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FACTORS THAT INFLUENCE HIGH SCHOOL STUDENT PARTICIPATION IN
UNITED STATES DEPARTMENT OF AGRICULTURE SCHOOL LUNCH
NUTRITION PROGRAMS

by

Rebecca S. McKinnon

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF DIETETICS ADMINISTRATION

in

Nutrition and Food Sciences

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

2001

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ABSTRACT

FACTORS THAT INFLUENCE HIGH SCHOOL STUDENT PARTICIPATION IN UNITED STATES DEPARTMENT OF AGRICULTURE SCHOOL LUNCH NUTRITION PROGRAMS

by

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Utah State University, 2001

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The survey investigated factors that influenced high school student participation in the National School Lunch Program. The National School Lunch program provides nutritionally balanced meals based on the Dietary Guidelines for Americans, the Recommended Dietary Allowances, and the Food Guide Pyramid. This nutrition program contributes significantly to the nutrient needs of adolescents, however, participation rates are low and students do not receive the health benefits associated with this nutrition program when they do not participate.

The survey was conducted in two high schools, both with grades sophomore through senior. The two high schools had distinct differences in location, cafeteria design and seating arrangement, number of lunch periods, and proximity to additional eating establishments. The survey asked the high school students to rate their school lunch program from "Very Good" to "Poor" in the areas of taste, appearance, temperature and

amount of the food, and the courtesy of the foodservice staff. The survey also asked students to rate the variety and selection offered in the school, the time spent waiting in line, and the frequency which the student participated in the school lunch program. Questions regarding the current grade in school, the type of food typically selected, and any comments the students chose to add were also on the survey.

Students with the newer cafeteria design were more likely to rate the food appearance as very good compared to students with an older cafeteria design. The temperature of the food, and the variety and selection were viewed more positively by the school with the more attractive cafeteria design than the school with the older cafeteria. Taste, frequency of participation, amount of food, time spent waiting in line, and the courtesy of the foodservice staff were rated similarly by both schools. The survey showed that the school lunchroom environment can influence student participation.

(74 pages)

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Rebecca S. McKinnon

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INTRODUCTION

Nutritional intake during childhood and adolescence plays a vital role in growth, cognitive development, incidence of illness and chronic disease, and long-term health outcomes. Research has shown that poor nutrition in early years of life can restrict long term intellectual development and the ability to learn is also affected by how recently one has eaten (1). Good nutrition during childhood and adolescent years can lay the foundation for lifelong healthy eating. The United States Department of Agriculture (USDA) has developed numerous nutrition programs that promote healthy eating for children. Among these is the National School Lunch Program (NSLP). The NSLP is the largest child nutrition program funded by the USDA both in the amount of students served per day and also in the amount of funding received by the federal government (2). The NSLP is available to 92% of all students throughout the United States (3). In the year 2000, approximately 27.3 million students participated in the NSLP. However, the school environment is changing. In the first years of the NSLP, reimbursable school lunches were the main source of food for students at school. However, students of today are exposed at a much earlier age to a variety of food options and experiences including fast food, fine dining, and ethnic foods (4). Television advertisements entice children to consume fun, colorful foods. More than 90% of foods advertised on television are high in fat and sugar (5). Many schools provide increased food options such as vending machines, snack bars, and a la carte foods sold in the school lunchroom.

The Dietary Guidelines for Americans 2000 urge Americans to choose foods

sensibly that are low in fat, to drink beverages that limit the intake of sugars in our diet, and to base our diet around the Food Guide Pyramid. The Food Guide Pyramid suggests a daily intake of 6 to 11 servings of breads, cereals and grains, 3 to 5 servings of vegetables, 2 to 4 servings of fruits, 2 to 3 servings of milk and other dairy products, 2 to 3 servings of meat, poultry, fish, and other protein rich foods, and limited servings of fats, oils, and sweets. However, the percentage of school aged children who meet the recommended number of servings of food from the Food Guide Pyramid are 14 % for fruit, 17% for meat, 20% for vegetables, 23% for grains, and 30% for milk (6). Soda consumption is also high among teenage children, especially males. One third of teenage males drink more than 3 servings of soda each day (6). Many young people's diets are high in added sugars. Teenage males ages 14 to 17 consume approximately 36 teaspoons of sugar each day which is the equivalent of three fourths of a cup of added sugar each day (6). Teenage girls are also likely to have low intake of vitamins and minerals, especially folic acid and calcium (6). This is due to low intake of fruits and dairy products by teenage girls, especially between the ages of 14 and 18 (6). 12% of adolescents age 12 to 17 in the United States are overweight (7).

The NSLP contributes significantly to the nutrient intake of children in the United States by providing meals that are centered around the Recommended Dietary Allowances (RDA), Dietary Guidelines for Americans, and the Food Guide Pyramid. (8). Participation in school food programs is a significant way to ensure that school aged children will have access to a healthful diet (1). NSLP participants consumption of all vitamins and minerals is well above the RDAs especially for vitamin B6, vitamin B12, thiamin, riboflavin,

calcium, phosphorus, magnesium, and zinc (9). NSLP participant's also consume lower amounts of added sugar than nonparticipants (6). Non-NSLP participants have greater intakes of fat and carbohydrates at the noon meal (10). NSLP participants are also more likely to eat fruits and vegetables, milk and other dairy products, and meat products for lunch than non-school lunch participants. Diets rich in fruits and vegetables are associated with health benefits such as lower risk of cancer and heart disease (11). Participants in the NSLP also have lower intakes of soda and fruit drinks since these are not regularly provided in the reimbursable school lunch meal.

Research specific to child nutrition programs has helped to provide and improve the quality of nutrition served to students in the United States participation in child nutrition programs. Nutrition guidelines for menu planning in school meals have become stricter, requiring that school meals meet the standards of the Dietary Guidelines for Americans and the RDAs. In addition, menu and serving styles such as offer versus serve were implemented to offer food items in school lunches that were more appealing and acceptable to students.

Despite the improvements being made in current child nutrition programs and the health and nutrition benefits the NSLP provides, only about 58% of students participate in the NSLP. For all students to be able to reap the benefits associated with a balanced, nutritious meal patterned after the RDAs, Dietary Guidelines for Americans, and the Food Guide Pyramid, more students need to participate in the NSLP. High school students are less likely than elementary students to participate in the school lunch program. Many factors exist that can affect whether or not a high school student will participate in the

NSLP. It is important to understand these factors, make necessary changes, and improve the NSLP so more students will participate.

LITERATURE REVIEW

History of United States Department of Agriculture National School Lunch Program

The National School Lunch Program (NSLP) is a federally assisted meal program which currently operates in more than 96,000 public and non-profit private schools and residential child care institutions. It provides nutritionally balanced, low-cost or free lunches to nearly 27 million children each school day. The U.S. Department of Agriculture leads the program at the federal level. At the State level, the NSLP is managed by state education agencies, which operate the program through agreements with school districts throughout each state. School districts and independent schools that choose to take part in the lunch program get cash subsidies and donated commodities from the USDA for each meal they serve. In return, the school must serve lunches that meet Federal requirements, and they must offer free or reduced-price lunches to eligible children. School lunches must meet the Dietary Guidelines for Americans, which recommend that no more than 30% of an individual's calories come from fat, and less than 10% from saturated fat. Regulations also establish a standard for school lunches to provide one third of the RDA for protein, Vitamin A, Vitamin C, iron, calcium, and calories.

The NSLP officially began in 1946 with the passing of the National School Lunch Act by Congress. However, the roots of the School Lunch Program were started long before that. The Children's Aid Society of New York began the first school feeding

program as early as 1853. The idea expanded throughout the United States and by 1913 school lunch programs were in operation in 30 cities in 14 states. These programs were largely developed and operated by volunteer parents, community, and civic organizations. During the 1930s and the Great Depression, school lunch programs provided benefits to the United States by providing food for underfed and undernourished children, preparation and serving of the school lunches also provided jobs, and the lunch program supplied an outlet for the surplus of commodities in the U.S. at that time. In 1935, a new federal program called the Works Progress Administration (WPA) was established and provided the first federal funding for school lunch. Each state had a supervisor of the WPA lunch program and a staff of district and local school lunch supervisors. This staff would visit each individual school and assist in menu planning and service. Also that year, Congress enacted a law that directed surplus agricultural commodities to be distributed to needy families and school lunch programs. By 1937, 15 states had passed laws permitting schools to operate lunch programs. Schools with lunch programs in place began to see a link between good nutrition and increased learning and attendance. Books were written and appeals were made to the Congress of the United States about the importance of feeding programs for school children. In 1941, WPA lunch programs were operating in all states as well as the District of Columbia and Puerto Rico. By 1942, 92,916 schools throughout the United States were participating in school lunch programs (12). During World War II, the WPA was eliminated and the surplus commodities were used to support and feed the Armed Forces. Schools with operating lunch programs decreased to 34,064 and student participation in existing lunch programs decreased to 5 million. Many groups

pleaded with Congress to provide continued support to school nutrition programs. Federal funds were provided for the school years of 1944-1946. The program participation increased once again. Nine bills were introduced to Congress proposing the establishment of a permanent school lunch program. After extensive debate, the National School Lunch Act (NSLA) was adopted by congress and signed by US President Harry S. Truman on June 4, 1946. In signing the 1946 Act, President Harry S. Truman said, "Nothing is more important in our national life than the welfare of our children, and proper nourishment comes first in attaining this welfare" (13).

The NSLA had many provisions including requirements that meals served to students under the NSLP must meet minimum nutritional requirements based on tested nutritional research. Section 9 of the Act provided that "Lunches served by schools participating in the school lunch program under this Act shall meet minimum nutritional requirements prescribed by the Secretary on the basis of tested nutritional research." The Secretary of Agriculture introduced three types of lunches that would be acceptable, known as Type A, Type B, and Type C. The Type C lunch consisted of one half pint of whole milk served as a beverage. The milk would have to meet the minimum standards of the state and local laws and ordinances concerning butterfat content and sanitation requirements. The minimum nutritional requirements of the Type A and Type B lunches were as follows:

Table 1: Nutrition Requirements of Type A and Type B Lunches Approved by the NSLA of 1946

Nutrition Requirement	Type A	Type B
Milk, whole	½ pint	½ pint

Protein-rich food (consisting of any of the following or a combination of them) Fresh or processed meat Poultry Cheese Cooked or canned fish	2 ounces	1 ounce
Dry peas, beans, or soy beans	½ cup	¼ cup
Peanut butter	4 tbsp	2 tbsp
Eggs	1	1/2
Raw, cooked, or canned vegetables or fruits or both	¾ cup	½ cup
Bread, muffins made of whole grain cereal or enriched flour	1 portion	1 portion
Butter or fortified margarine	2 tsp	1 tsp

Type A lunch was designed to meet one third to one half of the minimum daily nutritional requirements of a child 10 to 12 years of age. This meal pattern could also be adapted to meet the nutritional requirements for children of all ages through adjustment of the menu. The Type B pattern was created as a supplementary lunch for schools where adequate facilities for the preparation of a Type A lunch could not be provided.

Schools were reimbursed for a portion of the cost of food that was purchased and used in preparing the school lunches. Schools were paid a certain amount on a monthly basis per meal for the number of meals served that were compliant with the nutritional requirements. The maximum reimbursement given were Type A, 9 cents; Type B, 6 cents; Type C, 2 cents. Meals served without milk were not reimbursable unless there was an inadequate supply of milk available that met proper State and local standards as to butterfat content and sanitation. If this milk was not available, reimbursement rates were

reduced by 2 cents (13). Total reimbursement to any school could not exceed the total amount spent for food. In addition, students who were unable to pay were to be provided meals at no cost without any discrimination or segregation. The NSLP was to be operated on a non-profit basis and surplus commodities were to be used by the NSLP. Another provision of the NSLA was the federal-state partnership. The secretary of agriculture was responsible for determining the national standards for the NSLP, but state agencies were responsible for managing the program within each state. This shared responsibility between federal and state governments has helped to keep the program successful. Effective programs for children occur when state and local authorities use national guidelines and federal funds to support state and local needs (12). The American School Foodservice Association (ASFSA) was organized on October 11, 1946. This organization was created to promote the expansion and improvement of school foodservice programs and to provide opportunities for continuing education and professional growth of ASFSA members.

During the first year of operation, each state, as well as the District of Columbia, Puerto Rico, and the Virgin Islands all had established child nutrition programs under the NSLA. More than seven million children were served meals through the NSLP by the end of the 1946-1947 school year. The longer the NSLP was in operation, the more educators were able to see the importance of the NSLP and its place in the total education program. By the early 1950s, nutrition education was receiving support from the National Dairy Council, the National Livestock and Meat Board, and General Mills (12). In 1954, Congress authorized the Special Milk Program (SMP). The SMP provides milk to

children in schools and child care institutions that do not participate in other federal child nutrition meal service programs. The program reimburses schools for the milk they serve.

When changes came about in the RDA, USDA also reviewed and changed the meal pattern to fit with the changes made in the RDAs. The first changes included a vitamin A rich food to be added to the menu at least twice a week and a vitamin C rich food to be added daily to the menu. In 1958, more changes were made including:

- The fruit and vegetable component had to be met with two or more vegetables, two or more fruits, or a combination of both.
- 100% fruit and vegetable juice could only count as meeting one fourth of the fruit and vegetable component.
- Protein rich foods were to be served in the main dish and in no more than one other item.
- Adjustments in portion sizes were to be made for various age groups.

In 1963, in response to further revisions in the RDAs, the USDA included iron rich foods to be part of school meals.

In 1966, the Child Nutrition Act was passed by Congress. The Child Nutrition Act authorized a pilot breakfast program and also authorized the SMP for three years. The USDA was also recognized as the federal agency that would administer all school foodservice nutrition programs. In 1968, Congress amended the NSLA to include the special food service program for children. This program provided a year round food program for children in day care and a summer feeding program. The NSLA was also amended at this time to include an allowance for students with special dietary needs and

provided an extension of the School Breakfast Program.

During the 1970s, Congress appointed the USDA with the authorization to regulate the sale of competitive foods sold in competition with school meals (14). Since no regulation had been made in 1946 with the NSLA, each state had been dealing with the issue of competitive foods on their own. The USDA limited the foods that could be sold in schools to foods that could contribute to a part of the required meal components or to foods that were served as an additional item with the school meal (14). In 1972, Congress repealed the authority from the USDA and allowed the sale of any foods from which the proceeds would go to the school or to school organizations. In 1977, Congress passed yet another regulation giving the USDA authority to approve the types of competitive foods that could be sold in schools (14). The USDA issued a rule that defined foods of minimal nutritional value and restricted the sale of these foods and beverages in the foodservice area during the meal period. This rule is very weak and not enforced in many schools (12). The special milk program was made permanent in 1970. In 1978, the Special Food Service Program was made permanent and renamed the Child Care Food Program. This program allowed reimbursement for meals served in day care centers.

The 1980s were a difficult time for the NSLP. In 1980, the Omnibus Reconciliation Act was passed which reduced child nutrition program funding by \$400 million. Efforts were made by the ASFSA to promote program expansion and return funding but in 1981, another Omnibus Reconciliation Act was passed which reduced funding for child nutrition programs by \$1.4 billion, the equivalent of 25 %. The result of

the budget cuts was detrimental to the NSLP. Student participation declined in the lunch program. Many schools dropped their school lunch programs. Other schools added a la carte lines to help generate revenue for their school lunch program. The foods sold on the a la carte lines were typically based on student preferences and did not follow any nutritional guidelines. Lawsuits against the USDA restrictions of competitive foods sold in schools in the mid 1980s forced the USDA to loosen its restrictions on the sale of competitive foods that could be sold within the schools and in vending machines (14).

During the 1990s, the focus centered around improving the nutritional value of the lunches served under the NSLP. A law was passed requiring schools to offer low fat milk as an option. The Dietary Guidelines for Americans were used in menu planning in child nutrition programs. Funding was appropriated for nutrition education and training in school nutrition programs. USDA developed a training program known as "Team Nutrition" which provided education, training, and information for all school food and nutrition personnel. In 1996, Congress passed a bill which allowed school districts to use any reasonable approach to menu planning as long as the nutrition goals of the Dietary Guidelines for Americans were reached (12). Schools can choose one of the four standard systems for their menu planning: Nutrient Standard Menu Planning, Assisted Nutrient Standard Menu Planning, the traditional meal pattern, and the enhanced meal pattern. Schools and state agencies may also develop their own alternate approach to menu planning. Both Nutrient Standard and Assisted Nutrient Standard Menu Planning systems base their planning on a computerized nutritional analysis of the week's menu. The traditional and enhanced meal pattern options base their menu planning on minimum

component quantities of meat or meat alternate; vegetables and fruits; grains and breads; and milk. An alternate approach would usually modify these approaches.

School lunches must meet federal nutrition requirements, but decisions about what specific foods to serve and how they are prepared are made by local school food authorities, usually at the district level. USDA has made a commitment to improve the nutritional quality of all school meals. USDA works with state agencies and local school food authorities through the Team Nutrition program to continue to teach and motivate children to make healthy food choices, and to provide school food service staff with training and educational opportunities.

Historical and Recent USDA National School Lunch Participation Statistics

Since the initial years of the NSLP, participation rates have almost steadily increased. Participation decreased during the 1980s which can be attributed to the detrimental budget cuts to the NSLP during this time. In the 1990s and the year 2000, participation increased once again and has steadily increased each year. For instance, in 1990, an average of 24 million children in the United States participated in the NSLP every day. In the 1997 school year, more than 26.3 million children each day ate school lunch. Since the modern program began, more than 170 billion lunches have been served. Table 2 below shows the participation rates and number of lunches served beginning with 1969 to the year 2000.

Table 2: Participation and Lunches Served in the NSLP Shown in the Millions From the Fiscal Year 1969 to the Fiscal Year 2000

National School Lunch Program: Participation and Lunches Served						
Data as of May 25, 2001						
Fiscal Year	-----Average Participation-----				Total Lunches Served	Percent Free/RP of Total
	Free	Reduce d Price (RP)	Full Price	Total		
	-----Millions-----					%
1969	2.9	1]	16.5	19.4	3,368.2	15.1
1970	4.6	1]	17.8	22.4	3,565.1	20.7
1971	5.8	0.5	17.8	24.1	3,848.3	26.1
1972	7.3	0.5	16.6	24.4	3,972.1	32.4
1973	8.1	0.5	16.1	24.7	4,008.8	35.0
1974	8.6	0.5	15.5	24.6	3,981.6	37.1
1975	9.4	0.6	14.9	24.9	4,063.0	40.3
1976	10.2	0.8	14.6	25.6	4,147.9	43.1
1977	10.5	1.3	14.5	26.2	4,250.0	44.8
1978	10.3	1.5	14.9	26.7	4,294.1	44.4

1979	10.0	1.7	15.3	27.0	4,357.4	43.6
1980	10.0	1.9	14.7	26.6	4,387.0	45.1
1981	10.6	1.9	13.3	25.8	4,210.6	48.6
1982	9.8	1.6	11.5	22.9	3,755.0	50.2
1983	10.3	1.5	11.2	23.0	3,803.3	51.7
1984	10.3	1.5	11.5	23.4	3,826.2	51.0
1985	9.9	1.6	12.1	23.6	3,890.1	49.1
1986	10.0	1.6	12.2	23.7	3,942.5	49.1
1987	10.0	1.6	12.4	23.9	3,939.9	48.6
1988	9.8	1.6	12.8	24.2	4,032.9	47.4
1989	9.8	1.6	12.9	24.3	4,004.9	47.2
1990	9.9	1.7	12.6	24.1	4,009.1	48.3
1991	10.3	1.8	12.1	24.2	4,050.9	50.4
1992	11.2	1.7	11.7	24.6	4,101.9	53.0
1993	11.8	1.7	11.3	24.9	4,137.7	54.8
1994	12.2	1.8	11.3	25.3	4,201.8	55.9
1995	12.5	1.9	11.3	25.7	4,253.4	56.4
1996	12.7	2.0	11.3	25.9	4,313.2	56.9
1997	13.0	2.1	11.3	26.3	4,409.0	57.6
1998	13.1	2.2	11.3	26.6	4,424.9	57.8
1999	13.0	2.4	11.6	26.9	4,513.2	57.6
2000*	13.0	2.5	11.8	27.2	4,573.5	57.1

Table Adapted from the USDA website

*FY 2000 data are preliminary; all numbers are subject to revision. Participation data are 9 month averages (summer months are excluded). 1] Included with free meals.

Each state has different participation rates as well. Many states have policies that protect the nutritional integrity of foods sold through the NSLP. In spite of improvements made to the nutritional quality of food served in the NSLP, participation rates remain low in comparison to the amount of students enrolled in each school in every state. The following table shows the total participation per U.S. state or territory for the years 1996, 1997, 1998, 1999, and the year 2000. 35 of the 55 states or territories has increased participation rates in the NSLP each year.

Table 3: Total Participation in the NSLP Per U.S. State or Territory For the Fiscal Years 1996, 1997, 1998, 1999, and 2000

NATIONAL SCHOOL LUNCH PROGRAM: TOTAL PARTICIPATION					
Data as of May 25, 2001					
State / Territory	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
					<i>Preliminary</i>
ALABAMA	547,592	549,315	541,445	540,810	541,423
ALASKA	47,457	49,505	50,113	49,882	50,421
ARIZONA	406,199	422,017	431,371	443,495	446,583
ARKANSAS	313,344	311,029	309,743	310,741	311,943
CALIFORNIA	2,414,950	2,491,456	2,529,592	2,537,539	2,566,998
COLORADO	308,733	310,958	314,459	318,809	320,778
CONNECTICUT	235,106	241,698	247,324	258,521	265,075
DELAWARE	66,700	67,076	69,055	70,267	71,542
DISTRICT OF COL	49,458	50,989	46,748	47,255	47,199
FLORIDA	1,225,392	1,267,713	1,291,759	1,307,102	1,322,406
GEORGIA	1,006,590	1,024,709	1,044,719	1,054,226	1,065,362
GUAM	18,389	18,032	16,915	14,141	13,401
HAWAII	143,534	144,578	146,932	145,914	143,108
IDAHO	139,142	139,419	139,900	141,624	142,771
ILLINOIS	975,704	1,002,641	1,020,790	1,035,129	1,056,756
INDIANA	597,625	599,396	605,364	613,022	622,399
IOWA	378,435	386,811	370,754	381,877	382,630
KANSAS	306,876	309,830	306,673	307,285	308,414
KENTUCKY	505,828	500,038	498,054	496,734	499,368
LOUISIANA	661,625	660,013	655,795	652,265	646,085
MAINE	104,073	104,327	105,021	105,813	106,604
MARYLAND	372,081	375,706	382,974	386,356	392,417
MASSACHUSETTS	479,598	489,599	502,821	520,478	528,225
MICHIGAN	758,623	762,116	768,030	780,189	802,805
MINNESOTA	533,167	545,894	554,422	566,210	562,471
MISSISSIPPI	403,038	402,540	400,683	400,699	397,126
MISSOURI	573,448	578,081	579,610	583,973	586,760
MONTANA	85,181	84,104	82,346	80,974	79,000
NEBRASKA	207,839	211,526	216,118	217,617	220,042
NEVADA	99,352	101,721	104,461	108,417	113,726
NEW HAMPSHIRE	93,665	94,118	98,467	100,808	103,955
NEW JERSEY	530,013	542,147	553,852	567,684	585,388
NEW MEXICO	189,387	191,026	191,300	193,935	192,374
NEW YORK	1,674,508	1,704,491	1,735,380	1,773,276	1,789,676
NORTH CAROLINA	772,677	790,975	798,624	815,517	821,586
NORTH DAKOTA	86,369	83,970	83,077	81,979	80,367
OHIO	967,636	973,478	964,141	986,279	995,968

OKLAHOMA	366,250	366,792	365,931	371,286	374,227
OREGON	253,319	259,392	262,470	266,428	266,068
PENNSYLVANIA	999,952	1,007,937	1,006,185	1,007,162	1,012,844
PUERTO RICO	415,889	394,347	403,819	397,160	397,842
RHODE ISLAND	57,689	56,665	59,286	61,014	63,552
SOUTH CAROLINA	452,901	458,402	465,688	473,096	470,932
SOUTH DAKOTA	106,584	105,113	104,144	104,266	104,646
TENNESSEE	606,024	605,627	603,934	609,197	621,630
TEXAS	2,224,507	2,287,548	2,339,519	2,392,448	2,450,412
UTAH	250,114	258,217	261,436	266,892	269,477
VERMONT	50,620	51,209	51,053	52,048	51,878
VIRGIN ISLANDS	15,854	17,708	18,209	17,232	16,017
VIRGINIA	626,633	633,551	640,602	651,242	665,276
WASHINGTON	434,895	439,771	446,600	457,640	465,923
WEST VIRGINIA	202,855	209,999	202,788	204,129	201,588
WISCONSIN	509,888	518,245	520,066	530,915	536,065
WYOMING	56,569	55,973	54,747	53,399	51,688
DPT. OF DEFENSE	32,536	31,648	32,442	33,934	35,113
TOTAL	25,942,410	26,341,186	26,597,751	26,946,327	27,238,326

Table adapted from the USDA website

The Relationship Between Child Nutrition Programs and Learning

Scientific evidence shows a strong relationship between nutrition and learning in the school environment (15). Child nutrition programs in schools have an important role in improving school and educational performance of children. The NSLP is seen by teachers, principals, and administrators as a valuable tool in the learning process. Teachers report an improvement both academically and behaviorally with students who are getting proper nutrition through the NSLP. In regards to student participation in the school lunch program, some teachers have said, "17 out of my 36 children are either not getting any lunch or an adequate one. I see definite personality changes when a child doesn't get lunch," and "Since getting free lunch she has shown a marked improvement in attitude. Last year she was a major discipline problem," as well as "Children that don't eat are very hard to discipline." (13). A letter from a Green Bay, Wisconsin elementary principal written about the school lunch program stated that:

"I believe this to be one of the finest programs initiated at the school for the following reasons: Attendance has improved by approximately three fourths per day per student. The majority of the children have shown a good increase in weight (some 10-12 pounds). Children are now receiving an on-going education in meal planning and nutrition, as well as invaluable experience in observation. The attitude of parents toward federal programs has shown good growth because they are directly involved. This has also created a better home-school relationship."(13).

Since children of today will become our nation's leaders of tomorrow, protecting children's health and providing nutritious meals to aid in their cognitive and learning development is the best way to ensure for a strong nation in the future (15).

Children who are malnourished or hungry are not able to learn. Children who suffer from inadequate nourishment have been described as apathetic, non responsive, inactive, irritable, and unable to handle frustration and stress (15). Undernourished children also have less social interaction with other students (15). Social interaction is an important part of the learning process.

There is a strong link associated with iron status and brain function (15). Short attention spans and low educational achievements have been found with school aged children with iron deficiency anemia (15). When the iron status of anemic students was improved, scores on achievement tests were increased.

Children who are undernourished are also more likely to get sick and be absent more from school, therefore missing out on more information and subjects that are taught. When children go to school hungry, they are unable to perform tasks as well as students who are well nourished (15). Attention spans are lower with hunger. Hungry children are also more likely to have behavioral problems and problems with aggression, anxiety, and irritability (15). Moderate undernutrition, which is the most common type of malnutrition in the United States, has shown to have lasting effects on the cognitive development of children and it also increases the chance of educational failure among lower income children (15).

Food likes and dislikes, fad diets, ethnic backgrounds, eating habits, lifestyle, and income all play a part in the dietary intakes of an individual. Changing an individual's food habits and ideas about food is difficult. Nutrition education can teach students the proper foods to eat to obtain adequate nutrition for learning. School lunch programs, coupled

with nutrition education, can provide an answer to childhood malnutrition by providing accessible, nutritionally sound meals each day to students.

School lunch programs can help children learn and perform better in school by providing proper and adequate nutrition. School meals meet the nutritional needs of students for calories, protein, fat, vitamin A, vitamin C, calcium, and iron. School lunch must provide at least one third of a student's RDA for lunch. The nutrient standards differ based on the student's age group. These nutrient goals are based on an average weekly nutrient analysis, and are developed according to the 1989 RDAs. The nutrient standards are shown below for school lunch.

Table 4: School Lunch Nutrient Requirements Based on One Third of the 1989 RDAs and a 2000 Calorie Diet for Grades Kindergarten Through Sixth Grade and Grades Seven Through Twelve

Nutrient	Grades K-6	Grades 7-12
Calories	664	825
Protein	10 grams	16 grams
Total Fat *	22 grams	28 grams
Saturated Fat*	7 grams	9 grams
Vitamin A	224 RE	300RE
Vitamin C	15 mg	18 mg
Iron	3.5 mg	4.5 mg
Calcium	286 mg	400 mg

* Total fat should not exceed 30% of calories and total saturated fat should not exceed 10 % of calories

Research from the USDA shows that students who participate in school lunch have higher nutritional intake compared to students who do not participate in the school lunch program (15). Lower income children rely on school lunch for one third to one half of their nutrient intake every day (15). The school lunch program therefore has an important role in improving the nutritional status of low income participating children.

School lunch can also help improve the nutrition status of students by providing lunches at a price that most students can pay. Federal regulation also stipulates that if a child meets income eligibility guidelines, they can purchase the lunch at a reduced price or for free. At this free or reduced price, students can afford to purchase and consume a nutritious lunch.

Local school districts are given the ability to plan their own menus, therefore local food habits and preferences can be observed in planning the lunches. The school lunch program can also introduce new foods to students which they may not be accustomed to eating at home. This can widen student's food selection, preferences and eating habits and also ensure an adequate and balanced diet. Healthy eating habits are developed and will last from childhood into adulthood.

When proper nutrition is taught in the classroom, the school lunch program can reinforce what was taught by providing healthful foods and serve as a laboratory for students, providing hand-on experiences in principles of food safety and sanitation, food storage and handling, foodservice management, and nutrition. Nutrition education is an important factor in health promotion and the prevention of chronic disease.

Factors Influencing Participation in the School Lunch Program

Food Sold in Competition With School Meals

Child nutrition program participation is low in many schools throughout the United States. The USDA is concerned about the effect that competitive foods sold at school have on child nutrition program participation. The USDA defines competitive foods as "foods offered at school other than meals served through USDA's school meal programs."

(16). The USDA places competitive foods into the following categories of competitive foods:

1. Foods of minimal nutritional value. USDA regulations require that foods of minimal nutritional value cannot be sold during meal time in the same area where reimbursable meals are served and consumed. Foods of minimal nutritional value are defined as foods that provide less than 5% of the Reference Daily Intake (RDI) for each of the required nutrients per serving or 100 calories. These nutrients include protein, vitamin A, vitamin C, niacin, riboflavin, thiamin, calcium, and iron.

Foods of minimal nutritional value include:

- Soda water
- Water ices, excluding those that contain fruit or fruit juices
- Chewing gum

- Hard candies, including sour balls, fruit balls, candy sticks, lollipops, starlight mints, after dinner mints, sugar wafers, rock candy, cinnamon candies, breath mints, jaw breakers, and cough drops
- Jellies and gums, including gum drops, jelly beans, jellied and fruit flavored slices
- Marshmallow candies
- Fondants, including candy corn and soft mints
- Licorice
- Spun candy
- Candy coated popcorn

2. All other foods offered for individual sale. These foods range from second servings of food that are part of the reimbursable meal to foods that students can purchase instead of reimbursable meals such as a la carte sales, foods and beverages purchased from vending machines, and school snack bars where food items such as chips, candy bars, and non-carbonated drinks are sold. There are no regulations that prohibit the sale of these foods at any time during the school day in the foodservice area or anywhere on the school campus.

Some manufacturers have petitioned and have had several foods exempted from the category of foods of minimal nutritional value.

Competitive foods are now being seen in middle schools/junior high schools, not only high schools. Even elementary school students are now being faced with competitive

foods. Elementary and middle school/junior high school students are at particularly sensitive and influential ages when it comes to food preferences and peer influence. Schools are providing these food alternatives for many reasons. The main reason is due to student preferences. Children and teens are faced today with sophisticated, multi-million, fun, and exciting marketing campaigns for foods low in nutrients and high in sugar, salt, and fat. Students come to school with set preferences and tastes that are usually for fast foods, and sweetened snacks and beverages.

Schools are also faced with limited funds and increased financial demands. School foodservice programs are challenged today with competition for participation with fast food restaurants, lunches from home, vending machines, students choosing not to eat, and clubs selling candy and snacks as fund raisers during lunch hours (4). Many schools will compensate for loss of funds by providing higher priced a la carte and fast food items in the lunchroom. Competitive food also offer additional revenue that can be spent for "discretionary purposes not necessarily related to food service" (16). Many school districts will negotiate "pouring rights" with soft drink companies. Some claim that principals and school administrators are "prostituting" themselves with the sale of competitive foods in order to make money for their schools (17). The contracts usually include a provision that will increase the percentage of profits schools receive when sales increase. Therefore, many schools will promote soft drink consumption by adding vending machines, increasing the times they are available to be used, and marketing the beverages to the students.

Another reason schools provide less nutritious food alternatives is due to limited preparation and serving space for the school lunch room. As school enrollment increases, schools tend to give higher priority to building more classrooms than to expanding foodservice facilities. Foodservice preparation areas, serving lines, and lunch room space is often inadequate to serve appealing meals to all students. Some schools have inadequate seating capacity which may cause lunch to be served as early as 10:30 a.m. and end as late as 1:30 p.m. in order to seat and serve all the students in a school. (16). Many students will therefore turn to more readily available sources of food found in vending machines and snack bars.

Finally, since there are no education standards for school foodservice managers and directors, levels of education in these positions can vary from advanced degrees from universities to less than a high school education. Child nutrition program managers themselves may lack the education and understanding of the nutrition and health implications involved with providing competitive foods to students. Appropriate and high standards are imperative for the managers and directors of child nutrition programs to ensure that nutritionally sound meals are offered, that the director or manager can serve as a spokesperson and example to school administration and the community and hold a part in the education system (16).

School lunches must provide one third of the RDA for protein, calcium, iron, vitamin A and Vitamin C for the appropriate age group to which they are being served. In addition, one third of the appropriate calories for the age group to which the lunch is being served must be provided. School meals must also meet the recommendations for the

Dietary Guidelines for Americans for limiting total fat to 30% of calories or less and saturated fat to less than 10% of calories. They must also include dietary fiber in the menu, reduce cholesterol level of the meal, and use salt in moderation. These nutrition standards DO NOT apply to foods sold in the a la carte lines or other competitive foods sold in school snack bars and vending machines. With these food alternatives and competitive foods available, the participation in school nutrition programs is decreased and the nutrition intake that students would receive through participation in school meal programs is reduced. The impact that competitive foods have on school nutrition programs such as the NSLP is discussed below.

- Competitive foods have nutrition related health risks. Since competitive foods have no regulated nutrition standards, they are low in nutrients and high in fat, added sugars, and calories. If students are eating less nutritious foods and beverages instead of the foods offered in the school meal programs, their daily dietary intake could be inadequate in vitamins, minerals and other nutrients that are essential for proper growth, development, and learning. Unhealthy weight gain could also occur when competitive foods are purchased and consumed in large quantities, or when they are purchased in addition to the school meal. Having competitive foods available for consumption encourages the consumption of partial meals. Schools should provide healthful meals and messages to students. Due to social and economical changes in today's society, many children eat foods high in fat, salt, sugar, and calories for breakfast, dinner, and snacks at home. If

these same foods are available at school, it is most likely they will choose these items for lunch as well.

- Competitive foods incorrectly promote the idea that school meals are for needy children. When the NSLP was first established in 1946, it created as a program available for all children. Not until the 1960s were there any federal funds allocated for free and reduced meals for students. However, that view has changed in many schools today with the availability of a la carte items, vending machines, and school snack bars. Since only students who have money can pay the price for these competitive foods, some students may perceive school meal program as a program for poor children, and the a la carte foods and competitive foods are for other students. Due to this perception, non-needy students and students who are eligible for free and reduced meals may choose not to participate in the school nutrition program. School enrollment has increased 6.8% in the last 20 years, yet school meal program participation has decreased by 1.2% (16). However, states that have restrictions on the sale of competitive foods (Louisiana, West Virginia, Georgia, and Mississippi) maintain higher participation rates in their school nutrition programs than the national average (16).
- Competitive foods put school meal programs at financial risk. School nutrition programs are expected to be self-supporting and non-profit making operations. Because of this, high participation is important to a fiscally sound program. Increase in the sale of competitive foods and the subsequent decline in the participation of the school meal programs can put the financial well being of school

nutrition programs at risk. In an effort to compete for customers and to bring additional revenue to the school foodservice program, many school meal programs have increased the foods they offer in the a la carte line. While this income can offset the losses from the declining participation in reimbursable meals, it also reduces nutritional standards offered to students and compromises the school meal program's identity as a program available to all children regardless of income (18).

The decline in participation also results in decreased cash and commodity assistance from the USDA (16).

- Competitive foods carry a mixed message. Ideally, students are taught about healthful eating in the classroom and then encouraged to make healthy choices in the lunchroom. When they are faced with choices from vending machines, snack bars, and a la carte items that are low in nutrients and high in fat, salt, sugars, and calories, they receive the message that good nutrition is not supported by teachers, foodservice staff and administrators and therefore must not really be important. Students should be taught about good nutrition and which should then be followed up by a lunchroom environment conducive to making healthful choices. Local administrators will sometimes offer less nutritious foods in the a la carte lines and even the reimbursable lines to attract students who might otherwise eat from vending machines or the snack bar. This conveys the message that it is acceptable to compromise good health for financial reasons (18).

The sale of these food items of minimal nutritional value compete with student's appetites, time, and money (18). Competitive foods can decrease nutrition standards of child nutrition and program and decrease participation.

Price

In many studies, price has been shown as the number one factor that influences student participation in the NSLP. A negative effect has been found between price and participation in the NSLP. (3,19). When students pay a lower price for lunch, they have been shown to participate more often in the School Lunch Program. For example, an increase in the price of school lunch from \$1.20 to \$1.60 is followed by a decrease in the participation rate from 48% to 44% (3). Many students believe that school lunches are overpriced. Some students state that, "The portions are really small. If they gave us more, I would be willing to pay more." (8). "It used to be \$ 0.60 and now they raised it to \$ 0.75. That is too high" (8). One way that the National School Lunch Program promotes participation is to offer the meals at a free and reduced price to eligible students. Students eligible for reduced-price meals are those whose family income is less than 185% of the poverty line and students who qualify for free meals are those whose family income is less than 130% of the poverty line. Shown below are the guidelines for the school year 2000-2001.

Table 5: Income Eligibility Guidelines for Free and Reduced Price Lunches for the 2001-2002 School Year for the United States, District of Columbia, Guam, and U.S. Territories

Effective from July 1, 2001 to June 30, 2002						
48 CONTIGUOUS UNITED STATES, DISTRICT OF COLUMBIA, GUAM AND TERRITORIES						
Household size	Reduced Price Meals - 185%			Free Meals - 130%		
	Annual	Month	Week	Annual	Month	Week
1.....	15,892	1,325	306	11,167	931	215
2.....	21,479	1,790	414	15,093	1,258	291
3.....	27,066	2,256	521	19,019	1,585	366
4.....	32,653	2,722	628	22,945	1,913	442
5.....	38,240	3,187	736	26,871	2,240	517
6.....	43,827	3,653	843	30,797	2,567	593
7.....	49,414	4,118	951	34,723	2,894	668
8.....	55,001	4,584	1,058	38,649	3,221	744
For each additional family member add	+5,587	+466	+108	+3,926	+328	+76
ALASKA						
Household size	Reduced Price Meals - 185%			Free Meals - 130%		
	Annual	Month	Week	Annual	Month	Week
1.....	19,851	1,655	382	13,949	1,163	269
2.....	26,844	2,237	517	18,863	1,572	363
3.....	33,837	2,820	651	23,777	1,982	458
4.....	40,830	3,403	786	28,691	2,391	552
5.....	47,823	3,986	920	33,605	2,801	647
6.....	54,816	4,568	1,055	38,519	3,210	741
7.....	61,809	5,151	1,189	43,433	3,620	836
8.....	68,802	5,734	1,324	48,347	4,029	930
For each additional family member add	+6,993	+583	+135	+4,914	+410	+95
HAWAII						
Household size	Reduced Price Meals - 185%			Free Meals - 130%		
	Annual	Month	Week	Annual	Month	Week
1.....	18,297	1,525	352	12,857	1,072	248
2.....	24,716	2,060	476	17,368	1,448	334
3.....	31,136	2,595	599	21,879	1,824	421
4.....	37,555	3,130	723	26,390	2,200	508
5.....	43,975	3,665	846	30,901	2,576	595
6.....	50,394	4,200	970	35,412	2,951	681
7.....	56,814	4,735	1,093	39,923	3,327	768
8.....	63,233	5,270	1,217	44,434	3,703	855
For each additional family member add	+6,420	+535	+124	+4,511	+376	+87

Table Adapted From USDA website

Many parents do not apply for free or reduced-price meals because they are unaware that they are eligible. Some are embarrassed by the stigma attached to being on "free lunch." Having school meals available at free and reduced-price levels increases participation. Based on the data collected in the School Nutrition Dietary Assessment Study in 1992, 75% of the students who were eligible for free and reduced-price meals ate a school lunch on a given day, compared to less than half of students who pay the full price for the lunch.(3). Students who are certified to receive free and reduced-price meals are 20 % to 30 % more likely than non-certified students to eat a school lunch (3). This is because certified students pay less than non-certified students for school meals and are less likely to be able to afford other foods at lunchtime.

A La Carte Option

The a la carte menu supplies separately priced foods to students and is usually offered to increase sales for the School Nutrition Program. The foods available in the a la carte line are reimbursable foods operated by the foodservice program. \$3 in a la carte sales is the equivalent of one reimbursable school lunch. Students pay more for the foods in the a la carte line. Not every school has an a la carte line since this alternative to school lunch can decrease participation in the NSLP. Foods that are typically offered in the a la carte line are shown in the table below.

Table 6: Typical Foods Available in A La Carte Lines in High School Lunchrooms

Fresh Fruit	Granola Bars
Cookies	Hamburgers

Cookies	Hamburgers
Milk	Cheeseburgers
Chips	Muffins
Pizza	Yogurt, low-fat
Juice Drinks	Ice Cream
Fruit Juice	French Fries
Doughnuts	Nachos with Cheese
Sandwiches (Hoagies)	Shakes and Smoothies

Table Adapted from Journal of the American Dietetic Association. 1996; 96: 123-126.

The best selling items found on a la carte menus based on sales are cookies, fruit juice and fruit drinks, pizza, cakes, chips, fries, malts, nachos, and sandwiches (20).

Vending Machines

The majority of high schools and now even middle schools and some elementary schools have vending machines. One survey of 55 Minnesota high schools found that 48 schools had vending machines, with the majority of these being open at some time during the school day (20). 25% of these vending machines were open all day. The main food items sold in the vending machines are shown in the table below.

Table 7: Types of Foods Typically Offered in Vending Machines in High Schools

Juice Drinks	Carbonated Beverages
Fruit Juice	Candy Bars
Cookies	Candy

Chips	Snack Mix
Sports Drinks	Granola Bars
Pretzels	Pie
Water	Gum
Popcorn	Nuts, seeds
Doughnuts	Fruit
Milk	Chocolate Milk

Table Adapted from Journal of the American Dietetic Association. 1996; 96: 123-126.

The money made from the vending machines typically goes to school administration or school clubs and organizations instead of the school lunch program. The presence of vending machines decrease participation by providing alternatives to the NSLP (8). Vending machines offer a quick snack that usually has little or no wait in line when compared to the lines in the lunch room.

School Snack Bars

School stores and snack bars, which are commonly referred to as "bookstores," also provide an alternative to the NSLP which can decrease participation rates (8). The school bookstores are usually operated by students in business and marketing classes and the profits from the sale of food at the bookstores do not go to the school foodservice program. Most of the bookstores are open during lunch. Table 8 shows the types of food items that are commonly offered in school bookstores. Almost all of the food is high in fat, sugar, and calories. Fruit is seldom sold in school stores (20).

Table 8: Types of Foods Typically Offered in Snack Bars in High Schools

Candy Bars	Candy
Cookies	Doughnuts
Granola Bars	Juice Drinks
Chips	Carbonated Beverages
Fruit Juice	Pie
Nuts, seeds	Pretzels, popcorn

Table Adapted from Journal of the American Dietetic Association. 1996; 96: 123-126.

The location and operating hours of the school bookstores and vending machines can also play a role in the participation in school nutrition programs. When school stores and vending machines are open throughout the day, students are more likely to purchase foods from these locations. Additionally, if the vending machines and stores are in or near the cafeteria, students may be more apt to choose these options due to the shorter time spent in line at these options.

If vending machines, school stores, and a la carte lines are available in schools, providing healthful, lower fat options in these locations such as fruit instead of candy and pretzels in place of chips could be an acceptable alternative. Giving students exposure to and placing an emphasis on healthy foods provides a consistent message between the classroom and the cafeteria. Concepts students learn regarding nutrition in their studies can be enhanced by providing these same healthful options in School Nutrition Programs.

Peer Influence

Choices of teenagers are most influenced first by their peers, next the media, and finally by parents, and then by teachers. Many students are influenced by what their friends are choosing to eat and will follow the advice and actions of their friends. Most students enjoy talking with friends during the lunch hour and the lunchroom provides an environment for this socialization (21). Some students report that their participation is not affected by the opinion of friends and that their rate of participation would not increase or decrease depending on if their friends did or did not eat school lunch.

Parental influence can also affect student participation. Students whose parents believe that school lunches are inexpensive, nutritious, and more convenient than lunches from home are more likely to participate in the NSLP.

Teacher's attitudes regarding school lunch is another factor that can affect student participation. Teachers with positive attitudes toward the NSLP reflect this attitude in their teaching behaviors and actions in the classroom, which can positively affect their student's participation in the school lunch program (22). Conversely, teachers with negative attitudes and beliefs about the school lunch program can affect participation in a negative way. Students watch teacher's actions regarding school lunch. Some students comment, "I know teachers that will bring lunch because they don't trust the [school lunch] either" (8).

Age and Gender

Older students participate in the school lunch program less than younger students (8). Many times this is due to the fact that lunches for older students cost more, increased mobility with high school students (access to a car or to a friend with a car), busier schedules, more availability to decide where and what to eat for lunch, and a greater desire for independence than younger students (23). Males participate more often than females in the school lunch program (8).

Variety and Selection

Students report they would participate more in the NSLP if the variety of food was increased (24). The same holds for nonparticipants in the NSLP. Nonparticipants report that their participation would increase if the variety of food was increased (24). The selection available also makes a difference. School lunch programs that have a wide selection of foods available that fit student preferences will have higher participation. For example, when offered fresh or canned fruits and vegetables, most students prefer and consume more fresh than canned fruits and vegetables (11).

Perceived Quality and Nutritional Value

The perceived quality and nutritional value has been shown to affect participation in the NSLP. Many students have a low opinion of the food served in school lunch programs and report to not participating in the NSLP because they dislike the food. Some students feel distrust and disgust for the food that is being served in the school lunch program. Comments are made by students regarding school such as "the fruit is bruised,"

“the vegetables look nasty” (23), and “I have eaten things at school I would have never dreamed of eating, but just because I am at school and it is late in the day and I’m really hungry, I eat it,” and “You don’t know what is in there! I don’t trust what the schools will put in their food” (8). Typically, students who participate in school lunch perceive the food quality higher than nonparticipants (24). Both participating and nonparticipating students state that if the quality of the school lunch was improved, they would be more likely to participate more often.

Time Considerations: Length of Lunch Period and Time Spent Waiting in Line

Many activities compete for a student’s attention during the lunch period including the desire for socialization and free time (25). Studies have shown that competition during the school meal hour will increase plate waste (25). School meal periods must be planned to provide adequate time for pleasant eating experience without student’s feeling rushed to accomplish all of their desired activities (26). Adolescents report that the amount of time they feel they have or that they want to spend in line will influence the food choices they make. Some report to skipping meals because they don’t want to wait in a long line or to buying food at a fast food restaurant because the food is served quickly (23). One study shows that as the length of the lunch period increases, the participation in school lunch increases (27). Many teenagers perceive themselves as being very busy and not having enough time to worry about food, nutrition, and eating right (28). Students state that, “There is a lot more than food that’s really important to us” (28). Some students say that they will worry about healthful eating when they get older and start having heart problems (23,28).

Closed or Open Campus Policy

Some schools have the option of an open campus where students can leave the school during lunch time and eat off campus. Students with an open campus policy at their school are less likely to participate in the School Nutrition Program. The predicted participation rate for the NSLP is lower in schools with an open campus policy (49%) when compared to schools with a closed campus policy (58%) (3). Students who eat off campus generally spend more per meal than if they had purchased their lunch at school. Students spend \$10 to \$15 dollars a week when eating off campus, with an average of \$3.25 per meal (8). Some students prefer eating off campus and never participate in the NSLP. Some students stated they would "rather starve than eat school lunch." (3)

Lunchroom Environment and Friendliness of Foodservice Staff

The environment of the cafeteria including lighting, color, space available, cleanliness, and appearance can affect student participation. Surveys have shown student and teacher responses that appearance changes such as smaller tables would improve the atmosphere of the lunchroom (22) which could have an affect on participation. One study showed that as the size of the lunchroom increased, the participation in the school lunch program also increased (27). Both participants and nonparticipants in the NSLP rate their school lunch room environments as poor, although higher numbers of nonparticipants rate the lunchroom environment as poor. Friendliness of the foodservice staff is not a major factor affecting participation in high schools where friendliness of the staff is rated as

satisfactory by the majority of the students (24). However, in high schools where the foodservice workers are rated as unfriendly, participation rates are greatly affected (24).

METHODOLOGY

Purpose of Survey

A customer satisfaction survey was conducted to determine student's perception and attitudes about the lunch program at their high school. The survey was also performed to determine if student perception and participation in the school lunch program is affected by differences in the high school environment, specifically location of the high school to additional eating establishments (fast food, convenience stores, etc.), appearance of the high school lunchroom, and number of lunch periods.

Survey Population

The survey was performed at two high schools in the Davis County area of Utah. These high schools were both different in location, appearance of the lunchroom, number of lunch periods, and proximity to additional food establishments. The first high school, called BHS for this study, had an old lunchroom that had not been remodeled since it was first built in the school in 1950. Other parts of the school had been remodeled, but not the lunchroom. The school population had increased but the lunchroom did not have any additions to go along with the expanding student population. The lunchroom was located in the basement with dark red carpet and drapery. The tables were long and rectangular seating approximately fifteen to twenty students per table. The lighting in the lunchroom was dim. There was only one lunch period for all of the students in the school and the school had an open campus policy. This high school was located in a wealthy part of

Davis County and most of the students had access to a car during the lunch period. Fast food establishments were located at an approximate five to ten minute drive away from the high school but mainly the school was close to grocery stores, gas stations, and department stores. The high school was in a residential area and located near the freeway. The total number of student enrollment of BHS for the 2000-2001 school year was 1,526. BHS had a 28% average daily participation in the school lunch program, meaning approximately 427 students participated in the lunch program on a given day. 11% (or approximately 168 students) of the enrolled students at BHS were certified for free or reduced lunch.

The second high school, LHS, was a high school that had been built in 1970, but the cafeteria had been redesigned in 1996. The lunchroom had modern tables and design and was more attractive than the lunchroom at BHS. The lunchroom was organized "food court style" with small, round tables seating approximately five or six students per table. The floor was covered in tile. The lunchroom had many windows allowing bright, natural light to come in as well as glass doors that led outside. This high school was located in an area of Davis County surrounded by fast food establishments and gas stations within walking distance of the high school. This high school had an open campus policy as well and two lunch periods were offered. The enrollment at LHS was 1,753 students for the 2000-2001 school year. LHS had an average daily participation rate in the school lunch program of 28% (approximately 491 students) and 17% (or approximately 298 students) of the enrolled students at LHS were certified for free or reduced lunch.

The menu was not a variable in this survey since both schools had the same menu selection. School lunch menus were written each month for all schools within the school district. The menus and food provided for each school were the same. The district operated a central cook-chill facility where the food was prepared and then shipped out to each school to be reheated and served.

Cook-chill systems are USDA approved. With this system, food products are cooked in big kettles then pumped into polyethylene bags while still at a temperature of 180° F. The bags are sealed and put into a chilled ice water bath which drops the temperature to 38°F within 30 to 60 minutes (29). The product can be refrigerated for up to 45 days, or it can be frozen. The chilled bags of food are then shipped out to the various schools within the school district when needed for the menu that is to be served. Both schools had a la carte lines. Neither school had any vending machines present in the lunchroom and the vending machines located elsewhere inside of the school were closed during the lunch period. The following food options were available to the students at both schools every day:

- The main entree line featuring different choices each day
- A sandwich bar offering hoagie type bread, ham or turkey, lettuce, tomato, mayonnaise, and mustard
- The Pizza line which offered pizza brought in from an outside restaurant
- The Mexican line which offered daily tacos and burritos with refried beans, taco meat, lettuce, tomato, and salsa

- The Salad Bar which contained prepared salads. There were two varieties of salads: the chef salad which consisted of iceberg lettuce, tomato, shredded carrot, and ranch dressing, and the chicken salad which was also made with iceberg lettuce, shredded carrots with the addition of four strips of chicken, cheddar cheese, and ranch dressing
- The Grab-N-Go line, which is the a la carte line. This line had a variety of foods that included ice cream (chocolate, vanilla, or strawberry) on a waffle cone, cookies (sugar, chocolate chip, oatmeal raisin, ringer, snickerdoodle), yeast-raised and cake doughnuts (all varieties), breadsticks with pizza sauce, fruit juice, juice, milk (chocolate and 1% white), and fruit (apple, orange, or banana).

The surveyor stood at the entrance of the lunchroom and handed out the surveys as the students came in for lunch. Each student was asked to fill out the survey and return it to the surveyor when completed and before leaving the lunchroom to return to class. The survey was given to sophomore, junior, and senior aged students (15-18 years old).

Survey Instrument

The survey contained questions regarding feelings and perceptions of the school lunch program. Students responded to questions using a rating scale with ranges from "Very Good" to "Poor" on questions regarding taste, appearance, temperature, and courtesy of the foodservice staff. The survey also asked the students to rate the variety and selection offered in the lunchroom, the time spent waiting in line, and the frequency at which the student participated in the School Lunch Program. Questions regarding the current grade in school, the type of food typically selected, and any comments the students chose to add were also on the survey. A copy of the survey is found in Appendix A.

Data Analysis

Only the completed surveys were used. BHS had 68 completed forms returned and LHS had 75 completed forms returned. The number of responses for each rating per category were then calculated. The students were analyzed together without division into grades. The two schools were statistically analyzed and compared using a the Chi-Square Test method. Chi-Square Tests measure the discrepancy between two sets of cell frequencies (30). Statistical significance is shown with the Chi-Square Test with a value of less than 0.05.

RESULTS AND DISCUSSION

Results

Comparison of the two high schools revealed differences in all of the areas with statistical significance in student perception of variety and selection offered, the line usually chosen by the students, the appearance of the food, and the temperature of the food.

BHS had a smaller percentage of students that participated every day (41.2%) compared to LHS with a student reported participation rate of 47.9% every day. However, LHS had a greater percentage of students who reported almost never eating in the lunchroom than BHS. The results are shown in the table below.

Table 9: Number of Times Per Week Student Participates in the School Lunch Program

High School	Almost Never	1-2 Times	3-4 Times	Every day
Percentage of Students at BHS	2.9%	26.5%	29.4%	41.2%
Percentage of Students at LHS	6.8%	16.4%	28.8%	47.9%

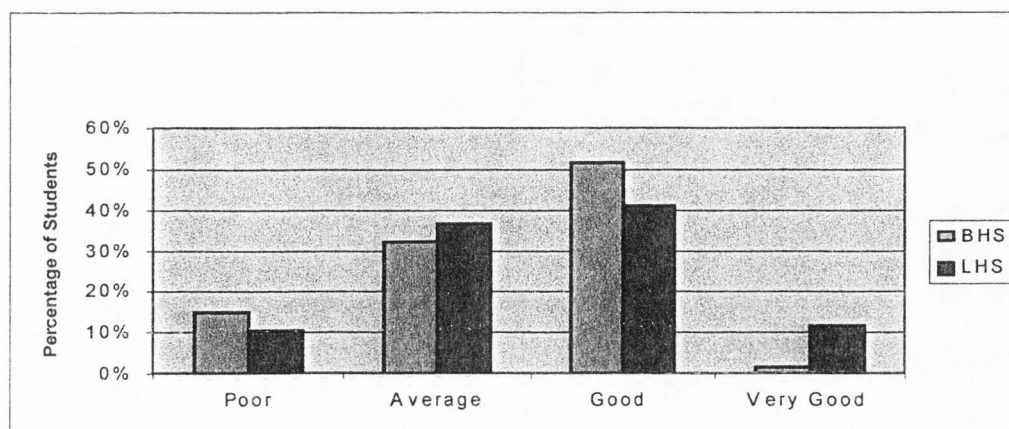
Students rated taste similarly at each high school. There was no statistical significance in the rating of taste between the two high schools. The student reported results are shown in the table below.

Table 10: Student Perception of Taste of Food in the School Lunch Program

High School	Poor	Average	Good	Very Good
Percentage of Students at BHS	5.9%	41.2%	41.2%	11.8%
Percentage of Students at LHS	4.1%	41.9%	43.2%	10.8%

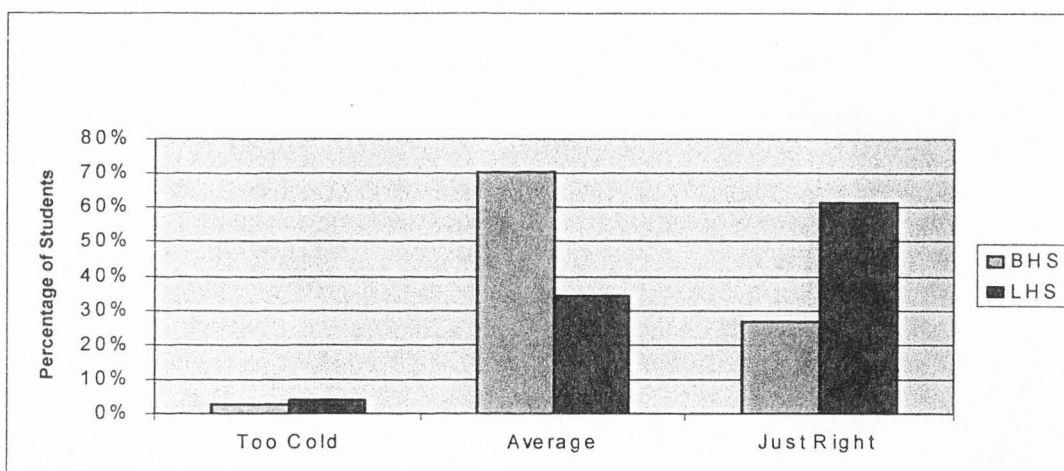
Appearance of the food revealed a difference with statistical significance between the two high schools. The students at BHS had higher numbers of “poor appearance” and “good appearance” than the students at LHS. The students at LHS were more likely to rate the appearance of the food as “very good” and “average.” The figure below shows the results of student perceived food appearance.

Figure 1: Student Perception of Appearance of Food in the School Lunch Program. Graph Shows Statistical Significance.



The temperature of the food also showed a difference with statistical significance between the two high schools. The students at BHS were more likely to rate the temperature of the food as average while the students at LHS were more likely to rate the food temperature as just right. The results for student perceived temperature of food are shown in the figure below.

Figure 2: Student Perception of Temperature of Food in the School Lunch Program. Graph Shows Statistical Significance.



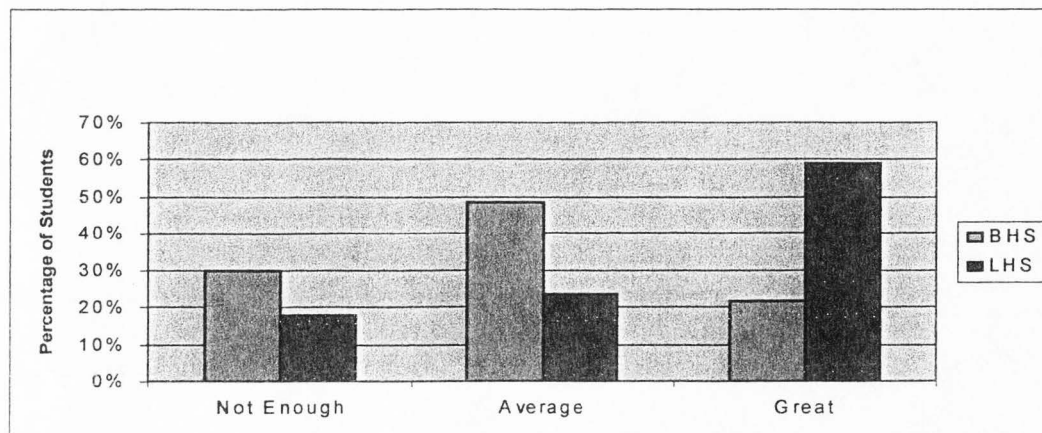
The amount of food received in the school lunch program was perceived similarly by students at both high schools. The majority of the students surveyed at each school believed the food received was the right amount. However, a greater number of students at LHS felt the amount of food received was not enough than students at BHS. The results of student perceived amount of food in the school lunch program are shown in the following table.

Table 11: Student Perception of Amount of Food Received in the School Lunch Program

High School	Not Enough	Right Amount	Too Much
Percentage of Students at BHS	35.3%	61.8%	2.9%
Percentage of Students at LHS	41.1%	57.5%	1.4

The perceived variety and selection offered in the school lunch programs differed greatly between the two schools. A statistical significance was shown with the Chi-Square Test. The majority of the students at LHS rated the variety and selection as “great” while the students at BHS mainly rated the variety and selection provided with school lunch as “average.” The student perceived variety and selection in the school lunch program is shown in figure 3 below.

Figure 3: Student Perception of Variety and Selection of Food Served in the School Lunch Program. Graph Shows Statistical Significance.



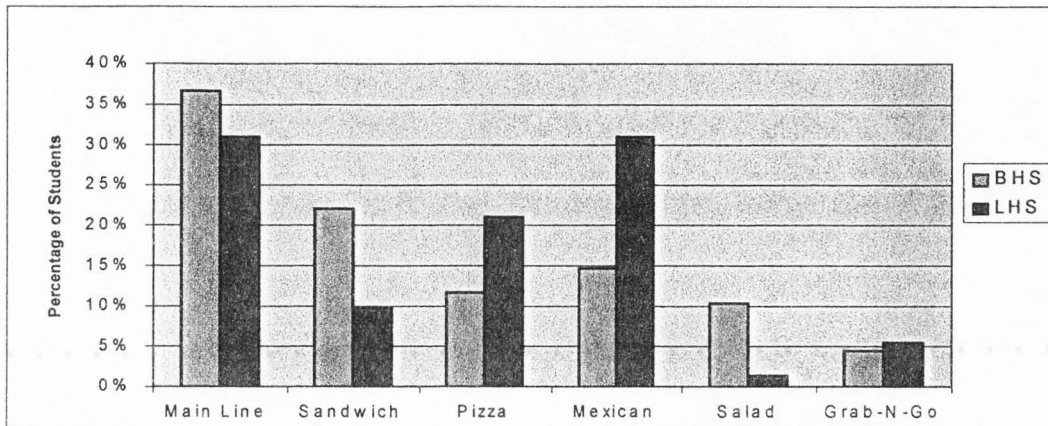
The time spent in line was perceived and rated very similarly by both high schools. The majority of the students at both BHS and LHS believed the wait time in line was too long. The results of student perceived time spent in line is shown in table 12 below.

Table 12: Student Perception of Wait Time in Lunch Lines

High School	Too Long of Wait	Average	Short Wait
Percentage of Students at BHS	66.1%	30.5%	3.4%
Percentage of Students at LHS	68.5%	27.4%	4.1%

The line selection differed greatly between the two high schools. The students at BHS were more likely to choose the main line than the students at LHS. The sandwich line and salad line were also selected more often by the students at BHS than by the students at LHS. The students at LHS were more likely to choose the Mexican line than students at BHS. LHS students also chose the pizza line and the grab-n-go line more often than the students at BHS. The results of the line selection by the students is shown in figure 4.

Figure 4: Line Selection by Students in the School Lunch Program. Graph Shows Statistical Significance.



The courtesy of the foodservice staff was perceived as very good by the majority of students at both high schools. The results of student perceived foodservice staff courtesy are shown in table 13 below.

Table13: Students Rating of Courtesy of Foodservice Staff

High School	Poor	O.K.	Good	Very Good
Percentage of Students at BHS	1.4%	5.8%	36.2%	56.5%
Percentage of Students at LHS	5.8%	11.6%	31.9%	50.7%

Discussion

The students at LHS felt that the appearance of the food was more pleasing than the students at BHS. This could be attributed to the overall dining experience being more pleasing at LHS than BHS. LHS had a brighter, more attractively decorated lunchroom than BHS. The perception of the appearance of food could be altered by the surroundings where it is being eaten. The visual appeal of the food being served carries an important role in customer satisfaction. In turn, customer satisfaction has a big role in whether or not a customer (in this case, student) returns and eats in the food establishment (school lunchroom) again.

The students at LHS with the more attractive lunchroom again felt that the variety and selection offered in their school lunch program was great while the students at BHS felt that the variety and selection provided was not enough or just average. Both schools had the same menu and the same foods offered each day. The difference in the rating could be due to the eating environment of the lunchroom. The students at LHS had a nicer dining atmosphere which can affect the perception of the variety and selection of the food provided. Schools with newer cafeterias are more able to offer new foods and an increased variety and selection compared to older schools with limited facilities and space. Older schools with outdated equipment would find it more difficult to offer increased food choices and attractive line selections that would entice and attract more students to participate in the school lunch program. If a school dining room has an attractive environment and a modern decorating scheme, the students may feel that the variety and

selection offered is good. More students may wish to participate since the lunchroom has a pleasing environment and a good variety and selection.

The perceived temperature of the food differed greatly at each school. The students at BHS felt that the temperature was O.K. while the students from LHS felt that the temperature was just right. Students at BHS had only one lunch period where all of the students were trying to hurry and choose a line, wait in the line, find a place to sit, eat their food, and return to their next class. With only one lunch period, the lunchroom at BHS was very crowded and at times it was difficult for students to find places to sit and eat the food. By the time they found a place to sit, the temperature of the food may have been affected. Food that was at a hot temperature may have cooled down to a less palatable temperature. However, the students at LHS had two separate lunch periods. The lunchroom was less crowded and therefore there was a greater availability of seating for the students. The students at LHS were able to purchase their food, find a seat, and begin eating before the temperature of the food had suffered. It is advantageous for both students and the foodservice staff to have multiple lunch periods. Providing more than one lunch period for the students allows the foodservice staff to stagger the foods they have to prepare in advance which improves the temperature and quality of the food. The wait in line for the students to purchase foods is also decreased since the number of students in the lunchroom at one time is decreased. Wait time in line also affects participation since students may feel pressure with not enough time to purchase the food, eat, and return to class without being tardy.

More students at LHS reported participation in the school lunch program every day than students at BHS. Customer satisfaction surveys in foodservice establishments show a relationship between customer satisfaction and purchasing behavior (4). The more satisfied the students are with the variety and selection and appearance of the food offered at the school, the more likely they are to purchase food in the school lunch program.

It can be concluded from this survey that a relationship exists between dining environment and perception of overall food quality. Students with a newer, more attractively designed cafeteria setting are more likely to participate in the NSLP offered at their school. Students attending schools with more modern design and seating arrangements view the overall appearance of the cafeteria, including the visual appeal of the food, the variety and selection offered, and the food temperature, as more satisfactory.

A limitation of this survey is that it was only given out to students who entered the lunchroom on that particular day, therefore excluding students who left for lunch outside of the school or chose not to eat in the lunchroom on that day. Therefore, information gained from the surveys gives student opinion from those already participating in the school lunch program. These students may have a higher satisfaction rating about the school lunch since they participate in it if not on a regular basis, at least on a partial basis. They may already like the school lunch and are participating, since a relationship exists between satisfaction and participation. This relationship can be seen both ways. If a student never participates in the school lunch program, he or she may have a negative perception of the school foodservice program since he or she is unaware of the foods being served, the appearance, taste, and temperature of the foods, and the appearance of

the lunchroom. Likewise, if a student eats in the lunchroom on a regular basis, they may be satisfied with the food and dining atmosphere and therefore continue to purchase foods in the school lunch program.

RECOMMENDATIONS

This survey showed that students with a more attractive and modern cafeteria design perceived the school lunch program in their school as providing more visually appealing food, a greater variety and selection, and a better temperature of food. The NSLP provides a nutritionally sound lunch that is available to all students. Research has shown that the NSLP can improve the nutritional status and dietary intake of students (31). However, for students to reap the benefits of improved health and diet, students must participate in the school lunch program. The best, most healthy, and most nutritious lunch can be prepared for a student, but unless he or she buys the lunch and eats it, health and diet are not being improved. Knowing and understanding factors that may cause a student to participate and then implementing program changes that will increase satisfaction is the best way to improve and increase participation. Food served in the NSLP should include a wide variety and selection, encourage consumption, and help to increase participation. The following suggestions based on factors that influence student participation may serve to increase participation in the NSLP.

Student Involvement

To have increased high school student participation, high school students must be able to give input and opinions about the school lunch program. Students should be involved in every process of the school lunch program, from menu planning, introduction

of new foods, cafeteria design, and improvement ideas. When students are involved in the planning process, they may feel they are part of the program and may have more desire to participate. Students can become involved through taste panels, suggestion boxes, and student satisfaction surveys. The results of this student interaction can give the foodservice staff clues on where the foodservice program needs to improve through the eyes of the students they are trying to serve each day. Changes to the school lunch program can then be changed based on the results. Other ways students can become involved is by starting a Nutrition Advisory Council (NAC) in the school. An NAC is a school organization that is sponsored by the ASFSA. The purpose of the NAC is to promote the importance of good nutrition and health and the role that school meals have in contributing to health and learning in the school environment (12). Students relay this information to their peers which can help the message to be better accepted. NACs have no strict set up rules that need to be followed. Many students will survey their peers about food preferences, ideas for menus, or suggestions for improvement in cafeteria design. Some students will write a column for the school newsletter about the school lunch program. It is important to remember that what is important to teenagers may not be important to school foodservice personnel. The foodservice staff should not expect students to purchase and eat whatever foods are provided. Since students are the main customers of the NSLP, it is vital to understand their views of the school lunch program for participation to increase.

Competitive Foods

The sale of competitive foods in schools is one of the most challenging factors in school lunch program participation. Foods sold in the NSLP provide more nutrition and are of higher quality than lunches from non USDA meal sources (32). Students need to choose the foods sold in the NSLP to get these benefits! Getting vending machines completely out of schools or at least filling the vending machines with nutritious, low-fat options such as fruit, pretzels, and milk, is the best way to decrease the purchase of competitive foods by students. Schools with established contracts with fast food restaurants should eliminate these contracts or ensure that only foods that can fit into the reimbursable meal pattern are served. Another option is to have a closed campus policy. More students would participate in the NSLP since they would not be able to leave the school to purchase other foods. Efforts should be made both locally within a school district and by each state towards the development and implementation of policies that support nutrition integrity of foods sold in schools. If possible, each school should be given the discretion and authority to control competitive foods that are sold inside the school. All foods available in schools should be consistent with the Dietary Guidelines for Americans and with the RDAs (25). School administrators, state boards of education, teachers, parents, and other members of the community must all recognize the importance of providing healthful foods to students in schools in order for any change with competitive foods to take place.

Marketing

Marketing is a key factor in the success of child nutrition programs. Students need to be aware of the school cafeteria and that it exists for their benefit and participation. The school foodservice staff should turn the focus of the lunchroom to fit adolescent needs and encourage participation. Any marketing tactic should include the four P's: Product, Place, Price, and Promotion. The same is true for the NSLP. Shown below are possible marketing tactics for the NSLP.

- **Product:** Add a new student requested food item once a week. Highlight this new item and announce that it was selected by a student.
- **Place:** The dining area of the school lunchroom must be appealing to students. The atmosphere should be conducive to socialization and should be attractive. The cafeteria should be pleasant, well lit, colorful, and have adequate space. Options such as food courts that resemble mall food courts with small, round tables in place of long, industrial tables and different serving lines with attractive signs and creative names should be explored. Additional serving lines such as salad bars, pizza lines, and sandwich lines that are popular with adolescents and that fit into the reimbursable meal pattern should also be explored.
- **Price:** Ensure that students and their parents are aware of the free and reduced price certification and who is eligible. Reassure students that this information is confidential.

- Promotion: Promote the NSLP within the school by having weekly contests, drawings, new menu items, bulletin boards, advertising low fat menu items, making overhead announcements of the day's menu on the school speaker system, and so on (12).

Marketing and making students aware of the NSLP can increase participation and awareness.

Nutrition Education

Schools are able to do more than any other agency in society to help adolescents grow into healthy adults and live longer, healthier, and more productive lives (20). All schools should provide nutrition education that includes classroom learning and cafeteria experiences. Food served in the lunchroom should coordinate with subjects taught in the classroom. The lunchroom should become a laboratory where students can learn to cook, have ethnic dining experiences, learn about chemical principles of baking and food preparation. Foodservice personnel can be guest lecturers in classrooms (33). The possibilities are endless.

Most will agree that the NSLP is necessary and beneficial to the health and nutrition status of its participants. More studies and surveys should be performed and the results implemented. School foodservice staff and other school personnel should collaborate and interact more. The NSLP is an optimal way to improve the nutrition status and nutrition awareness of all students. However, improvements still need to be made so participation will increase and its benefits can reach out to even more students.

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APPENDIX

HIGH SCHOOL STUDENT QUESTIONNAIRE USED IN STUDENT PERCEPTION
OF THE SCHOOL LUNCH PROGRAM SURVEY

Please circle one word that BEST describes how you feel about the food served in the lunchroom.

Taste	Very Good	Good	O.K.	Poor
Appearance	Very Good	Good	O.K.	Poor
Temperature	Just Right	O.K.	Too cold	
Amount	Too Much	Right Amount	Not Enough	
Variety and Selection	Great	Some variety	Not enough variety	
Time spent in line	Too long	O.K.	Short wait	
Grade in School	Senior	Junior	Sophomore	
Which line do you usually choose	Main Meal Mexican	Sandwich Bar Salad	Pizza Grab & Go	
Courtesy of foodservice staff	Very Good	Good	O.K.	Poor
I eat in the lunchroom	Everyday	3-4 times a week	1-2 times a week	Less than 1 time a week

What do you like best about the lunchroom? _____

THANK-YOU!