BODY IMAGE IN CHILDREN OF THE APPALACHIAN REGION

A thesis presented to

the faculty of

the College of Health and Human Services of Ohio University

In partial fulfillment

of the requirements for the degree

Master of Science

Lisa Tulkki

August 2005
This thesis entitled

BODY IMAGE IN CHILDREN OF THE APPALACHIAN REGION

by

LISA A. TULKKI

has been approved for

the School of Human and Consumer Science

and the College of Health and Human Services by

Darlene Berryman
Assistant Professor of School of Human and Consumer Sciences

Gary S. Neiman
Dean, College of Health and Human Services
Previous studies have suggested that Appalachian children have higher rates of obesity and unique barriers to obesity prevention. This study examines the relationship between actual weight status versus perception and satisfaction with that size in children of the Appalachian region. Thirty-one males (10.0±2.1 years) and 34 females (9.9±1.8 years) participated in the study. To assess actual body size, body mass index (BMI) and percent body fat using skinfold calipers were measured. The Children’s Body Image Scale was used to evaluate body image and a survey completed by parents was used to compare income and educational status of these families versus the norm for Appalachian residents. Subjects had high rates of overweight and obesity with 26% having a BMI > than the 95th percentile and with 43.1% having a percent body fat that was classified as moderately high, high, or very high. Both genders showed a strong positive correlation ($r = .694$) between actual body image and perceived body image meaning that children of both genders did reasonably well estimating their actual body size. In contrast, 69% of children were dissatisfied with their current body size with 56% of females and 55% of males expressing the desire to be smaller. Interestingly, this study found a higher percentage of boys that wished to have a smaller figure in comparison to previous reports. Furthermore, participating families did not reflect the typical income or educational profile of Appalachian families suggesting that the underlying cause for the high incidence of obesity in these children is beyond poverty and may be related to
something that could be innate to the region or pervasive in the culture. Overall, these results confirm previous studies showing high rates of obesity in children residing in Appalachia. Furthermore, this study demonstrates that children in this region are generally dissatisfied with that body size. Collectively, this study highlights the need for obesity prevention in this region while underscoring the importance of instilling a positive body image in these children.

Approved:

Darlene Berryman

Assistant Professor, School of Human and Consumer Sciences
# Table of Contents

Abstract .............................................................................................................................. iii

List of Tables ..................................................................................................................... ix

List of Figures ................................................................................................................... x

Chapter 1. Introduction ......................................................................................................11
  Statement of the Problem.......................................................................................13
  Research Questions .................................................................................................14
  Limitations .............................................................................................................14
  Delimitations ..........................................................................................................15
  Definitions of Common Terms ..............................................................................15

Chapter 2. Review of Literature .........................................................................................17
  Overweight Children ..............................................................................................17
    Problems Associated with Overweight Children .............................................17
    Cardiovascular Disease .....................................................................................18
    Type 2 Diabetes ...............................................................................................19
    Hypertension ....................................................................................................19
    Asthma .............................................................................................................20
    Psychological Impacts .....................................................................................20
    Dietary Impact ................................................................................................21
  Risk Factors that Influence the Development of Overweight Children ..........21
    Television Viewing ..........................................................................................22
    Physical Activity .............................................................................................22
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BMI Classifications According to the Center for Disease Control, 2004</td>
<td>36</td>
</tr>
<tr>
<td>2. Body Fat Measurement Tools</td>
<td>38</td>
</tr>
<tr>
<td>3. Age Appropriate Equations for Determining Percent Body Fat Using Body Density</td>
<td>49</td>
</tr>
<tr>
<td>4. Mother’s and Father’s Highest Level of Education</td>
<td>55</td>
</tr>
<tr>
<td>5. Family Income Levels</td>
<td>56</td>
</tr>
<tr>
<td>6. Body Sizes of Participants</td>
<td>61</td>
</tr>
</tbody>
</table>
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age Distribution of Male and Female Participants</td>
<td>53</td>
</tr>
<tr>
<td>2. BMI Percentiles for All Participants</td>
<td>58</td>
</tr>
<tr>
<td>3. Percent Body Fat Determined by Skinfold Calipers</td>
<td>59</td>
</tr>
<tr>
<td>4. Percent Body Fat Determined by BOD POD</td>
<td>60</td>
</tr>
<tr>
<td>5. Body Dissatisfaction Score for Males and Females</td>
<td>63</td>
</tr>
<tr>
<td>6. Perception of Body Image (Actual-Perceived) for Males and Females</td>
<td>65</td>
</tr>
</tbody>
</table>
CHAPTER 1: INTRODUCTION

Alarmingly, the rates of overweight children have risen since 1963 and still continue to rise. In 1963, only 4% of children ages 6-11 and 5% of adolescents ages 12-19 were overweight (Center for Disease Control, 2004a). According to the most recent National Health and Nutrition Examination Survey, 16% of children and adolescents are now overweight (Center for Disease Control, 2004a). This increase poses a number of current and future health concerns. Many health problems, such as type 2 diabetes, cardiovascular disease, hypertension, asthma, and hypercholesterolemia, have been shown to develop much earlier in children who are overweight. These health problems often persist into adulthood. In addition, the psychological impact of being overweight in childhood is associated with an increased risk of depression, lower self-esteem and more negative eating habits (Meijboom, Jansen, Kampman, & Schouten, 1999; Onyike, Crum, Lee, Lyketsos, & Eaton, 2003; Strauss, 2000).

The Appalachian region is a 200,000 square mile region that covers all of West Virginia and parts of 12 other states, including New York, Pennsylvania, Maryland, Virginia, Ohio, Tennessee, Kentucky, North Carolina, South Carolina, Georgia, Alabama, and Mississippi. Approximately 23 million people live in this region and over 42% of this region’s population is rural compared with 20% of the national average (Appalachian Regional Commission, 2004a). The Appalachian region is characterized by lower incomes and less education than national averages. Lower income, poverty and less education are themselves associated with an increased risk of obesity; therefore, it is not surprising that children in this Appalachian region have been reported to have higher
than average rates of obesity (Demerath, et al., 2003). Twenty-nine of Ohio’s 88 counties are considered Appalachian counties. As expected, Appalachian Ohio has a higher rate of poverty than the rest of the nation (U.S. Census Bureau, 2004).

Body image and obesity are intimately linked. Body image as defined by Slade (1988, p. 20) is “the picture we have in our minds of the size, shape and form of our bodies; and our feelings concerning these characteristics of our constituent body parts.” Body image consists of two components including (a) perceived body image and (b) attitudes and feeling towards the body (body dissatisfaction) (Skrzypek, Wehmeier, & Remschmidt, 2001). Perceived body image is the way a person perceives their current body size or shape to be. Body dissatisfaction is the difference between a person’s perceived body image (how they feel they currently look) minus their ideal body image (the body shape or image that someone would most want to look like). In the past, adolescent females and college-aged women have been the groups with the highest prevalence of body dissatisfaction, but lately, more research is examining body image in younger children and how this influences them as they age (Lowes & Tiggemann, 2003). There are many different factors that can influence body image in children. Some factors include culture, parental influence, gender, age, and body size. Relevant to this thesis, several studies have looked at the relationship between body image and body mass index (BMI), a general tool used to calculate one’s body size. These reports show that children with higher BMIs have more body dissatisfaction than children who have a BMI in the healthy range (18.5-24.9) (Dunkan, Woodfield, O'Neill, & Al-Nakeeb, 2002; Hill & Silver, 1995).
There are several reasons why studying children and body image in the Appalachian region is important. First, children who have a negative self image are more prone to lower self-esteem (Meijboom et al., 1999), depression (Goodman, Slap, & Huang, 2003; Stunkard, Faith, & Allison, 2003), eating disorders and dieting (Gustafson-Larson & Terry, 1992). Second, children who are overweight are more likely to have body dissatisfaction (Dunkan et al., 2002). Third, living in the Appalachian region puts kids at greater risk for a variety of chronic diseases and becoming overweight. For example, the CARDIAC study of West Virginia found that rates of overweight children are comparable to the highest in the nation (Demerath et al., 2003). Finally, there is a distinct cultural and economic climate of the region that likely influences body image.

This study of body image in children is part of a larger, comprehensive study, which looked at body size, nutritional choices, food security, body image, physical activity, leisure time choices, and family health routines for children and families in Appalachia Ohio. A copy of all tools and questionnaires can be found in Appendix A. The population in this study was children ages 6-15 who participated in Intermediate Bank One Academy and National Youth Sports Program at Ohio University. Researchers assessed body image (both body dissatisfaction and body image perception) using the Children’s Body Image Scale. Researchers assessed body size by using BMI, skinfold calipers, and air displacement plethysmography.

Statement of the Problem

Current research has shown body dissatisfaction can lead to depression, lowered self-esteem, and negative eating habits in children. No study has addressed body image in children residing in Appalachia. Since children with higher body mass indexes also
have more body dissatisfaction (Dunkan et al., 2002) and because children residing in Appalachia have been reported to have high rates of overweight (Demerath et al., 2003), it is important to determine whether Appalachian children have an altered body image. Therefore, the purpose of this study is to (a) to examine the relationship between body image in children and how it relates to their percent body fat, specifically looking at children residing in the Appalachian region of southeastern Ohio, and (b) identify how rates of overweight children living in the Appalachian region of Ohio compare to national averages of overweight children.

Research Questions

Using children ages 6-15 from Athens County Ohio, the following research questions were asked:

1. Is there a difference between actual body image and perceived body image? (body image perception)

2. Is there a difference between perceived body image and ideal body image? (body dissatisfaction)

3. Is there a relationship between body image and percent body fat?

4. Is there a difference between gender and body image?

5. How do overweight rates of children in our study compare to national averages of overweight children?

Limitations

1. The extensive surveys required for the larger project may have inhibited parents or guardians from taking part in the study.
2. Because of the nature of the summer program, the researchers had limited control for physical activity and eating prior to measurements with air displacement plethysmography.

3. The sample population was a sample of convenience instead of a random sample of kids in Appalachia Ohio.

Delimitations

1. The parents of less overweight children and with higher educational levels may have been more likely to allow their kids to participate in the study.

2. There could have been some error in percent body fat measurements due to smaller body sizes of children (Lockner, Heyward, Baumgartner, & Jenkins, 2000)

Definition of Common Terms

1. **Body mass index**: Expressed as weight/height$^2$ (BMI = kg/m$^2$) is commonly used to classify overweight and obesity among adults and is also recommended to identify children who are overweight or at risk of becoming overweight.

2. **Percent body fat**: Amount of adipose (fat) tissue in one’s body as a percentage of total body weight.

3. **Obesity**: Defined as an excessively high amount of body fat or adipose tissue in relation to lean body mass. The Center for Disease Control no longer uses this term to classify children, but obesity is still used in some papers in which it is considered to be $>$95th percentile of body mass index. Greater than the 95th percentile of BMI is now currently considered “overweight” by the CDC.
4. **At risk of overweight**: According to the Center for Disease Control, at risk of overweight is classified as having a body mass index for age at the 85th percentile to >95th percentile.

5. **Overweight**: According to the Center for Disease Control, overweight in children is classified as BMI-for-age ≥ 95th percentile.

6. **Body image**: Defined as how an individual feels about his/her body. There are two components of body image, which include perceived body image and body dissatisfaction.

7. **Actual body image**: Body image calculated by the researcher using body mass index (BMI).

8. **Perceived body image**: Body image based on how a person perceives themselves to look.

9. **Body image perception**: Measured by taking the actual body image minus the perceived body image.

10. **Ideal body image**: The body shape or image that one most wants to look like.

11. **Body dissatisfaction**: The difference between the perceived body image and the ideal body image. One may wish to be larger or smaller, but there is a difference between how one currently feels they look and how they want to look.

12. **Appalachia**: A region of the United States that covers all of West Virginia, and parts of 12 other states, including New York, Pennsylvania, Maryland, Virginia, Ohio, Tennessee, Kentucky, North Carolina, South Carolina, Georgia, Alabama, and Mississippi.
CHAPTER 2: REVIEW OF LITERATURE

Overweight Children

The number of overweight children is a growing problem in the United States. According to the National Health and Nutrition Examination Survey V, 16% of children ages 6-11 and adolescents ages 12-19 are overweight (McVey, Tweed, & Blackmore, 2004). Alarmingly, these rates have quadrupled in the last 25 years (American Obesity Association, 2004).

Defining weight in childhood is more complicated than in adulthood. Currently, the most accepted standard for assessing weight in children is using body mass index (BMI). The standards of BMI for at-risk of overweight and overweight are set by the Center for Disease Control (See Appendix B). BMI’s of children and adolescents ages 2-20 are categorized as underweight, acceptable, at risk of overweight, or overweight. Age and sex specific BMI values below the 5\textsuperscript{th} percentile are considered underweight. From the 5\textsuperscript{th} to the 85\textsuperscript{th} percentile, children and adolescent BMIs are considered acceptable or within the healthy range. From the 85\textsuperscript{th} to 95\textsuperscript{th} percentiles, they are considered at risk of overweight and over the 95\textsuperscript{th} percentile, children and adolescents are considered overweight (Center for Disease Control, 2004a). It is worthwhile to note, that although the term “obesity” is not used in the CDC nomenclature, BMI greater than the 95\textsuperscript{th} percentile is what many would consider obese as opposed to simply overweight.

Problems Associated with Overweight Children

The overweight epidemic among youth is troubling not for cosmetic reasons, but because being overweight in childhood has tremendous health implications. Research
suggests that risk factors observed in childhood often become chronic diseases in adulthood (American Obesity Association, 2004). The importance of understanding the relationship of overweight children and health is essential. Being overweight in childhood has been associated with increased risk of chronic health problems such as cardiovascular disease (Freedman, Dietz, Srinivasan, & Berenson, 1999), type 2 diabetes (Ludwig & Ebbeling, 2001), hypertension (Reich et al., 2003), asthma (Gilliland et al., 2003), and hypercholesterolemia (Tershakovec et al., 2002). Children who are overweight are also at a higher risk for psychological disorders such as depression (Onyike et al., 2003), lower self-esteem (Strauss, 2000), and eating disorders (Kelly, Ricciardelli, & Clarke, 1999). Furthermore, being overweight as a child likely leads to an overweight adult (American Obesity Association, 2004).

**Cardiovascular Disease**

Excess weight is one of the main risk factors in developing cardiovascular disease. Several studies provide evidence that the origin of atherosclerosis begins in youth (Zieske, Malcom, & Strong, 2002). Studies have shown fatty streaks develop in early childhood, increase with age and are positively correlated with very low density lipoprotein (VLDL) and low density lipoprotein (LDL) levels (Strong et al., 1999). Furthermore, heart disease risk factors accelerate the progression of atherosclerosis in the teenage years (Zieske et al., 2002). The Bogalusa Heart study found that of 9,167 children, 11% were overweight and overweight children were 2.4 times as likely to have elevated levels of cholesterol than children who weren’t overweight (Freedman et al., 1999). In studies with Appalachian children, the West Virginia Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) study discovered that 45% of 5th
graders were at risk of overweight or overweight (Demerath et al., 2003). Compared with non-overweight children, overweight children in this study had 50% greater risk of having elevated total cholesterol and 66% had depressed high density lipoprotein (HDL) levels. Two other conditions that also significantly increase the risk of cardiovascular disease and that are more common with excess weight are type 2 diabetes and hypertension.

Type 2 Diabetes

As with adults, type 2 diabetes is more strongly associated with being overweight than any other clinical condition (Ludwig & Ebbeling, 2001). In Cincinnati, Ohio, rates of type 2 diabetes have increased in children as much as 10 fold over the past 2 decades (Pinhas-Hamiel, Dolan, Daniels, Standiford, Khoury, & Zeitler, 1996). Furthermore, 92% of children newly diagnosed with type 2 diabetes were characterized as being overweight (Ludwig & Ebbeling, 2001).

Hypertension

Studies have confirmed the positive association between body fat and hypertension in children aged 10 and above (Lurbe, Alvarez, Liao, Tacons, Cooper, Cremades et al., 1998; Reich et al., 2003). Approximately 20-30% of children who are overweight have high blood pressure (Freedman et al., 1999) and, alarmingly, overweight adolescents have 8.5-10 times greater risk of developing hypertension than overweight adults (Lauer, Burns, Clarke, & Mahoney, 1991). Appalachian children who were overweight were also reported to have a higher rate of systolic and diastolic blood pressure (Demerath et al., 2003). These findings demonstrate the importance of weight reduction in preventing or treating hypertension in children.
Asthma

Respiratory problems, such as asthma, also are related to excess weight. Several cross-sectional studies have indicated that there is an association between being overweight and the likelihood of developing asthma in youth (Gennuso, Epstein, Paluch, & Cerny, 1998; Gilliland et al., 2003). Obstructive airway disease, obstructive sleep apnea, hypoxia and right ventricular hypertrophy are also more prevalent in overweight children (Guilleminault & Pelayo, 1998).

Psychological Impacts

Being overweight as a child may have a negative psychological impact on the child. For example, self-esteem can be negatively influenced by excess weight. In young children, self-esteem affects body image and also plays a role in restrictive eating patterns in adolescents (Meijboom et al., 1999). Straus (2000) found overweight white and Hispanic females had significantly lower levels of self-esteem by 13-14 years of age compared with non-overweight children of the same age and race. There are also significant social consequences of having a decreased self-esteem in overweight children. Overweight children with decreased levels of self-esteem expressed significantly increased rates of sadness, loneliness, and nervousness (Strauss, 2000). Children with decreased self-esteem are also more likely to participate in smoking and drinking activities than peers with higher self-esteem (Strauss, 2000). Collectively, these studies show that early adolescence is a critical time for the formation of self-worth in overweight children.

Another psychological difference of overweight children is found in rates of depression. For example, according to the Third National Health and Nutrition
Examination Study, there is a positive correlation between being overweight and depression meaning that the more overweight a person was, the more depressed they tended to be (Onyike et al., 2003). Stunkard et al. (2003) showed that major depression among adolescents predicted a greater body mass index in adults. Being overweight can cause children to have a negative self-image (Kostanski & Gullone, 1998), be teased by their peers (Thompson, Coover, Richards, Johnson, & Cattarin, 1995), and can cause adolescents to develop negative eating habits, such as binge eating (Meijboom et al., 1999). All these factors can contribute to depression in overweight children.

**Dietary Impact**

Body image in adolescents has been shown to be related to restrained eating habits in young adults (Meijboom et al., 1999). Rolland, Farnill, and Griffiths (1997) found that 50% of girls and 33% of boys have wanted to be thinner and 40% and 24%, respectively, have attempted to lose weight by negative strategies such as dieting (28%), exercising (59%), binging (28%), or vomiting after eating (10%). Gustafson-Larson and Terry (1992) found that 40% of fourth grade children reported very often or sometimes dieting, while 80% reported very often or sometimes altering their food choices to prevent gaining weight.

**Risk Factors that Influence the Development of Overweight Children**

The risk of obesity is due to a combination of genetics and environment as well as the interrelationship between the two. Environmental risk factors that have been shown to contribute to overweight children include television viewing, increase in soda consumption, decreased physical activity, increase in portion sizes, eating away from the home more often, and socioeconomic status.
Television Viewing

There are four hypothesized theories of why television is associated with developing overweight children. These include reduced energy expenditure by television replacing physical activity (Dietz & Gortmaker, 1985), increased caloric intake from eating during watching television (Robinson & Killen, 1995), increased caloric intake due to the effects of food advertising (Clancy-Hepburn, Hickey, & Nevell, 1974) and decreased resting metabolic rate during television viewing (Klesges, Shelton, & Klesges, 1993).

Regardless of the cause, time spent in front of the television is highly correlated with excess weight. The Framingham school study examined the relation between the amount of time spent watching television throughout childhood and the change in body fatness from preschool to the early adolescent years. The study found that children who watched the most television during childhood had the greatest increase in body fat over time and had the highest total energy intake per day (Proctor et al., 2003). It is also interesting to note that children who watch the most television have been reported to have parents with higher BMI levels (Proctor et al., 2003). Other studies have also found relationships between television viewing and percent body fat in children (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998; Dietz & Gortmaker, 1985).

Physical Activity

Lack of physical activity has been theorized to play a role in the increased prevalence of overweight children. The difference between energy intake and energy expenditure needs to be balanced in order to maintain weight. A study by Tremblay and Willms (2003) showed that participation in organized or unorganized sports was
negatively associated with being overweight, while playing video games or watching television more than two hours a day was a risk factor for being overweight. Numerous other studies have also confirmed the positive correlation between rate of overweight and sedentary behavior in children (Rowlands, Eston, & Ingledew, 1999; Salbe, Fontvieille, Harper, & Ravussin, 1997; Salbe et al., 2002).

Changes in Food Patterns

A variety of changes in food patterns in recent years may have an impact on increasing a child’s risk of becoming overweight. For example, soft drink consumption can lead to excessive energy intake which may lead to an increased risk of developing overweight children (Harnack, Stang, & Story, 1999). Ludwig, Peterson, and Gortmaker (2001) found each 12 oz. sugared soft drink consumed daily has been associated with a 0.18 point increase in a child’s BMI and a 60% increase in risk of becoming overweight. Another factor likely related to childhood obesity is the growing portion sizes of American foods. Portion sizes have increased dramatically since the 1970’s especially with respect to fast food chains (Nielsen & Popkin, 1998). Another factor, which also contributes to increasing portion sizes and excess weight gain, is the increased meals eaten away from home. More and more people are choosing to eat out because it’s convenient and less time consuming (Harnack et al., 1999). Between 1977 and 1996, the proportion of foods that children consumed from restaurants and fast food outlets increased by nearly 300% (St-Onge, Keller, & Heymsfield, 2003). Furthermore, saturated fat intake increases significantly among children with higher frequencies of breakfast and late night snacks eaten away from home (Gonzales, Marshall, Heimendinger, Crane, & Neal, 2002). Higher intakes of fat, saturated fat, and cholesterol
could possibly lead to becoming overweight and other health related problems (Atkin & Davies, 1999). Numerous other studies support the positive correlation of eating away from home and overweight rates in children (St-Onge et al., 2003; Zoumas-Morse, Rock, Sobo, & Neuhouser, 2001).

**Socioeconomic Factors Influencing Weight**

Socioeconomic factors also influence the development of overweight in childhood. Several studies have found a relationship between being overweight and lower socioeconomic status (Drewnowski & Specter, 2004; Strauss & Knight, 1999). Drewnowski and Specter (2004) found the highest rates of overweight occur among population groups with the highest poverty rates and the least education. Furthermore, findings indicate that there is an inverse relationship between energy density and energy cost meaning that the foods highest in fat and added sugars are the least expensive to buy. Energy dense foods, such as sweets and fats are associated with higher energy intakes (Drewnowski & Specter, 2004). Kids who grow up in lower socioeconomic areas are also less likely to exercise (Lindquist, Reynolds, & Goran, 1999).

**Body Image**

Body image as defined by Slade, (1988, p. 20) is “the picture we have in our minds of the size, shape and form of our bodies; and our feelings concerning these characteristics of our constituent body parts.” Body image consists of two components including (a) perceived body image and (b) body dissatisfaction (Skrzypek et al., 2001). Perceived body image is the way a person perceives their current body size or shape to be. A person can perceive their body image as negative if they see themselves as being much larger (or smaller) than they actually are. Body dissatisfaction is the difference
between perceived body image (how they feel they currently look) minus their ideal body image (the body shape or image that someone would most want to look like). Children with body dissatisfaction are unsatisfied with their body and wish they could be smaller (or larger in some cases). On the other hand, body image can be positive. Children with a positive body image have a true and clear perception of their body shape and feel comfortable and confident with their body shape. A positive body image can improve children’s self-esteem, self-worth, and self-confidence (Dunkan et al., 2002).

Body dissatisfaction has been shown to affect many individuals. In the past, teenage females and college age women have been the groups with the highest prevalence of body dissatisfaction. However, more research is looking at body image in younger children and how this affects them as they age (Lowes & Tiggemann, 2003). It has been found that children as young as 6 years old are dissatisfied with their bodies (Lowes & Tiggemann, 2003). Researchers have reported that females as young as 6, 7, and 8 years old rated their ideal body figure as significantly thinner than their current figure (Lowes & Tiggemann, 2003). Ideal body image is defined as the shape or figure a person would most want to look like. Lowes and Tiggemann (2003) suggested that young children have certain beliefs about the ideal body shape and are aware of dieting as a means for achieving this goal. Furthermore, Nichter and Nichter (1991) found that adolescent females thought the ideal body was 5’7”, 100 pounds, size 5 and had blond hair and blue eyes. If a female actually was 5’7” and weighed 100 pounds, her BMI would be 15.61 which is considered extremely underweight and very unhealthy. This unattainable, western ideal of body shape leads children to have more body dissatisfaction.
Importance of Studying Body Image

Body image is important to study in children because it affects their self-esteem both now and when they are older (Dunkan et al., 2002; Meijboom et al., 1999). Self-esteem can also influence how children stereotype other people. Tiggeman and Wilson-Barrett (1998) found that the level of body dissatisfaction correlated negatively with self-esteem and positively with negative stereotyping in males, but not in females. Children can hold very negative views about obese people (Tiggemann & Wilson-Barrett, 1998). These negative views are very influential in determining their beliefs concerning correct and incorrect body size. Our society’s values on attractiveness and thinness can lead a number of men, women, and children to be preoccupied with trying to be thin.

Body image is also important to study since numerous reports have linked body dissatisfaction in adolescents to disordered eating later in life. Schur, Sanders, and Steiner (2000) reported that 16% of male and females aged 8-13 years had already made an effort to alter their weight by either changing food choices or exercising. Thelen and Cormier (1995) found that 28% and 21% of fourth grade females and males, respectively, had already dieted at least once. Gustafson-Larson and Terry (1992) found that 40% of fourth grade children reported very often or sometimes dieting, while 80% reported very often or sometimes altering their food choices to prevent gaining weight.

Body Image in Males vs. Females

Body image, even though it is mostly researched in young females, is also a problem for young males. A comprehensive analysis of previous research on body image found that many males of all ages can be dissatisfied with their bodies (Cohane & Pope, 2001). Males who express the most body dissatisfaction were those who believed they
were underweight and thus wanted to gain weight (Cohane & Pope, 2001). On the other hand, males tend to have a better judge of their actual body size compared to females. Kostanski and Gullone (1998) looked at body image dissatisfaction in 12-18 year old adolescents and they found that females tended to rate their perceived body image as being two sizes larger than their ideal figure, whereas males rated their perceived body image within two sizes of their idealized norm. In both males and females, it was found that high levels of body dissatisfaction were more associated with lower levels of self-esteem than actual body mass (Kostanski & Gullone, 1998). Barker and Galambos (2003) found that in females, risk factors for body dissatisfaction included a higher BMI, greater effort to manage body shape and size, and being teased about appearance. In this study, for males, it was found that being teased was the only factor that negatively affected body image. By high school, females have been reported to be three times as likely as males to perceive themselves as overweight despite being underweight or average weight (Barker & Galambos, 2003). Overall, males can be affected by body dissatisfaction, but they may not be as susceptible to body dissatisfaction as females. Furthermore, males’ body dissatisfaction tends to not be as severe as females’ body image dissatisfaction and males tend to want a larger body size whereas females tend to want a smaller body size.

*Age Affecting Body Image*

Age can also affect body image. Some studies have suggested that body image is more negative when a child is young and going through puberty, but as a person gets older they tend to accept and embrace their body. For example, a study done by Cash, Winstead and Janda (1986) mentioned that adolescents place more importance on and
feel more negatively about their bodies than older adults. Other studies support these findings (Rosenblum & Lewis, 1999; Schur et al., 2000). Although these studies show body dissatisfaction declines with age, some recent studies have shown that older adults can still have relatively high levels of body dissatisfaction (McCabe & Ricciardelli, 2004; McLaren & Kuh, 2004).

**Body Size Affecting Body Image**

A number of studies show that there is a relationship between body dissatisfaction and weight, meaning that children who have a higher BMI have higher body dissatisfaction (Hill & Silver, 1995; Kostanski & Gullone, 1998; Tiggemann, & Pennington, 1990). Only one study has looked at the relationship between body image and percent body fat. Dunkan et al. (2002) looked at percent body fat among British school children ages 11-14 using skinfold indices. They found that boys and girls who had a lower percent body fat had a more positive body image. With overweight rates on the rise, it is likely that in the future we may see more children with increasing body dissatisfaction.

**External Factors that Affect Body Image**

**Parental Perceptions of Weight Status of Children**

Many studies have found that parents play a role in how children develop thoughts and ideas on body image (Field, Camargo, Taylor, Berkey, Roberts, & Colditz, 2001; Maynard, Galuska, Blanck, & Serdula, 2003; Ricciardelli, McCabe, & Banfield, 2000). Parents can contribute to children’s body image in many ways, such as their assessment of a child’s appearance, their emphasis on thinness and dieting, and their own body image dissatisfaction.
Parent’s assessment of the child’s weight can have a significant role in developing body image in children. Striegel-Moore and Kearney-Cooke (1994) found that parents are more likely to focus on physical appearance in females, whereas in males, they tend to emphasize athletic skills. Age is a significant factor in how parents perceived the child (Striegel-Moore & Kearney-Cooke, 1994). Parents with younger children evaluated the child’s physical appearance, as well as eating and exercise habits, more positively than parents with older children. They also reported, the younger the child, there was higher levels of praise and lower levels of criticism related to physical appearance. Hence, parents tend to increase criticism with increasing age of the child. Furthermore, mothers tend to be more critical of daughters and more correctly identify daughters as overweight than their sons (Maynard et al., 2003).

The role of parental influence on dieting and body awareness can shape children’s attitudes about body image. Field et al. (2001) observed that children who perceive that their mothers are frequently trying to lose weight were more likely to become highly concerned with weight or to be constant dieters. Several other studies have found that females whose mothers diet and are concerned with their weight are more likely than their peers to develop unhealthy weight control practices (Hill & Franklin, 1998; Pike & Rodin, 1991).

The parent’s body image dissatisfaction has also been identified as a factor influencing body image in children. When looking at parent’s body image dissatisfaction, Lowes and Tiggeman (2003) found children who perceived their mothers to desire a thinner figure also tended to desire a smaller ideal figure than their current size. Interestingly, in this study, neither males’ nor females’ body image correlated
significantly with their perception of their father’s level of body dissatisfaction. These studies offer evidence that parents play a role in the transmission of values about desirable body weight and shape.

Media

The media offers powerful messages regarding the acceptability and unacceptability of certain physical attributes. The exposure to media is highly correlated to body dissatisfaction (Field, Cheung, Wolf, Herzog, Gortmaker, & Colditz, 1999). Intervention studies by Groesz, Levine, and Murnen (2003) discovered that after young females watched TV or looked at magazines of thin models, the body image dissatisfaction of the females was significantly higher than after viewing average sized models, plus sizes models or inanimate objects. In fact, in a recent study, it was found that, for 15-year old females, the media provided the strongest pressure to be thin in their environment (Wertheim, Paxton, Schutz, & Muir, 1997). Field et al. (1999) observed that the frequency of reading fashion magazines was positively associated with the prevalence of having dieted to lose weight, having gone on a diet because of a magazine article, and exercising to lose weight or improve body shape. Together, these studies provide strong evidence that media can be a very powerful tool in shaping body image in children.

Physical Activity

There are many benefits of physical activity in children, such as increasing cardiovascular endurance, decreasing risk of certain diseases such as overweight, type 2 diabetes, cardiovascular disease, and improving psychological health. The relationship of physical activity and body image is complex. That is, studies suggest physical activity
can have both a positive and negative effect on body image. For example, Kirkcaldy, Shephard, and Siefen (2002) found that frequent participation in physical activity led to increased self image and an increase in physical and psychological well-being in adolescent males and females ages 14-18. Promotion of physical fitness in adolescents could lead to decreasing body mass and could help promote a more favorable body shape. Exercise could also provide more positive social feedback and could subsequently lead to improvement in an individual’s self-esteem and self-image (Kirkcaldy et al., 2002).

On the other hand, there have been studies that show desiring a thin figure is motivation for excessively high physical activity levels. In one study, girls who wanted to look like media figures spent 3.5 hours more per week exercising than other girls who didn’t want to look like media figures. Also, boys who wanted to look like media figures spent 6 hours more a week exercising than boys who didn’t want to look like media figures (Taveras, Rifas-Shiman, Field, Frazier, Colditz, & Gillman, 2004). Body image may be an important variable in children’s wellness and participation in physical activity (Dunkan et al., 2002).

Body Image and Culture

Concepts of physical attractiveness and body image are culturally determined. Indeed, studies demonstrate different accepted body shapes for specific ethnic or racial groups. For example, Dunkan et al. (2002) reported that African American children had a more positive body image and lower percent body fat than white or Asian children of both genders. Furthermore, a study done by Thompson, Corwin and Sargent (1997) found that African American children are reported to have a heavier ideal size than white children. The study concluded that socioeconomic status, gender and race are all factors
that lead to determining body satisfaction (Thompson et al., 1997). As another example, Davidson, Thill, Welborn and Lash (2002) studied children ages 6-10 from the United States, China, and Turkey. Heavier female figures were chosen as ideal body figures by children from the Middle East, American children viewed very obese figures as their least preferred, and Chinese children revealed that they thought the extremely obese figures simply did not exist. These studies provide evidence that body image is influenced by culture and race.

**Socioeconomic Status (SES) Affecting Body Image**

Socioeconomic status can play a role in how children develop body image and self-esteem. O’Dea and Caputi (2001) found that male and female children and adolescents of lower socioeconomic status (SES) were significantly more likely to be overweight and were more likely to see themselves as being “too thin” than children from middle/high SES. The lower SES children were also currently trying to gain weight compared to their higher SES counterparts. Consistently, children of lower SES maintained a positive physical self-esteem despite being overweight. Authors of this study hypothesize that young people of lower SES may be resistant to socio-cultural influences, such as the media, affecting body image and that it may be possible that their self-esteem is enhanced by having a bigger body than their peers. The cause of the intriguing relationship between SES and body image in children requires further study.

**Tools to Assess Body Image**

There are many published methods used to assess body image in children. These include the Body Esteem Scale (Mendelson, Mendelson, & White, 2001), Body Image Assessment (Veron-Guidry & Williamson, 1996), Body Image Questionnaire (Dunkan et
al., 2002), Children’s Eating Attitudes Test (Maloney, McGuire, & Daniels, 1988), and Children’s Body Image Scale (Truby & Paxton, 2002). Each one of these methods is slightly different, but they have all been validated to assess aspects of body image in children.

The Body Esteem Scale has been used to measure children’s evaluations of their body and its appearance. The scale is made up of 24 yes-no questions, such as, “I like what I look like in a picture,” “My weight makes me unhappy.” A study done by Mendelson et al. (2001) used the body esteem scale and they found that the scale had a high reliability and was appropriate to use in adolescents. The advantages to this method include that it is easy to administer, and it measures body esteem in relationship to appearance and weight. However, it has only been shown to be valid in children 12 years and older and may not be appropriate for younger children with lower literacy skills.

The Body Image Assessment is another way to assess body image in children older than 8. There are two different forms; the Body Image Assessment for Children (BIA-C) and the Body Image Assessment for Preadolescents (BIA-P). With this assessment, children are shown pictures of different body types and asked to locate the picture that most looks like them and then also locate the picture they would most like to look like. This scale gives the perceived score minus the ideal score which reveals the child’s body dissatisfaction score (Veron-Guidry & Williamson, 1996). The BIA-C and BIA-P is a reliable and valid method to use with children when measuring body size dissatisfaction. This tool is easy to use and the pictures help the children understand the task better than verbal tests (Veron-Guidry & Williamson, 1996).
The Body Image Questionnaire was used in a study comparing body image and percent body fat in British school aged children ages 11 to 14. The Body Image Questionnaire measures individuals’ attitudes about their overall body satisfaction. This method was chosen for children in this study because it was easy to complete by children, it had a short number of questions and it did not use complex language (Dunkan et al., 2002). Validity of the test re-test reliability was supported for children ages 11-14, but further studies need to be done in order to validate it as a reliable method to use in younger children (Dunkan et al., 2002).

The Children’s Eating Attitudes Test (CHeat) is a 26-item self-report inventory that assesses dietary behaviors, food preoccupation, bulimia, and concerns about being overweight. It has been shown to have good validity and reliability in children eight years and older and has been used in many studies to measure eating disorder attitudes and children’s body image (Halvarsson, Lunner, & Sjoden, 2000; Markovic, Votava-Raic, & Nikolic, 1998; McVey et al., 2004; Ricciardelli et al., 2000; Smolak & Levine, 1994). The disadvantage to using this scale is that it focuses more on eating disorders in children rather than body image (Rolland et al., 1997).

The method used in this thesis is the Children’s Body Image Scale (CBIS) (See Appendix C). This method uses a set of pictorial scales for males and females containing several different body shapes. The pictures represent the standard percentile curves for BMI. This tool uses actual, perceived, and ideal body image to quantitative values for body size dissatisfaction and perceived body image. Actual body image is the image of what the researcher feels the child looks like. Perceived body image is the image of what the child currently thinks they look like and ideal body image is the image
the child would most want to look like. Like the BIA-C and BIA-P, the Children’s Body Image Scale has the child point to the picture that they feel best represents or looks like them (perceived figure) and the picture that they would most like to look like (ideal figure). The difference between the perceived and ideal figures is used as a way to measure the child’s level of body size dissatisfaction (Truby & Paxton, 2002). The one difference between the BIA-C/BIA-P and the Children’s Body Image Scale (CBIS) is the CBIS has the ability to measure body image perception because it has known BMI ranges of the picture scale. The CBIS was found to be a good method for use in measuring body image perception and body size dissatisfaction in females and adequate measure in males aged eight years and older (Truby & Paxton, 2002). The advantages of this method are it is easy to use and it is easy for the child to understand. Also this method does not require sophisticated technology to administer or analyze. A disadvantage of using this method is it is not reliable in children under age eight since the authors report that children under eight years old have a difficult time selecting an accurate picture of themselves (Truby & Paxton, 2002).

Measuring Body Size in Children

Assessing Weight in Children

It is very difficult to assess the weight status of children because of continuous growth. However, the availability of the CDC’s Body Mass Index (BMI) growth charts, has resulted in BMI being the preferred and predominant method to use in assessing size of children. BMI is calculated by taking the weight in kilograms divided by height in meters squared. The BMI charts establish specific percentiles for each sex and children ages 2-20 years (See Appendix B). These charts can be used to identify children and
adolescents with expected growth patterns and can be used to identify children who may need further evaluation.

The use of BMI charts has a few limitations such as it does not take into account lean body tissue verses fat tissue. However, because of the ability to quickly assess weight status, this method is commonly used.

Table 1

*BMI Classifications According to the Center for Disease Control, 2004*

<table>
<thead>
<tr>
<th>Classifications</th>
<th>Specific Percentiles for age and gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>Below the 5th percentile</td>
</tr>
<tr>
<td>Acceptable</td>
<td>Between the 5th and 85th percentile</td>
</tr>
<tr>
<td>At risk of overweight</td>
<td>From the 85th to the 95th percentile</td>
</tr>
<tr>
<td>Overweight</td>
<td>Over the 95th percentile</td>
</tr>
</tbody>
</table>

*Techniques for Measuring Body Fat in Children*

BMI, although a quick, easy tool to assess weight, does not provide information about body composition (i.e., the percent of weight that is composed of lean vs. fat mass). More expensive, intensive methods are needed to evaluate body composition in children. Measuring body composition can sometimes be difficult in children because of normal changes in body fat and bone growth during their growth phase. Current methods used include skinfold calipers, bioelectrical impedance, underwater weighing, dual energy X-ray absorption (DEXA), and air displacement plethysmography using the BOD POD.
There are several advantages and disadvantages when using each of these methods with children and other special populations as summarized in Table 2.
<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>% error/reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skinfold</td>
<td>* Easy to use</td>
<td>* Requires technical expertise</td>
<td>± 3-7%</td>
</tr>
<tr>
<td>Calipers</td>
<td>* Rapid</td>
<td>* Less accurate for person who is overweight</td>
<td>(Nicholson, McDufie, Bonat, Russel, Boyce, McCann et al., 2001)</td>
</tr>
<tr>
<td></td>
<td>* Non-invasive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Low Cost</td>
<td>* Only counts for subcutaneous fat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioelectrical Impedance</td>
<td>* Little technical to perform test</td>
<td>* Inaccurate if subject fails to follow strict guidelines</td>
<td>± 8%</td>
</tr>
<tr>
<td></td>
<td>* Takes less than 1 minute</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Mobile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underwater</td>
<td>* Most accurate</td>
<td>* Hard to use with special populations such as the elderly and children</td>
<td>± 1-2%</td>
</tr>
<tr>
<td>Weighing</td>
<td>* Costly equipment</td>
<td>* Time consuming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Requires technical skill</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 (continued)

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>% error/reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Energy</td>
<td>* Looks at bone density</td>
<td>* Costly equipment</td>
<td>± 1-2%</td>
</tr>
<tr>
<td>X-Ray</td>
<td>* Takes 10 minutes</td>
<td>* Small exposure to</td>
<td>(Fields et al.,</td>
</tr>
<tr>
<td>Absorption</td>
<td>* Can wear street clothes</td>
<td>radiation</td>
<td>2002)</td>
</tr>
<tr>
<td>Air Displacement</td>
<td>* Rapid</td>
<td>* Hydration status and</td>
<td>± 2-3%</td>
</tr>
<tr>
<td>Plethysmography</td>
<td>* Easy testing protocol</td>
<td>breathing can affect</td>
<td>(Fields et al., 20</td>
</tr>
<tr>
<td>(BOD POD)</td>
<td>* Good for special populations</td>
<td>results</td>
<td>02)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Costly equipment</td>
<td>(Lockner et al., 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02)</td>
<td></td>
</tr>
</tbody>
</table>

There have been a few studies done measuring the accuracy of these methods in children. In general, the most accurate methods for measuring body composition in children are DEXA, underwater weighing, and air displacement plethysmography.

Certain studies have shown that measuring air displacement plethysmography with the BOD POD is just as accurate as DEXA or underwater weighing (Fields & Goran, 2000; Nicholson et al., 2001). For example, Field and Goran (2000) compared the accuracy and precision of DEXA, underwater weighing, and air displacement plethysmography and found air displacement plethysmography was the only technique that could accurately, precisely and without bias estimate fat mass in children 9-14 years of age. Moreover, Fields and Goran (2000) and Nicholson et al. (2001) compared
skinfold calipers, bioelectrical impedance and air displacement plethysmography to DEXA and found that all methods used to estimate percent body fat significantly correlated with DEXA. Also, body fat estimation by air displacement plethysmography and DEXA did not vary with age or race. Researchers agreed that in children ages 6-14, percent body fat determined by air displacement plethysmography is equivalent to those obtained by DEXA in boys and underestimates the body fat of girls by a small, but significant amount (Nicholson et al., 2001).

Appalachian Region

The Appalachian region is a 200,000 square mile region that covers all of West Virginia and parts of 12 other states, including New York, Pennsylvania, Maryland, Virginia, Ohio, Tennessee, Kentucky, North Carolina, South Carolina, Georgia, Alabama, and Mississippi (See Appendix D). In general, Appalachia is an underdeveloped region characterized by lower socioeconomic status, lower levels of income, lower education, and lower standards of living than the rest of the United States (Appalachian Regional Commission, 2004b). Approximately 23 million people live in this region and over 42% of Appalachian residents live in rural areas where they experience greater poverty, less access to food and greater food security risks (Appalachian Regional Commission, 2004b). According to the Appalachian Regional Commission (2004b), the Appalachian counties that experience the greatest prevalence of poverty are generally located in Kentucky, West Virginia, Mississippi, and Ohio.

Characteristics of Appalachia

The Appalachian region is one of the poorest in the nation. In 2001, the unemployment rate was 5.3%, which was above the US national rate of 4.8%
Along with unemployment comes poverty. In 2001, the Appalachian region had 15% of its population living below the poverty level. This was higher than the national average of 13%. The per capita market income in 2001 for the United States was $24,819, whereas the Appalachian region’s per capita market income during this time was $19,210 (Appalachian Regional Commission, 2004b).

Education

The Appalachian region also suffers from lower levels of education. Although many Appalachians are well-educated, for some, education beyond elementary school is not considered important because it is not viewed as necessary to earning a living or in their traditional occupations (Prunell & Paulanka, 2005). Currently, 76.8% of Appalachian adults aged 25 years and older have a high school diploma compared with the national average of 80.1% and only 17.7% of Appalachian adults have a college degree compared with the national average of 24.4% (Appalachian Regional Commission, 2004b). Accordingly, in the 1999-2000 school year, one-third of Ohio’s 100 lowest performing school districts on the sixth grade math proficiency test were located in the Appalachian region (Ohio Appalachian Center for Higher Education, 2002).

Athens County, Ohio

Athens County is classified as a distressed Appalachian county (See Appendix E) (Appalachian Regional Commission, 2004b). Distressed counties are those with poverty and unemployment rates that are 150% or more of the national rates and 67% or less of U.S. average per capita market income (Appalachian Regional Commission, 2004b). Athens County has the highest poverty rate in the state with a poverty level (29%) that is
over double the national average (Appalachian Regional Commission, 2004b). Likewise, the per capita market income in Athens County is only $15,967, which is only 60.7% of the U.S. average per capita market income (Appalachian Regional Commission, 2004b).

**Health Status of Appalachia**

The health of Appalachian residents is influenced by their socioeconomic status. According to a 2004 Appalachian Rural Health Institute research report, the rate of heart disease in the Appalachian region of Ohio is 52% greater than the national average. Twenty-five percent of participants in the Appalachian Rural Health Institute study reported they had high cholesterol with only 52% currently taking medication to treat the condition (Appalachian Rural Health Institute, 2004). The reported rate of hypertension in this study was not significantly different than the national average; however, Hocking County, a nearby county of Athens, had a 26% greater incidence of hypertension that the national average (Appalachian Rural Health Institute, 2004). Pertaining to weight in the Appalachian region, the CARDIAC study found that over 44% of West Virginian children, living in rural counties of the state, were at risk of overweight or were overweight (Demerath et al., 2003). Overall, the Appalachian region is known for its high rates of cardiovascular disease, hypertension, hypercholesterolemia, overweight, and other health issues. These health implications can play a major role on the health status of children.

**Access to Healthcare**

Part of the reason for poor health status of Appalachian residents is that they do not have access to quality healthcare. Finally, even with access to quality care, many people cannot afford to go to the doctor (Pheley, Holben, Graham, & Simpson, 2002).
The status of profitable hospitals and nursing homes, mental health hospitals, drug and substance abuse facilities and obstetrics all play a role in an area’s health care. In 1999, over 25% of hospitals in the Appalachian region had severe financial problems, with many hospitals having to close down, resulting in decreased access to health care for numerous individuals living in rural areas (Appalachian Regional Commission, 2004a). The number of physicians and dentists in a region also affect access and quality of care for this region. Many family practice physicians end up practicing in metro areas instead of rural areas after residency (Rosenthal, McGuigan, & Anderson, 2000). Only 9% of the country’s physicians practice in rural areas, while 20% of the United States population lives in rural areas (Ricketts, 1999).

Food Security

Access to quality food can also contribute to overall health problems in the Appalachian region. Pheley et al. (2002) studied rural Appalachia and found that 23% of households were food insecure, which means that at all times, people did not have access to enough food for an active healthy life. With a national average for food insecurity of 11.1% (United States Department of Agriculture, 2004), this region of Appalachia Ohio is over twice that of the national average. Being food insecure affects physical functioning, bodily pain, general health, social functioning, physical and emotional problems, and mental health (Pheley et al., 2002). Food insecurity becomes important to health since people who do not get adequate nutrition often develop other chronic health concerns and have a decreased quality of life (Pheley et al., 2002).
Why Study Body Image in Children in Appalachia?

Studying more thoroughly and understanding body image in children in the Appalachian region is of great importance for several reasons. First, children are more prone to developing lower self-esteem, depression, eating disorders and dieting behaviors if they have a negative self-image of themselves. Second, children with higher body mass indexes have been found to have more body dissatisfaction. Third, living in the Appalachian region puts kids at greater risk for becoming overweight, and other chronic diseases such as type 2 diabetes, cardiovascular disease, asthma, high blood pressure and high cholesterol at a younger age. Fourth, there is a distinct cultural and economic climate of the region, which promotes many people who live in this area to have a sense of individualism, self-reliance, and pride (Ohio Appalachia Center for Higher Education, 2004). Furthermore, there is a sense of pride that makes them less likely to accept help or handouts from other people (Ohio Appalachia Center for Higher Education, 2004). Finally, this population has never been studied with respect to body image. Although body image is well studied in children in other parts of the country, nothing is known about how the unique cultural and high rates of overweight come together to influence body image.

Summary

Rates of overweight children have risen since 1963 and continue to rise. Today over 15% of adolescents are overweight and being overweight can put them at an increased risk of developing chronic diseases such as cardiovascular disease, type 2 diabetes, high cholesterol, hypertension, and overweight. These health problems caused by being overweight can be detrimental to these youth and can persist into adulthood.
Looking at body image in children is important because children with negative body image issues are more likely to suffer from depression, are more likely to have a lower self esteem, and are at a higher risk of developing eating disorders or dieting at a young age. In turn, this may exacerbate the overweight problem in children. Studying the Appalachian region is vital because this area of the country has a high percent of children who are overweight, this area suffers from a disproportionate amount of health problems, there are distinct economic and cultural characteristics to this region, and also there is currently no data related to body image in children for this region.
CHAPTER 3: METHODOLOGY

Many studies have assessed body image and body mass index in children. However, to the author’s knowledge, no studies have been conducted that assess body image in children and how it relates to their percent body fat in the Appalachian region. The purpose of this study is to: (a) assess the relationship between body image in children and how it relates to their percent body fat in Appalachian Ohio, and (b) identify how rates of overweight children living in the Appalachian region of Ohio compare to national averages of overweight children. This research project was approved by the Institutional Review Board (IRB) in the Office of Research Compliance at Ohio University before the study was conducted (See Appendix F).

This thesis was part of a larger study which measured body size, nutritional choices, food security, body image, physical activity, leisure time choices, and family health routines for children in Appalachian Ohio. Faculty involved in this comprehensive study include Dr. Sharon Rana, Dr. Darlene Berryman, Dr. Sharon Denham, Dr. David Holben, and Dr. Nancy Nisbett. Other co-investigators include Jessica Meek and myself. For this thesis, the only methods that are discussed are the methods to assess body image, body size, and percent body fat.

Subjects

Participants in this study included children between the ages of 6-15 who attended Intermediate Bank One Academy (Kids on Campus) and the National Youth Sports Program (NYSP) at Ohio University. Intermediate Bank One Academy is for children ages 5-11; families need to apply to the program and acceptance into the program is
typically reserved for children who qualify for free or reduced price lunches. The National Youth Sports Program is for children ages 9-16. This is a free program that allows youth to participate in different sports throughout the summer. NYSP does not have any restrictions in terms of income or financial need. Each family with children participating in an on-campus program was mailed a letter explaining the study, along with a consent form (See Appendix G) and a set of questionnaires to complete. From the questionnaires, only questions involving education and income were used as data for this thesis, but all the questionnaires were necessary for the larger comprehensive research study. The children were required to have a parent/guardian sign the consent form giving the child permission to participate in the study. The parents were sent a self-addressed, stamped envelope in order to return the consent form and the questionnaires. The children of parents who returned a signed consent form were invited to participate in the study ($N = 65$, 34 females and 31 males). Subjects signed an assent form (See Appendix H) stating that they had been informed of the measurements to be taken and that they were aware that they can withdraw from the study at any time without affecting their relationship with the researchers.

In order to maintain anonymity and confidentiality during the study, researchers made a code key for each family and each child participating in the study. Before mailing out the questionnaires, researchers coded each questionnaire. The informed consent was the only form that identified the parents, but it was separated from the questionnaires so the family and child could not be identified. Only one researcher (Dr. Sharon Rana) had the code key in order to match the child with the proper code, but on all other documents, the code was used instead of the child’s or family name. The code
was locked in a file cabinet and will be destroyed after 10 years. Parents were informed of this in the consent form.

Measurements

In order to gather information about body size, percent body fat, and body image multiple measurements were taken. Note that additional data were collected on this cohort by other researchers. Only methods used to address research questions for this thesis are presented.

**Anthropometry**

In order to assess body size, researchers measured each child’s height and weight while the child was dressed in a swim suit. In order to help the children feel comfortable during the measurement process, researchers used small groups of children. Height was measured without shoes using a wall mounted stadiometer (Seca). Weight was measured using a highly sensitive spring loaded scale (Life Measurement Inc, Concord, CA) accurate to the nearest 0.1kg. The scale was calibrated each day to ensure accuracy.

In order to assess percent body fat, researchers used the BOD POD (Life Measurement Inc, Concord, CA) and skinfold calipers. For the BOD POD, the child sat inside the egg shaped container wearing a bathing suit and a swim cap. The BOD POD is a non-invasive procedure that measures the amount of air displaced. The amount of air in the lungs is measured by having the child puff into a tube three times while sitting in the BOD POD. Since BOD POD currently does not have an equation to use with children, researchers used the density of the child as determined by the BOD POD and then calculated the child’s percent body fat using age-appropriate equations shown in Table 3. (As recommended by Lohman (1986), children ages 11 or 12, go in the 11-13 age group,
if they are 13, they go in the older ages 13-15 group). Two body density measurements were taken with the BOD POD, and if these did not agree, a third measurement was taken. If the third measurement did not resolve the discrepancy, then researchers had to rely only on percent body fat based on skinfold measurements as described below. Body mass index [weight (kg)/height (m$^2$)] was also calculated for each child.

Table 3

*Age Appropriate Equations for Determining Percent Body Fat Using Body Density*

<table>
<thead>
<tr>
<th>Ages</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages 7-9</td>
<td>% Fat = (5.38/Db - 4.97) x 100</td>
<td>% Fat = (5.43/Db - 5.03) x 100</td>
</tr>
<tr>
<td>Ages 9-11</td>
<td>% Fat = (5.30/Db - 4.89) x 100</td>
<td>% Fat = (5.30/Db - 4.89) x 100</td>
</tr>
<tr>
<td>Ages 11-13</td>
<td>% Fat = (5.23/Db - 4.81) x 100</td>
<td>% Fat = (5.25/Db - 4.84) x 100</td>
</tr>
<tr>
<td>Ages 13-15</td>
<td>% Fat = (5.08/Db - 4.64) x 100</td>
<td>% Fat = (5.12/Db - 4.69) x 100</td>
</tr>
<tr>
<td>Ages 15-17</td>
<td>% Fat = (5.03/Db - 4.59) x 100</td>
<td>% Fat = (5.07/Db - 4.64) x 100</td>
</tr>
</tbody>
</table>


For skinfold measurements, researchers took measurements using Lange skinfold calipers on the bicep, tricep, chest (males only), subscapular region, abdomen, iliac crest, thigh, and mid calf as recommended (Latin, 2001). To calculate percent body fat in males from skinfolds, researchers used the equation developed by Slaughter et al. (1988).
For males, the percent body fat equation is:

\[
\% \text{ Body fat} = 0.735 (\text{sum of the 2 skinfolds - calf, triceps}) + 1.0.
\]

For females, the percent body fat equation is:

\[
\% \text{ Body fat} = 0.610 (\text{sum of the 2 skinfolds - calf, triceps}) + 5.1.
\]

For both equations the \( R^2 = 0.77 \) and the percent error is equal to 3.8\% body fat (Slaughter et al., 1988).

*Body Image*

Measuring children’s body image was done by using a gender-appropriate scale called the Children’s Body Image Scale developed by Truby and Paxton (2002). There are two versions of the scale, one for each gender. Each gender-specific scale has a set of pictures ranging from 1-7 according to increasing size (See Appendix C). The picture scale has known body mass indexes of different sized children. Each number/picture represents a different BMI on the scale. The range of BMIs representing the males’s scale is (a) 14.0 - 14.6, (b) 14.7-15.5, (c) 15.6-16.5, (d) 16.6-18.5, (e) 18.6-24.9, (f) 25.0-28.4, and (g) 28.5-29. For female’s, the BMI range is (a) 13.0-13.5, (b) 13.6-14.9, (c) 15.0-16.6, (d) 16.7-17.7, (e) 17.8-19.4, (f) 19.5-24.6 and (g) 24.7-28.5. Corresponding numbers of 1-7 represent the letters a-g in order to figure out the body image dissatisfaction score and body image discrepancy score.

As discussed before, there are two components to body image: perceived body image and body dissatisfaction. To measure body dissatisfaction, the subjects were asked to choose which figure they felt best represented them (perceived body image), and then chose which figure they would most like to look like (ideal body image). According to Truby and Paxton (2002), the difference between the perceived minus the ideal represents
their body dissatisfaction score. The perceived minus ideal difference will provide a directional score such that a child wanting to be thinner will obtain a positive score and a child wanting to be larger will obtain a negative score. For example, children who perceive themselves as picture five, but then ideally want to look like picture three, will obtain a positive score of two. Along the same lines, a child wanting to be larger will obtain a negative score. In order to measure body image perception, researchers looked at the child and circled the picture they felt best represented the child (actual body image). Actual minus perceived body image is used to calculate body image perception.

Statistical Analysis

All collected data were entered using Statistical Package for the Social Sciences (SPSS version 11.5, 2002, Chicago, IL). Both non-responses and responses of “non applicable” to a question on the questionnaires were treated as missing values. Descriptive statistics were used to summarize variables and were presented in terms of mean and standard deviation or correlations. A $p$ value of $<0.05$ is considered statistically significant. Dependent $t$-tests were used to determine if there was a difference between actual BMI and perceived body image and to determine if there was a difference between perceived body image and ideal body image in children ages 6-15. A Pearson’s correlation was used to determine if there was a relationship between perceived body image and percent body fat determined by skinfold calipers in children. A Pearson’s correlation was also used to determine if there was a relationship between perceived body image and BMI. A 2x3 repeated measures analysis of variance (ANOVA) was used to determine significant differences between perceived, actual and ideal body images when looking at the group as a whole. After completing the ANOVA,
researchers used Tukey’s Honestly Significant Difference test to determine which groups had significant differences. A paired sample $t$-test was used to determine significant differences between male skinfold caliper and male BOD POD data and female skinfold caliper and female BOD POD data. Researchers also compared body fat percentages of our population to national percentages of overweight children provided by the most recent National Health and Nutrition Examination Survey V, (1999-2002) data (Center for Disease Control, 2004a)
CHAPTER 4: RESULTS

Demographics of Families and Children

Seventy-four children participated in the study. Throughout the data collection period, nine children dropped out of the program which excluded them from the study. Of the final 65 participants, 34 were female (52%) and 31 were male (48%). Participants were between the ages of 6-15 and there was a normal distribution of ages for both genders as shown in Figure 1. The average age of males was 9.9±2.1 years and the average age of females was 9.8±1.8 years.

*Figure 1*. Age distribution of male and female participants.
The city of Athens has a major university and is sometimes not representative of the Appalachian region or of Athens County. Therefore, researchers attempted to see if this cohort was reflective of the norm for this region (i.e., less education and lower income). Our population had some differences compared to the rest of Appalachia with respect to education and income level (See Table 4 and 5). In our study, 45.4% of mothers or fathers had earned a bachelor’s, associate, or master’s degree. Compared to the entire Appalachian region, this is a fairly high percentage because only 32.7% of people living in the Appalachian region have a bachelor’s, associate, or master’s degree. Another 15% of mothers and fathers had also completed a doctoral degree or a post-doctoral degree bringing the percentage of mothers and fathers who have earned a bachelor’s degree or higher to 56.5%. Data on doctoral degrees or post doctoral degrees were not available for Athens or Appalachia (Appalachian Regional Commission, 2004b).

With respect to income, this cohort, on average, made more money than the average income in the Appalachian region. According to the Appalachian Regional Commission (2004b), the average income in 2001 for the entire Appalachian region was $24,912. In 2001, the mean average income in Athens, Ohio was $19,805. The mean income for the families in our study was approximately $34,250. Approximately 14% of families in our study made between $20,000-$30,000. Fifty-two percent of families earned above the average, and 34% of families earned below the average for this region.
Table 4

Mother’s and Father’s Highest Level of Education

<table>
<thead>
<tr>
<th>Variable</th>
<th>f</th>
<th>%</th>
<th>Athens County</th>
<th>Appalachia</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school graduate or GED</td>
<td>24</td>
<td>18.0</td>
<td>34.2</td>
<td>41.0</td>
</tr>
<tr>
<td>Bachelors degree</td>
<td>26</td>
<td>19.4</td>
<td>12.6</td>
<td>17.7</td>
</tr>
<tr>
<td>Associate degree</td>
<td>21</td>
<td>15.6</td>
<td>6.5</td>
<td>7.0</td>
</tr>
<tr>
<td>Masters degree</td>
<td>16</td>
<td>12.5</td>
<td>13.1</td>
<td>8.0</td>
</tr>
<tr>
<td>Doctoral degree</td>
<td>8</td>
<td>5.9</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Completed post-doctorate</td>
<td>7</td>
<td>5.2</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note. Athens County data are from the U.S. Census Bureau, (2004) and Appalachian data are from the Appalachian Regional Commission, (2004b)
### Table 5

*Family Income Levels*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$f$</th>
<th>%</th>
<th>Athens County Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>13</td>
<td>20.0</td>
<td>9.5</td>
</tr>
<tr>
<td>$10,000-15,000</td>
<td>3</td>
<td>4.6</td>
<td>6.8</td>
</tr>
<tr>
<td>$15,000-20,000</td>
<td>6</td>
<td>9.2</td>
<td>12.8 (15-25,000)</td>
</tr>
<tr>
<td>$20,000-30,000</td>
<td>9</td>
<td>13.8</td>
<td>14.8 (25-35,000)</td>
</tr>
<tr>
<td>$30,000-40,000</td>
<td>12</td>
<td>18.4</td>
<td>18.5 (35-50,000)</td>
</tr>
<tr>
<td>$40,000-50,000</td>
<td>8</td>
<td>12.3</td>
<td></td>
</tr>
<tr>
<td>$50,000-75,000</td>
<td>8</td>
<td>12.3</td>
<td>18.9</td>
</tr>
<tr>
<td>More than $75,000</td>
<td>6</td>
<td>9.2</td>
<td>18.6</td>
</tr>
</tbody>
</table>

*Note.* Athens County percentage data are taken from the U.S. Census Bureau, 2004.

Unfortunately, our study did not use the ranges of income level used by the U.S Census making it difficult to compare data. The numbers in parentheses indicate the income range found on the U.S Census Bureau website.
Body Size

An alarming 45.9% of participants had a BMI that put them in the categories of “at risk of overweight” (85-95th percentile) or “overweight” (>95th percentile) (See Figure 2). When looking at genders 48% and 44% of males and females respectively had BMIs that classified them as at risk of overweight or overweight. There were no significant differences between males and females with respect to BMI values (female=20.8±6, males=19.4±4). Consistent with BMI, these subjects also had a relatively high percent of body fat. Forty-three percent of children had a percent body fat that was classified as moderately high, high, or very high as determined by skinfold calipers (See Figure 3). When comparing genders, there was a significant difference between males and females in percent body fat as determined by skinfold calipers (females=24.1±9%, males=20.9±7%; p<.05). Researchers normally expect this difference between females and males with this age group because as females begin puberty, their bodies begin to store more fat than males. When using the BOD POD, 37% of children were classified as having a percent body fat that was considered moderately high, high, or very high (See Figure 4). There was a significant difference between genders when comparing data from the BOD POD with females having significantly higher values than the males (females=24.4±12%, males=13.7±8%; p<.001). Table 6 summarizes participants’ body sizes determined by skinfold calipers, BOD POD, and BMI.
According to the Center for Disease Control (2004), 0-5\textsuperscript{th} percentile is considered “underweight”, 5-85\textsuperscript{th} percentile is considered “normal”, 85-95\textsuperscript{th} percentile is considered “at risk of overweight” and >95\textsuperscript{th} percentile is considered “overweight.”

*Figure 2.* BMI percentiles for all participants.
Figure 3. Percent body fat determined by skinfold calipers for males and females.
Figure 4. Percent body fat determined by BOD POD for males and females.
Table 6

Body Sizes of Participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skinfolds (%)</td>
<td>20.9</td>
<td>6.9</td>
<td>9.1 - 38.5</td>
<td>24.7</td>
<td>8.0</td>
<td>3.1 - 47.2</td>
</tr>
<tr>
<td>BOD POD (%)</td>
<td>13.7</td>
<td>7.8</td>
<td>2.0 - 30.1</td>
<td>24.4</td>
<td>11.8</td>
<td>8.2 - 51.7</td>
</tr>
<tr>
<td>BMI</td>
<td>19.4</td>
<td>3.6</td>
<td>15.3 - 26.1</td>
<td>20.8</td>
<td>5.7</td>
<td>14.7 - 37.1</td>
</tr>
</tbody>
</table>

BOD POD vs. Skinfold Calipers

Overall, percent body fat values were considerably different between the skinfold calipers and the BOD POD. However, when looking at gender, an interesting observation was made. That is, more consistent data were obtained for females rather than males. In females, there was no significant difference in the mean percent body fat values obtained with the BOD POD (24.4±12%) versus skinfold calipers (24.7±8%). On the other hand, there was a significant difference ($p<.001$) in the mean percent body fat values for males with the BOD POD (13.8±7.8%) versus skinfold calipers (20.7±7%). Potential causes of the gender differences will be discussed in the next chapter. Several studies have suggested that the accuracy of the BOD POD may vary in young children because of a child’s smaller density (Fields et al., 2002). In our study, age did not significantly impact the accuracy of the BOD POD or skinfold calipers. That is, the older children were not more likely than younger children to get accurate results between the two body fat measurements.
Body Image

Body Dissatisfaction

Overall, 69% of males and females were dissatisfied with their bodies (74% males and 65% females). There was no significant difference between gender when looking at body dissatisfaction. Of those who were dissatisfied, 55% and 56% of males and females, respectively, wanted to have a smaller body size and 19% and 9% of males and females, respectively, wanted to have a larger body size. In addition, there were more children who wanted a significantly smaller body size verses children who wanted a significantly larger body size. That is, seven children (11%) reported wanting to be three or four body sizes smaller verses only two children (3%) reported wanting to be three or five body sizes larger (See Figure 5).
The negative numbers represent children who wanted to be larger than their current size and positive numbers represent children who wanted to be smaller.

*Figure 5.* Body dissatisfaction score for males and females.

**Perceived, Actual, and Ideal Body Image**

There was a significant difference between perceived, actual, and ideal body images when looking at the group as a whole ($p<.001$). To determine the source of the significant differences, researchers used Tukey’s Honestly Significant Difference (HSD) test ($HSD = .48; p<.05$). Tukey’s HSD test revealed there was a significant difference between perceived and ideal body image ($HSD = .70; p<.05$) and between actual and ideal body image ($HSD = .64; p<.05$). This means children were not satisfied with their
current body shape and they wished for an ideal body image that was different than their perceived and actual body image. There was no significant difference between perceived and actual body image (HSD = .05; \( p > .05 \)) meaning children were able to accurately predict their correct size.

**Perceived Body Image and Gender**

Perceived body image is based on how a person perceives themselves to look. When looking at perceived body image and gender, females selected a larger perceived figure (3.9±1.46) than males (3.1±1.22), although the results were not significant.

**Body Image Perception**

Body image perception is the score that is based on actual body image determined by the researcher minus perceived body image determined by the child. Perception measures how close the child’s perceived body image is to the actual body image determined by the researcher. When comparing perception of body image, 38% of children perceived themselves the same as researchers perceived the child. Thirty-two percent of the children perceived themselves larger than what the researcher perceived them to be and 30% perceived themselves smaller than what the researchers thought the child looked like. Figure 6 shows the distribution of the children’s perception of their body image.
Negative numbers represent children who perceived themselves larger than the researcher perceived them and positive numbers represent children who perceived themselves as smaller than the researcher perceived them.

*Figure 6.* Perception of body image (actual – perceived) for males and females.

*Perceived Body Image Compared to Body Size*

Pearson’s correlation revealed a strong positive correlation between perceived body image and percent body fat as determined by either skinfold calipers \((r = .601; p < .01)\) or air displacement plethysmography \((r = .635; p < .01)\), for the group as a whole. This suggests the higher percent body fat of the child, the more likely they were to perceive themselves as having a larger figure.
When looking at gender, Pearson’s correlation revealed there was a strong positive correlation between males’ perceived body image and percent body fat as determined by skinfold calipers ($r = .650; p < .01$), however, male’s perceived body image was not correlated to percent body fat as determined by BOD POD ($r = .479; p > .05$).

When looking at females, Pearson’s correlation showed there was a weak, positive correlation between females’ perceived body image and percent body fat as determined by skinfold calipers ($r = .338; p < .05$) and BOD POD ($r = .407; p < .05$).

**Body Dissatisfaction Compared to Body Size**

There was a strong positive correlation between BMI and body dissatisfaction in females ($r = .656; p < .01$) and in males ($r = .623; p < .01$). Thus, the higher a BMI for a particular child, the more likely they were to be dissatisfied with their body. When looking at percent body fat determined by skinfold calipers, there was only a moderate, but significant correlation between percent body fat and body dissatisfaction in females ($r = .436; p < .05$) and males ($r = .441; p < .05$), respectively.

**Actual Body Image Determined By Researchers**

To determine if researchers did an adequate job of estimating the actual size of the child, we compared BMI to actual body image as determined by the researcher. Our data show that researchers did not do an adequate job at determining actual body size. When comparing measured body mass index to actual body size as determined by the researcher, researchers correctly estimated actual body size 42% of the time. Thus, the researcher was off more than half of the time. Estimating children’s actual size was difficult since pictures on the Children’s Body Image Scale were fairly similar between categories. It was difficult to estimate exactly which size the child most resembled on the
scale. Interestingly, when researchers estimated incorrectly, researchers always (100%) underestimated the child’s actual body size compared to the child’s BMI. Truby and Paxton (2002), developers of the Children’s Body Image Scale, also found there was a consistent bias towards underestimation of body size using this scale. Researchers still used actual body size as determined by the researcher in our comparison of data because that is the way the Children’s Body Image Scale is designed to be used.
The purpose of this research study was to assess body image in children ages 6-15 in the Appalachian region in order to provide further insight into the topic of body image in children. This chapter provides a discussion of the data, conclusions, and recommendations to improve body image among children of the Appalachian region.

The most striking finding of our study was the high prevalence of overweight children and high rate of body dissatisfaction of participants in our study. Our data revealed that 43.1% of children had a percent body fat that was classified as moderately high, high, or very high as determined by skinfold calipers. Also, an alarming 45.9% of participants had a BMI that put them in the categories of at risk of overweight or overweight. Along with being an overweight population, 69% of children in our study were dissatisfied with their body. Fifty-six percent of girls desired a smaller body figure, which is similar to what has been reported in other studies (Gustafson-Larson & Terry, 1992; Lowes & Tiggemann, 2003; Maloney et al., 1988; Rolland et al., 1997; Schur et al., 2000; Truby & Paxton, 2002). However, unlike previous studies, our results found a much higher proportion of males who desired a smaller body figure (55%) (Gustafson-Larson & Terry, 1992; Lowes & Tiggemann, 2003; Maloney et al., 1988; Rolland et al., 1997; Schur et al., 2000; Truby & Paxton, 2002).

Appalachia

Our participants did not represent the typical status of individuals residing within the Appalachian region. Both level of income and education were higher than reported for Appalachian counties. The discrepancy in the educational level of parents in our
sample can most likely be explained by the fact that Athens has a major university; thus, many adults in this region work for the university or come to this area to pursue an educational degree. The close proximity of a university in Athens likely increased the level of education completed by the parents of study participants. As for income, Bank One Intermediate Academy requires at least 75% of participants need to be children whose families qualify for the free and reduced food program. To qualify for free and reduced food, there are Summer Food Service Program Family Size/Income Guidelines that indicate if a family qualifies for free or reduced food based on the number of people in the household and the household’s yearly income. The National Youth Sports Program did not require participants to be within a certain income bracket and because approximately half our participants were from this program, their data likely skewed the income level of our study participants.

Prevalence of Overweight Children

According to National Health and Nutrition Examination Survey, 1999-2002, 16% of children ages 6-11 and adolescents ages 12-18 nationwide are considered overweight. Alarmingly, 45.9% of children and adolescents of our study were classified as “at risk of overweight” (19.7%) or “overweight” (26.2%) as determined by BMI. The high prevalence of obese children is similar to other data from children residing within the Appalachian region. Studies by Muratova, Islam, Demerath, Minor, and Neal (2001) found 40% of children in rural West Virginia had BMIs classified as at risk of overweight and 21% classified as overweight. A more recent study in rural West Virginia found that 44.5% of children had BMIs classified as at risk of overweight or overweight (Demerath et al., 2003). A study in the eastern part of Kentucky found 60% of males and 32% of
females were above the NHANES II 85th percentile for BMI (Crooks, 1999). These findings place Appalachian children significantly above the national average for prevalence of overweight children (16%). Interestingly, our data revealed a high rate of overweight children even though the participating families did not reflect the income or educational levels typical of Appalachian families. These findings suggest that the underlying cause of the high incidence of overweight in these children is beyond poverty and may be related to something that could be innate to the region or pervasive in the culture.

Results of our study are consistent with previous studies showing a high prevalence of overweight children in the Appalachian region, but because our subjects’ families tended to be better off economically, it suggests that there might be unique barriers to obesity prevention for the youth of this region. Due to geographical limits, about 42% of Appalachian residents live in rural areas, where they tend to experience greater poverty, less access to food, and less access to quality health care (Morris, Neuhauser, & Campbell, 1992). The geographic isolation typically results in inferior roads with poor maintenance, lack of public transportation, and large mountainous terrain or large bodies of water (Sims, 2002). Thirty-one of Ohio’s 88 counties have designated Health Professional Shortage Areas (HPSA), meaning they do not have enough health professionals to adequately serve the population (Sims, 2002). Athens is included as one of these counties. Residents of rural counties often live farther from health care resources and have a lower supply of health care providers (Sims, 2002). People of Appalachia may not receive periodic health examinations or counseling about exercise or diet due to
lack of health insurance, which may be a reason why this region has a higher percentage of children and adolescents who are overweight.

Diets of Appalachian residents may also contribute to the high rates of overweight people. According to Prunel and Paulanka (2005) many children and adolescents of the Appalachian region replace meals with snacks. The most common snacks are candy, salty foods, desserts, and carbonated beverages. It is possible that the people who live in the Appalachian region may not believe health and nutrition are an important aspect to life. In general, the culture of the Appalachian region may not stress nutrition and exercise as important as family, work, or other cultural beliefs and could be the reason why this region is known to have a higher prevalence of overweight people or children than other parts of the country (Prunell & Paulanka, 2005).

Body Size

Our study utilized two separate methods, air displacement plethysmography (BOD POD) and skinfold calipers, to estimate percent body fat. While data for the female subjects was consistent between the two methods, the values for males from the BOD POD appeared to be less accurate than the skinfold calipers. Most likely, the reason for the lower accuracy was that researchers did not control for variables, such as clothing worn, food eaten or participation in physical activity, prior to testing that are known to impact the BOD POD measurements. Since the female values seemed to be more consistent than the males and since diet and physical activity levels were not controlled for either gender, we assume that the most likely reason for the discrepancy between methods was that females always wore tight fitting suits. On the other hand, almost all males wore loose fitting shorts or baggy swim suits which would result in
lower percent body fat. Another reason for the discrepancy between the BOD POD and skinfold calipers include BOD POD measurements were only achieved by 38 participants instead of 65 participants with the skinfold calipers. The reason that fewer participants had BOD POD values is that the BOD POD is a large instrument that can be intimidating to a small child; thus, some children refused to participate in the measurement. Furthermore, even if the child did want to participate, the measurement did not always work. The BOD POD is a highly sensitive machine and, if at any point, the children did not breathe correctly, did not keep a tight seal around the mouth piece, moved, or giggled in the BOD POD then no measurement could be taken.

Despite our problems, the BOD POD could still be a valuable tool to use in young populations. Other studies have shown it to be just as accurate as underwater weighing when used on children (Fields et al., 2002; Lockner et al., 2000). In order to get more accurate results from the BOD POD, researchers would need to have more control for variables such as correct clothing worn inside the BOD POD, making sure participants do not eat or drink 5-6 hours before the measurement and controlling for physical activity done before the measurement. Unfortunately, the nature of these two summer programs makes it difficult to control for these variables, which could mean that skinfold calipers might be a better option for estimating body fat in future studies.

Researchers also used skinfold calipers to measure percent body fat. Researchers were able to get more data from skinfold calipers since children seemed more inclined to allow this measurement and because very little cooperation was needed from the children.
Body Image

Body Image in Females

As mentioned by Dunkan et al. (2002), body image may be an important variable in children’s quality of life, wellness, and physical activity participation. The development of a positive body image may also lead to improvement in exercise motivation and development of greater self-esteem and self-confidence. Our study found that 56% of females wanted to be smaller and 9% of females wanted a larger figure. Our results conform with many other studies that have reported approximately 50% of females wanting a smaller figure than their current body size (Gustafson-Larson & Terry, 1992; Lowes & Tiggemann, 2003; Maloney et al., 1988; Rolland et al., 1997; Schur et al., 2000; Truby & Paxton, 2002) and approximately 10% of females wanting a larger body size (Collins, 1991; Rolland et al., 1997; Schur et al., 2000; Truby & Paxton, 2002). Previous studies have attributed this large rate of females’ body dissatisfaction on our western culture, which places more pressure on females to be thin and on the pubescent changes in body shape (Kelly et al., 1999). Together, these factors may play a role in why more females tend to choose a smaller ideal figure; however, we did not look at the Tanner stage of development to address stage of puberty in our sample. Also, the fact that a majority of our population was overweight may contribute to the high rates of body dissatisfaction.

Body Image in Males

Recent studies have witnessed a striking increase in body image concerns among males (Cohane & Pope, 2001; Schur et al., 2000). Prior to the late 1980’s, body image was often considered primarily a female problem. However, several studies have shown...
that males also suffer from body image preoccupations (Cohane & Pope, 2001; Moore, 1990; Page, Phillips, & Olivardia, 1989). A unique discovery of our study was that a much higher percentage of males (55%) wanted a smaller figure than what has been reported previously in the literature. More troublesome is that since our researchers tended to underestimate size, body dissatisfaction rates were likely even higher. Several studies on body image and males from other parts of the nation have reported that approximately 30% of males want to be smaller (Gustafson-Larson & Terry, 1992; Lowes & Tiggemann, 2003; Maloney et al., 1988; Rolland et al., 1997; Schur et al., 2000; Truby & Paxton, 2002). Furthermore, other studies have also found that a majority of males, who are dissatisfied with their body, wish to be larger as opposed to smaller (Barker & Galambos, 2003; Cohane & Pope, 2001). Barker and Galambos (2003) also stated that when males are dissatisfied with their body their dissatisfaction tends to not be as severe as females’ body image dissatisfaction. The reason for the higher percentage of males in our study who wanted to be smaller could be due to the high prevalence of overweight children in this region. Most previous studies have not compared body image with actual body size and have also had lower rates of overweight children than in this study. Since this is the first study to address body image in males of the Appalachian region, it is also possible that males in this region of the country have unique body image pressures as compared with other areas of the country.

Even though our study found a high percent of males who wanted to be smaller, males (19%) were twice as likely to wish for a larger figure as females (9%). Similarly, studies by Truby and Paxton (2002) and Lowes and Tiggemann (2003) also found twice as many males than females wanting a larger figure. Thus, the trend for wanting a larger
body size between genders is similar to previous research although the absolute numbers are very different.

Kostanski and Gullone (1998) also stated that males tend to have a better judge of their actual body size as compared to females. In contrast, our data showed that males and females were quite similar at estimating their actual body size.

Perceived Body Image

Kostanski and Gullone (1998) found 67% of females tended to rate their perceived body image as being two sizes larger than their ideal figure, whereas males rated themselves within two sizes of their idealized norm. Our data revealed this same finding even though our numbers were not as extreme. Our data showed female’s perceived body image was approximately one size larger than their ideal body image, whereas in males, their perceived image was within one size of their ideal body image.

Body Dissatisfaction Compared to Body Size

BMI. Our study found that there was a strong positive correlation between BMI and body dissatisfaction in both males and females. Studies by Sands and Wardle (2003), Lowes and Tiggemann (2003), Rosenblum and Lewis (1999), and Kostanski and Gullone (1998) also found that body dissatisfaction was associated with a higher body mass index. Lowes and Tiggemann (2003) suggest that the positive correlation between body dissatisfaction and BMI in females is likely related to the physical changes that accompany puberty, which moves females away from the societal prescribed thin ideal (Kelly et al., 1999).
Percent Body Fat with Skinfolds

Our research found a significant positive correlation between percent body fat as determined by skinfolds and body dissatisfaction. This means the higher percent body fat a child had, the more body dissatisfaction they had. Studies by Dunkan et al. (2002) and Hill and Silver (1995) also found a positive correlation between percent body fat as determined by skinfolds and body dissatisfaction meaning the children with a higher percent body fat had more body dissatisfaction than children who were classified as having a normal percent body fat. The studies that have found a strong correlation between percent body fat and body dissatisfaction were performed in other regions of the United States or in other countries such as England or Australia. These regions likely have a higher socioeconomic status and may not have as high of prevalence of overweight children as the Appalachian region.

Future research should attempt to more fully examine the factors that contribute to obesity in this region. Because of the vast amount of data collected in this multidisciplinary study, one could look at how other factors, such as physical activity, television viewing, and parental perception of their child’s body image correlate with body weight. There are studies published that have shown these factors affect body image in children, but these topics have not been extended to the Appalachian region. In order to get a better feel of the culture of the region, qualitative research using focus groups and interviews discussing attitudes and beliefs about health, nutrition, physical activity, body image and other health related issues may be an important component of future studies. Ultimately, qualitative research could possibly identify needs of the community and could help develop programs that could be implemented to improve the
health status of the region. If this study were to be repeated, it is recommended that more time be allotted for BOD POD measurements and proper clothing be worn to comply with the BOD POD manufacturer recommendations. Also more meaningful data on income, education level, percent body fat and body image could be achieved if the researchers took a random sample from kids in Appalachia instead of a convenience sample.

*Children’s Body Image Scale*

Truby and Paxton (2002) found that there could be some error in testing perceived and ideal body image in children under eight years old because it is hard for them to select an accurate picture of themselves. Our data, however, did not find this be to true. Children under eight years old seemed to accurately judge their perceived image as well as older children.

The Children’s Body Image Scale (CBIS) seemed like an appropriate tool to use for our study even though researchers tended to underestimate actual body image. Developers of the Children’s Body Image Scale, Truby and Paxton (2002), also found there was a consistent bias towards underestimation of body size using this technique so it was not just our researchers who had difficulty determining actual body size. It is difficult to determine the actual size of the child because there are only slight differences between the different pictures of the CBIS. Also, the pictures on the scale are only 2-dimensional and the child is 3-dimensional. The authors of the CBIS suggest that different measuring strategies appear to result in different biases in children and adolescents. Bergstrom, Stenlund, and Svedjehall (2000) reported an overestimation of body perception when using a visual size estimation technique, whereas (Gardner et al.,
using a video adjustment estimation, reported a slight overestimation in younger children and underestimation in older children. Authors of the CBIS believe it is quite possible that young boys may not provide very reliable information on any figural rating scale and suggest that considerable caution should be taken when using body figure scales in young boys. The authors did not offer any other suggestions as to how to deal with researcher’s underestimation of body size in children. Besides underestimating children’s body size, the tool was easy to use and it was easy for the child to understand. Also, this method does not require sophisticated technology to administer or analyze. Overall, the CBIS is a good tool to use and would be a good tool to use in future research.

Recommendations

To the best of our knowledge, this is the first study to address body image in children residing within the Appalachian region. Because this was part of a much larger study that will hopefully be part of longitudinal data collection, it is important to consider ways in which recruitment and data collection could be improved in the future. The following recommendations could provide meaningful information:

1. Develop focus groups to try to address the culture along with attitudes and perception related to health, weight status and body image in children and their caregivers of the Appalachian region. Focus groups for males would be helpful in determining why a large majority of males in this area have greater body dissatisfaction than other studies involving body image and males.

2. Look at correlations between eating habits, physical activity, parental body image, socioeconomic status, and television viewing with body image to determine
factors that can play a role in body dissatisfaction and body size in the Appalachian region.

3. Take a sample from a rural Appalachian county without a major university to get data that better reflects this region.

4. If using the BOD POD, control for variables such as clothing worn, physical activity, and food consumed before the measurement to get accurate results.
References


pathobiological determinants of atherosclerosis in youth study. *Journal of the American Medical Association, 281*(8), 727-735.


Appendix A

Survey Instruments
Child Health Status Questionnaire

This form is used to indicate the health status of your child. This information will not be released to anyone and will be kept in a locked filing cabinet for 10 years and then destroyed. If this information is used for a research publication, the child’s name will not be used. The information will be identified by only a code number.

Date of Birth ________________________________

Height: ___ ft ____ in;  Weight: ___ lb

A: Weight and Physical Examination History:

Has your child gained weight in the past year? ( ) Yes ( ) No

If YES, about how many pounds? ___ lbs

Has your child lost weight in the past year? ( ) Yes ( ) No

If YES, about how many pounds? ___ lbs

What was the birth weight of your child? ____ lb _____ oz

How would you rate your child’s current weight?

( ) very underweight
( ) underweight
( ) normal weight
( ) overweight
( ) very overweight

What was the approximate date of your child’s last physical examination by a health care provider? Month _____ Year ______

Has your child’s health care provider told you in the last 12 months that your child’s weight is above the recommended level? ( ) Yes ( ) No

Has your child’s health care provider ever suggested any of the following? (check all that apply)

( ) child should change eating habits
( ) child should exercise
( ) child should maintain/lose weight

Has your child’s health care provider ever suggest your child limit his/her activity level? ( ) Yes ( ) No

If YES, what was recommended?
B. Child Health History (Check if your child had or has any of the following conditions)

- ( ) High Blood Pressure
- ( ) Heart Disease or Heart Problems
- ( ) Diabetes or High Blood Sugar
- ( ) High Blood Cholesterol
- ( ) High Blood Triglycerides

- ( ) Kidney Problems
- ( ) Asthma
- ( ) Allergies
- ( ) Others not mentioned

(please list):

____________________

D. Current Diet

Does your child follow a special diet?

- ( ) No
- ( ) Yes

If YES, please describe.

E. Family Health History (Check if any of your child’s parents/grandparents have or had any of the following conditions)

- ( ) High Blood Pressure
- ( ) Heart Disease or Dysfunction
- ( ) Diabetes or High Blood Sugar
- ( ) High Blood Cholesterol
- ( ) High Blood Triglycerides
- ( ) Kidney Problems
- ( ) Others not mentioned

(please list):

____________________
Summer 2004 Family Health Survey

In this survey, mother is the mother or mother figure of the children living in the household. Father means the father of the children in the family or the male figure giving the most support to the children (even if all children do not have the same father). If no mother or father figure is now living in the household then leave those questions blank. In some families, all children do not always live with their parents. Your answers should be about all children now living in your household.

1-6. List ages of all children attending summer camp programs

<table>
<thead>
<tr>
<th>Girl #1</th>
<th>Boy #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Girl #2</td>
<td>Boy #2</td>
</tr>
<tr>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Girl #3</td>
<td>Boy #3</td>
</tr>
<tr>
<td>______</td>
<td>______</td>
</tr>
</tbody>
</table>

Mother: (answer questions about the mother of the children in the household or the female figure currently giving the most care to children in the household, even if all children do not have the same mother).

7. Mother’s Age: __________

8. Marital Status (check one that is most true at present time):
   - Single
   - Married
   - Divorced
   - Separated
   - Living with partner/not married
   - Living with same sex partner
   - Mother deceased

9. Education: (check highest grade completed)
   - 8th grade or less
   - Some high school, but not completed
   - High school graduate
   - GED
   - Some college, no degree
   - Associate Degree
   - Bachelors Degree
   - Masters Degree
   - Doctoral Degree
   - Completed post-doctorate work

10. Is mother working outside the home? ______ Yes

10a. If working outside the home, how much: ______ Full-time
11. Rate mother’s health status within the last six months:
   Excellent _____ Very good _____ Good _____ Fair _____ Poor _____

12. Check all of the following that apply to the mother in the household:
   _______ A physical disability
   _______ A mental/emotional problems
   _______ Learning problems
   _______ Born too early (premature)

   Health problem she has had for a long time, please describe the problem(s)?

List current health problems

14. Please check what is most true currently of mother:

   _____ Has never smoke at all   _____ Has smoked more than 11 years
   _____ Has smoked 5 years or less   _____ Use to smoke, but does not smoke now
   _____ Has smoked 6-10 years

14a. Please check what is most true currently of mother:

   _____ Does not smoke at all   _____ Smokes 10 cigarettes or less daily
   _____ Smokes 11-20 cigarettes daily
   _____ Smokes more than a pack of cigarettes daily

14b. Please check what is most true currently of mother:

   _____ Has tried to quit smoking, but was not successful   _____ Quit smoking (how long ago)
   _____ Trying to quit smoking right now   _____ Smoking has never been a habit
   _____ Currently smoke, but would like to quit   _____ Currently smoke, but plan to quit

15. Please check what is currently most true for mother (alcohol refers to beer, wine, whiskey or any alcoholic drink):

   _____ Never drink alcohol   _____ Drinks alcohol 2 or less times weekly
   _____ Drinks alcohol daily   _____ Drinks alcohol 3-5 times a week
   _____ Drinks alcohol on special occasions   _____ Drinks little alcohol now, but was a problem in the past

15a. In the last six months, people in my family or friends have said my use of alcohol is a problem:

   _____ True   _____ False

15b. Prescription drug abuse has been a problem in the past:

   _____ Yes   _____ No

15c. Prescription drug abuse is currently a problem:

   _____ Yes   _____ No
16. Check the answer most true for mother (choose only one answer in this group):

- Participates in vigorous physical activity (active aerobic exercise lasting 20 minutes or longer)
  - Frequently (3-5 times a week)
  - Regularly (2-3 times/week)
  - Rarely

- Participates in moderate physical activity (exercise lasting 20 minutes or less)
  - Frequently (3-5 times a week)
  - Regularly (2-3 times/week)
  - Rarely

- Participate mainly in limited forms of physical activity
  - Most of the time

17. Please check the answer most true for mother:

- Slightly overweight
- Extremely overweight
- Underweight
- Weight is “just right”

16a. Height

16b. Weight

18. Does mother regularly takes drugs ordered by doctor? 

- Yes
- No

19. Does mother have any of the following conditions (check all that apply):

- High blood pressure
- Heart disease or dysfunction
- Diabetes or high blood sugar
- Asthma
- Depression
- Mental illness
- Kidney problems
- High blood cholesterol
- High blood triglycerides
- Cancer
- Others not mentioned: ____________________________

20. Please check all that are true for mother:

- Have seen a dentist in the last year
- Had a physical check-up in last year
- Have dental problems that need attention
- Had a mammography in last year
- Have seen an eye doctor in last year
- Had a pap smear in last year
- Been threatened with hitting or slapping
- Wear glasses
- Been treated violently by spouse or partner
- Had blood sugar checked in last year
- Pain (type ________________________)
- Have you ever seen a mental health professional
Father: (answer questions about the father of the children in the household or the male figure currently giving the most care to children in the household, even if all children do not have the same father).

21. Father’s Age: __________

22. Marital Status (check one that is most true at present time):
   ______ Single
   ______ Married
   ______ Divorced
   ______ Separated
   ______ Living with partner/not married
   ______ Living with same sex partner
   ______ Father deceased

23. Education: (check highest grade completed)
   ______ 8th grade or less
   ______ Some high school, but not completed
   ______ High school graduate
   ______ Some college, no degree
   ______ Bachelors Degree
   ______ Masters Degree
   ______ Doctoral Degree
   ______ Completed post-doctorate work

24. Is father working outside the home? _____ Yes _____ No
   24a. If working outside the home, how much: _____ Full-time
   ______ Part-time

25. Rate father’s health status within the last six months:
   Excellent _____ Very good _____ Good _____ Fair _____ Poor _____

26. Check all of the following that apply to the father in the household:
   ______ A physical disability
   ______ mental/emotional problems
   ______ Learning problem
   ______ Born too early (premature)
   ______ Health problem he has had for a long time, please describe the problem(s)?

27. List current health problems

28. Please check what is most true currently of father:
Does not smoke at all  
Has smoked more than 11 years  
Has smoked 5 years or less  
Use to smoke, but does not smoke now  
Has smoked 6-10 years

29a. Please check what is most true currently of father:
- Does not smoke at all
- Smokes 10 cigarettes or less daily
- Smokes 11-20 cigarettes daily
- Smokes more than a pack of cigarettes daily

29b. Please check what is most true currently of father:
- Has tried to quit smoking, but was not successful
- Quit smoking (how long ago_________)
- Trying to quit smoking right now
- Smoking has never been a habit
- Currently smoke, but would like to quit
- Currently smoke, but plan to quit

30. Please check what is currently most true for father (alcohol refers to beer, wine, whiskey or any alcoholic drink):
- Never drink alcohol
- Drinks alcohol 2 or less times
- Drinks alcohol daily
- Drinks alcohol 3-5 times a week
- Drinks alcohol on special occasions
- Drink little alcohol now, but it was a problem in the past

30a. In the last six months, people in my family or friends have said his use of alcohol is a problem:
- True
- False

30b. Prescription drug abuse has been a problem in the past:
- Yes
- No

30c. Prescription drug abuse is currently a problem:
- Yes
- No

32. Please check the answer most true for father:
- Slightly overweight
- Extremely overweight
- Underweight
- Weight is “just right”

32a. Height _________  
29b. Weight _________

33. Does father regularly takes drugs ordered by doctor?
- Yes
- No

34. Check the answer most true for father (choose only one answer in this
group):
Participates in vigorous physical activity (active aerobic exercise lasting 20 minutes or longer) (  ) Frequently (3-5 times a week) (  ) Regularly (2-3 times/week) (  ) Rarely
Participates in moderate physical activity (exercise lasting 20 minutes or less) (  ) Frequently (3-5 times a week) (  ) Regularly (2-3 times/week) (  ) Rarely
Participate mainly in limited forms of physical activity (  ) Most of the time

35. Does father have any of the following conditions (check all that apply):
_____ High blood pressure
_____ Heart disease or dysfunction
_____ Diabetes or high blood sugar
_____ Asthma
_____ Depression
_____ Mental illness
_____ High blood cholesterol
_____ High blood triglycerides
_____ Kidney problems
_____ Cancer
(Kind____________________________________________________)
Others not mentioned:
________________________________________________________________________

36. Please check all that are true for father:
_____ Have seen a dentist in the last year
_____ Had a physical check-up in last year
_____ Have dental problems that need attention
_____ Had blood sugar checked in last year
_____ Have seen an eye doctor in last year
_____ Have you ever seen a mental health professional
_____ Wear glasses
_____ Pain (type______________________)

******************************************************************************
**************
The following questions should be answered only about the children living in the household now.

36. How many children currently live in the home: ______________ (identify exact number)

37a. Do any of these children live with another parent or relative some of the time?
_____ Yes _____ No
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>37. Rate the overall health of your children who are attending summer camp this year:</td>
<td>Excellent_____ Very good_____ Good_____ Fair_____ Poor_____</td>
</tr>
<tr>
<td>38. Do any of your children who are attending camp this summer have health problems that are of concern? If so, identify the kinds of problems:</td>
<td>___________________________________________________________________________________</td>
</tr>
</tbody>
</table>
| 39. Check all of the following that apply to the children in the household attending camp (mark current age/gender of child): | ____ A physical disability, what kind ________________________  
____ Born too early (premature), how many____________ (children?)  
____ Need dental care, how many children ___________  
____ Mental/emotional problems, what kind ________________________  
____ Learning problems, what kind ________________________  
| 41. Have any of your children who are attending camp this summer (mark current age/gender of child): | ____ Been caught smoking cigarettes  
____ Been caught using smokeless tobacco  
____ Been caught using alcohol  
____ Been caught using prescription drugs illegally  
____ Been disciplined at school for fighting or hitting |
| 42. Would you say your children who are attending camp this summer are mostly (check all that apply): | ____ Overweight  
____ Underweight  
____ “Just right”  
42a. If any of your children are overweight, is the child: ____ Male  ____ Female  
____ N/A?  
42b. If any of your children are overweight, what age(s) are the children: | ____________________________________________________________________  
| 43. What concerns do your children who
are attending camp this summer have:

_____ None of the children currently have health problems

_____ Ongoing health problem(s), what is it (age/gender of child)?

_____ Problems at school, describe (age/gender of child):

_____ Problems with the law, describe (age/gender of child):

44. Do any of your children regularly take prescription drugs ordered by doctor?

_____ Yes   _____ No

******************************************************************************

Family Household Information

45a. How long have you lived in Athens County ________ If other county, give name________

45b. How many generations have lived in the area: ________________

45c. Were parents from this area? Mother’s family? _______ Father’s family?

45b. Were your grandparents from this area? Mother’s family _____

Father’s family ______

46. How often does your family go to church:

Several times a week _____ Weekly _____ Monthly _____ Special events _____

Never ______

46a. Who in your family goes to church (check the best answer)?

Whole family goes _____ Mother goes _____

Mother and children go _____ Father goes _____

All children go _____ Father and children go _____

Some children go _____
47. How would you rate your family’s health right now:
Excellent______ Very good______ Good______ Fair______ Poor______

48. Describe your family’s living arrangements (check all that apply):
_____ Rent a house
Rent a trailer
_____ Buying a house
_____ Buying a trailer
_____ Own a house
_____ Own a trailer
_____ Live in house with extended family
_____ Live in trailer with extended family
_____ Live in public housing
_____ Rent an apartment
_____ Other housing (please explain)

49. Does your family have health insurance for all family members?
50. Yes ______ No ______
If no, who is not covered:

49a. Does your family have dental insurance for all family members?
Yes ______ No ______

49b. What kind(s) of health insurance does your family have (check all that apply):
Private insurance (employer) _____ Medicare ______ Medicaid ______ Other

50. Family routines (mark the one most true for your family)

<table>
<thead>
<tr>
<th></th>
<th>ALWAYS</th>
<th>MOST OF TIME</th>
<th>SOMETIMES</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire family eats at least one meal together daily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Entire family eats all meals together daily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Entire family eats together on weekends.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mother plans meals for the week ahead of time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mother shops for groceries weekly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Mother shops for groceries monthly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### Entire family does some fun activity together daily.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
</table>

### Entire family does some fun activity together weekly.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
</table>

### Mother takes care of health care needs for the family.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
</table>

51. **Amount of money your family makes in a year (pick one):**

- Less than $10,000 ______
- More than $10,000/less than $15,000 ______
- More than $15,000/less than $20,000 ______
- More than $20,000/less than $30,000 ______
- More than $30,000/less than $40,000 ______
- More than $40,000/less than $50,000 ______
- More than $50,000/less than $75,000 ______
- More than $75,000 ______

52. **Have any of the following ever been a problem for your family (check all that apply):**

- Getting places (transportation?)
- Finding jobs to make enough money to cover living costs
- Telephone service
- Finding a doctor when needed
- Finding mental health services
- Affording doctor’s care
- Affording care for teeth
- Affording glasses or eye care
- Had to be late paying a utility bill (electric, gas, water)
- Had electric, gas or water shut off for non-payment
- Had difficulty finding good child care help
- Had to move because of not being able to pay the rent
Kids on Campus Food and Nutrition Survey 2004

Please circle the best answer

This survey should be completed by the female or male head of household. All survey questions should be answered about your household in the last 12 months. The survey will take about 10-15 minutes to complete.

1. How often have the following statements been true for you in the past 12 months? (circle one answer in each row)

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. “I worried whether our food would run out before we got money to buy more.”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>b. “The food that we bought just didn’t last, and we didn’t have money to get more.”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>c. “We couldn’t afford to eat balanced meals.”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2. How often have the following statements been true for you in the past 12 months? (circle one answer in each row)

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. “We relied on only a few kinds of low-cost food to feed the children because we were running out of money to buy food.”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>b. “We couldn’t feed the children a balanced meal because we couldn’t afford that.”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>c. “The children were not eating enough because we just couldn’t afford enough food.”</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

3. In the last 12 months, did you or other adults in your household ever cut the size of your meals or skip meals because there wasn’t enough money for food?

<table>
<thead>
<tr>
<th>No, Never</th>
<th>Yes, Almost every month</th>
<th>Yes, Some months but not every month</th>
<th>Yes, In only one or two month(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
4. Answer the following questions based on the past 12 months. (circle one answer in each row)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you ever eat less than you felt you should because there wasn’t enough money to buy food?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Were you ever hungry but didn’t eat because you couldn’t afford enough food.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Did you lose weight because there wasn’t enough food?</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

5. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn’t enough money for food? (circle one)

<table>
<thead>
<tr>
<th>Whole Day</th>
<th>Yes, Almost every Month</th>
<th>Yes, Some months but not every month</th>
<th>Yes, In only one or two months</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, Never</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

6. In the last 12 months, did you ever cut the size of any of the children’s meals because there wasn’t enough money for food? (circle one answer)

1 – yes 2 – no

7. In the last 12 months, did any of the children ever skip a meal because there wasn’t enough money for food? (circle one answer in each row)

<table>
<thead>
<tr>
<th>Meal Skipped</th>
<th>Yes, Almost every Month</th>
<th>Yes, Some months but not every month</th>
<th>Yes, In only one or two months</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, Never</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

8. Answer the following questions based on the last 12 months. (circle one answer in each row)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were the children ever hungry but you just couldn’t afford more food?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Did any of the children ever not eat for a whole day because there wasn’t enough money for food?</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
9. Do you have? (circle one answer in each row)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliable transportation to get food?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A garden in the spring and summer?</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

10. Do you use? (circle one in each row)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game meat for food</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Wild fish for food</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

11. Do you? (circle one in each row)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever worry about not having meat if you do not hunt or fish for food.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Depend on family members and friends outside of your household for food</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

12. Which programs do you currently participate in or have you participated in the last 12 months? (circle one answer in each row)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIC</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>WIC Farmer’s Market Program</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Food Stamps</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Food banks/food shelves</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Free or Reduced price school lunch</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Free or Reduced school breakfast</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Head Start</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other (please describe)</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

13. Is “pride” a reason that you would not seek help for your family from a supplemental food program? (circle one)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – yes</td>
<td></td>
<td>2 – no</td>
</tr>
</tbody>
</table>

14. My gender is: (circle one answer)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Female</td>
<td></td>
<td>2 – Male</td>
</tr>
</tbody>
</table>
MARKING INSTRUCTIONS

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

The RIGHT way 〇 to mark your answer!

The WRONG way □ □ □ to mark your answer(s)!

---

1. What is your AGE?
   ○ Less than 9 〇 13
   ○ 9 〇 14
   ○ 10 〇 15
   ○ 11 〇 16
   ○ 12 〇 17
   ○ 18 or older

2. Are you:
   ○ Male 〇 Female

3. Your Height

4. Current Weight (lbs)

5. Do you currently take multi-vitamins (like Flintstones, One-A-Day, etc.)?
   ○ No 〇 Yes → If yes:

6. How many teaspoons of sugar do you ADD to your beverages or food each day?
   ○ None
   ○ 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 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

---

Mark with a 〇 and a 2B pencil only. Use a NO. 2 PENCIL ONLY.
10. How many times each week (including weekdays and weekends) do you 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 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 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, etc.
   - Never
   - 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
   - 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?
   - 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, fried chicken)?
   - Less than once per week
   - 1 - 3 times per week
   - 4 - 6 times per week
   - Daily

DIETARY INTAKE

Estimate how often you eat the following foods:

**Example 1**: If you drink one can of diet soda 2 - 3 times per week, then your answer should look like this:

- Never
- 1 - 3 cans per month
- 1 can per week
- 2 - 6 cans per week
- 1 can per day
- 2 or more cans per day

**E1. Diet soda**
(1 can or glass)
- Never
- 1 - 3 cans per month
- 1 can per week
- 2 - 6 cans per week
- 1 can per day
- 2 or more cans per day
<table>
<thead>
<tr>
<th>BEVERAGES</th>
<th>FILL OUT ONE BUBBLE FOR EACH FOOD ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Diet soda (1 can or glass)</td>
<td>19. Soda - not diet (1 can or glass)</td>
</tr>
<tr>
<td>20. Hawaiian Punch, lemonade, Koolaid or other non-carbonated fruit drink (1 glass)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 cans per month</th>
<th>1 can per week</th>
<th>2 - 6 cans per week</th>
<th>1 can per day</th>
<th>2 or more cans per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per day</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example 2 If you eat:

- 2 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: ➔

<table>
<thead>
<tr>
<th>DAIRY PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per week</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per week</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 - 3 glasses per month</th>
<th>1 glass per week</th>
<th>2 - 6 glasses per week</th>
<th>1 glass per week</th>
<th>2 or more glasses per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Main Dishes

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. Instant breakfast drink (1 packet)</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
<tr>
<td>31. Whipped cream</td>
<td>- Never&lt;br&gt;- 1 - 3 times per week&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
<tr>
<td>32. Yogurt (1 cup) - Not frozen</td>
<td>- Never&lt;br&gt;- 1 - 3 cups per month&lt;br&gt;- 1 cup per week&lt;br&gt;- 2 - 6 cups per week&lt;br&gt;- 1 cup per day&lt;br&gt;- 2 or more cups per day</td>
</tr>
<tr>
<td>33. Cottage or mozzarella cheese</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 or more times per week</td>
</tr>
<tr>
<td>34. Cheese (1 slice)</td>
<td>- Never&lt;br&gt;- 1 - 3 slices per month&lt;br&gt;- 1 slice per week&lt;br&gt;- 2 - 6 slices per week&lt;br&gt;- 1 slice per day&lt;br&gt;- 2 or more slices per day</td>
</tr>
<tr>
<td>35. Cream cheese</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 or more times per day</td>
</tr>
<tr>
<td>36. What type of yogurt, cottage cheese &amp; dairy products (besides milk) do you use mostly?</td>
<td>- Nonfat/Skim&lt;br&gt;- Lowfat&lt;br&gt;- Regular&lt;br&gt;- Don't know</td>
</tr>
<tr>
<td>37. Butter (1 pat) - NOT margarine</td>
<td>- Never&lt;br&gt;- 1 - 3 pats per month&lt;br&gt;- 1 pat per week&lt;br&gt;- 2 - 6 pats per week&lt;br&gt;- 1 pat per day&lt;br&gt;- 2 - 4 pats per day&lt;br&gt;- 5 or more pats per day</td>
</tr>
<tr>
<td>38. Margarine (1 pat) - NOT butter</td>
<td>- Never&lt;br&gt;- 1 - 3 pats per month&lt;br&gt;- 1 pat per week&lt;br&gt;- 2 - 6 pats per week&lt;br&gt;- 1 pat per day&lt;br&gt;- 2 - 4 pats per day&lt;br&gt;- 5 or more pats per day</td>
</tr>
<tr>
<td>39. What form and brand of margarine does your family usually use?</td>
<td>- None&lt;br&gt;- Stick&lt;br&gt;- Tub&lt;br&gt;- Squeeze (liquid)</td>
</tr>
<tr>
<td>40. What type of oil does your family use at home?</td>
<td>- Canola oil&lt;br&gt;- Corn oil&lt;br&gt;- Safflower oil&lt;br&gt;- Olive oil&lt;br&gt;- Vegetable oil&lt;br&gt;- Don't know</td>
</tr>
</tbody>
</table>

### Cheeseburger (1)

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>41. Cheeseburger (1)</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
</tbody>
</table>

### Hamburger (1)

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>42. Hamburger (1)</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
</tbody>
</table>

### Pizza (2 slices)

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>43. Pizza (2 slices)</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
</tbody>
</table>

### Tacos/burritos (1)

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>44. Tacos/burritos (1)</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
</tbody>
</table>

### Which taco filling do you usually have?

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>45. Which taco filling do you usually have:</td>
<td>- Beef &amp; beans&lt;br&gt;- Beef&lt;br&gt;- Chicken&lt;br&gt;- Beans</td>
</tr>
</tbody>
</table>

### Chicken nuggets (6)

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>46. Chicken nuggets (6)</td>
<td>- Never&lt;br&gt;- 1 - 3 times per month&lt;br&gt;- Once per week&lt;br&gt;- 2 - 4 times per week&lt;br&gt;- 5 or more times per week</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>47. Hot dogs (1)</td>
<td>48. Peanut butter sandwich (1) (plain or with jelly, fluff, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>Never</td>
</tr>
<tr>
<td>1 - 3 per month</td>
<td>1 - 3 per month</td>
</tr>
<tr>
<td>One per week</td>
<td>One per week</td>
</tr>
<tr>
<td>2 - 4 per week</td>
<td>2 - 4 per week</td>
</tr>
<tr>
<td>5 or more per week</td>
<td>5 or more per week</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>54. Fish sticks, fish cakes or fish sandwich (1 serving)</td>
<td>55. Fresh fish as main dish (1 serving)</td>
</tr>
<tr>
<td>Never</td>
<td>Never</td>
</tr>
<tr>
<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>
</tr>
<tr>
<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>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>61. Spaghetti with tomato sauce (1 serving)</td>
<td>62. Eggs (1)</td>
</tr>
<tr>
<td>Never</td>
<td>Never</td>
</tr>
<tr>
<td>1 - 3 eggs per month</td>
<td>1 - 3 eggs per month</td>
</tr>
<tr>
<td>One egg per week</td>
<td>One egg per week</td>
</tr>
<tr>
<td>2 - 4 eggs per week</td>
<td>2 - 4 eggs per week</td>
</tr>
<tr>
<td>5 or more eggs per week</td>
<td>5 or more eggs per week</td>
</tr>
</tbody>
</table>
### MISCELLANEOUS FOODS

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
</table>
| **65. Brown gravy**                                                     | ○ Never  
○ Once per week or less  
○ 2 - 6 times per week  
○ Once per day  
○ 2 or more times per day |
| **66. Ketchup**                                                         | ○ Never  
○ 1 - 3 times per month  
○ Once per week  
○ 2 - 4 times per week  
○ 5 or more times per week |
| **67. Clear soup (with rice, noodles, vegetables) 1 bowl**              | ○ Never  
○ 1 - 3 bowls per month  
○ 1 bowl per week  
○ 2 or more bowls per week |
| **68. Cream (milk) soups or chowder (1 bowl)**                          | ○ Never  
○ 1 - 3 bowls per month  
○ 1 bowl per week  
○ 2 - 6 bowls per week  
○ 1 or more bowls per day |
| **69. Mayonnaise**                                                      | ○ Never  
○ 1 - 3 times per month  
○ Once per week  
○ 2 - 6 times per week  
○ Once per day |
| **70. Low calorie salad dressing**                                      | ○ Never  
○ 1 - 3 times per month  
○ Once per week  
○ 2 - 6 times per week  
○ Once or more per day |
| **71. Salad dressing (not low calorie)**                                | ○ Never  
○ 1 - 3 times per month  
○ Once per week  
○ 2 - 6 times per week  
○ Once or more per day |
| **72. Salsa**                                                           | ○ Never  
○ 1 - 3 times per month  
○ Once per week  
○ 2 - 6 times per week  
○ Once or more per day |
| **73. How much fat on your beef, pork, or lamb do you eat?**            | ○ Eat all  
○ Eat some  
○ Eat none  
○ Don't eat meat |

**74. Do you eat the skin of the chicken or turkey?**                    | ○ Yes  
○ No  
○ Sometimes |
# Breads & Cereals

<table>
<thead>
<tr>
<th>75. Cold breakfast cereal (1 bowl)</th>
<th>76. Hot breakfast cereal, like oatmeal, grits (1 bowl)</th>
<th>77. White bread, pita bread, or toast (1 slice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Never</td>
<td>□ Never</td>
<td>□ Never</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>□ 1 hour per week</td>
<td>□ 5 - 7 slices per week</td>
</tr>
<tr>
<td>□ 5 - 7 bowls per week</td>
<td>□ 2 - 4 bowls per week</td>
<td>□ 2 - 3 slices per day</td>
</tr>
<tr>
<td>□ 2 or more bowls per day</td>
<td>□ 6 - 7 bowls per week</td>
<td>□ 4+ slices per day</td>
</tr>
<tr>
<td></td>
<td>□ 2 or more bowls per day</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>78. Dark bread (1 slice)</th>
<th>79. English muffins or bagels (1)</th>
<th>80. Muffin (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Never</td>
<td>□ Never</td>
<td>□ Never</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>81. Cornbread (1 square)</th>
<th>82. Biscuit/roll (1)</th>
<th>83. Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Never</td>
<td>□ Never</td>
<td>□ Never</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 per week</td>
<td>□ 5 or more times per week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>84. Noodles, pasta</th>
<th>85. Tortilla - no filling (1)</th>
<th>86. Other grains, like kasha, couscous, bulgur</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Never</td>
<td>□ Never</td>
<td>□ Never</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>
</tr>
<tr>
<td>□ 5 or more times per week</td>
<td>□ 5 or more per week</td>
<td>□ 5 or more times per week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>87. Pancakes (2) or waffles (1)</th>
<th>88. French fries (large order)</th>
<th>89. Potatoes - baked, boiled, mashed</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Never</td>
<td>□ Never</td>
<td>□ Never</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 - 4 times per week</td>
<td>□ 2 - 4 orders per week</td>
<td>□ 2 - 4 times per week</td>
</tr>
<tr>
<td>□ 5 or more times per week</td>
<td>□ 5 or more orders per week</td>
<td>□ 5 or more times per week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Fruits & Vegetables

#### 90. Raisins (small pack)
- Never
- 1 - 3 times per month
- 1 per week
- 2 - 4 times per week
- 5 or more times per week

#### 91. Grapes (bunch)
- Never
- 1 - 3 times per month
- Once per week
- 2 - 4 times per week
- 5 or more times per week

#### 92. Bananas (1)
- Never
- 1 - 3 per month
- 1 per week
- 2 - 4 per week
- 5 or more per week

#### 93. Cantaloupe, melons (1/4 melon)
- Never
- 1 - 3 times per month
- 1 per week
- 2 or more times per week

#### 94. Apples (1) or applesauce
- Never
- 1 - 3 per month
- 1 per week
- 2 - 6 per week
- 1 or more per day

#### 95. Pears (1)
- Never
- 1 - 3 per month
- 1 per week
- 2 - 6 per week
- 1 or more per day

#### 96. Oranges (1), grapefruit (1/2)
- Never
- 1 - 3 per month
- 1 per week
- 2 - 6 per week
- 1 or more per day

#### 97. Strawberries
- Never
- 1 - 3 times per month
- Once per week
- 2 or more times per week

#### 98. Peaches, plums, apricots (1)
- Never
- 1 - 3 per month
- 1 per week
- 2 or more times per week

#### 99. Orange juice (1 glass)
- Never
- 1 - 3 glasses per month
- 1 glass per week
- 2 - 6 glasses per week
- 2 or more glasses per day

#### 100. Apple juice and other fruit juices (1 glass)
- Never
- 1 - 3 glasses per month
- 1 glass per week
- 2 - 6 glasses per week
- 1 glass per day
- 2 or more glasses per day

#### 101. Tomatoes (1)
- Never
- 1 - 3 per month
- 1 per week
- 2 - 6 per week
- 1 or more per day

#### 102. Tomato/spaghetti sauce
- Never
- 1 - 3 times per month
- Once per week
- 2 - 4 times per week
- 5 or more times per week

#### 103. Tofu
- Never
- 1 - 3 times per month
- Once per week
- 2 - 4 times per week
- 5 or more times per week

#### 104. String beans
- Never
- 1 - 3 times per month
- Once per week
- 2 - 4 times per week
- 5 or more times per week
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Never</td>
<td>Never</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>Once per week or less</td>
<td>1 - 3 times per month</td>
</tr>
<tr>
<td>Once per week</td>
<td>2 or more times per week</td>
<td>Once per week</td>
</tr>
<tr>
<td>2 - 4 times per week</td>
<td>5 or more 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>108. Peas or lima beans</th>
<th>109. Mixed vegetables</th>
<th>110. Spinach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Never</td>
<td>Never</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 a 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>111. Greens/kale</th>
<th>112. Green/red peppers</th>
<th>113. Yams/sweet potatoes (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Never</td>
<td>Never</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 a week</td>
<td>Once a 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></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Never</td>
<td>Never</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>117. Celery</th>
<th>118. Lettuce/tossed salad</th>
<th>119. Coleslaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Never</td>
<td>Never</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 - 6 times per week</td>
<td>2 - 6 times per week</td>
</tr>
<tr>
<td>5 or more times per week</td>
<td>One or more per day</td>
<td>One or more per day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>120. Potato salad</th>
<th>121. Beans/lentil/soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Never</td>
</tr>
<tr>
<td>1 - 3 times per month</td>
<td>Once per week or less</td>
</tr>
<tr>
<td>Once per week</td>
<td>2 or more times per week</td>
</tr>
<tr>
<td>2 or more times per week</td>
<td>Once per day</td>
</tr>
</tbody>
</table>
SNACK FOODS/DESSERTS

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

<table>
<thead>
<tr>
<th>Snacks</th>
<th>School Days</th>
<th>Vacation/Weekend Days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HOME</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>HOME</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>HOME</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>HOME</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>HOME</td>
<td>1</td>
</tr>
</tbody>
</table>

Think about your usual snacks. Estimate how often you eat each type of snack food.

Example 3. If you eat poptarts occasionally (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

123. 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

124. 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

125. 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

126. 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

127. Pretzels (1 small bag)
- Never/less than 1 per month
- 1 - 3 small bags per month
- 1 small bag per week
- 2 or more small bags per week

128. 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

129. Fun fruit (1 pack)
- Never/less than 1 per month
- 1 - 3 packs per month
- 1 - 4 packs per week
- 5 or more packs per week

130. Graham crackers
- Never/less than 1 per month
- 1 - 3 times per month
- 1 - 4 times per week
- 5 or more times per week

131. 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
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>132. Poptarts</strong></td>
<td><strong>133. Cake (1 slice)</strong></td>
<td><strong>134. Snack cakes, Twinkies (1 package)</strong></td>
</tr>
<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 - 3 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>1 or more per week</td>
<td>1 or more per day</td>
<td>1 or more per day</td>
</tr>
<tr>
<td><strong>135. Danish, sweetrolls, pastry (1)</strong></td>
<td><strong>136. Donuts (1)</strong></td>
<td><strong>137. Cookies (1)</strong></td>
</tr>
<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>1 or more per day</td>
<td>2 or more slices per week</td>
<td>4 or more cookies per day</td>
</tr>
<tr>
<td><strong>138. Brownies (1)</strong></td>
<td><strong>139. Pie (1 slice)</strong></td>
<td><strong>140. Chocolate (1 bar or packet)</strong></td>
</tr>
<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>1 or more per day</td>
<td>1 or more per day</td>
</tr>
<tr>
<td><strong>141. Other candy bars (Milky Way, Snickers)</strong></td>
<td><strong>142. Other candy without chocolate (mints, Lifesavers) (1 pack)</strong></td>
<td><strong>143. Jello</strong></td>
</tr>
<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>6 or more candy bars per week</td>
<td>5 or more times per week</td>
<td>5 or more times per week</td>
</tr>
<tr>
<td><strong>144. Pudding</strong></td>
<td><strong>145. Frozen yogurt</strong></td>
<td><strong>146. Ice cream</strong></td>
</tr>
<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>b or more times per week</td>
<td>5 or more times per week</td>
</tr>
<tr>
<td><strong>147. Milkshake or frappe (1)</strong></td>
<td><strong>148. Popsicles</strong></td>
<td></td>
</tr>
<tr>
<td>Never/less than 1 per month</td>
<td>Never/less than 1 per month</td>
<td></td>
</tr>
<tr>
<td>1 - 3 per month</td>
<td>1 - 3 popsicles per month</td>
<td></td>
</tr>
<tr>
<td>1 per week</td>
<td>1 popsicle per week</td>
<td></td>
</tr>
<tr>
<td>2 or more per week</td>
<td>2 - 4 popsicles per week</td>
<td></td>
</tr>
<tr>
<td>5 or more popsicles per week</td>
<td>5 or more popsicles per week</td>
<td></td>
</tr>
</tbody>
</table>
149. Please list any other important foods that you usually eat at least once per week that are not listed (for example, coconut, hummus, falafel, egg rolls, chili, plantains, mangoes, etc.)

**FOODS**

a) 

b) 

c) 

d) 

**HOW OFTEN?**

a) 

b) 

c) 

d) 

---

**THANK YOU FOR COMPLETING THIS SURVEY!**
Appendix B

Body mass index for age percentiles: Boys and Girls
2 to 20 years: Boys
Body mass index-for-age percentiles

<table>
<thead>
<tr>
<th>Date</th>
<th>Age</th>
<th>Weight</th>
<th>Stature</th>
<th>BMI*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*To Calculate BMI: Weight (kg) / Stature (cm) - Stature (cm) x 10,000
or Weight (lb) / Stature (in) - Stature (in) x 703

2 to 20 years: Girls
Body mass index-for-age percentiles

<table>
<thead>
<tr>
<th>Date</th>
<th>Age</th>
<th>Weight</th>
<th>Stature</th>
<th>BMI*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*To Calculate BMI: Weight (kg) = Stature (cm) + Stature (cm) x 10,000
or Weight (lb) = Stature (in) + Stature (in) x 703

Appendix C

Children’s Body Image Scale
Appendix D

Map of Appalachian Region
The Appalachian Region

Figure 1. Map of Appalachia.

Appendix E

Distressed Counties in Ohio
Appendix F

*Human Subjects Approval*
The following research study has been approved by the Institutional Review Board at Ohio University for the period listed below. This review was conducted through an expedited review procedure as defined in the federal regulations as Category(ies): 4

**Project Title:** A Comprehensive Study on Body Size, Nutritional Intake, Leisure Choices, Food Insecurity, and Family Health Routines of the Children and Families of SE Ohio

**Project Director:**
- Sharon Rana
- Darlene Barryman
- Nancy Nisbett
- Sharon Denham
- David Holben
- Jessica Meek
- Lisa Tulki

**Faculty Advisor (if applicable):**

**Department:** Human and Consumer Sciences

**Approval Date:** 4/30/04

**Expiration Date:** 4/29/05

This approval is valid until expiration date listed above. If you wish to continue beyond expiration date, you must submit a periodic review application and obtain approval prior to continuation.

The approval remains in effect provided the study is conducted exactly as described in your application for review. Any additions or modifications to the project must be approved by the IRB (as an amendment) prior to implementation.

Adverse events must be reported to the IRB promptly, within 5 working days of the occurrence.
Appendix G

Parent Consent Form
Ohio University Consent Form
Parents: Please sign this consent form after reading if you will allow your child to participate in this research project. If you do not sign the form, your child will not be able to participate. Please place your signed consent form in the self-addressed stamped envelope, and mail it back to the investigators. Thank you!

Title of Research: A comprehensive study on body size, nutritional intake, leisure choices, food insecurity, and family health routines of the children and families of SE Ohio.

Principal Investigator(s): Sharon Rana, School of Recreation and Sport Sciences; Nancy Nisbett, School of Recreation and Sport Sciences; Darlene Berryman, School of Human and Consumer Sciences; Sharon Denham, School of Nursing; Dave Holben, School of Human and Consumer Sciences

Federal and university regulations require signed consent for participation in research involving human subjects. After reading the statements below, please indicate your consent to allow your child to participate by signing this form.

Explanation of Study

Purpose of the research
The purpose of this research is to determine the food choices and activity choices and interests of the children of Southeast Ohio, the food security and health status of the families of these children, and how they relate to the body size and image of the children. “Food security” is the family’s availability of food or the ability of the family to obtain food.

Procedures to be followed
As a parent, you will be asked to fill out two questionnaires about your family and one questionnaire about each of your children who is participating in either Kids on Campus or the National Youth Sports program at Ohio University for the summer of 2004. You are also asked to sign the informed consent (this form). After doing so, please place these forms in the self-addressed stamped envelope provided and place in the mail. Your child will only be allowed to participate if you sign the informed consent form (this form). Upon signing this form, you also agree to allow the researchers to obtain the registration information you have sent for the summer program in which your child is participating.

If you give your child permission to participate, he/she will participate in the study while at the Kids on Campus or National Youth Sports summer program. The children will have body measurements taken including the following:

1. Resting blood pressure
2. Circumferences (taken with a measuring tape) including the head,
neck, shoulders, biceps, forearms, wrists, chest, abdomen, natural waist, hips, thighs, knees, calves, and ankles.

3. **Diameters** (taken with a large caliper): this is the distance between two bony landmarks to determine skeletal size. The body parts to be measured include distance between the acromion processes (shoulder size), elbow, wrist, chest breadth on males, hips, knees, and ankles.

4. **Skinfolds** (taken with a small caliper): this is the amount of skin and fat that can be pinched off of the body at certain places. The measurements include tricep, bicep, chest, subscapular (beneath the shoulder blade), suprailiac (above the hip bone), abdomen (next to the belly button), thigh, and calf.

5. **Bod Pod**: this is a piece of equipment that measures how much fat is on a person’s body. The child will sit quietly in a chamber for about 30 seconds while the machine takes its measurement. The child will also have to puff air into a tube so the machine can measure how big the lungs are.

The children will also fill out three questionnaires. One is to determine what kinds of leisure activity preferences (called the Leisurescope Plus). One will determine how often they eat different kinds of food (Food Frequency Questionnaire). The third will determine how they perceive their own body shape (Children’s Body Image Scale). The food frequency questionnaire may ask about alcohol consumption, *which is for the sole purpose of assessing calorie intake and nutrient consumption*. Any alcohol use will not be reported to the authorities, and you or your child can choose not to participate at any time if this makes them uncomfortable.

Duration of subject's participation
Each child that participates will probably be done in a total of one hour. The measurements may be done on separate days, but the total time involved will be approximately one hour. This is a longitudinal study, children who participate in this summer program in subsequent years will be asked to continue their participation in this study. At the end of the study, your child will be given an informational sheet about healthy eating. We will ask the child to bring this home for you to read and discuss with him or her.

Identification of specific procedures that are experimental
None of the measurements are considered experimental. Every measurement has been done numerous times, and there is very little risk involved.

**Risks and Discomforts**
The risks and discomforts of participating in this study are minimal. There may be slight discomfort during the skinfold measurements, since the skin has to be lightly pinched. The other discomfort may be during the Bod Pod measurement, since the child has to sit in a chamber for a few seconds, and although the chamber has a window, the child may not like the small space (about the size of a closet). If the child does not want to
participate in any measures, s/he will be free to decline without affecting his/her relationship with any investigator. Many of the body measurements will be done while the child is in their swimming suit. If this makes a child uncomfortable, the measurements can be done in regular clothes, although with less accuracy, or in a private space where no other children can see them.

**Benefits**
You will be informed of your child’s body measurements and answers to the leisure activity, nutritional, and body image surveys upon request. The summer programs will benefit from this study in learning what types of activities the children are interested in, so activities can be modified in the future, if necessary.

**Confidentiality and Records**
The records of the information gathered in this study will be kept in locked files in the researchers’ offices for 10 years. Each family and each participant will be given a code number and will only be identified by a number, not by name. A code key will be developed by the investigators to match the subject to their subject number in order to match data. Only the investigators will have access to the code key, which will be kept in a locked file in the researchers office and will be destroyed after 10 years. If the collected information is used for a publication, no participant will be identified by name, only subject numbers will be used. Also, the signed consent form will be kept in a separate place from the other forms, so no questionnaire or measurements can be identified by a name, only by code. This means not even the investigators will be able to match any of the forms filled out to any particular family or child, but can only match the codes.

**Compensation**
No compensation is being offered for participation in this research project.

**Contact Information**
If you have any questions regarding this study, please contact:

Sharon Rana  740-593-9494  
Nancy Nisbett  740-593-0637  
Darlene Berryman  740-593-9943  
Dave Holben  740-593-2875  
Sharon Denham  740-593-4499
If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740)593-0664.

Please sign below and return this sheet if you agree to participate and agree to allow your child to participate in this study.

I certify that I have read and understand this consent form and agree to allow my child to participate as a subject in the research described. I agree that known risks to my child have been explained to my satisfaction and I understand that no compensation is available from Ohio University and its employees for any injury resulting from my participation in this research. My child’s participation in this research is given voluntarily. I understand that my child may discontinue participation at any time without penalty or loss of any benefits to which he or she may otherwise be entitled. I certify that I have been given a copy of this consent form to take with me.

Child’s Name (printed)__________________________________________________________

Your Signature_________________________ Date ____________

Your Printed Name__________________________
Appendix H

Assent Form
Assent form/Agreement to Participate in Research Project

Title of Research: Leisure time and nutritional choices as compared to body size and image in children of Southeast Ohio.

The purpose of this research is to determine your food choices and activity choices and interests and how they relate to your body size and image.

You will have body measurements taken including the following:

1. Resting blood pressure: just like at the doctor’s office.
2. Circumferences (taken with a measuring tape) including the head, neck, shoulders, arms, forearms, wrists, chest, abdomen, waist, hips, thighs, knees, calves, and ankles: we will measure the distance around these body parts.
3. Diameters (taken with a large caliper): this is the distance between two points on your skeleton to determine its size. The body parts to be measured include the shoulders, elbows, wrists, chest for boys, hips, knees, and ankles. In other words, we want to find out how big your bones are.
4. Skinfolds (taken with a small caliper): this is the amount of skin and fat that can be pinched off of the body at certain places. The measurements include the back of the arm, front of the arm, chest, beneath the shoulder blade, above the hip bone, tummy, thigh, and calf.
5. Bod Pod: this is a piece of equipment that measures how much fat is on a person’s body. You will sit quietly in a chamber for about 30 seconds while the machine takes its measurement. You will also have to puff air into a tube so the machine can measure how big your lungs are.

You will also fill out three questionnaires. One is to determine what types of activities you like to do. One will determine how often you eat different kinds of food. The third will determine how you see your own body shape.

Some of the questions about what foods you eat ask about alcohol and drug use and may make you feel uncomfortable. Remember, you do not have to answer the questions and can choose not to participate at any time.

If you would like to participate in these measurements, you will need to sign your name below. If you sign this form, and then decide not to participate later on, you can just tell one of the investigators, and you do not have to continue participating. Your parents have given us permission for you to participate.
This research project has been explained to me and all of the questions I have about it have been answered. I agree to participate in this project and know that I can stop participating at any time.

_____________________________  _________________________
NAME                       DATE