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How Does Parent Nutrition Education Change What Children Bring for Lunch?

An Action Research Report

By Theresa A. Brandl

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By Theresa A. Brandl

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in fulfillment of final requirements for the MAED degree
St. Catherine University
St. Paul, Minnesota

Advisor _____

Date _____

Abstract

The intent of this action research was to see if parent nutrition education changed what parents packed in their children's lunches. This study was conducted at a Colorado Montessori school enrolling infants through kindergartners. Data sources included teacher observation before and after the nutrition classes, a pre-class parental survey on nutrition knowledge and topic needs, a teacher journal, and a post-class evaluation. Results showed that after the class, five out of seven students' lunches changed 20 to 60%. Parents incorporated ideas learned from the class and ways to entice picky eaters. Based on this action research project, the school is implementing a hot lunch program. I initiated a monthly food club to teach parents ways to cook multiple meals from a basic staple, explore ethnic cuisines, and share recipes.

As a teacher in the toddler program, I see what the students bring for lunch. Some of them have healthy lunches, but others contain all processed foods. Sugary cookies, candy, and even marshmallows show up in their lunch bags. Some parents send baby food. The meals are not well balanced or nutritious. As with most children, the toddlers think the food the other students bring is more appetizing than their own lunches. The children with the less healthy meals seem naturally drawn to the fruits and vegetables of the other children. I began to wonder why the children got the lunches that they did. Was it because of parental lack of knowledge? I know most of my working parents have time constraints; was that the problem? Do they think commercially prepared food is more economical? Do they send the same food every day because their child is a picky eater and they finally found a food he likes? Do they send baby food because they think their toddler is still a baby? How would a parent education class affect what children bring for lunch?

I knew parents had an effect on what foods their children ate. Young children learn about eating foods by watching their parents' eating habits. Parents determine what foods they offer their children and provide the dining atmosphere (Rich, 2012). Prepackaged lunches with meat, crackers, cheese, and an over sweetened dessert are a quick meal, but the sodium, sugar, and preservatives are not healthy for a growing toddler body. Even items parents think are healthy, such as yogurt in a tube, is loaded with refined sugar. Baby food does not give children the opportunity for chewing that they need to develop the muscles used in language development. Crunchy foods can help children who bite because the biter enjoys and seeks out the physical sensation of biting or chewing that he does not get from pureed foods ("Responding to").

Before I became a teacher, I was in food service and had my own catering company. I ran the hot lunch program in four schools for five years. During the summer, I cooked for an

independent living senior residence. I incorporated those meals into the school lunch program. Later, I was the director of food and nutrition for a skilled nursing facility.

As I researched, I learned that schools play a part in promoting healthier eating habits. By involving parents in food education, the children increase their knowledge about nutrition (Moore, Murphy, Moore, 2011). When parents know more, they can help their children choose a diet low in unhealthy fats and help them learn how to judge serving sizes (Baskale & Bahar, 2011). Childhood obesity has doubled in the last 30 years and tripled in adolescents. In 2010, more than one third of children and adolescents were overweight or obese (CDC, 2013).

Mealtimes are a great place to encourage children's fruit and vegetable choices (Taras, 2005). Allow children to pick out new foods at the grocery store. Children are more likely to try a new food if they select it (Martinez, Bennett & Shelnut, 2013). A parent education class can help parents understand how their students' dietary intake affects their abilities to learn. This knowledge can encourage parents to help their children make good food choices and pick healthier snacks (Baskale & Bahar, 2011). Parents also need to understand the importance of hydration. Water enhances circulation and aids in waste removal. Helping students make healthier choices is an essential part of their education and well-being (Norman, 2013).

The United States Department of Agriculture sets dietary guidelines. Some of their goals are to provide healthy meals that appeal to children and to meet their nutritional requirements. The department suggests increasing the amounts of fruits and vegetables served. The USDA emphasizes whole grain-rich foods, limiting calories, and reducing saturated fats and sodium. If parents ask their children if they want to sample a new food rather than just serve it to them, the children are more apt to try it. Children often need a new food offered 10 to 15 times before they eat it (Lerner & Parlakian, 2007).

Parents need to learn that good nutrition is critical for brain development and plays an important role in brain function (Wolfe, 2010). Healthy students learn better because diet affects mental and emotional states. Poor nutrition affects academic achievement, classroom behavior, concentration, and test scores (Espy, 2013). The ability to perform daily activities is dependent on the consumption of nutrients. Good nutrition promotes not only physical growth and health, but also cognitive development. Morris (2011) states that cognitive development includes remembering, problem solving, and decision-making. Children perform their intellectual best when they have the winning combination of healthy, balanced meals and daily physical activity. It influences neurotransmitters in the brain's frontal lobes (Raby, 1995). Good nutrition promotes physical health and cognitive development (Morris, 2011).

In 1999, Butler, a principal in an elementary school in Georgia, launched her Achieving Academic Excellence through Nutrition program, which banned refined sugars, high fat, and processed foods and drinks from the cafeteria. She involved parents through cooking classes and nutrition education. The immediate results were a significant drop in absenteeism, improvements in attention and energy levels, plus higher grades (Butler, 2005). I hope to achieve similar results.

Parent nutrition classes can teach how different foods aid learning. Foods containing iron help transport oxygen to the brain. Protein aids in alertness and motivation. Foods high in B vitamins help memory. A vitamin B deficiency may result in memory problems and confusion (Morris, 2011).

It is vital that parents recognize that diet influences neurotransmitters in the brain's frontal lobes (Raby, 1995). Norman (2013) explains how the brain works. As neurons connect, they communicate using a process called neurotransmission. As a child thinks, speaks, moves, or

feels, electrical impulses trigger the release of chemicals, called neurotransmitters, which travel across the synapses, transmitting information to the next cell. This cell-to-cell communication forms the basis of learning. Neurotransmitters are responsible for cognition, emotion, mood, and behavior (Raby, 1995). Neurotransmitters help connect verbal, emotional, visual, and kinesthetic memories. They connect prior learning to new learning and correlate with mood and behavior. They regulate learning states and levels of alertness. The raw material for building and pruning of these connections comes from food (Norman, 2013). The consumption of nutrients affects body chemistry, and body chemistry affects brain chemistry and function. It was interesting to learn that researchers know little about how specific nutrients influence the brain in relation to mental activities and behavior in healthy people, so they do not consider behavioral consequences of deficiency when establishing recommended dietary allowances criteria (Espy, 2013).

I am fascinated with the correlation certain vitamins and nutrients have on challenging behavior and good learning. The deleterious effect of preservatives and artificial ingredients has me concerned. There is a strong correlation between pesticides and Attention Deficit Hyperactivity Disorder (Raby, 1995). ADHD affects between three and seven percent of the children in the United States. Recent research suggests an even higher prevalence (Hunt & Marshall, 2012). It is the most commonly diagnosed behavioral problem in children. Children with ADHD have reduced attention spans, less concentration, excessive activity, distractibility, and impulsiveness. Since 1990, sales for drugs that treat ADHD have increased five fold (Schardt, 2000).

Excess or deficiency in certain dietary components contribute to the functioning of the central nervous system and have effects on behavior. Dietary factors are the basis of all

biochemical reactions and physiological functions in the body, including the brain (Raby, 1995). Nutritional factors have a significant impact on brain function. If deficiencies or imbalances occur, depression, anxiety, or ADHD may arise (Thiboutot, 2008). Damage to neurotransmitters can also cause ADHD (Raby, 1995).

In the early 1970s, California allergist, Dr. Benjamin Feingold, started the idea that food affects children's behaviors (Schardt, 2000). Wilson believes there is a relationship between nutritional imbalances and psychological or behavioral symptoms and conditions (Wilson, 2009). Processed foods are more prevalent today than 20 years ago (Bucher, 2010). Certain synthetic food additives can cause serious learning and behavior problems for sensitive people ("Many Learning," 2010). There is a connection between pesticides in food and ADHD (Raby, 1995). A healthy diet helps alleviate many of these problems. If a parent knows these facts, they can make healthier food decisions.

There is a direct connection among nutrition, brain function, and behavior (Espy, 2013). Twenty three studies looked at whether food dyes or ordinary food worsened behavior in children with ADHD or other behavioral problems. Some of the studies compared regular diets to those free of food dyes, preservatives, and caffeine. Other studies put children on highly restricted diets, and then fed them food dyes or foods that typically cause food allergies. In all the studies, there was a control group, but the children, parents, teachers, and psychologists did not know which children comprised the group until the study was over. Some of the studies demonstrated significant improvement in the children's behavior when they ate healthy food (Schardt, 2000).

Parents should know about the Feingold diet, which eliminates artificial colors, flavors, sweeteners, and preservatives. It also eliminates salicylates. Salicylate is a natural pesticide that

plants produce to protect themselves. It was originally a diet for allergies, but doctors and patients saw an improvement in behavior and attention. Often Feingold's patients have ear infections, asthma, sinus problems, migraines, stomachaches, or sensory deficits. His diet sometimes alleviates these ailments, but the biggest modification is in behavior ("Many learning," 2010). Omega 3 and omega 6 fats play a pivotal role in brain health. Emerging findings show that omega 3 fatty acids are useful in depression, ADHD, and stress (Thiboutot, 2008).

Aggression is a characteristic of ADHD. There are many causes of aggressive behavior in children. One cause is poor nutrition (Bucher, 2010). Studies prove modifications of diet sometimes improve unwanted behaviors in children. Sugar, additives, saturated fats, refined carbohydrates, and caffeine may all contribute to violence. Good nutrition plays a key part in helping children overcome aggressive behavior (Bucher, 2010). Carbohydrate intolerance is a common nutritional disorder that produces severe behavior changes. Confusion, irritability, anxiety, and violence are symptoms of this sensitivity (Wilson, 2009).

What children ingest can have an impact on their emotions and behaviors. Most clinicians in the mental health field often overlook this connection. Vitamins B12, B6, and folate have many effects to mental health. A vitamin B12 deficiency can cause the inability to concentrate, poor memory, confusion, loss of concentration, agitation, and depression (Thiboutot, 2008). Calcium, magnesium, and zinc are three elements that help calm the nervous system. Calcium raises the point where nerves fire. This reaction reduces the irritability and sensitivity of the nervous system. Zinc is an anti-stress nutrient and magnesium is a powerful sedative. Wilson gave a child these supplements and within two days, the child was more relaxed, could sit still, and was easier to manage (Wilson, 2009).

A good diet promotes intellectual development and less challenging behaviors. I hope that by giving parents more ideas about which foods are good for their children, they will help their children make better food choices. If I gave them inexpensive, healthy lunch ideas, I hoped that they would pack better food in their children's lunch bags. With information about enticing a picky eater, the parent can understand their child better. As a result, I hope to see children with longer attention spans and less challenging behaviors. Vitamins and other nutrients can alleviate other health concerns. Good nutrition helps children perform at their intellectual best. I want to show that parent nutrition education changes what children bring for lunch. In order to show the effectiveness of nutrition classes I developed an action research plan outlined in the next section.

Description of the Research Process

In order to assess the effects of parent nutrition education on what children eat for lunch, I used four data sources to triangulate my results. My data collection resources included teacher observation before and after the nutrition classes, a pre-class parental survey on nutrition knowledge and topic needs, a teacher journal, and a post-class evaluation. My plan was to send out a parental survey, observe the students before and after the classes, plan parent nutrition classes, and utilize a post-class evaluation. The nutrition classes were available to infant, toddler, pre-primary, and primary parents. I observed all the children whose parents attended the classes and who ate lunch at school.

I sent out a survey to the parents to find out how much they thought they knew about nutrition - (See Appendix A). The survey included questions about their children's eating habits, how often they had dinner as a family, and how often they shopped. I wanted to know if their children were picky eaters or had food allergies. I questioned how much they thought they knew about their child's nutritional need. I also asked what topics they were interested in learning

about in the classes. Options included healthy snack alternatives and healthy lunch ideas. Other suggestions were learning about foods that affect behavior and which foods to avoid. I wanted to know if they were interested in inexpensive alternatives to packaged foods, cooking multiple meals, or enticing a picky eater.

I scheduled three nutrition classes, one for teachers and two for parents. Each class was about an hour - (See Appendix B for class outline). In these classes, I introduced myself and described my food background. I solicited demographic information about their children, ages, genders, food allergies, or diet restrictions. I asked about their greatest feeding challenges. I explained how food affects behavior, learning, and attention. Good nutrition also promotes physical health and growth. Proper nourishment is critical for brain development and function. Healthy students perform better. Diet affects mental and emotional states. I showed them which nutrients are most important for brain development, cognitive performance, and concentration. Protein, iron, and foods high in vitamin B aid brain function.

I instructed them about how we need to avoid food dyes, preservatives, and caffeine because they can worsen behavior in children with ADHD or other behavioral problems. Sugars, additives, saturated fats, and refined carbohydrates also contribute to aggressive behavior.

I tackled the problem of dealing with picky eaters; how to tempt the children without making a big fuss that could cause a power struggle. Respecting the children's appetites, being patient with new foods, and recruiting their help selecting and preparing meals were some ideas I provided to help picky eaters. Minimizing distraction is one of the easiest and best ways to help fussy eaters and enjoy conversation during a meal.

I gave them healthy snack options such as fruit kabobs, homemade applesauce, and cheese and meats cut into shapes. Lunch ideas included individual meatloaves and single serve omelets.

I gave them some recipes. I offered inexpensive alternatives to packaged food such as making your own version of the packaged meat, cheese, cracker, sugary drink, and unhealthy dessert product. I explained how to cook several meals at a time and freeze them for later meals. I showed how varied presentations of food kept the children's interests and made them want to try the food. Using an ice cube tray or silicone baking cups changed how the food looked and might tempt the children to try it. I also explained that children needed exposure to a new food 10 to 15 times before they try it. I included a resource list of cookbooks and websites for further information. After a question and answer period, I passed out the class evaluation - (See Appendix C).

I observed the toddlers the week before the class. I wrote down everything they had in their lunchboxes. After the classes, I again observed the toddlers whose parents came to the classes. I observed them for one week. I wanted to see how quickly their parents responded to the information from the classes. I waited a week between observations. The following week, I observed the same toddlers. I needed to see if the parents who made changes quickly continued with the healthier lunches and if the parents who did not immediately change would change later. After attending the information night, did parents give their children different foods for lunch?

Analysis of Data

I received 23 survey forms back from the parents. The data does not always add up to 23 because some parents have multiple children at the school, and others did not respond to every question.

I asked how often parents shop for groceries because I wanted to see if people planned meals a week at a time or if they were more spontaneous. If they purchase more organic fruits

and vegetables they need to shop more often for fresh produce since pesticides and preservatives aren't applied. Figure 1 shows the breakdown of parental shopping patterns.

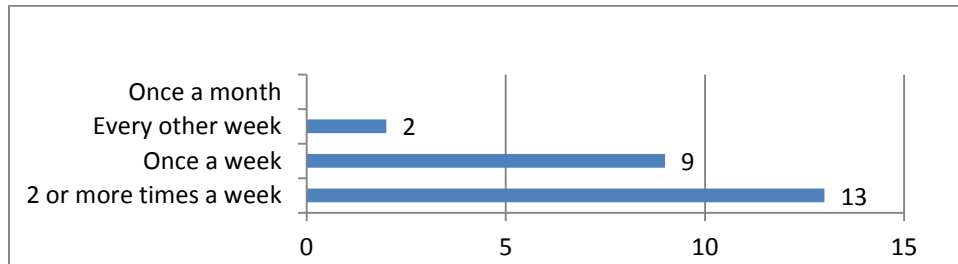


Figure 1. Shopping habits.

Figure 2 shows that the majority of the families ate together at least three to five times a week.

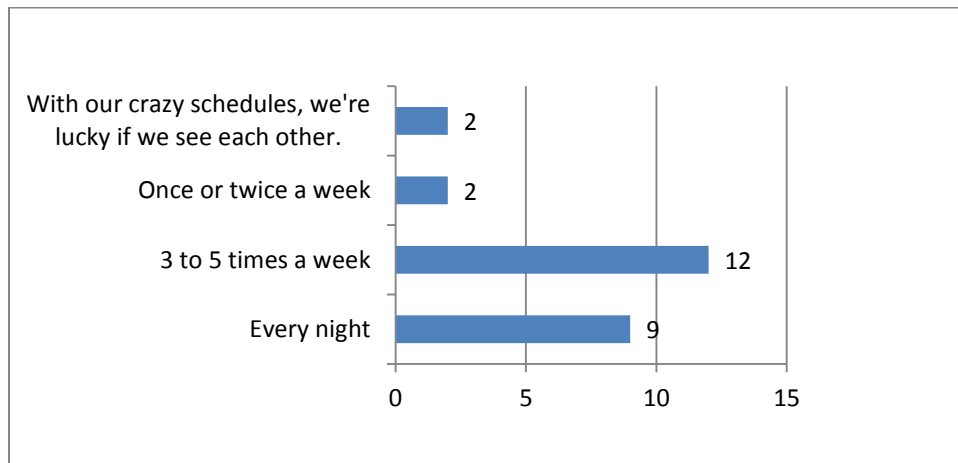


Figure 2. Family mealtime frequency.

Out of 23 surveys, 18 responders were interested in attending a parent nutrition class. Nine parents felt they knew a lot about a child's nutritional needs, eight did not think they knew very much, and two answered a little. Only four children had food allergies that included wheat, milk, gluten, eggs, and citrus fruits. One child was allergic to all tree nuts and another, just cashews, peanuts, pecans, and walnuts. The responses were about even between parents who thought their children were picky eaters and those who did not – (See Figure 3).

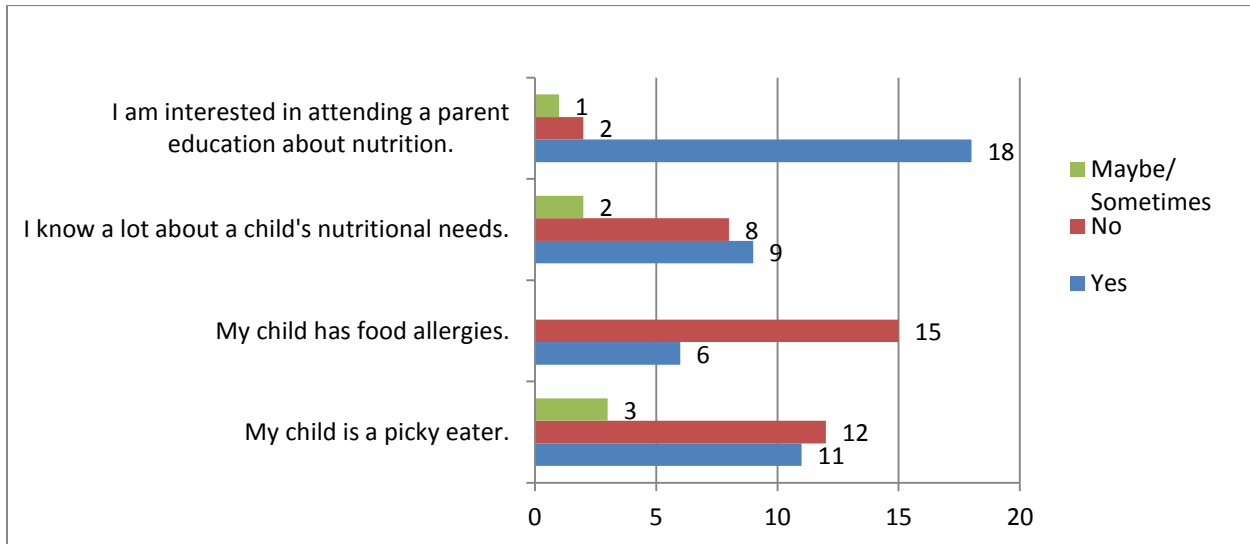


Figure 3. Survey answers.

Most parents were interested in learning about healthy snack options and lunch ideas, followed closely by how to entice a picky eater. Figure 4 shows how parents responded to topics in a nutrition class.

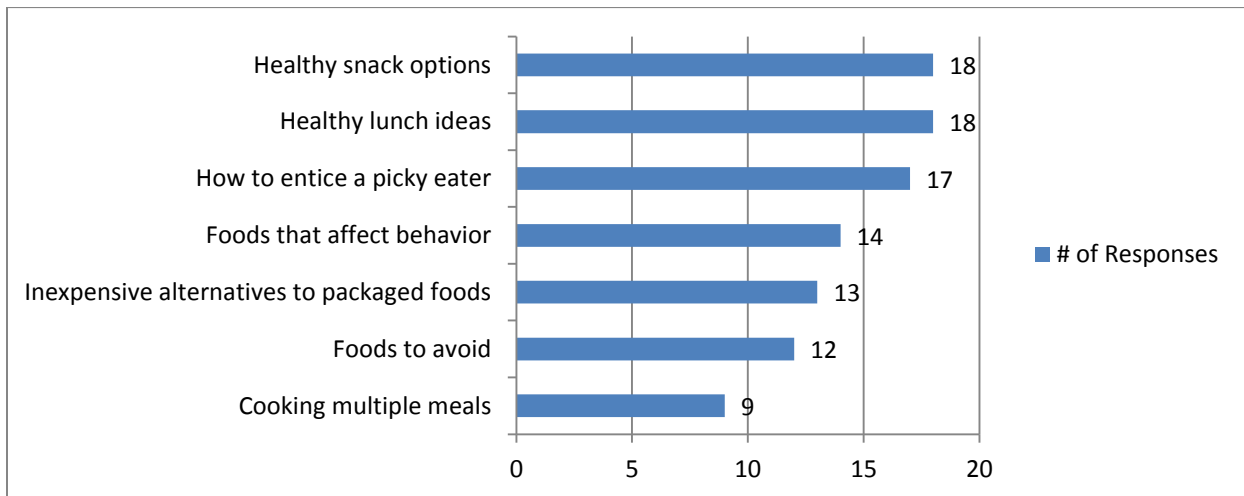


Figure 4. Nutrition class topics.

I started my observations a week before the nutrition classes – (See Appendix D for observations). Because I was unsure which parents would attend the class, I observed two

classrooms of toddlers. The school has a five day, a three day, or a two day option for attendance. There are children who attend half day and do not stay for lunch. We also had many sick children which is why there are days with few entries. Friday is Pizza Day for the children who choose to participate

I taught the first class for parents on February 26, at 9:00 a.m. Five mothers attended. Of the five attendees, two have children who attend half day, two were toddler mothers, and one was a primary mother. We talked about all the topics on the survey. Table 1 shows what the children brought for lunch immediately after the first class. I observed the children for a week. The entries in red are the changes to the original lunches or food items I mentioned in my class. I was interested in seeing how quickly parents reacted to the new ideas. N’s mother immediately added sliced peppers and dip to her daughter’s lunch. I was pleased to see such a quick response. Later in the week, she also added snap peas. I had never seen this in N’s lunch before. N’s mother added new items 60% of the week. D’s mother told me she tried to add new foods to his lunch, but he would only eat the same things every day. A’s mother already served a variety of foods. A’s dad is a chef. She gave many new lunch ideas during the class.

Table 1

Observations after Wednesday’s class

Child	Feb. 27	Feb. 28	March 3	March 4	March 5
D	Greek yogurt	Blueberry Greek yogurt	Tuberz organic low fat blueberry yogurt	Strawberry Greek yogurt	Strawberry Greek yogurt
	Clif kid bar	Clif kid bar	Clif kid bar Cookies and Cream	Clif kid bar Cookies and Cream	Clif kid bar Cookies and Cream
	Strawberries and blueberries	Watermelon	Kiwis	Kiwis	Kiwis
	Cheese and mayo sandwich on ciabatta	Cheese and mayo sandwich on ciabatta	Cheese and mayo sandwich on ciabatta	Cheese and mayo sandwich on ciabatta	Cheese and mayo sandwich on ciabatta

Child	Feb. 27	Feb. 28	March 3	March 4	March 5
N	Crackers Applesauce Nutrigrain bar Sunbutter and jelly on wheat bread Sliced peppers Ranch dip	Veggie straws Tangerine Sliced peppers Strawberries Nutrigrain bar Turkey American cheese slice	Strawberries and blackberries Applesauce Sunbutter and jelly on white bread Cucumbers Strawberry banana yogurt Nutrigrain bar	Banana Snap peas Strawberries Cheese and turkey roll up Applesauce Multigrain crackers	Green beans Strawberries Cheese and turkey roll up
	A	Milk Quinoa, spaghetti squash, spinach, and ricotta Strawberries Puffed wheat and nuts	Milk Natural spinach chips Kraft mac and cheese with broccoli Strawberries and kiwis	Milk Grapes Mini bagel with cream cheese Sunbutter on wheat bread	Milk Sweet potato chips Tortilla with avocado, tomato, and cream cheese

The second class was the following day at 3:30 p.m. It was for the teachers. Eleven teachers were present. One of the teachers has a daughter in the school, but she does not stay for lunch. The day following the class, one of the toddler teachers incorporated my suggestion of adding dip to encourage children to eat vegetables and fruits. Children love to dip food items. The toddler classes are the only ones in the school that prepare a snack for the children. In the other classrooms, a different parent brings a prepared snack for the entire class.

My last class was February 27, at 5:30 p.m. Seven women attended, one of whom is a teacher at my school. Of the other six, one has a child who attends half day, one has an infant, one has a toddler, one has a pre-primary student, and two have primary students. Table 2 shows my observation of what the children brought for lunch after their mothers attended my class. Again, the entries in red reflect changes in their lunches. This observation lasted a week. T's lunch reflected change from the Lunchables he usually ate. His mother substituted cubed cheese and ham for the processed cheese and ham of the prepared meal. K's mother added plain yogurt with just fruit jelly instead of the single serve yogurts. She did this once. Two of the lunches had no changes.

Table 2

Observations after Thursday’s class

Child	Feb. 28	March 3	March 4	March 5	March 6
S	Strawberries Organic reduced fat chocolate milk Goldfish Nature Valley peanut butter granola bar	Organic reduced fat chocolate milk Multi grain crackers Cheese cubes Nature Valley peanut butter granola bar Goldfish Peanut butter and jelly on whole wheat bread Homemade cheddar zucchini biscuit Raisins Fig bar	Breaded chicken Strawberries Organic reduced fat chocolate milk Goldfish Homemade cheddar zucchini biscuit Raisins Fig bar	Organic reduced fat chocolate milk Gogurt Cheese slices on whole wheat bread	Organic reduced fat chocolate milk Strawberries Goldfish Nature Valley peanut butter granola bar Homemade ground beef burrito topped with cheese raisins
T	Pizza	Granny Smith apple Sunbutter on whole wheat bread Blue corn chips Single serve applesauce	Banana Blue corn chips Single serve applesauce Cheese cubes Ham	Banana Blue corn chips Cheddar bunnies Sunbutter on whole wheat pita Dried apricots	Granny Smith apple Blue corn chips Cheddar bunnies Sunbutter on whole wheat pita Dried apricots Cheese cubes
K	Low fat pineapple Greek yogurt Grapes, strawberries, cantaloupe, and blackberries Homemade corn muffin Muenster cheese	Muenster cheese slices Homemade corn muffin Light and Fit Greek strawberry yogurt Oranges, grapes, and blackberries	Yogurt - not single serve Oranges, grapes, and blackberries Hummus Pita bread	Light and Fit Greek strawberry yogurt Fish shaped graham crackers Sunbutter on whole wheat pita	Light and Fit Greek blueberry yogurt Homemade blueberry muffin Grapes and oranges
I		Mini Triscuits Ham Clementine Yogurt raisins Single serve pears Prune	Nutri Grain apple cinnamon bar Clementine Yogurt raisins Single serve pears Prune Sesame green bean cracker	Sesame sticks Apple pear sauce (pouch) Fruit veggie smoothie (pouch) Nutri grain bar apple cinnamon Single serve pears	

I did one more observation, a week after the last one ended. I observed three toddlers, one pre-primary, and three primary students’ lunches. I wanted to see if the children who had no change the first week, brought new foods for lunch. I wondered about the lunches that improved immediately after the class. Would they continue with my suggestions or go back to the original lunches? Table 3 shows those results. The entries in blue reflect new changes.

Table 3

Observations two weeks after class

Child	March 13	March 14	March 17	March 18	March 19
S	Goldfish Gogurt Berry Blue Blast Organic strawberry smoothie Nature Valley peanut bar Almonds Cheese sandwich on wheat	Goldfish Gogurt Blue Berry Blast Organic strawberry smoothie Nature Valley peanut bar Almonds	Goldfish Gogurt Strawberry Splash Organic strawberry smoothie Nature Valley peanut bar Cream of Chicken soup	Goldfish Organic strawberry smoothie Nature Valley peanut bar Breaded chicken Ranch dressing	Pirate's Booty Gogurt Berry Blue Blast Organic strawberry smoothie Nature Valley peanut bar Carrot sticks Ranch dressing for dipping Cream of chicken soup
T	Banana Single serve applesauce Cheddar bunnies Brown rice and black beans	Pizza	Banana Single serve applesauce Cheddar bunnies Whole grain crackers Sunbutter on a whole wheat pita	Banana Single serve applesauce Cheddar bunnies Sunbutter on a whole wheat pita	Banana Cheddar bunnies Brown rice and black beans
I			Single serve pears Strawberry yogurt raisins Prune Mini Triscuits Go Go Squeeze pouch – apple, mango, pineapple, banana, and peach	Single serve pears Strawberry yogurt raisins Prune Mini Triscuits Nutri grain apple cinnamon bar	Single serve pears Go Go Squeeze pouch – apple, blueberry, and pomegranate Prune Sesame sticks
K	Light and Fit Greek strawberry yogurt Raspberries and mangoes Almond butter on a roll	Light and Fit Greek pineapple yogurt Raspberries and mangoes Mini quiche, egg and broccoli	Light and Fit Greek strawberry yogurt Strawberries, grapes, and , mango Hummus Pita triangles	Single serve applesauce Pineapple, strawberries, and grapes Sunbutter and jelly on a roll	Light and Fit Greek strawberry yogurt Strawberries, grapes and mangoes Hardboiled egg Roll
D	Key lime Greek yogurt Clif kid bar Cookies and Cream Kiwis Cheese and mayo sandwich on ciabatta	Clif kid bar Cookies and Cream Kiwis Cheese and mayo sandwich on ciabatta Tuberz organic low fat blueberry yogurt	Clif kid bar Cookies and Cream Peach Greek yogurt Apple slices Cheese and mayo sandwich on ciabatta	Clif kid bar Chocolate Chip Peach Greek yogurt Clementine Cheese and mayo sandwich on ciabatta	Clif kid bar Chocolate Chip Strawberry Greek yogurt Apple slices Cheese and mayo sandwich on ciabatta
N	Strawberries Single serve pears Cheddar cheese slices Multigrain crackers Sliced turkey Raisins Sunbutter and jelly on a tortilla	Cucumber slices Hummus Cheddar bunnies Turkey Multi grain crackers Cheddar cheese slices Raisins	Multi grain crackers Craisins Yogurt raisins Colby, Monterey Jack cheese slices Cherry tomatoes and raspberries Butterfly shaped sunbutter and jelly sandwich on whole wheat	Colby, Monterey Jack cheese slices Turkey slices Yogurt raisins and Craisins Multi grain crackers Raspberries Butterfly shaped sunbutter and jelly sandwich on whole wheat	Cheddar bunnies Multi grain crackers Colby, Monterey Jack cheese slices Turkey and pepperoni slices Craisins Butterfly shaped sunbutter and jelly sandwich on whole wheat Mandarin oranges, not single serve

Child	March 13	March 14	March 17	March 18	March 19
A	Milk Ricotta, fresh blueberries, and peas Strawberries and kiwis Cookie bites	Sweet potato chips Fresh mozzarella, cherry tomatoes, broccoli Grapes		Milk Pumpnickel triangles Cream cheese cucumber for dipping Apples and grapes Cheerios and crackers Cucumber yogurt salad	Milk Organic cheddar cheese stick Turkey, cucumbers, cherry tomatoes, and fresh mozzarella Cheerios, pretzels and cheddar bunnies

Two weeks after the class, S’s mother added almonds to his lunch. This was a suggestion for adding non-meat protein to the meal. He had no change immediately following the class. T’s lunches included brown rice, black beans, and whole grain crackers. Adding whole grains aids digestion by increasing fiber. Black beans are a source of protein, fiber, and phytonutrients. Phytonutrients help fight disease and keep the child’s body working properly. These foods replaced the Lunchable alternative he had previously. K’s lunch of hardboiled egg, pita triangles, and hummus were suggestions from the class. Children love to dip foods and cutting food into shapes piques their interests. N’s mother continued adding new foods to her lunch. Butterfly shaped sandwiches, cucumber slices, and hummus were different this week. A’s pumpnickel slices and dipping sauce was the biggest surprise. Since her dad is a chef, I did not know if A’s mom would learn anything new in the class. I’s lunches showed no change. None of her lunches incorporated any protein. D’s lunches were the same as the week following the class.

Four of the seven lunches I observed added suggestions 20 percent more the second week of observation. One improved 60 percent. This time only two lunches reflected no change. I attribute the increase to the parents using up the foods in their pantry and having time to shop for the healthier alternatives. Figure 5 shows the increase in healthier items in lunches over a two week period.

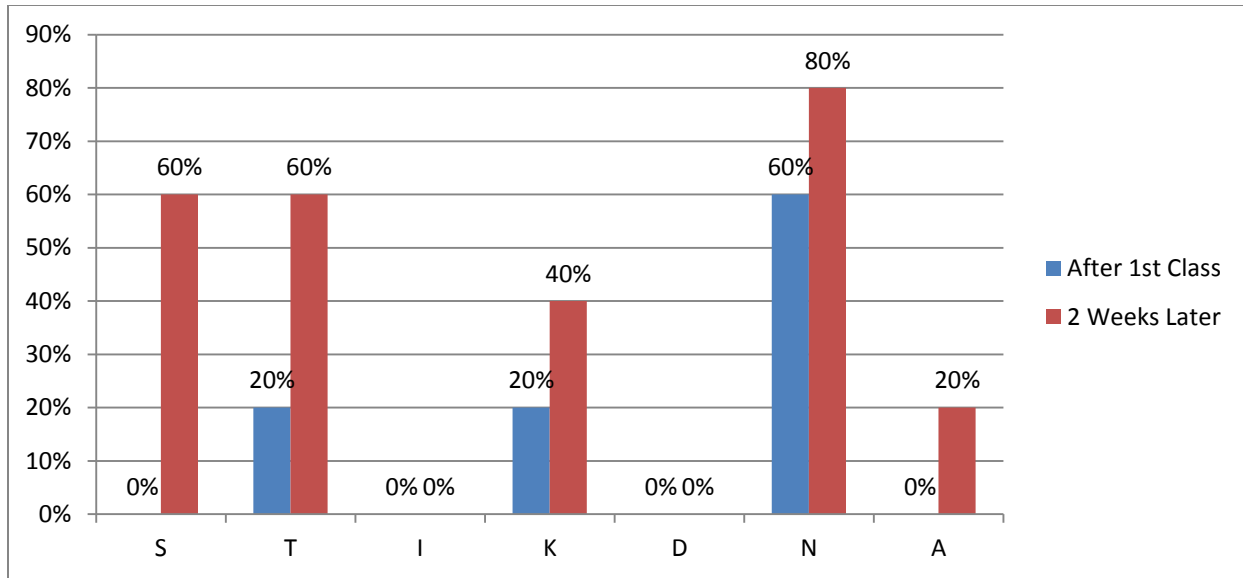


Figure 5. Increase in healthier items in lunches.

After the classes, I gave the attendees a class evaluation form. I received 21 responses. I hoped to get some constructive feedback on my class. The results were very positive and the one negative response gave me no ideas for improvement. I included these results in Figure 6. Two people wanted more handouts. I will add that suggestion to my next class. Other recommendations were recipes and a follow up session.

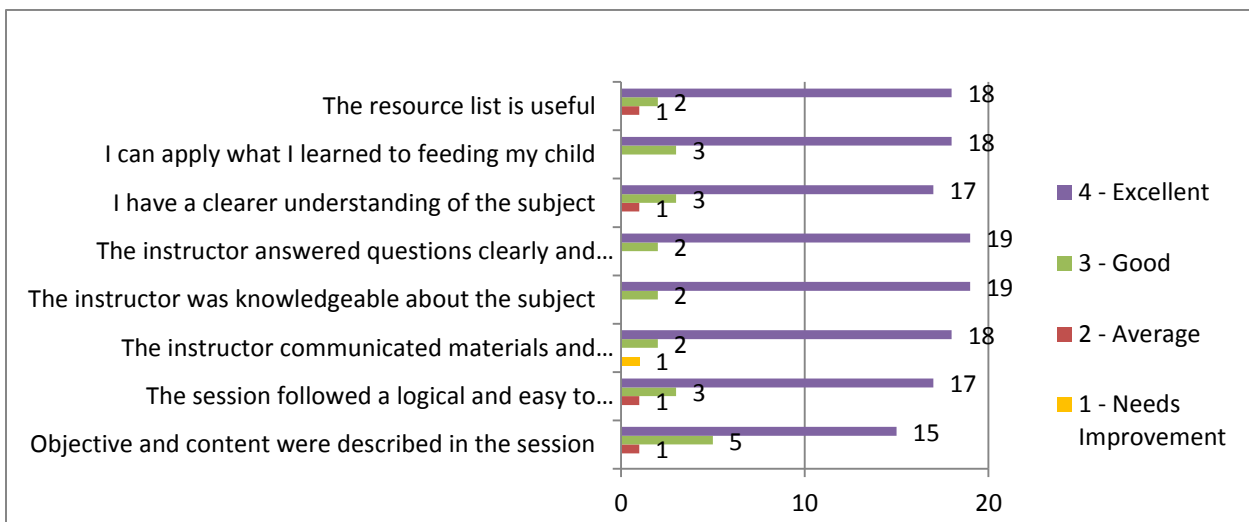


Figure 6. Evaluation results.

Action Plan

Even with a small turnout for the nutrition classes, I observed enough children's lunches to see a change in food items. With my research, I learned that parent education helps change what children bring for lunch. After the nutrition class, several parents mentioned wanting follow up classes, so I started a Food Club.

Once a month, parents and teachers come and learn some aspect of food preparation. I scheduled the first class two weeks after the nutrition classes. This class demonstrated a variety of Mediterranean dishes. All of these dishes are quick and easy to make from the same basic ingredients. The concept is to make one meal fresh and freeze the others for later use. These kid friendly recipes allow children to help with food preparation and simplify cooking during the week. Parents bring the requested ingredients and we show them a variety of ways to use these foods.

At our first class, we prepared a basic, healthy, versatile marinara sauce. We then sampled spaghetti Bolognese, vegetarian lasagna, eggplant parmesan, mussels Fra Diavolo, and sausage and peppers, all made with the same Mother sauce. Cooks can customize these meals for vegetarian or gluten free diets. The April class will feature chicken, prepared and sampled in a variety of international recipes. May's class will spotlight seafood.

Many of the recipes from the Food Club will complement the lunch program. As I stated before, a child must see a new food 10 to 15 times before he will try it. Preparing some of the same meals at home that the chef will serve at lunch reinforces this transition by exposing the child to the food in multiple familiar locations.

The results of my research changed the lunchroom dynamics. The school is in the process of implementing a hot lunch program. This lunch program will serve menu items made from

scratch. They will offer fresh fruits and vegetables, whole grains, and naturally sweetened desserts using fruits, stevia, or agave nectar - no refined sugar. The chef will allow the students to help in the kitchen under his supervision. They will clean and cut vegetables, stir sauces, measure ingredients, monitor cooking times, and prepare food for service.

For serving foods grown and prepared by students, he will use the Seed to Table guidelines. Seed to Table (2013) is a program that creates meaningful relationships between young people and food in order to transform the school food system. They place an emphasis on hands on experiences taking student from planting to harvesting to serving produce. Students and parents will generate menu ideas. This includes any family recipes the chef can incorporate into the lunches. The chef will name them after the originator of the recipe, for example, Johnny's Mom's Chili or Grandma Pam's Chicken and Rice. This will encourage other children to try dishes they might not otherwise sample. If a student says, "My grandpa makes this food and I love it," maybe his friends will try the food. Sometimes peer pressure is beneficial.

The chef plans to introduce a variety of ethnic foods and offer gluten free and vegetarian options. He will distribute complete nutritional information on all of the foods. In addition, the parents will receive a complementary list of foods. This list will provide them with breakfast and dinner items for the best overall daily nutrition to complete the lunches. He will share the list with weekly lunch choices, so parents can plan meals for daily nutritional guidelines. Some of the vegetables and herbs will come from the gardens on the campus. As we saw from the research, children who help with food preparation are more likely to try those foods.

The school will have a parent nutrition education class at the beginning of the school year to encourage healthy, nutritious lunch items for the children bringing lunches. They will repeat the class in January, as a refresher, and to encourage parents new to the school to learn about

good food. The nutrition class will also focus on ideas of what to serve at home. The feedback from the survey indicated a deep interest in more recipes and handouts.

The hot lunch program will actively involve students on a daily basis. Students will practice grace and courtesy in the lunchroom when they set the tables and help clean up. They will learn patience and taking turns as they serve their lunches. Children also learn care of the earth as they plant, water, and harvest the gardens. They will experience the whole life cycle from seed to table. Since the children have ownership of the fruits of the garden, there are more likely to try the foods and encourage others to do the same. With more students eating healthy, nutritious lunches, I expect to see less challenging behaviors and higher attention spans. Children are getting a balanced meal and nutritional factors have a significant impact on brain function. When deficiencies or imbalances occur, challenging behaviors may arise. With the nutrition facts the chef includes, there will be no deficits. Good food also improves the attendance rate because there are fewer sick children. Eliminating refined sugar, high fat, processed foods, and sugary drinks, improves the body's metabolic function, which improves its health. The school anticipates a higher enrollment rate with the addition of this hot lunch program.

Next year, I plan to conduct action research on whether a school lunch program changes challenging behaviors and attention spans. This was my original action plan, but since I was not implementing a school lunch program, I had no data upon which to base the research. Teachers, especially the primary teachers, now tell me about all the processed foods and sugary snacks some children eat. The teachers observe that these children are the most challenging, exhibiting hyperactivity, belligerence, short attention spans, and lack of concentration.

I believe good nutrition is a key component to effective learning and brain development. My research is already indicating a strong demand for more information and guidance for

practical applications. With the implementation of the hot lunch program, I expect parents to be more knowledgeable and vigilant about their children's nutritional needs.

Beyond the near future, I anticipate 100% participation in the hot lunch program. The director is already considering adding the lunch price to the tuition fee so that all children benefit from a healthy, convenient lunch. Our school lunch program will incorporate all the components I learned during this research project and my personal experience. It will set the standard for school lunch programs everywhere.

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Appendices

Appendix A

Parent Education Nutrition Survey

We are planning a parent education about nutrition. Please take a few minutes to complete this survey so we can better address your concerns.

How often do you go to the grocery store?

- 2 or more times a week
- Once a week
- Every other week
- Once a month

How often do you eat dinner as a family?

- Every night
- 3 to 5 times a week
- Once or twice a week
- With our crazy schedules, we're lucky if we see each other.

My child is a picky eater.

- Yes
- No
- Other:

My child has food allergies.

- Yes
- No

If yes, what allergies does your child have.

I know a lot about a child's nutritional needs.

- Yes
- No

I am interested in attending a parent education about nutrition.

- Yes
- No

- Other:

I'm interested in learning about...

Check all that apply.

- Healthy snack options
- Foods that affect behavior
- Foods to avoid
- Healthy lunch ideas
- Inexpensive alternatives to packaged foods
- Cooking multiple meals
- How to entice a picky eater
- Other:

Appendix B

Opening:

Introduction

Feeding your child

What is your greatest feeding challenge?

Body:

Foods that affect behavior

Foods to avoid

How to entice a picky eater

Healthy snack options

Healthy lunch ideas

Inexpensive alternates to packages foods

Cooking multiple meals

Conclusion:

Review

What else can I share with you?

Appendix C

Parent Nutrition Class Evaluation

Date and Time of Session: _____

Instructor: _____

Please rate the following using a scale of 1 to 4 by marking the appropriate box.

1 = Needs Improvement 2 = Average 3 = Good 4 = Excellent

	1	2	3	4
Objective and content were described in the session				
The session followed a logical and easy to understand sequence				
The instructor communicated materials and concepts effectively				
The instructor was knowledgeable about the subject				
The instructor answered questions clearly and concisely				
I have a clearer understanding of the subject				
I can apply what I learned to feeding my child				
The resource list is useful				

Comments

Appendix D

Child	Feb. 18	Feb. 19	Feb. 20	Feb. 24	Feb. 25
G			Salmon Clementine Watermelon Grapes		
L	Drinkable yogurt Baked potato chips Sunbutter on wheat bread		Teddy Grahams String cheese Sunbutter on wheat bread	Sunbutter on wheat bread Hardboiled egg Yogurt BBQ chips Fruit leather	Peanut butter Ritz Bitz Sunbutter and jelly on wheat applesauce
N	Green beans Strawberries Blueberries Turkey slices	Roast beef Cheese Strawberries Crackers	Green beans Muenster cheese slices Turkey slices Strawberries	Cheese Ham Blueberries Avocado	Strawberries Cucumbers Sunbutter on wheat bread
E	Fruit and veggie pouch Fruit shreds Beet crackers Yogurt drops Grammy Sammy*	Beet crackers Yogurt drops Cereal Blueberry puree	Yogurt Beet crackers Fruit shreds Raisin	Fruit and veggie pouch Beet chips Crackers Yogurt Grammy Sammy*	
C			Cream cheese, turkey bagel Cantaloupe Kraft mac and cheese		
A	Peas Spaghetti squash Grapes Chex	Pasta Cheerios Grapes milk	Spaghetti squash, spinach, and feta Yogurt with grapes and kiwis		Quinoa salad Bagel Jicama
K	Blackberries and strawberries Muenster cheese slices Hummus on wheat bread	Homemade corn muffin Strawberry banana yogurt Strawberries and blueberries	Blackberries and strawberries Sunbutter and jelly on a whole wheat pita	Cheddar zucchini muffin Strawberries, grapes, and cantaloupe Cheese stick	Yogurt Sunbutter and jelly on a whole wheat pita Strawberries and green and red grapes
Al			Pickles Strawberries American cheese and mayo on wheat bread		
Au	Cheddar and turkey on a whole wheat pita Applesauce Cheddar bunnies	Applesauce Cheddar and turkey on a whole wheat tortilla Cucumbers Tomatoes	Cheddar and turkey on a whole wheat pita Applesauce Veggie straws Cucumbers Sunflower seeds	Ham and Swiss on a whole wheat tortilla Cucumbers Cantaloupe Veggies straws	Cheese and turkey on whole wheat Tomatoes Cucumbers Sunflower seeds
H	Lunchable Orange Organic vanilla milk		Raspberries Cheerios Cinnamon raisin bagel		Turkey on white bread Cheese Tangerine Sweet potato corn puree Goldfish
B	Cucumbers Oatmeal with raisins Cantaloupe	Watermelon Ham Corn	Watermelon Sugar snap peas Ham slices Orange	Tomatoes Kiwi Chicken Brown rice	Avocado Banana Coconut milk Cheerios Vanilla yogurt Havarti cheese

Child	Feb. 18	Feb. 19	Feb. 20	Feb. 24	Feb. 25
All		Hot dog Pirate Booty Grapes	Guacamole Quesadilla Mango		
Ha	Blueberries Organic shells and cheese Multi grain crackers	Mashed potatoes Chia squeeze** Cottage cheese Diced chicken	Fettuccine Sausage blueberries	Mashed potatoes Raspberries and blueberries Veggie burger	Avocado Banana Coconut milk Cheerios Vanilla yogurt Havarti cheese
Co	Roast beef on a hamburger bun Grapes	Applesauce Green beans	Chicken Green beans	Apples, grapes, and strawberries Orange Turkey on whole wheat tortilla	Applesauce Turkey and cheese on a whole wheat tortilla Banana
S		Pasta Mixed vegetables Blueberries	Garbanzo beans Rice Sugar snap peas Salad with feta Salmon		
R		Watermelon, grapes Crackers Carrots Cheese stick PBJ on white bread			
Ry		Quesadilla Banana chips Raisins Yogurt		Salmon Strawberries, cantaloupe, and pineapple Blueberry Greek yogurt	
Ch				Cheese Goldfish Strawberries and kiwis Pasta	Kraft mac and cheese Banana Fruit Burst veggie blend
Sc				Sloppy Joe Tater tots Corn Applesauce	
T				Bagel and cream cheese Blackberries, blueberries, and raspberries	Raspberries and black berries Chicken nuggets Cheese squares

*Grammy Sammy is sweetened yogurt between two graham crackers

**Chia Squeeze is organic chia seeds infused with fruits and vegetables

