

Childhood Obesity: The Role of Dairy Products

Jennifer Harguth

Faculty Sponsor: Gwen Achenreiner, Department of Marketing

ABSTRACT

This paper investigates if there is a correlation between childhood obesity and dairy products, specifically chocolate milk. Data for this study came from two different locations, Waseca Central Intermediate School, and Waseca Hy-Vee grocery store. The first study analyzed children's taste preferences and observed the role of the parent in the child's decision. A sample of 46 children between the ages of two and seventeen chose among six different beverages. As expected, chocolate milk and Mountain Dew were the most prevalent choices and parent/guardian involvement showed a linear decrease as the child's age increased. The second study assessed eating habits and opinions on particular dairy topics, such as removing chocolate milk from school lunch lines, and whether or not dairy plays an important role in a child's health and well being. Interestingly, there is a correlation between children's BMI levels and children who rarely eat breakfast.

INTRODUCTION

Childhood obesity is a growing problem with the percentage of obese children doubling from 6.5% in 1980, to 17.0% in 2006.¹ Weight, nutrition, and physical activity are the main components to a child's overall health. Today, many families are spending too much time buying into the idea of convenience than they are spending cooking meals in their homes. When parents become too busy to cook meals in their homes, children learn poor eating habits and develop into unhealthy eaters.² Children that eat poorly at home will continue their bad habits at school. The National School Lunch Program (NSLP) has been implemented to develop menus for students that are high in nutrition and contain a balanced diet. The program offers healthy eating for the most part, however, due to a small budget, they are not always able to offer as much fresh food as they would like. In an interview with the Waseca Central Intermediate School Principal, John Huttemier, he stated, "For the most part CIS students receive a healthy hot lunch, however, there is no doubt they could be receiving more fresh fruit. The cost of the fresh fruit is the reason why they don't receive higher amounts."³ In order to implement a completely healthy lunch, "Parents would need to pay around four dollars." This cost would pay for the food to come unprocessed and for the school system to be able to hire employees that are certified in food safety to work with the unprocessed food.⁴

A growing concern is that children are being given access to snacks during school hours and mother's feeling, "School lunch goes against what they're teaching in health class."⁴ Food that is rich in nutrients and essential vitamins are becoming neglected because they would rather eat cookies, chips, and a can of soda, than an apple and a carton of milk. Children are often denied access to fresh fruit and are given fruit cocktail from a can instead, due to budget concerns. A solution to the growing concern is far into the future with the cost of hiring professionals into a small business that doesn't pay well. "The average price parents are willing to pay for a school lunch is \$1.86 and the cost to produce the meal is \$2.92."⁴ This does not leave room to improve, unless parents are willing to pay more.

After an interview with Jason Forshee, I found that Waseca Schools sold 8,925 cartons of milk total in the week of April 12th and 1,776 fruit juice drinks. Of those beverages sold, 4,725 were white milk and 4,200 were chocolate.⁵ Comparing that of milk and soda quantities sold in schools to milk and soda levels in grocery stores, an interview was completed by Todd Altman at a local grocery store. He informed me that, "milk categories run about \$4000 per week, while soda levels peak around \$10,000 per week."⁶ Clearly, beverages high in sugar are sought more than the types with nutritional value.

Nutrition education is an important topic because not only does it play a vital role in the classroom, it also hits home. Parent's influence on their child's eating habits should be significant in order for the child to develop the skills to form a balanced diet. "Once kids are old enough to care about what they eat, what they've learned can help them make appropriate dietary choices."⁷

In an interview with Judy Hoffman, I found that there are ample amounts of dairy promotions designed to educate families about the importance of dairy products and where milk actually comes from. A new promotion,

“People Behind the Product,” shows the producers and what they do to ensure a safe and healthy product to the consumer. An exciting effort came about when the Secretary of Agriculture teamed up with the NFL and National Dairy Council in January to sign a proclamation supporting efforts to overcome childhood obesity.⁸

After reading the Midwest Dairy Association Annual Report, I found that Midwest Dairy Association created a new way of increasing dairy promotion by teaming up with food franchises. Milk producers, princesses, and public relations representatives completed radio advertisements in order for Dominos to add 40% more cheese to their pizza, and McDonald’s McCafe’ specialty coffee to be made up with 80% milk.⁹

In another interview completed by Sue Harguth, I found that another big dairy promotion being implemented is the, “Fuel 60.” This promotion encourages children to complete 60 minutes of exercise a day to stay fit. The promotion is looking out for children and hoping to decrease the likelihood of childhood obesity to occur. The best part is that kids are empowering kids to do so, as well as players in the NFL. When questioned about the nutritional value between chocolate and white milk, she stated, “The nutritional value in flavored milk is just as good. It is better to drink flavored beverages than soda or fruit juices that lack essential vitamins.”¹⁰

The National School Lunch Program, (NSLP) is “required to include a serving of milk with each meal and comply by nutritional guidelines.”¹¹ After analyzing the choices in beverages at Waseca Intermediate School, I found there to be 110 calories and 12 grams of sugar in a single serving 1% carton of milk. In a single serving carton of chocolate milk, there contains 130 calories and 21 grams of sugar and in skim milk there are 90 calories and 12 grams of sugar. The calcium levels of the three choices range as follows; skim milk and 1% contain 30% of the daily amount needed, while chocolate milk contains slightly less with 25%. Certainly, there is more sugar in chocolate milk than white, which has raised some concern among mothers who worry about high calorie levels in the lunch line. Caloric levels are similar in beverage choices on the lunch line and may start to see milk being replaced by “less nutrient-dense beverages that could contribute to higher BMI levels such as; soft drinks, juice, and other fruit beverages.”¹ My interest is to find whether or not milk is playing a role in childhood obesity, and if so what can be done to correct it (*See Appendix One for milk labeling*).

A store taste test was implemented to show the level of influence parent’s play on their children when choosing beverages. This research method was demonstrated to provide an insight on what children’s first choice of beverage is and whether their parents play a role in the decision or not. A survey was also sent out to all 5th grade students in the Waseca Public Schools to find eating habits and opinions on specific dairy topics. The survey was sent home with the students for their parents to fill out in order to bypass doing research specifically on children. The first question asked whether they ate breakfast or not, and if so whether they ate at school or home. The survey also analyzed lunch beverage choices, as well as if dairy has an importance in the lives of their children. The removal of chocolate milk in schools is a big issue with the dairy industry as mother’s feel the sugar content in chocolate milk is too high.⁸ An opinion about whether or not chocolate milk should be removed from school lunch lines was another variable. Soft drinks and fast food consumption was measured and demographics were taken of the students. After the surveys were returned, BMI was measured using the height and weight of the students (*See Appendix Two for the chart used*). After measuring the BMI levels, a chart was used to find what body type the student was categorized in- underweight, healthy, overweight, or obese (*See Appendix Three for the body type chart*).

METHODOLOGY

The main goal for the first study, *Kool Drinks for Kids*, was to find taste preferences among children and whether their parent/guardian had a role in the decision. The observational study was carried out in the grocery store, Hy-Vee, located in Waseca, Minnesota. Data was gathered during the four hour observational time spent behind the booth.

The primary methods of data collection took place after positioning six beverages on a booth with an attractive sign for kids to choose a drink of choice. The six beverages being sampled were: Mountain Dew, chocolate milk, white milk, apple juice, orange juice, and water. The sample size collected was 46 children. Data was gathered on the children’s gender, age, choice, and whether or not the parent/guardian held an influence in the decision making. Information on the parent’s preference was also recorded for analysis. Access to the booth was granted by the Hy-Vee assistant director, Todd Altman. The sampling observation took place on Saturday, April 10, 2010 from 9 am to 1 pm.

The main goal of the second study was to find eating habits among 5th graders and whether their parents agree with chocolate milk in schools, or not. The observational study was carried out through the 5th grade students taking

the survey home to their parents to complete and returning them to the teacher. Data was gathered during a four-week interval.

The primary methods of data collection took place after sending the survey home for completion by the parents, about the child. The sample size collected was 80 students. Demographics were included on the survey in order to calculate the body mass index, (BMI). Other questions involved whether the students eat breakfast at home or at school, or if they “rarely” eat breakfast. Lunch beverage choices were analyzed as well as a typical after school snack. The consumption of dairy consisted as an open-ended question and the minimum values were recorded. Whether dairy plays an important role in the lives of their children was questioned, as well as the idea of removing chocolate milk from the lunch line to limit sugar consumption. The final questions on the survey consisted of their child’s typical fast-food and soda intake levels. Each student’s survey was kept confidential to ensure honest answers and protection of identity.

RESULTS

Store Study

The results of the store study were collected, recorded in a spreadsheet, and uploaded to SPSS for analysis. A total of 46 children between the ages of 2 and 17 were observed in order to collect the data. Of the participants in the study, 53.2% were female and 46.8% were male. With age as the variable, 36.2% fell between 0 and 5 years old (preschool), 40.4% were between 6 and 9 years old, and 23.4% were above the age of 10.

The percentage of each beverage ranged as follows: 27.7% chose chocolate milk, 12.8% chose white milk, 2.1% chose water, 4.3% chose orange juice, 17.0% chose apple juice, and 36.2% chose Mountain Dew (See Figure 1).

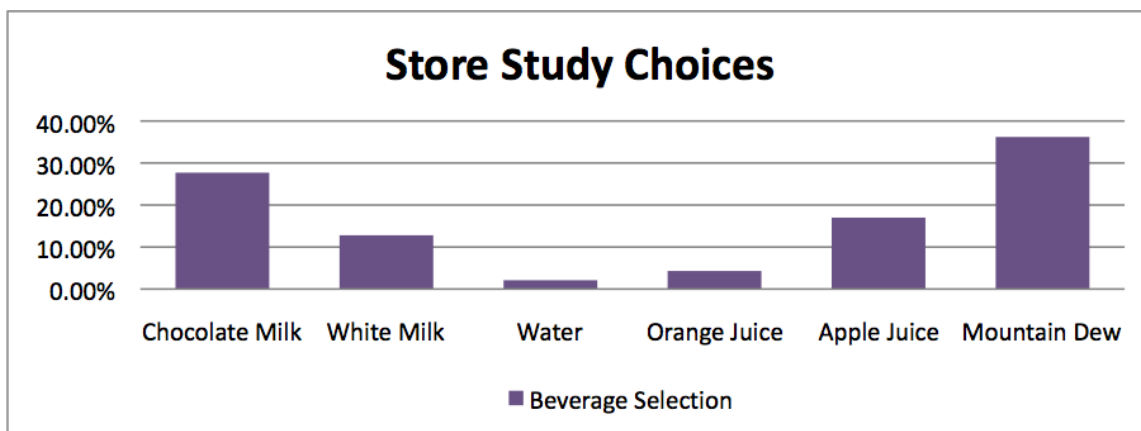


Figure 1.

When comparing involvement of the parent/guardian in the child’s selection, 29.8% were involved, 51.1% were not involved, and 19.1% were occupied elsewhere and were not present to be involved in the child’s choice.

After comparing selection of beverages from male to female, 31.8% of males and 24% of females chose chocolate milk, 4.5% of males and 20% of females chose white milk, 0% of males and 4% of females chose water, 4.5% of males and 4.0% of females chose orange juice, 13.6% of males and 20.0% of females chose apple juice, and 45.5% of males and 28.0% of females chose Mountain Dew (See Figure 2).

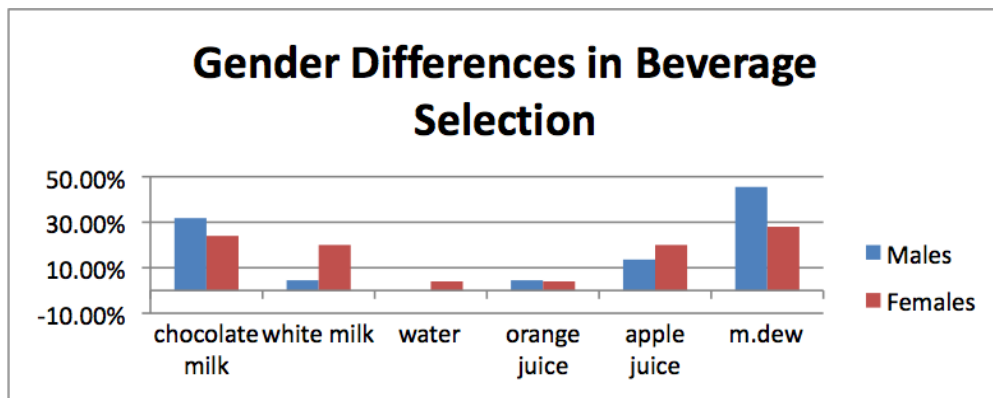


Figure 2.

After running a cross tabulation of the beverage choices and age levels it was found that 52.9% of children aged 0-5 selected chocolate milk, 23.5% chose white milk, 0% chose water or orange juice, 17.6% chose apple juice, and 5.9% chose Mountain Dew. Of the children between the ages of 6-9, 21.1% chose chocolate milk, 10.5% chose white milk, 0% chose water or orange juice, 15.8% chose apple juice, and 52.6% chose Mountain Dew. Of the children that are above the age of 10, 0% chose chocolate milk and white milk, 9.1% chose water, 18.2% chose orange juice and apple juice, and 54.5% chose Mountain Dew.

After running a Chi-Square test on this data, it was found that there was a significant difference in the amount of Mountain Dew consumed by children over the age of 5 (See Figure 3 or Table 1).

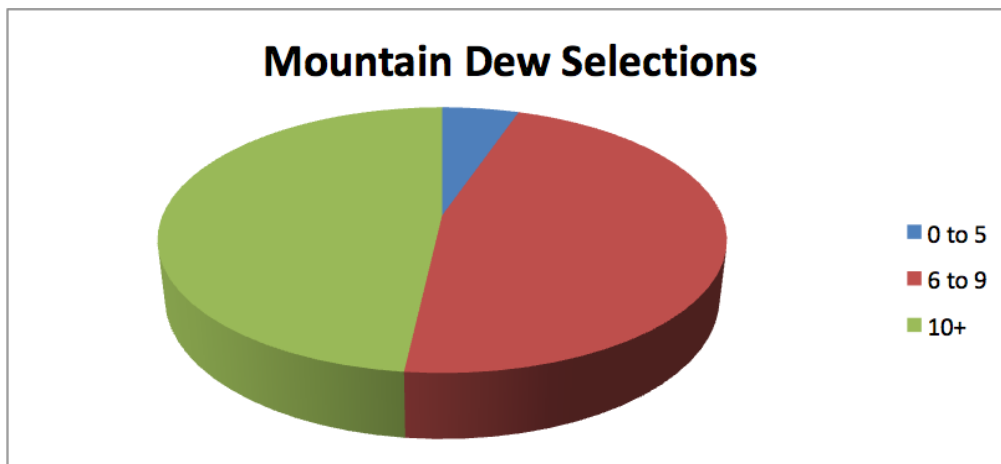


Figure 3.

Table 1. Cross Tabulation

	Age 0-5	Age 6-9	Age 10+
Mountain Dew Selected (%)	5.9%	52.6%	54.5%

When analyzing the cross tabulation of the parent/guardian’s influence on the selection, it was found that 47.1% were involved in children ages 0-5, 21.1% were involved in the selection of 6-9 year olds, and 18.2% were involved in children above the age of 10 (See Table 2). This shows a linear decline in parent involvement of children’s selections as the age of the child increases (See Figure 4).

Table 2. Cross Tabulation

	Age 0-5	Age 6-9	Age 10+
Parent/Guardian Involvement	47.1%	21.1%	18.2%

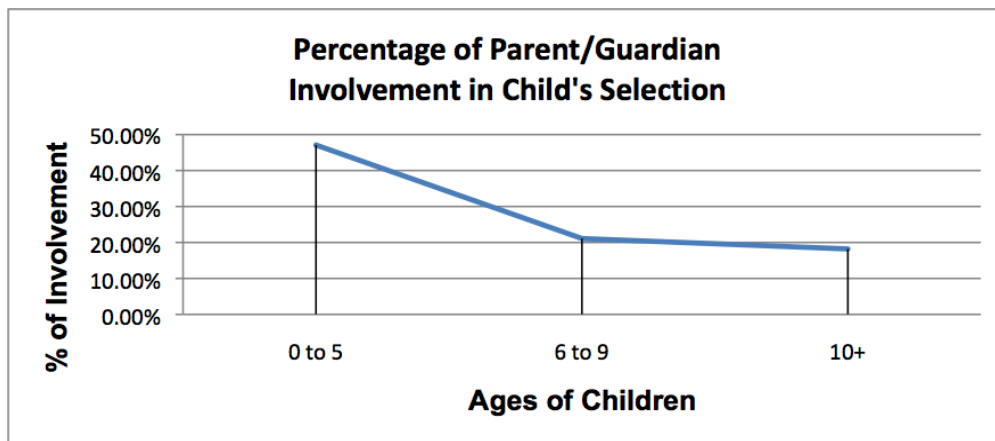


Figure 4.

When breaking the age groups into smaller increments, we see that the milks and juices play a more significant role in the lives of children ages 0-5. Around the age of 5 we see an increase in interest with Mountain Dew. As the ages increase, milk levels seem to decline and eventually drop off. This could be a result of an increase in choice by the child without the parent/guardian's influence on the decision. (See Appendix Four for Beverage Selection Graph by Age and Number of Selections).

The graph below shows white milk, chocolate milk, apple juice, and Mountain Dew as variables compared with the number of beverages chosen and the age group choosing them. Water and orange juice had such a low response that they weren't included in this particular graph (See Figure 5).

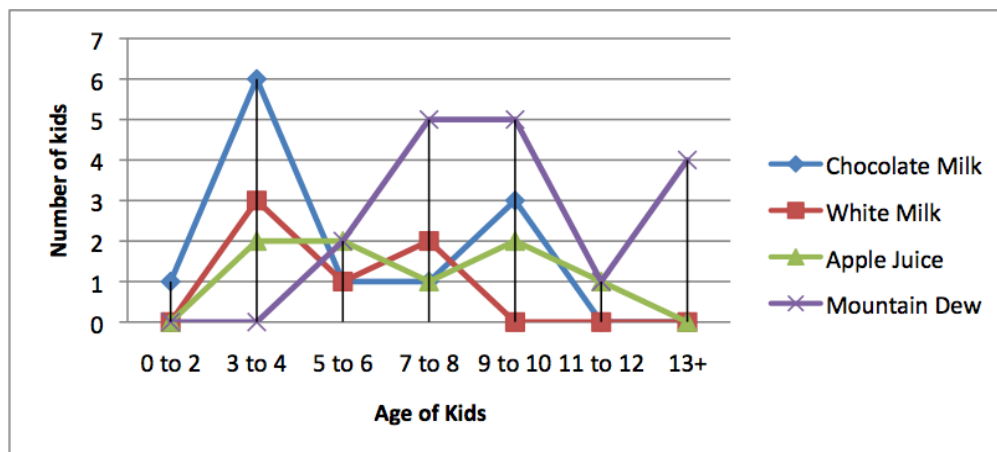


Figure 5. Beverage Selection

5th Grade Survey

The results of the survey were collected from the school, recorded in a spreadsheet, and uploaded to SPSS for analysis. A total of 80 5th grade students' parents responded to the survey. Demographically, 21 of the children reported on were 10 years old, 55 respondents were 11, and four were 12 years old.

Incidence of Obesity

When analyzing BMI of the children, 2.0% of students were underweight, 60.0% of students were considered healthy, and 27.0% of students were considered overweight, and 11% of students were considered obese (as shown in Figure 6).

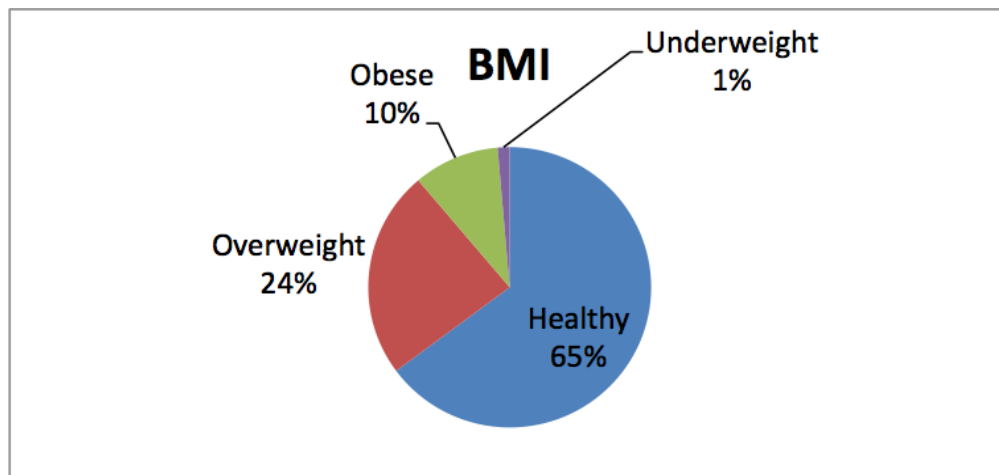


Figure 6.

Breakfast

After analyzing the amount of students that eat breakfast at home, at school, or rarely eat breakfast; it was found that 15% rarely eat breakfast, while 5% eat at school and 80% eat breakfast at home. Next, a One Way Anova test was used to find if there was a correlation between breakfast location and BMI of the respondents. Since there weren't enough respondents who ate breakfast at school, they were lumped in to eating breakfast at home. The variables used when running the test were eating breakfast at home and rarely eating breakfast. The results show of the respondents who eat breakfast at home, the average BMI level was 18.48, which falls under the healthy BMI category. Of the respondents who indicated they rarely eat breakfast, the average BMI was 21.30, which falls into the overweight BMI level. The Anova test was found to be statistically significant which means high BMI levels correlate with students rarely eating breakfast.

After completing a cross tabulation of healthy and overweight body types with breakfast location, it was found that 70% of overweight and obese students rarely eat breakfast and 30% of healthy students rarely eat breakfast (See Figure 7). This was found to be of statistical significance which also proves that high BMI levels correlate with students rarely eating breakfast after using alpha levels of $p < .05$.

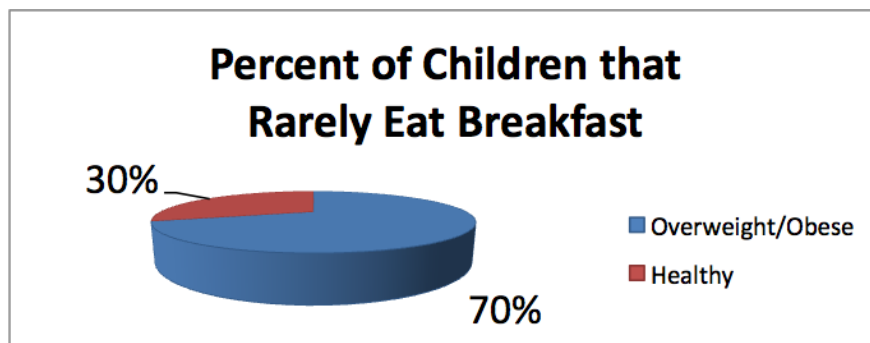


Figure 7.

Should chocolate milk be removed?

The data found that after asking whether chocolate milk should be removed from schools, 78.8% feel it should not, while 21.3% of respondents think it should be removed. A cross tabulation of the respondents whom answered yes or no to chocolate milk removal and BMI were taken. Of the respondents who answered yes to chocolate milk being removed from the store, 43.8% were overweight or obese and 56.3% were healthy. Of the respondents who answered no to removing chocolate milk, 30.9% were overweight or obese, and 69.1% were healthy.

Lunch Beverage Choices

Cross tabulation results of BMI levels and lunch beverage choices were compared and it was found that of the respondents that chose a fruit juice, 23.1% are overweight. Of the respondents that chose white milk, 57.9% are overweight and 42.1% are healthy. Finally, of the respondents that chose chocolate milk, 20.0% are overweight and 80.0% are healthy. This suggests that chocolate milk should be of little concern when removing high sugar levels from the lunchroom.

DISCUSSION

The purpose of these studies is to determine whether dairy plays a significant role in childhood obesity. After running a cross tabulation it was found that chocolate milk was actually chosen significantly more by children that were classified as being healthy as compared to obese. This study also shows that there is a difference in the children that eat breakfast and those that decide to skip the essential meal altogether. The results of the test show that there is significance in the BMI levels when children eat breakfast, compared to not eating breakfast. Data shows that 70% of children that are overweight or obese rarely eat breakfast. This implies that they are lacking a nutritious breakfast to start out their day.

As the ages increase, milk levels seem to decline and eventually drop off. This could be a result of an increase in choice by the child without the parent/guardian's influence on the decision. When looking at the level of involvement, 29.8% were involved, 51.1% were not involved, and 19.1% were occupied elsewhere and were not present to be involved in the child's choice. This suggests that parent involvement should be more evident and nutrition should be taught until maturity to ensure the child's skeletal structure has developed properly.

Knowing the right kinds of foods to help your child develop positive eating habits, is important. Sugar isn't as bad as it is made out to be. Warren B. Silberstein, M.D., states that, "A teaspoon of sugar adds 18 calories to your beverage."¹² The excess desserts loaded with sugar are high in fat as well. Portion control is the most important part of keeping a child's meal balanced. As for milk, drink low-fat forms of it whether it is flavored or not. Choosing to cut chocolate milk out of the mix is fine as long as you are doing it for the right reasons. Companies are working on lowering sugar levels in flavored milk. While doing so, tests have shown that the small amount of sugar in a carton of flavored milk "Enhances children's ability to finish the rest of their meal."⁸

RECOMMENDATIONS

The level of participation parents have on the lives of their children is what needs to be addressed. It is easy to blame something else when problems appear. Instead of blaming schools for lack of nutrition in their meals, make sure education is being taught in the home so children can make the right decisions when age appropriate. After completing the studies, it is suggested that as the age of the child increased, the parent involvement with choice decreased. The charts analyzed show a drop off in involvement around age 6. This seems to be a young age as many of these children are choosing soft drinks at this point. School lunches are operating on a tight budget and are trying to implement the best choice with the amount of money they have. If parents are teaching their children good eating habits, they will reach for the apple and not the cookie.

LIMITATIONS

This paper was not able to address the level of physical activity each student commits to. The survey should have included this question in order to cross tabulate BMI levels and physical activity. The other limitation in this particular study was that although the sample size was adequate with the 5th grade survey, some of the subgroups within the sample size were limited.

ACKNOWLEDGEMENTS

I am grateful to the University of Wisconsin-La Crosse for letting me pursue the studies I have completed. I would like to thank Mr. John Huttemier for helping me implement the survey into the 5th grade classes of Waseca Central Intermediate School as well as the Waseca County American Dairy Association Board for donating prizes to the kids for completing the study. I would like to thank Todd Altman for assisting me with the funds for the *Kool*

Drinks for Kids study and sharing with me the sales volumes, as the Assistant Director of Hy-Vee, in Waseca, MN. Finally, I would like to give a large thank-you to Dr. Gwen Achenreiner of the University of Wisconsin-La Crosse for putting numerous hours into helping me with the analytical part of the project and lending a hand whenever she could.

REFERENCES

- ¹ Li, J., & Hooker, N. (2010). Childhood Obesity and Schools: Evidence From the National Survey of Children's Health. *Journal of School Health*, 80(2), 96-103. doi:10.1111/j.1746-1561.2009.00471.x.
- ² King, N., & Hayes, D. (2003). Shame, Blame, and the 'War on Childhood Obesity': Confronting the Real Problems, Identifying the Positive Solutions. *Healthy Weight Journal*, 17(2), 28. Retrieved from Academic Search Premier database.
- ³ Huttemier, John. Principal, Waseca Central Intermediate School. Interviewed March 19, 2010.
- ⁴ Kelleher, J. (2009). school lunch REPORT. *Parenting School Years*, 23(4), 62-66. Retrieved from Consumer Health Complete - EBSCOhost database.
- ⁵ Forshee, Jason. Director of Food and Nutrition Services, Waseca Public Schools. Interviewed April 6, 2010.
- ⁶ Altman, Todd. Assistant Store Director, Waseca Hy-Vee. Interviewed April 6, 2010.
- ⁷ (1998). Is your kid failing lunch? *Consumer Reports*, 63(9), 49. Retrieved from Academic Search Premier database.
- ⁸ Hoffman, Judy. Secretary, Minnesota Dairy Promotion Council, Minnesota Division Board, and Corporate Board for Midwest Dairy Association. Interviewed March 16, 2010.
- ⁹ Newell, Sherry. (2010). Dairy Promotions Update. *Midwest Dairy Association Annual Report, Spring 2010*.
- ¹⁰ Harguth, Sue. Princess Chair, Waseca County American Dairy Association. Interviewed March 16, 2010
- ¹¹ Senauer, Benjamin., Ghosh, Koel and Wang, Yu. (2009). The Child Nutrition Act and the National School Lunch Program (NSLP): revising the annual adjustment in the federal reimbursement rate. *University of Minnesota Healthy Foods, Healthy Lives Institute*. 1-4. Retrieved from Hugh Chester Jones, University of Minnesota.
- ¹² Silberstein, Warren B., M.D. (1997) Childhood Obesity. *Pediatrics- Articles Written by Dr. Warren*. Retrieved from <http://www.mindspring.com/~drwarren/index.htm>.

APPENDIX ONE: MILK LABELING



1% Milk



Chocolate Milk



Skim Milk

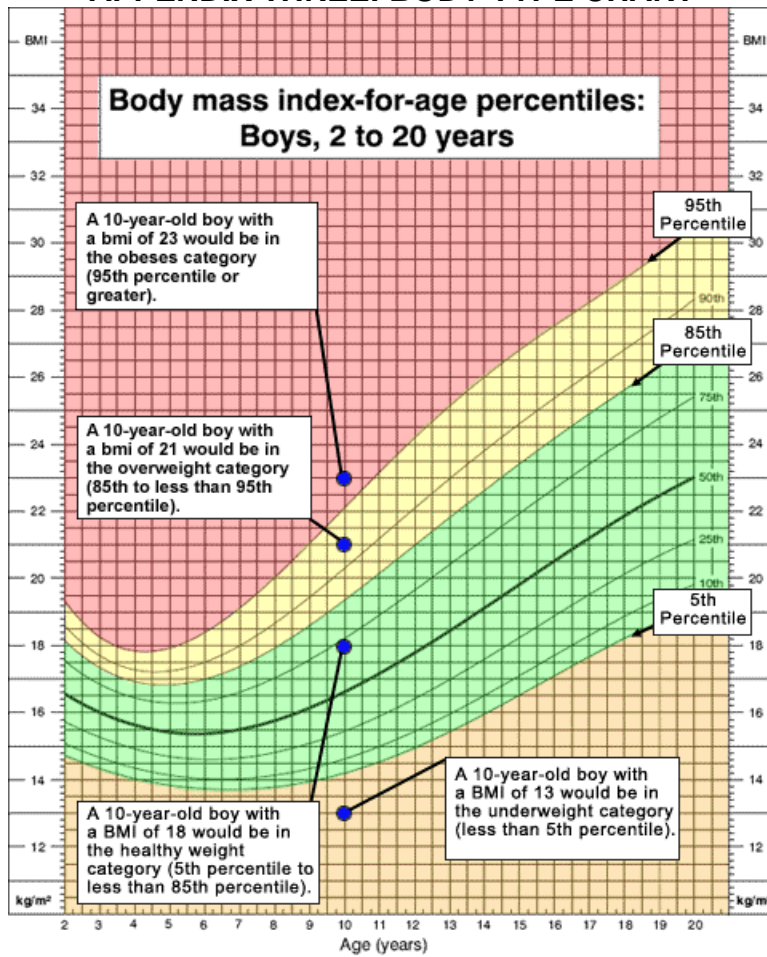
APPENDIX TWO: BMI CHART

Weight in pounds

		20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	
2'0" (24 inches)		24	37	48																	
2'1" (25 inches)		22	34	45	56																
2'2" (26 inches)		21	31	42	52																
2'3" (27 inches)		19	29	39	48	58															
2'4" (28 inches)		18	27	36	45	54															
2'5" (29 inches)		17	25	33	42	50	59														
2'6" (30 inches)		16	23	31	39	47	55														
2'7" (31 inches)		15	22	29	37	44	51	59													
2'8" (32 inches)		14	21	27	34	41	48	55													
2'9" (33 inches)		13	19	26	32	39	45	52	58												
2'10" (34 inches)		12	18	24	30	36	43	49	55												
2'11" (35 inches)		11	17	23	29	34	40	46	52	57											
3'0" (36 inches)		11	16	22	27	33	38	43	49	54											
3'1" (37 inches)		10	15	21	26	31	36	41	46	51	56										
3'2" (38 inches)		10	15	19	24	29	34	39	44	49	54	58									
3'3" (39 inches)			14	18	23	28	32	37	41	46	51	55									
3'4" (40 inches)			13	18	22	26	31	35	40	44	48	53	57								
3'5" (41 inches)			13	17	21	25	29	33	38	42	46	50	54	59							
3'6" (42 inches)			12	16	20	24	28	32	36	40	44	48	52	56							
3'7" (43 inches)			11	15	19	23	27	30	34	38	42	46	49	53	57						
3'8" (44 inches)			11	15	18	22	25	29	33	36	40	44	47	51	54	58					
3'9" (45 inches)			10	14	17	21	24	28	31	35	38	42	45	49	52	56	59				
3'10" (46 inches)			10	13	17	20	23	27	30	33	37	40	43	47	50	53	56				
3'11" (47 inches)			10	13	16	19	22	25	29	32	35	38	41	45	48	51	54	57			
4'0" (48 inches)				12	15	18	21	24	27	31	34	37	40	43	46	49	52	55	58		
4'1" (49 inches)				12	15	18	20	23	26	29	32	35	38	38	44	47	50	53	56	59	
4'2" (50 inches)				11	14	17	20	22	25	28	31	34	37	39	42	45	48	51	53	56	
4'3" (51 inches)				11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54	
4'4" (52 inches)				10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	49	52	
4'5" (53 inches)				10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50	
4'6" (54 inches)				10	12	14	17	19	22	24	27	29	31	34	36	39	41	43	46	48	
4'7" (55 inches)					12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	46	
4'8" (56 inches)					11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	39	
4'9" (57 inches)					11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	45	
4'10" (58 inches)					10	13	15	17	19	21	23	25	27	29	31	33	36	38	40	43	
4'11" (59 inches)					10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	37	
5'0" (60 inches)					10	12	14	16	18	19	21	23	25	27	29	31	33	35	37	42	
5'1" (61 inches)						11	13	15	17	18	20	22	24	26	28	30	32	34	36	40	
5'2" (62 inches)						11	13	15	16	18	20	22	23	25	27	29	31	33	34	36	
5'3" (63 inches)						11	12	14	16	17	19	21	23	24	26	28	30	32	33	35	
5'4" (64 inches)						10	12	14	15	17	18	20	22	24	25	27	29	31	32	34	
5'5" (65 inches)						10	12	13	15	16	18	20	21	23	25	26	28	30	31	33	
5'6" (66 inches)						10	11	13	15	16	17	19	21	22	24	25	27	29	30	32	
5'7" (67 inches)							11	13	14	15	17	18	20	22	23	25	26	28	29	31	
5'8" (68 inches)							11	12	14	15	16	18	19	21	22	24	25	27	28	30	
5'9" (69 inches)							10	12	13	14	16	17	19	20	22	23	25	26	28	29	
5'10" (70 inches)							10	11	13	14	15	17	18	20	21	23	24	25	27	28	
5'11" (71 inches)							10	11	13	14	15	16	18	19	21	22	23	25	26	28	
6'0" (72 inches)								11	12	13	14	16	17	19	20	21	23	24	25	27	

If your BMI is not listed on this chart,
Please visit CDC's Web site at
<http://apps.nccd.cdc.gov/dnpabmi/Calculator.aspx>
to calculate your child's BMI

APPENDIX THREE: BODY TYPE CHART



APPENDIX FOUR: BEVERAGE SELECTION GRAPH

