
- 4 - College Degree
- 5 - Some Graduate School
- 6 - Graduate Degree

# Heart-healthy eating

5. For each of the foods below, indicate if the item would count as a serving of a fruit or vegetable.

a. Half cup of orange juice?	Yes	No	Don't Know
b. Half cup of lettuce?	Yes	No	Don't Know
c. Half cup of steamed broccoli?	Yes	No	Don't Know

6. From which food group should you eat the most servings a day?

- 1 - Bread, cereal, rice, and pasta
- 2 - Vegetable
- 3 - Fruit
- 4 - Meat, poultry, fish, eggs, dry beans, and nuts
- 5 - Milk, yogurt, and cheese
- 0 - Don't know

7. Which of these is the best choice for a low-fat diet? *(circle just one)*

- 1 - Whole milk
- 2 - Low-fat yogurt
- 3 - Cheese
- 4 - Fat-free milk
- 0 - Don't know

8. Which is the best snack choice for a low-fat diet? *(circle just one)*

- 1 - Cookies
- 2 - Fruit roll-ups
- 3 - Pie
- 4 - Ice cream
- 0 - Don't know



9. Please indicate whether you think the following statements are true or false by circling T or F after each one.

	True	False
a. Polyunsaturated fat has the same number of calories as saturated fat.	T	F
b. The single most important change most people can make to lose weight is to avoid sugar.	T	F
c. Being overweight puts you at risk for heart disease.	T	F
d. A reduced intake of sodium or salt does not always lower high blood pressure to normal.	T	F
e. If you are overweight, losing weight helps lower your high blood cholesterol and high blood pressure.	T	F
f. The best way to lose weight is to eat fewer calories and be physically active.	T	F
g. Overweight children are likely to become overweight adults.	T	F
h. Skipping meals is a good way to cut down on calories.	T	F
i. Foods high in complex carbohydrates (starch and fiber) are good choices when you are trying to lose weight.	T	F

10. To you personally, how important is each of the following choices?  
(Circle one on each line.)

	Very Important	Somewhat Important	Not Too Important	Not at all Important
a. Choosing a diet with plenty of fruits and vegetables.	4	3	2	1
b. Eating a variety of foods.	4	3	2	1
c. Maintaining a healthy weight.	4	3	2	1
d. Choosing a diet low in fat.	4	3	2	1
e. Choosing a diet with plenty of breads, cereals, rice, and pasta.	4	3	2	1
f. Eating at least two servings of dairy products daily.	4	3	2	1



11. Please indicate how much you tend to agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
a. With my schedule, it's impossible to eat right.	1	2	3	4
b. There's too much stress in my life for me to handle managing my weight.	1	2	3	4
c. I just can't let food go to waste.	1	2	3	4
d. I eat more when I'm alone than when I eat around others.	1	2	3	4
e. When I've done something good, I reward myself with food.	1	2	3	4
f. I eat more on the weekends.	1	2	3	4
g. If I'm craving food, my body must need it.	1	2	3	4
h. Some people are meant to be fat.	1	2	3	4

12. Please indicate the term that most closely describes your habits when you eat the following foods.

(Circle one on each line. If you do not eat any of the foods listed in an item circle "X".)

	Almost Always	Often	Some- times	Rarely	Never	N/A
a. Eat turkey bologna <i>instead</i> of regular bologna?	4	3	2	1	0	X
b. Use fat-free milk or 1% milk <i>instead</i> of 2% or whole milk	4	3	2	1	0	X
c. Eat low-fat cheeses when you eat cheese?	4	3	2	1	0	X
d. Eat ice milk, frozen yogurt, or sherbet <i>instead</i> of ice cream?	4	3	2	1	0	X
e. Use low-calorie <i>instead</i> of regular dressing?	4	3	2	1	0	X
f. Have fruit for dessert?	4	3	2	1	0	X
g. Eat fish or poultry <i>instead</i> of meat (e.g., beef, pork, or lamb)?	4	3	2	1	0	X

# Physical Activity

Moderate physical activity includes activities such as walking, gardening, and heavy house cleaning. For moderate activity to be regular, it must add up to a total of 30 or more minutes per day and be done at least 5 days per week. For example, you could take a 30-minute walk or take a 10-minute walk, rake leaves for 10 minutes, and climb up stairs for 10 minutes—adding up to a total of 30 minutes of time.

Please circle Yes if the statement applies to you, or No if it doesn't.

1. I currently participate in moderate physical activity.	Yes	No
2. I intend to increase my participation in moderate physical activity in the next 6 months.	Yes	No
3. I currently engage in regular moderate physical activity.	Yes	No
4. I have been participating in moderate physical activity regularly for the past 6 months.	Yes	No
5. In the past, I have been regularly physically active in moderate activities for a period of at least 3 months.	Yes	No

For the following two statements, circle the number that corresponds to your answer.

6. During the past 7 days, how many times did you engage in physical activity to try to lose weight or keep from gaining weight?

- |   |                     |
|---|---------------------|
| 0 - I have never done this                      | 2 - 1 to 2 times    |
| 1 - I have done this but not in the last 7 days | 3 - 3 to 6 times    |
|   | 4 - 7 or more times |

7. On how many of the past 7 days did you do any kind of physical activity in a place such as a "Y", sports league, dance class, recreational center, or any other community center?

- 0 - None
- 1 - 1 - 2 days
- 2 - 3 - 4 days
- 3 - 5 - 7 days

## 8. How likely are you to say each of the following statements? (Circle one answer on each line)

	Very Likely	Somewhat Likely	Somewhat Unlikely	Very Unlikely
a. I'm just too tired after work to engage in physical activity.	1	2	3	4
b. I've been thinking about being more physically active, but I just can't seem to get started.	1	2	3	4
c. I'm getting older so physical activity can be risky.	1	2	3	4
d. I'm not physically active because I have never learned the skills for any sport.	1	2	3	4
e. I don't have access to jogging trails, swimming pools, bike paths, etc.	1	2	3	4
f. Physical activity takes too much away from my other commitments - like work, family, etc.	1	2	3	4
g. I'm embarrassed about how I will look when I engage in physical activity with others.	1	2	3	4
h. It's easier for me to find excuses not to be physically active than to go out and do something.	1	2	3	4
i. I really can't see learning a new sport at my age.	1	2	3	4
j. My free time during the day is too short to include physical activity.	1	2	3	4
k. My usual social activities with family or friends do not include physical activity.	1	2	3	4
l. I'm too tired during the week and I need the weekend to catch up on my rest.	1	2	3	4
m. I'm afraid I might injure myself or have a heart attack.	1	2	3	4
n. If we had exercise facilities and showers at work, then I would be more likely to engage in physical activity.	1	2	3	4

9. The following statements are either true or false. Please choose your response by circling T or F.

	True	False
a. Regular physical activity can reduce your chances of getting heart disease.	T	F
b. It doesn't take a lot of money or expensive equipment to become physically fit.	T	F
c. Exercise programs do not require a lot of time to be very effective.	T	F
d. You should always consult a doctor before starting a physical activity program.	T	F
e. There are many risks and injuries that can occur with exercise.	T	F
f. Most people get enough physical activity from their daily routine.	T	F
g. You don't have to train like a marathon runner to become more physically fit.	T	F
h. People who need to lose some weight are the only ones who will benefit from regular physical activity.	T	F
i. The older you are, the less active you need to be.	T	F
j. People who have had a heart attack should not start any physical activity program.	T	F
k. All exercises give you the same benefits.	T	F
l. To help you stay physically active, include a variety of activities.	T	F

**10. Fit Score**

In the past 7 days, how much time did you spend on each of the following activities?

Write in the number of hours for each one, rounding to the nearest half-hour

(1/2, 1, 1 1/2). Add your totals for each day in the last row.

Activity	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Organized or Team Sports (e.g., basketball, tennis, racquetball, softball, etc.)							
Bicycling							
Dancing / Aerobics							
Walking / Hiking							
Golf							
Heavy Household Chores							
Pushups / Situps							
Rollerskating / Blading							
Jogging / Stairs / Treadmill							
Snow Skiing (winter sports)							
Swimming (water sports)							
Bowling							
Weightlifting							
Other Physical Activities; Specify: _____							
<b>DAILY TOTALS</b>							

**FIT SCORE GRAND TOTAL:** \_\_\_\_\_

**11. Sit Score**

In the past 7 days, how much inactive time did you spend at work, reading, watching TV programs, using a home computer, or watching videotapes and movies on TV or in a theater? In each space, write the number of hours for each activity, rounding to the nearest half-hour. Add your totals at the bottom.

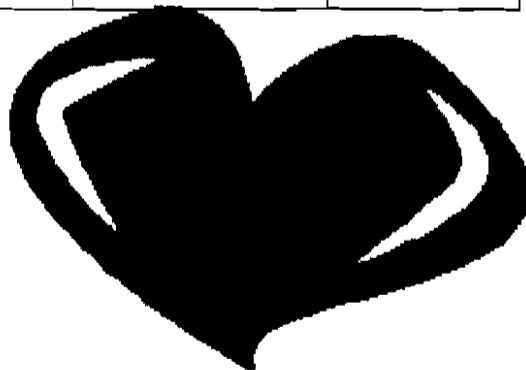
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
At work (nonmanual labor)							
Reading							
Watching TV							
Using the computer							
Watching movies							
<b>DAILY TOTALS</b>							

**SIT SCORE GRAND TOTAL:** \_\_\_\_\_

# Possible causes of high blood pressure

Listed below are some things that have been said are possible causes of high blood pressure (HBP). For each of those listed, please check whether you think it is a Cause or Not a Cause, or else check Not Sure.

	Cause of HBP	Not a Cause of HBP	Not Sure
1. Being overweight			
2. Heredity—it runs in the family			
3. Eating too much salt			
4. Race or ethnic group			
5. Worrying, tension, strain			
6. Eating fatty foods			
7. Smoking			
8. Drinking too much alcohol			
9. Regular hard exercise			
10. Being underweight			
11. Being pregnant			
12. Not getting enough exercise			
13. Old age			
14. Stress			



# Actions

## to control high blood cholesterol



Listed below are some actions that people might take to control high blood cholesterol.

For each of these actions, please check whether it is an action that Would or Would Not Help control high blood cholesterol, or else check Not Sure.

	Would Help	Would Not Help	Not Sure
1. Getting regular exercise			
2. Eating less salt			
3. Eating less sugar			
4. Eating more soluble fiber			
5. Using fat-free milk or low-fat dairy products			
6. Eating less cheese			
7. Eating fewer eggs			
8. Eating more fish			
9. Eating less sausage, bacon, and luncheon meats			
10. Eating less saturated fat			
11. Losing weight if you are overweight			
12. Using soft or liquid margarine instead of butter			