



HOW CAN WE BE SURE THE STUDENTS ARE EATING A NUTRITIOUS SCHOOL LUNCH? SERVE HEALTHFUL ENTREES!

A PUBLICATION FOR CHILD NUTRITION PROFESSIONALS FROM THE NATIONAL FOOD SERVICE MANAGEMENT INSTITUTE

OVERVIEW

Child Nutrition Professionals throughout the nation are making great strides to meet the nutritional needs of children. The school setting is an excellent environment to stimulate healthy eating habits. With the passage of the *School Meals Initiative for Healthy Children*, the USDA affirms the responsibility of providing nutritious school meals that comply with the *Recommended Dietary Allowances (RDA)* and the *Dietary Guidelines for Americans*.

One method of supporting the *School Meals Initiative for Healthy Children* is by introducing sound principles of nutrition education as part of the education curriculum. Nutrition professionals believe that children provided with knowledge and decision making skills will make a wiser selection of food choices. Nutrition education integrated in the school curriculum endorses nutrition.

We know that point-of choice food labeling makes adults more aware of their food choices, and can aid in making those choices healthier. But can it also help elementary school children? Children need classroom and home activities to reinforce eating healthful foods as a lifelong habit. This study examined the outcome of joining classroom and home nutrition activities with nutrition labeling of cafeteria foods in an effort to encourage third and sixth grade students to select and eat a healthy diet. Child Nutrition Program (CNP) professionals can use the information introduced in the study to reinforce their efforts of providing nutritious food choices and the multiple exposure to nutrition education.

This study was conducted by Indiana University in 1996 in a local Indiana school district. Researchers found that nutrition education and labeling of the cafeteria food did not make a great difference in the food choices of the children having lunch at school. *There was a difference in food waste in that 3rd graders and students from all lower socioeconomic schools wasted more food. Waste from entrees that fulfilled the meal requirements for meat/meat alternate plus grain/bread were less than from other foods. In the study, one of the 16 entrees served were within the CATCH guidelines for fat and sodium.*

RESEARCH

The National Food Service Management Institute (NFSMI) contracted two studies measuring the impact of point-of-choice nutrition education activities. Although the studies had their differences, findings were similar. In 1995 the first study was conducted by Florida International University in a Florida school district. Although this *INSIGHT* focuses on the study conducted by Indiana University, both studies raise questions about the effectiveness of point-of-choice nutrition education programs as currently implemented.

OBJECTIVES

In order to provide an environment to help children select healthful food choices consistent with the *Dietary Guidelines for Americans*, the study conducted by Indiana University, had the following objectives:

- Provide point-of choice nutrition education materials in the cafeteria to stimulate healthful food selection at lunch.
- Provide classroom and home activities to reinforce eating healthful foods at home, in the school cafeteria, and throughout life.
- Determine student food preferences, based on the menu served and the amount of food consumed or left on the tray uneaten.
- Determine if the classroom/home activities and/or nutrition specific food labels in the cafeteria helped stimulate healthful food selection and consumption during lunch.

METHOD

Using NutriKids® 6.1 software, a USDA-approved nutrient analysis software, the calories, fat, and sodium content were analyzed in all foods available for lunch during a four-week menu cycle. The CNP director used the NuMenus option, to meet the school lunch program guidelines for 1996. In this option, foods are weighted, based on popularity, in terms of their nutrient content.

The school district involved in the study offered to elementary students a cafeteria-style lunch service with choices. The students were offered:

- the same four entrees daily, plus one entree rotating on a cycle;
- two vegetables;
- two fruits;
- chocolate and white milk; and,
- occasionally dessert, juice and competitive foods.

The researchers in the study decided to leave the foods unmodified in fat and

sodium content. This decision allowed for the foods offered to be similar to those available elsewhere in the school system. The foods were described according to standards established by the nationwide nutrition program, Child and Adolescent Trial for Cardiovascular Health (CATCH). Table 1 highlights these standards and Table 2 highlights how each food was categorized. Point-of-choice nutrition labels were created for each food for serving line display:

- Green (GO) labels were for the foods that met the CATCH standards;
- Yellow (SLOW) labels were for foods 1-25% over the standards;
- Red (WHOA) labels were made for foods greater than 25% over the standards.

Four elementary schools participated in the Indiana study. Two were treatment schools and two served as controls. There was an equal representation of high and low socioeconomic status schools. Treatment schools received food labeling in the cafeteria and classroom/home activities related to nutrition. Control schools did not receive the food labeling or classroom/home nutrition education activities.

The study was divided into three phases, totaling 9 weeks. The **pre-intervention phase** (1 week) allowed time to gather baseline data on food selection and food waste at all schools. During the 4 week **treatment phase** of the study, 242 third and sixth grade students from two schools received four weekly nutrition classes plus home activities to complete with their parents/guardians. The serving line was attractively arranged and foods offered were identified using point-of-choice nutrition labels. The 83 students in the control schools did not have nutrition education activities or labeling of the foods in the cafeteria. University dietetics/nutrition students recorded which foods the students selected and visually measured food the students did not consume in both control and treatment schools. During the 4 week **post-treatment phase** activities were the same at all schools. During this period of time, only food selections and measurements of food not consumed were gathered by the university nutrition students.

Table 1

CATCH fat and sodium guidelines.

Menu Items	Serving Size	Ft (gm)	Sodium (mg)
Meat/Meat Alternatives			
Mixed dish/Entree	as stated on label	15	750
Sandwich	1 sandwich	17	750
Meat, fish, poultry	2 oz	12	400
Cheese	1 oz	5	200
Dry beans/peas	1/2 cup	5	200
Fruits and Vegetables			
Fruits	1/2 cup	0	0
Vegetables	1/2 cup	1	140
Prepared salads	1/2 cup	3	200
Oven-baked french fries	1/2 cup	5	200
Potatoes	1/2 cup	3	200
Soups	1 cup	5	600
Dry beans/peas	1/2 cup	3	200
Bread/Grains			
Yeast bread, tortilla	1 slice or roll/1 tortilla	2	200
Crackers	as stated on label	2	200
Rice, pasta	1/2 cup	3	200
Quick breads	1 slice	5	200
Milk			
	8 fl. oz.	5	200
Other Foods			
Dairy desserts	1/2 cup/1 piece	5	140
Desserts	1 piece	5	200
Chips	as stated on label	2	200

^cClassroom activities apply to intervention schools only, unless otherwise indicated.

^bCafeteria activities apply to all schools, unless otherwise indicated. Food selection data gathered two days/week, and consumption data gathered one day/week. Days included Tuesday, Wednesday and Thursday. Data gathering days matched for intervention and post-intervention.

^aFood behavior/assessment survey administered to students at all schools.

Table 2

Classification of foods available to students.

GO ^a	SLOW	WHOA
<i>Entree:</i> Spaghetti	<i>Entree:</i> Chicken with noodles Corn dog Pizza	<i>Entree:</i> Chicken nuggets Fish wedge Hamburger Hot dog Pizza Salisbury steak with roll
<i>Vegetables:</i> Broccoli Corn Salad Peas	<i>Sandwiches:</i> Peanut butter Rib bar-b-que Sloppy Joe Submarine	
<i>Fruit:</i> Apple Applesauce Banana Fruit cocktail Orange Peaches Pears Pineapple	<i>Vegetables:</i> Fries (oven baked) Green beans	<i>Vegetables:</i> Mashed potato Potato puffs
<i>Beverages:</i> Milk-choc. Milk-white	<i>Dessert/snack:</i> Pretzels	
<i>Desserts-snacks:</i> Animal crax Fruit roll-up Sherbert Rice Krispies Twinkies		

^a Descriptions based on CATCH guidelines for sodium and fat (Table 1).

^b Foods offered daily. One fresh fruit offered daily among apple, banana, orange.

^c Pizzas at higher socioeconomic intervention school a different product from other three schools. Pizzas rotated daily between sausage and cheese.

^d Competitive foods.



FOOD SELECTION

Most of the students in the study (76%) achieved their general food selection goal of:

- 2 or more GO (green label) foods,
- 2 or less SLOW (yellow label) foods,
- 1 or less WHOA (red label) food.

Food labeling and classroom/home nutrition education had no effect in this study. At the treatment schools, the children who attended class and returned nutrition education homework chose fewer WHOA foods than students who did not complete homework activities.

Students at the control school, those from lower socioeconomic status, and third graders more frequently met the food selection goal than their counterparts. The most difficult goal to reach, especially for sixth graders, was limiting their selection of WHOA foods. Students from lower socioeconomic schools chose GO foods more often (94%) than those from higher socioeconomic schools (80%).

FOOD CONSUMPTION

There were some interesting trends in food consumption, as measured by the amount of food not consumed. Food labeling did not influence plate waste. In the study, the students consumed 81% of the foods they selected with 19% measured as plate waste (Figure 1- is a graphic representation of the foods consumed and not eaten by categories). The foods that were consumed the best (87%) were from the WHOA group, followed

by SLOW foods at 84% and finally, GO foods at 72% (Figure 2). Food groups with the greatest amount consumed were from the entree (82%) and dessert (94%) groups (Figure 3). More than 20% of the fruit, vegetable or beverage groups were not consumed. Foods with more than 25% left unconsumed were salads, apples, oranges, and peaches (GO foods); chicken with noodles and rib bar-b-que sandwiches (SLOW foods); and, Salisbury steak at all schools and cheese pizza at the higher socioeconomic treatment school (WHOA foods.) In the study, 3rd grade students left 23% unconsumed food, while sixth graders did not consume 15% of the food on their plate. The students from lower socioeconomic schools consumed less GO and WHOA foods than students at higher socioeconomic schools.

POPULARITY

An effort was made to look at the popularity of foods offered. Popularity was measured by the number of times food was selected when offered. For example, fruit cocktail had a rating of 30, meaning it was selected 30% of the time it was offered. By far, the most popular foods were WHOA foods at 37%, followed by GO foods at 28% and finally, SLOW foods at 18%. The most popular foods (with a popularity rating of 30% or greater) included chicken nuggets, Salisbury steak, potato puffs, and mashed potatoes at all schools, along with cheese pizza at the higher socioeconomic treatment school (WHOA foods); oven-baked fries (SLOW foods); and, chocolate milk, sherbert, fruit cocktail, pineapple, pears, applesauce, and corn (GO foods.) WHOA foods were more popular with students at the higher socioeconomic schools than at other schools.



Figure 1

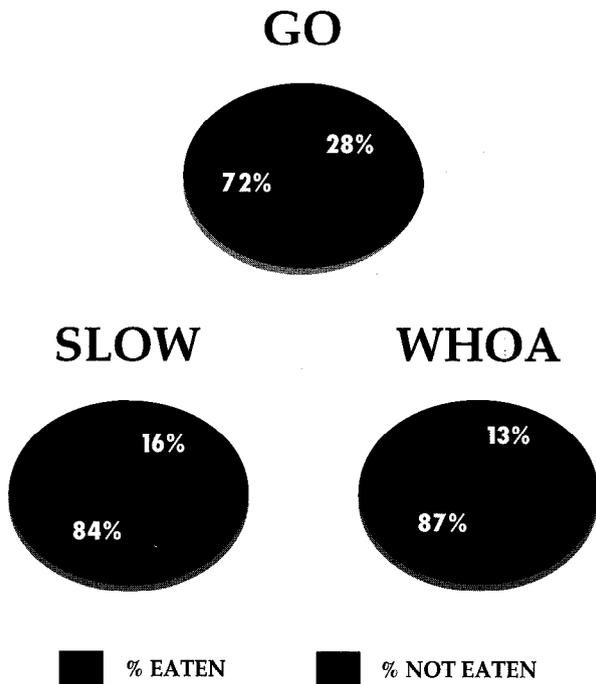


Figure 2

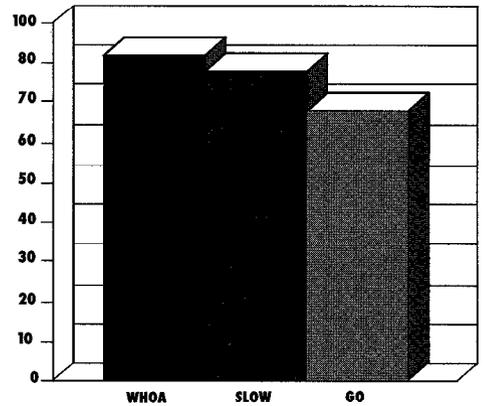
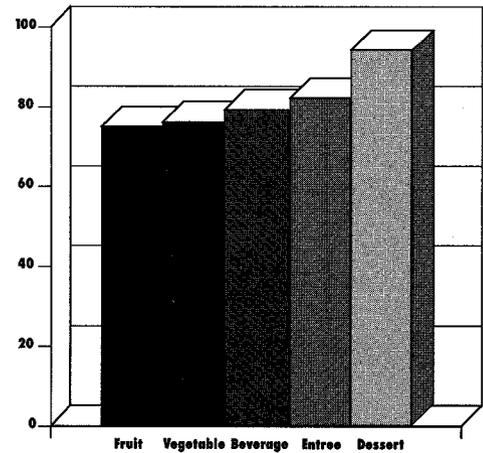


Figure 3



Practical Use Of This Information

When considering point-of-choice nutrition education for CNPs, first evaluate the overall nutrition integrity of the CNP operation. Although this study found that nutrition education and cafeteria food labeling did not make a great difference in the children choosing healthful lunches, the information gained could impact the nutritional lunch served and consumed by children.

The entree offered to the students significantly affected the results of the study and how healthfully the children ate. In the study, only one entree was classified as a healthful (GO) food. Following the CATCH guidelines the remaining 15 entrees scored moderately high (SLOW) to high (WHOA) in sodium and fat. The children in the study ate the entree over other foods selected, and with greater consumption, except for desserts that were seldom offered. For the CNP professional interested in providing healthful meals that students will consume, begin by providing healthful entrees. Menu planning, meal production, and nutritionally sound purchasing techniques are important in this situation. Meals that are nutritionally balanced will ultimately impact nutritional consumption by children. Plan, produce, and purchase following the guidelines established by the *School Meals Initiative*.

This study, and the one conducted in Florida, raised questions about the effectiveness of point-of-choice nutrition education programs as currently implemented. In both studies students, teachers, parents, and administration supported all efforts to influence students with quality nutrition information through weekly activities. Multiple exposure to nutrition education materials enhances nutritional knowledge of the students, yet students did not change eating behaviors.

The CNP professional has the perfect opportunity to provide an environment that can help children select healthful food choices. Through the information gained from measuring the amounts of food not eaten, it was determined that 81% of all foods offered to the students were consumed. For whatever reason, 19% of the food offered was not eaten. The pizza served at the higher socioeconomic treatment school was a wedge. It weighed 9.0 ounces and was classified as a WHOA food. A more traditional size pizza was offered at the other treatment school and two control schools. The traditional pizza rectangle, weighed 5.8 ounces and was classified as a SLOW food. Pizza was popular at all schools, with ratings from 20 to 31% acceptance. The decision was made to serve a 9 ounce pizza at one of the schools in hopes of improving student perception and increasing participation. Because the 9 oz pizza was served at the higher socioeconomic treatment school, this example probably explains why more WHOA foods were selected. The third graders receiving the 9 ounce slice could not finish eating the pizza, resulting in an increase plate waste. This information supports findings that the third graders had a higher plate waste (23%) than the sixth graders (15%). These study findings support several earlier research studies of school lunch. We believe that there are two major influences for the food waste trends:

- Recess following lunch results in greater food waste; and
- Meals in the United States focus on the entree.

In 1996 a study was conducted that found when recess was scheduled after lunch for first through third graders, students did not consume 35% of their food. This same study found that when recess was moved to before lunch, food waste decreased to 24%. We observed in the Indiana study a good deal of non-eating activities in the cafeteria: talking, listening, and being seen (or at least trying to be.) Recess before lunch may help the students get the "Sillies" out, visit with their friends, and stimulate hunger and thirst through play.

In the United States we plan our menu around the entree, and then plan the other components of the meal. The children in our study did just that: they ate more entree at lunch than the other foods selected. By beginning the meal with the entree, or if the entree is quite large, the children can quickly satisfy their hunger before turning attention to other foods still on the tray (except for desserts.) In our study, this meant the students ate more of the WHOA foods (entrees) than anything else.



QUESTIONS TO CONSIDER ARE:

- Has the entree been prepared using culinary techniques to assure a more healthful product?
- Would lowering the sodium, fat, and calories of the entree improved the nutrient density?
- Have the frequently used and more popular entree recipes been standardized to produce a more wholesome product?
- Do the menu planning techniques promote healthful (GO) foods combined with moderately high (SLOW) to high fat and sodium (WHOA) foods to provide a meal that is more nutritionally balanced?
- What about using a point-of-choice nutrition education program to educate and market healthy eating? Ultimately, continued exposure to nutrition education will provide the information needed for healthful food choices both in and out of the school setting. Remember, to avoid monotony, intermittent marketing campaigns provide consistent interest among students and staff.
- Have desserts been included on a daily menu that count as a part of the meal pattern? i.e. fruit component or grain/bread component desserts.

WHAT CAN A CNP PROFESSIONAL LEARN FROM THIS STUDY?

Point-of-choice nutrition education, though effective with adults, is not that effective with children when conducted on a short-term basis. It could, however, serve as a powerful marketing tool to show students, parents/guardians, teachers, administrators, and the community, that healthful meals are served at school. Also give attention to the following steps to assure healthful foods are offered:

SERVE HEALTHFUL ENTREES.

Children eat entrees first and eat more of these than other foods served, except for desserts. A CATCH publication gives a list of vendors who have commercially prepared healthful entrees, recipes, and tips to modify the fat and sodium content of existing recipes. See *For More Information* for available materials.

WRITE EXPLICIT FOOD SPECIFICATIONS.

Include in food specs a nutrient profile limiting fat, saturated fat, and sodium. By doing so, food vendors know you are genuinely concerned for the health of the population you serve.

BE AWARE OF THE PORTION SIZE OF FOODS OFFERED.

Most elementary school children, especially the younger ones, cannot eat adult-size portions.

TRAIN FOOD SERVICE EMPLOYEES ON FOOD PURCHASING AND PRODUCTION TECHNIQUES THAT MEET THE *Dietary Guidelines for Americans*.

Many staff may practice these techniques at home and have valued knowledge and experience. The CNP would benefit by drawing from their knowledge and expertise to enhance training. Some nutritionally-sound production techniques include:

- Draining the grease after browning meat
- Using parchment paper or non-fat food release spray;
- Using reduced fat margarine in baking;
- Reducing the amount of oil/shortening in baking and replacing with applesauce or prune puree;
- Using reduced fat salad dressings in salad preparation;
- Adding only small amounts of margarine or butter to cooked vegetables; and
- cooking vegetables to a tender-crisp stage, a technique to preserve vitamins.

LOOK AT ALL OF THE FOODS OFFERED ON THE MENU.

Some popular foods, such as fresh fruits and vegetables take time and effort to eat. Grouping these with other time-consuming foods could result in greater food waste of fruits and vegetables. Consider combining time-consuming foods (apples) with easy-to-eat foods (macaroni and cheese) to lessen waste. Also look for ways to make these foods quicker to eat for children by cutting into wedges or small chunks. Ready, easy-to-eat food is easier for school children to eat.

PRESENT FOODS ATTRACTIVELY.

Foods attractively arranged on the plate are appealing. When planning the menu consider color and flavor combinations. Also simple garnishes enhance the presentation.

LOOK FOR WAYS TO INCORPORATE NUTRITION EDUCATION INTO THE SCHOOL CURRICULUM.

Multiple exposures to different forms of nutrition education increases success in learning healthy eating habits. Nutrition education should be an integral part of a school curriculum from pre-school through the twelfth grade. The CNP professional desiring to improve healthy eating habits as a life long experience will work as an advocate to incorporate nutrition education in the school curriculum and throughout the school day.

By incorporating these simple steps into your CNP standards, you are informing the school community that their school offers healthful, nutritious foods and provides opportunities to develop the skills for healthy eating. Point-of-choice food labels will confirm this and transform the school cafeteria into a learning laboratory for promoting nutrition. School or community-based nutrition programs will be able to rely on CNPs to assure that all students are served healthful foods and taught the skills that promote a healthy lifestyle.

FOR MORE INFORMATION

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