

Nutrition Education: Health Promotion for the Next Generation

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by

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## NUTRITION EDUCATION: HEALTH PROMOTION

### Dedication and Acknowledgements

I would like to dedicate this capstone to the students I work with at Piper East Elementary. As the school nurse in this building, I see many of the students daily and am happy to care for their basic health needs at school. Although band aids and ice packs have their place in providing comfort, I hope to make more of an influence in the lives of these students. I hope to provide them with nutrition and health knowledge that they can carry with them as they grow and learn responsibility. My highest hope for these students is that they make take ownership and accountability for their health.

I would like to acknowledge my loving husband who has ensured I find balance while working on my degree. Doug, thank you for taking care of my nutritional needs (cooking, grocery shopping, packing lunches) while I write about the needs of others. More than that, thank you for supporting my decision to pursue my passion in nutrition. Your support means the world to me.

I would also like to thank my parents, Rick and Allison, and sister, Caitlin. Mom and Dad, thank you for raising me to “think outside the box” and always encouraging me toward a future in which I would find joy and purpose. I would not be who I am without you both. Caitlin, thank you for allowing me to read this capstone aloud to you, all 30 pages! And thank you for motivating me by example; your hard work as you advance in medical school is nothing short of amazing. I know you will go on to do great things!

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## NUTRITION EDUCATION: HEALTH PROMOTION

### Abstract

Childhood obesity is an ongoing issue in America. Although USDA guidelines attempt to regulate nutrition in schools, further intervention is necessary to improve the health of children (The State of Obesity, 2014). Obesity risk does not impact childhood alone, but transfers into adulthood as well, further increasing risk of a) cardiovascular disease b) metabolic syndrome c) type-2 diabetes d) sleep apnea and e) depression (Daniels, 2006). This risk is a combination of genes and environment (Birch & Ventura, 2009). Environmental factors are modifiable. Parental influence and education are amongst the most critical modifiable elements due to the fact that one or both often determine eating patterns, dietary intake, and access to food (Dev et al., 2013; Birch & Ventura, 2009). Furthermore, education of parent(s) strongly determines understanding of nutrition and obesity risks (Grossklaus & Marvicsin, 2014). Education in the school and community setting provides promising outcomes in both childhood obesity and overall health of children (Serpas et al., 2013). The educational initiatives involve a) nutrition curriculum that is age specific b) farm tours and school gardens c) cooking instruction and tasting new foods and d) school lunch improvements (Moss et al., 2013; Rodriguez et al., 2013; Morris & Zindenberg-Cherr, 2002; McMacken, 2015).

## Nutrition Education: Health Promotion for the Next Generation

### **Introduction**

The school setting is a fundamental part of nutrition and wellness education for both students and families. In the state of Kansas, health education standards were approved in 2006. The Kansas Model Curricular Standards meet national standards in topics including nutrition and physical activity. Also in 2006, wellness policies became required within all school districts nationwide. However, the goals that are developed within this policy can vary as long as they are consistent with USDA requirements. Additionally, many of the national requirements fail to address some of the major risk factors for childhood obesity. Over 31% of children in the United States are either obese or overweight (Kansas Model Curricular Standards for Health Education, 2007; The State of Obesity, 2014). The risk factors for childhood obesity include type 2 diabetes, heart disease, and metabolic syndrome that is continued into adulthood. Many successful nutrition education programs, with interactive options including cooking lessons, school gardening, farm to school cafeteria options and farm visits, have been implemented successfully into school and community settings. Parental education is also an integral component of childhood eating habits. Well-rounded nutrition programs that address not only basic nutrition concepts but also provide interactive and real-world options for both children and parents, are needed to improve the health of the nation.

### **Methods**

Utilizing the Library and Information Resources Network (LIRN), databases including ProQuest, PubMed, and Directory of Open Access Journals (DOAJ) were searched using the following terms: “Childhood obesity,” “Nutrition in schools,” “Healthy children,” “Nutrition and

learning outcomes,” and “School gardens.” The research was then reviewed and assessed for quality and relevance to the topic.

## Results and Discussion

### Childhood Obesity

The most effective time for obesity prevention is during early childhood (Birch & Ventura, 2009). Both genetic and environmental components make up risk factors for obesity. Table 1 demonstrates some of these early risk factors. The key points this reveals include the importance of early childhood nutrition and health education as well as parental education and access to quality food. In many cases, by the time a child is school-aged, many of the eating behaviors noted below have already been developed. More effort is then required from both educators and families to establish healthier habits (Birch & Ventura, 2009).

<b>Demographics</b>	<b>Physical Activity Patterns</b>	<b>Eating behaviors</b>
Overweight parents	Lack of regular physical activity	Solid food earlier than recommended
Eating patterns of parents	Frequent screen time (TV, videogames, etc.)	Low intake of vegetables and fruits
Low income/Low education levels	Lack of sleep	Large portion sizes
African American, Hispanic, American Indian ethnicities		High intake of sugar and high energy processed foods / frequent snacking
		Restricting food or pressure to “clean the plate” from parent

Table 1: Risk factors for childhood obesity (Birch & Ventura, 2009)

Childhood obesity is diagnosed when a child has as a body mass index (BMI) above the 95<sup>th</sup> percentile for children of the same age and sex. A BMI above the 85<sup>th</sup> percentile identifies children that are overweight and at risk for obesity (Defining childhood obesity, 2015). In a country where food is abundant, many children learn at an early age to eat for hedonic hunger, or

more for the pleasure or taste of foods as opposed to the need for energy. Food environments and social norms also play a major role in dietary patterns of children and adults alike (Ambrosini, 2014). A systematic literature review by Ambrosini (2014) indicated a positive relationship between the intake of high calorie, high fat, low fiber foods and future risk of obesity. This study also points out the limitations in reductionist research. In order to best understand the dietary patterns that predict obesity, total food consumption must be evaluated.

**Associated Diseases.** Many diseases that were only seen in adults are now seen in children as a result of children being overweight or obese. This leads researchers like Daniels (2006) to predict that today's children may live shorter lives than their parents if interventions are not taken to improve health. Examples of these health risks include hypertension, high cholesterol, heart disease, type 2 diabetes, psychological disorders, gastrointestinal conditions, and metabolic disorders. Table 2 shows the prevalence of these conditions in the pediatric population.

<b>Disease/Condition</b>	<b>Percentage of pediatric population diagnosed</b>
Hypertension (High Blood Pressure)	2-4%
Atherosclerosis (Hardening of arteries)	Fatty streaks seen in 50% of children Plaques seen in 8%
Dyslipidemia (Abnormal blood cholesterol)	5-10%
Metabolic syndrome	4% overall, 30% in obese children
Type 2 diabetes	1-15 children per 100,000
Obstructive sleep apnea (breathing interruptions while sleeping)	1-5% overall, 25% in obese children
Depression	3-5% in adolescents

Table 2: Diseases related to childhood obesity (Daniels, 2006)

**Cardiovascular disease.** High blood pressure appears to be highly correlated with obesity in children. Left ventricular hypertrophy, which is a thickening of the main pumping chamber of

the heart, is also related to childhood obesity. When combined, high blood pressure and left ventricular hypertrophy place an adult at a four times greater risk for heart disease. Fatty streaks in the arteries can lead to plaque formation and cardiovascular disease, as well as incidence of a heart attack or stroke. This development of atherosclerosis is related to high cholesterol as well as high blood pressure. Although enough is not known to determine obesity as a cause for atherosclerosis, the two are often seen together (Daniels, 2006).

***Metabolic syndrome.*** The gastrointestinal tract, liver, and hormonal systems are all involved in primary metabolic processes that control how the body utilizes energy and nutrients. When one or more of these systems becomes out of balance, disease often results. Characteristics of metabolic syndrome include a) obesity, specifically in the abdomen b) insulin resistance c) high blood pressure d) dyslipidemia and e) other factors. Approximately 30% of obese children already have signs of metabolic syndrome. Many diseases associated with obesity are correlated with one another, so it is not surprising that metabolic syndrome also increases the risk of developing cardiovascular disease and diabetes (Daniels, 2006).

***Type 2 diabetes.*** Among diseases that were not seen in adolescents until recent years is type-2 diabetes mellitus. Formerly, “adult-onset” diabetes was the term used to describe this disease. It is diagnosed when the insulin-secreting beta cells of the pancreas are unable to keep up with the demand for insulin. High blood glucose levels result. More than 45% of new diabetes diagnoses in children are now type-2 diabetes. The risk of cardiovascular disease also increases in this population (Daniels, 2006).

***Sleep apnea.*** The abnormal airway collapse that occurs during sleep, known as sleep apnea, is seen in both obese adults and children. This breathing disorder can lead to disrupted sleep, snoring, and daytime sleepiness that may interfere with performance in school. There have

also been correlations with sleep apnea and learning disabilities. The lack of oxygen that occurs from chronic sleep apnea can also lead to cardiovascular disease due to the increase in blood pressure that occurs in the pulmonary arteries, thereby decreasing blood flow to the vessels of the heart (Daniels, 2006).

**Depression.** Although this psychosocial disease may not relate to physical health in the same sense as the conditions previously mentioned, depression that begins in adolescence can affect long-term mental and physical health. It is unclear if depression more often leads to obesity, or if the reverse is true, and obesity leads to depression. There is evidence that both of these situations are accurate, depending on the age group and many other factors. Obese children also tend to have fewer friends and may have difficulties with socialization and relationships. More than half of obese adolescents are diagnosed with some form of depression (Daniels, 2006).

**Genetic components to obesity.** It is well known that family history is a major risk factor for obesity. Recent research regarding genome trait analysis uncovered new findings related to single nucleotide polymorphisms (SNPs), or variances in the DNA sequence. This research further verifies the correlation between genetics and obesity. Environmental factors also influence gene expression; this is known as epigenetics. When young rodents of the same litter are split into two groups, one group fed a Western diet, and the second group fed standard rodent chow, those consuming the Western diet developed early obesity. This confirms that genetic factors alone do not influence obesity, but rather, as figure 1 indicates, it is a combination of genetics and environmental factors that lead to the development of obesity (Kelsey, Zaepfel, Bjornstad & Nadeau, 2014).

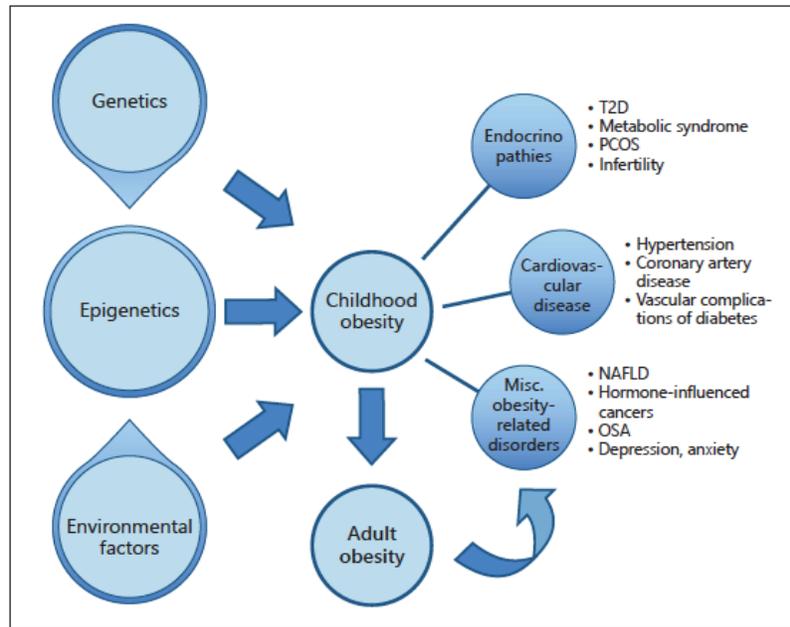


Figure 1. Childhood obesity: Contributing factors and future complications (Kelsey et al., 2014).

### **Modifiable Factors.**

Dev et al. (2013) discussed the importance of recognizing that risk factors for childhood obesity occur concurrently and often do not occur independently. A study reviewed 22 known risk factors positively associated with childhood obesity and found three of those factors to be strongly correlated with obesity rates: sleeping less than eight hours per night, parental BMI in the obese range, and parental restriction of child's food for weight control. These risk factors could be modified with the correct education model, specifically related to nutrition as two of these risk factors may be managed by dietary patterns (Dev et al., 2013).

**Prevalence of meals eaten out of the home.** The United States Healthful Food Council reports that up to 30% of children eat fast food daily. American adults also eat out at restaurants or convenience stores nearly 6 times per week. Considering that many American adults also have families who are shaped by their eating patterns, these numbers are significant (About the United States Healthful Food Council, n.d.). Research has confirmed that children who eat more meals

at home have healthier eating habits including consistent meal times, consuming healthier foods like protein, grains, and vegetables (Lee et al., 2014). Further research regarding dietary intake involved a large cross-sectional analysis that evaluated fast food consumption, as well as remainder dietary patterns, in over 4,000 children in the United States aged 2-18 years. The term remainder diet refers to foods eaten at home or through any venue aside from fast food restaurants. Half of the children in this study were found to eat fast food, with approximately 40% high-consumers and 10% low-consumers. The children who consumed fast food were also more likely to consume a Western remainder diet, which is correlated with obesity. A Western diet is generally defined as high intake of meat, processed meat and grains, high fat foods, and sugar sweetened beverages (Poti, Duffey & Popkin, 2013). There is also known increase in the prevalence of fast food restaurants and convenience stores near schools. Lower income students are more likely to walk to school and therefore more likely to visit these cheap options for food. Research pertaining to Philadelphia inner-city schools found that up to 48% of students bought snacks at these fast food options. Healthy food options are not found as often near inner-city schools, but healthier options are found near higher-income areas (Tester, Yen, Pallis & Laraia, 2011).

**Parental Factors.** In order for nutrition knowledge to be optimally received with the best outcomes, home and family life must be addressed and involved (Birch & Ventura, 2009). Parents are often responsible for both the genetic factors and environmental components of their child's life. The environmental components are especially important during the early years of life. Culturally, in America, eating patterns have shifted dramatically over the past century. There have been many time periods throughout history where food was scarce and options were limited. During these times, people ate the food that was available to them, often in large

portions, at the times it was available, paying little attention to hunger cues. When food was scarce, an overweight child was a sign of health and a result of parents that had the means to provide for their family. Some of the patterns that have continued in American culture today include choosing large portions and loss of hunger cues. Some new patterns have also become common, such as child preference for palatable junk foods, reward systems involving empty calorie junk foods, and a dislike for healthy foods or feelings of punishment when made to eat these foods. Most parents are unaware that these patterns may shape the eating habits of their children well into adulthood (Birch & Ventura, 2009).

***Perceptions of obesity.*** It is common for parents to not be aware that their child is overweight or obese until informed by a healthcare provider. In a study involving nearly 100 mothers of overweight children, 79% did not classify their child as being overweight. The authors of the study noted a direct correlation with the education level of the mother and the inability to identify their child as overweight. Independent variables that were accounted for included socioeconomic status, age, race, and the child's age. In a separate study with a larger sample size of 200 parents, 35% did not recognize their child as being overweight. It is safe to make the assumption that if parents are not aware their child is overweight or obese, they are likely not aware of the health implications of being overweight, both presently and in the future, for their child (Hodges, 2003). One of the most significant barriers healthcare providers face when evaluating child health is communication with parents or guardians. It is difficult for healthcare providers to understand the habits of the child and/or what the cause of their weight gain or obesity may be without the honest input of the parent. The parent holds most of this information, knows their child best, and is, therefore a vital component in the health of their child (Grossklaus & Marvicsin, 2014).

***Eating Patterns.*** Many parents are unaware of what constitutes healthy eating patterns. Portion sizes for children are often distorted due to an attempt to make sure the child's intake is adequate. It is vital to teach children to be aware of their own hunger cues, not simply hunger stimulated by an external cue, like driving by a fast food restaurant or seeing a TV advertisement for soda, chips, or candy. Another important factor involves parental eating choices. Many parents do not make healthy choices themselves, leaving the child with limited modeling of healthy food intake. Research indicates that modeling this pattern, along with involving positive contexts for healthy foods, leads to increased preference for these foods. On the contrary, forcing children to eat a certain amount of a vegetable before eating dessert would be a coercion tactic that is not positively associated with healthy food preferences (Birch & Ventura, 2009).

***Access to quality food and education.*** Even with parental awareness of healthy food choices for their child, they cannot make these choices without access to affordable and nutritious foods. In a study by Slusser et al., (2011) an intervention involving nutrition focus groups took place in elementary schools in Los Angeles, California, with primarily low income families. Common barriers to eating healthy foods noted by parents were: financial means to purchase healthy food, limited time to cook healthy meals at home, and limited experience cooking healthy meals. Some parents even blamed their children, stating their preference for junk foods and picky habits as a barrier too big to overcome. Parents reported learning basic information about nutrition through the media, but most stated they would be interested in nutrition programs if offered at no cost through their child's school. Some areas of interest included: healthy cooking lessons, tips for encouraging kids to try healthy foods, basic instruction on reading a food label, and methods that involve the entire family in this process (Slusser et al., 2001).

## **Current Interventions**

**Nutrition programs in schools.** Research regarding nutrition education in the school setting is abundant and many interventions have proven to be quite effective at promoting health and preventing childhood obesity. The majority of the literature is focused on the implementation of nutrition curriculum with some focus on physical activity, farm to school, or gardening programs. As children spend most of their days in the school setting, typically eating at least one meal per day in this environment, it is a critical time for them to begin learning and practicing healthy eating and lifestyle habits.

**Systems approach.** A team effort for childhood obesity prevention took place in San Diego, CA. Multiple groups came together, including schools, primary care offices, public health organizations, university researchers, and other community members, to evaluate an effective way to promote a healthy weight message along with encouraging healthy eating and physical activity. Some of the strongest research in the prevention of childhood obesity involves a systems approach of individual (child), family, health care providers, community groups, schools, and government. The message selected in this study for healthy weight promotion was the 5-2-1-0 program: five or more fruits and vegetables per day, two hours or less of screen time, one hour or more of physical activity, and zero sugary drinks, more water and low-fat milk. This message was then placed in schools and primary care offices throughout the community. Screening tools were also utilized to assess BMI and discuss results with families. The successful implementation of these evidence-supported programs for childhood obesity prevention indicates a success in this study. Follow up assessments and evaluation of a measured preventative effect would further credit this research (Serpas et al., 2013).

***CATCH program.*** Moss et al. (2013) studied a group of 3<sup>rd</sup> grade elementary students in a rural Illinois school after implementing a nutrition curriculum along with a Farm to School program. This intervention was known as the Coordinated Approach to Child Health (CATCH) program. The Farm to School portion of the study involved a farm tour and tasting of new vegetables and fruits. The children were surveyed before and after the intervention with a simple tool created by the authors. This unique combination of school nutrition education and “hands on” experience visiting a farm was successful. Results showed improvement in knowledge of vitamins, minerals, fiber and the roles they play in the human body. After the intervention, students also reported improved intake of vegetables and fruits at school (Moss et al., 2013).

***CHEFFs program.*** The Cooking, Healthy Eating, Fitness and Fun (CHEFFs) intervention took place in urban homeless shelters. Due to the fact that many of the participants were families with school aged children, it is reasonable to assume the results of this study may also transfer to the school setting. This program involved 15-weeks of nutrition education and physical education with some of the focus area being: knowledge of nutritional needs, understanding how nutrition affects health, and promoting accountability for nutritional choices. The children in the study were ages 6 to 14 years. Many of the children in this population were overweight or obese. All of these children lacked access to healthy food options as well as nutrition and physical education. The program implemented was developed by dietitians and the nutrition information was aligned with MyPlate. The sessions occurred biweekly for 1 hour. Some of the topics discussed were: food groups, fruits, vegetables, whole grains, calcium, sugar, fast food, portion sizes, exercise, media and health, and self esteem. Some of the sessions involved interactive activities like preparing a healthy snack, taste testing new foods, and physical activities. Results found that even after attending minimal sessions, the children showed

signs of a deeper understanding of the concepts discussed. Many also showed more interest in trying new and different foods. This study demonstrated the need for programs like this in community and school settings, specifically in ways that are accessible to that population. Limitations of the study included that the population was very specific, being homeless families, and this may not correlate to the majority of children living in homes with more opportunities (Rodriguez et al., 2013).

***CHANGE! program.*** The Children's Health, Activity and Nutrition: Get Educated! (CHANGE!) program also focused on healthy eating and physical activity as prevention for obesity. This study took place in United Kingdom schools and involved 20 weeks of nutrition and physical activity curriculum. The following variables were evaluated before and after the study: a) BMI b) physical activity and c) food intake. The outcomes of this study revealed that the CHANGE! program had a notable effect on waist circumference, BMI, and level of physical activity. These results show promise that nutrition interventions in schools are effective in improving the health of students. Some key notes the authors point out in relation to effective interventions include: parental involvement, focusing on the positive effects of eating healthy and exercising, and low cost programs. Some limitations of the study involved a lack of an objective way to measure food intake, this is often a struggle in nutrition-based research. The method used was a survey, however this survey did not account for macronutrients and made it difficult to determine the exact reason waist circumference and BMI improved in the results. Another limitation involved the evaluation of the nutrition teaching. The teachers completed this program in schools and although they were trained with the curriculum, there was no specific monitoring of the lesson delivery. The natural variations of multiple teachers providing this information could have influenced the results as well (Fairclough et al., 2013).

***School gardens.*** In a study by Morris and Zidenberg-Cherr (2002) three schools within the same district participated in an intervention involving both nutrition lessons and gardening activities. The lesson plans included: nutrients, plant anatomy, food guidelines, serving sizes, food labels, as well as physical activity and goal setting. There was also a specific gardening portion of each lesson plan, which involved planting, tending, and harvesting vegetables and often tasting various crops. Carrots, zucchini, snow peas, broccoli, spinach, and swiss chard are examples of some of the vegetables grown. Participating students were divided into three groups, the control group received no specific nutrition or gardening knowledge, the second group received only nutrition curriculum, and the third group received both nutrition and gardening curriculum. Students were asked to complete both a nutrition knowledge and vegetable preference pre and post test to evaluate the interventions. The students who participated in the nutrition and gardening curriculum had the largest improvement in nutrition knowledge as well as increased vegetable preferences. There was also an improvement in the nutrition only curriculum, though not as significant. Limitations to this study included a small sample size and a lack of randomization among the three groups. Further research is warranted to continue evaluating the many benefits of school gardens (Morris & Zidenberg-Cherr, 2002).

***School lunch.*** New initiatives in lunch rooms of New York schools located in Queens, the Bronx, Newark, and Manhattan address a different risk factor for obesity: meat intake. Dr. McMacken (2015) discusses the benefits of schools choosing vegetarian options, at least one day per week, with some schools completely vegetarian. Research shows that plant-based foods lower the risk of chronic diseases like cardiovascular disease and type-2 diabetes. Currently, the Western diet still dominates school lunchrooms around the country. Although more research is

warranted to determine the long term benefits of vegetarian diets in school-aged children, the overall benefits of vegetarian diets in disease prevention are significant (McMacken, 2015).

The United States Department of Agriculture (USDA) requires standards for school lunches as a part of the National School Lunch program. Many of the requirements entail simply offering healthier options while continuing to offer less healthy options as well (School meals, 2015). Many schools report issues with the guidelines of this USDA program, including one district in Vermont. Some concerns include: a) issues with utilizing farm to school programs or school gardens due to stringent requirements of label and calorie information b) less cooking from scratch and more use of processed foods due to time constraints c) increase in waste products d) increased preservatives in food and e) increase in fast food consumption outside of the school setting due to limited student choices (Scheffert, 2012).

### **Recommendations**

Children spend over 2,000 hours each year in the school environment (Survey: 76% of Kansas public school parents support healthy school nutrition standards, 2015). The literature indicates that there is a strong need for improved and consistent nutrition education in the school setting, as well as adequate resources and education for parents and families, to prevent childhood obesity (Birch & Ventura, 2009). The recommendations involve the creation of nutrition lesson plans to improve nutrition education in schools, including handout information to involve parents/guardians. Each age group should have access to quality nutrition education and information should be reinforced throughout grade levels. The table below outlines the evidence-based research evaluated and proposes implementation methods.

<b>Evidence-based Health Promotion for Children</b>	<b>Methods</b>
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<ul style="list-style-type: none"> <li>• Early Intervention</li> </ul>	Education in the elementary school setting regarding nutrition and health (Birch & Ventura, 2009)
<ul style="list-style-type: none"> <li>• Healthy choices at home</li> <li>• Parent modeling</li> </ul>	Education for parents and encouragement to involve family in healthy eating patterns (Birch & Ventura, 2009)
<ul style="list-style-type: none"> <li>• Education and hands-on experience gardening</li> <li>• Awareness food sources</li> </ul>	Combining nutrition education with farm tours, school gardens, or encouraging home gardens (Moss et al., 2013)
<ul style="list-style-type: none"> <li>• Positive associations with healthy food choices</li> </ul>	Utilizing positive reinforcement and reward systems for making healthy choices (Birch & Ventura, 2009)
<ul style="list-style-type: none"> <li>• Collaborative involvement in the community</li> </ul>	Systems approach (Moss et al., 2013)

Table 3: Evidence-based Health Recommendations for Children

The attached PowerPoint presentations are examples of nutrition lessons that could be utilized in the school setting. The first two PowerPoint presentations can be seen in Appendix A.

The following is a breakdown of an outline to be utilized for nutrition lesson plans:

**Basic Nutrition Concepts**

1. Review of MyPlate
2. Recommended servings of each food group and healthy options
3. Discussion of nutrition goals

**Sugar and Empty Calories**

1. Sugar consumption in the United States
2. Effect of sugar on the body and diseases it can lead to
3. Sugar content in common foods
3. Common empty calorie foods i.e. high in fat and/or sugar, little to no nutrients

**Where Our Food Comes From**

1. How vegetables and fruits are grown
2. Basics of common farming practices
3. Importance of supporting local farmers
4. Basic discussion of terms like organic, GMO, natural, etc.

**Advertisements and Label Reading**

1. Understand the basic concepts of reading a food label
2. Advertisements and how they often target children
3. Discuss the basics of health claims

In addition to educational opportunities for students, parental education is key to preventing childhood obesity. Grossklaus and Marvicsin (2014) indicated a need for parent education when researching parent stance on nutrition and health of their children. These researchers suggest the concept of parents completing a survey regarding their level of comfort on the nutrition needs of their child, knowledge of healthy eating-related behaviors, and how competent they feel. This survey also includes questions for parent interest in further educational opportunities, like nutrition forums or healthy cooking courses if offered at no cost through the school or other community settings (Grossklaus and Marvicsin, 2014). A sample parental survey can be seen in Appendix B.

**Conclusion**

It is the responsibility of school educators, healthcare providers, and community members alike to provide children and parents with the educational tools needed to pursue healthy lifestyles. The most successful intervention tools involve a collaborative approach and continued education throughout childhood (Moss et al., 2013). Although genetic factors play an important role, the role of the environment is equally as valuable (Kelsey et al., 2014). More vigorous screening methods are also indicated to provide the best resources to families with high risk factors for obesity and the associated health risks (Kelsey et al., 2014).

It is not only in the best interest of children and families to improve the health of future generations, but also in the best interest of the economy and the nation as a whole. If improvements are not made, the risks to our nation include a) further rise in healthcare costs b)

poor academic achievement for children c) higher number of student absences and lower test scores d) fewer young adults eligible for military service due to health concerns and e) struggling businesses due to lack of productive and healthy employees (Kansas School Wellness Policy Model Guidelines, 2014). These risks are summarized in figure 2. Although educational opportunities are not without cost and investment, the positive outcomes that result will not only save money, but lives as well.



Figure 2: Effects of poor nutrition and health (Kansas School Wellness Policy Model Guidelines, 2014)

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### MY PLATE REFRESHER

What's My Plate?

Choose **MyPlate**.gov

### VARY YOUR VEGGIES

- EAT A RAINBOW!
- EAT FRESH and SEASONAL
- Don't be afraid to try new things!
- How much do YOU need?
  - Girls (9-13) = 2 cups per DAY
  - Boys (9-13) = 2 1/2 cups per DAY

**Foodie SNACK Tip:**  
Keep a bowl of cut-up vegetables in the refrigerator. Carrot and celery sticks, red or green pepper strips, broccoli florets, or cucumber slices.

### FOCUS ON FRUITS

- Good choices: Any fruit or 100% fruit juice
- Things to avoid:
  - Dried fruit, fresh fruit, or juices with **added sugar!**
- How much do YOU need?
  - Boys & Girls (9-13) =
    - 1 1/2 cups per DAY!

**Foodie Tip:**  
Try making fresh fruit kabobs with chunks of pineapple, grapes, bananas, or berries! Choose your favorites :)

### G R A I N S

- Make at least HALF the grains you eat **WHOLE** grains
  - What IS a **WHOLE** grain?
    - Whole wheat bread, brown rice, quinoa, and oatmeal
  - What is a **REFINED** grain? (NOT whole wheat)
    - White bread, white rice, white pasta, MOST cookies, cakes, breakfast cereals, and snack foods :)
- How much do YOU need?
  - Girls (9-13) = 5 ounces per day
  - Boys (9-13) = 6 ounces per day

**Foodie Tip:**  
2 slices of whole wheat bread, 1 cup rice and 1/2 cup oatmeal = 5 oz = ONE day's grains!

### PROTEIN

- Meat, chicken, seafood, beans & peas, eggs, soy products, nuts & seeds!
- Proteins build **bones, muscles, skin and blood cells!**
- How much do YOU need?
  - Boys & Girls (9-13) = 5 ounces per DAY

**Foodie Tip:**  
Some foods play double duty as grains & protein like quinoa, brown rice, oats and other whole grains! More reasons to make half of your grains whole grains!

# Appendix A

## DAIRY



- HIGH in calcium = strong bones & teeth
- The smallest portion on My Plate
- CHOOSE fat-free or low fat milk, yogurt, cheese & AVOID sweetened milk and yogurts.
- How much do YOU need?
  - Boys and Girls (9-13) = 3 cups per DAY

**Foodie Fact:**  
IF you do not consume dairy, CALCIUM can be found in many other foods like: soy products, most beans, and LEAFY greens! More double duty foods!



## WATER



...It may not be a food group, BUT it's VERY important.

- Water makes up 80% of your BRAIN
- When YOU are thirsty, you don't THINK as well!
- Water keeps you healthy!
- Dehydration (lack of water) can cause headaches and dizziness!

**FOODIE FACT:**  
DID YOU KNOW THAT BY THE TIME YOU FEEL THIRSTY YOUR BODY IS ALREADY DEHYDRATED!  
DRINK UP DURING THE SCHOOL DAY!!

HOW MUCH DO YOU NEED??  
1/2 OZ FOR EVERY POUND YOU WEIGH!  
(6-8 GLASSES PER DAY)

## NUTRITION GOALS



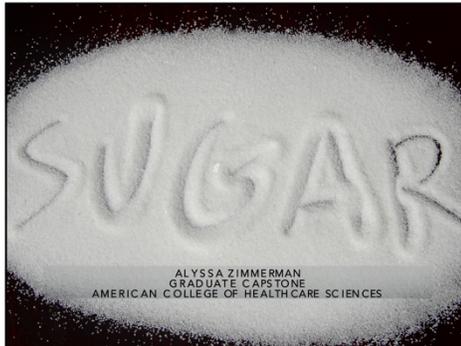
- CHOOSE a **new** healthy food to try (fruit, veggie, whole grain, or lean protein!)
- FOCUS on making **half** of your plate VEGGIES & FRUIT
- GET in the **kitchen** and LEARN how to help your parents prepare fresh meals cooked at home!
- MAKE **your own goal!**

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MOVIE CLIP

#FEDUPMOVIE

HOW MUCH IS TOO MUCH?

- What is the recommended amount of added sugar a child should have per day??
  - 3-6 teaspoons per day
- How much added sugar do most Americans eat per day?
  - 19.5 teaspoons per day

Do you think sugar is addictive?

SUGAR IN YOUR FOOD...

- Glucose
- Dextrose
- Sucrose
- Honey
- Sorghum
- Syrup
- Fruit Juice Concentrate
- High-Fructose Corn Syrup
- Corn Syrup
- Maltose
- Fructose

ACTIVITY TIME

Look for the many NAMES of sugar in your food or drink item.

What do you find??

- Please get into groups of 3-4
- We will hand out a food or drink item to each group
- On your piece of paper, work together to determine the GRAMS of sugar in the item.
- Then, determine the serving size and multiply the grams of sugar by the amount you would eat or drink in one setting. This tells us the TOTAL amount in the item.
- Lastly, divide the total GRAMS by 4 to calculate the teaspoons! **1 tsp = 4 grams**
- Then, we will measure the sugar into a bag to SEE how much sugar is in each item!
- RAISE YOUR HAND with questions.

### HIDDEN SUGAR

- Granola Bars
- Tomato soup
- Sports Drinks
- Packaged Oatmeal
- Salad Dressing
- Iced Tea
- Peanut Butter
- Ketchup
- Pasta Sauce
- Dried Fruit
- Yogurt
- Canned vegetables

### What is an empty calorie??

They are the calories from **bad fats and added sugars** in foods and drinks! They add to your total calories but provide **LITTLE OR NO VITAMINS OR MINERALS.**

Empty Calorie = No nutrition :(

### HOW DOES SUGAR AFFECT THE BRAIN??

#### ...AND Body?

- **Gain weight**
  - Drinking 1 can of Coke per day could add up to 15 lbs of weight to a person's body!
- **Feel Moody**
  - Sugar HIGH followed by a crash or feeling low and tired
- **Feel Unfocused**
  - You may have a hard time concentrating at school
  - Eating a balanced diet helps keep your energy up and your brain focused!
- **Crave more sugar**
  - Eating sugar makes us want to eat MORE sugar. A bad cycle!

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## Parental Survey

1. How comfortable do you feel regarding the nutritional needs of your child?
  - a. Very comfortable
  - b. Comfortable
  - c. Not comfortable
  
2. Where do you receive most knowledge about nutrition and health?
  - a. Physician of healthcare provider
  - b. Books or magazines
  - c. Online sources and social media
  - d. Other: \_\_\_\_\_
  
3. How many dinners per week does your family eat at home?
  - a. 6-7
  - b. 4-5
  - c. 3 or less
  
4. What is the most common snack your child eats at home or school?
  - a. Fresh fruit or vegetable
  - b. Yogurt
  - c. Granola bar
  - d. Cookie
  - e. Other: \_\_\_\_\_
  
5. Would you be interested in receiving nutrition related information through your child's school?
  - a. YES
  - b. NO

IF YES, please indicate the type of educational opportunity in which you have interest:

  - a. Healthy cooking tips
  - b. Weekly recipe club
  - c. The basics of interpreting food labels
  - d. Question/Answer nutrition forums