

FOOD PREFERENCES AND PLATE WASTE IN
A HIGH SCHOOL CAFETERIA

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CHAPTER I

INTRODUCTION

A program that is receiving increased publicity is the National School Lunch Program. This program, initiated in the 1920's and 1930's, was financed by local organizations and the government. The first legislation, the National School Lunch Act, was enacted in 1946. This act provided a long-term commitment of cash and commodities, and established nutritional guidelines. The school lunch program was to operate on a non-profit basis, and was to provide meals free or at a reduced price for the economically deprived students.

The 1969 White House Conference on Food, Nutrition, and Health resulted in several further amendments, leading to a rapid expansion of the program. Today school food service is the second largest away-from-home food market in the United States, having a monetary value of \$7 to 8 billion in 1978, with the federal share amounting to 30 percent. Approximately 25 million children are served daily. About 30 to 40 percent of the meals are served free or at a reduced price (LaChance, 1978).

The primary goal for the school lunch program is producing and serving acceptable, nutritious meals. The

Type A lunch requirements are based on the Recommended Dietary Allowances (RDA's). The reference child is a 10-to 12-year-old boy or girl (Daniels, 1977). The Type A pattern consists of four components: meat or meat alternate, fruit and/or vegetable, bread, and milk (Texas Education Agency, 1979).

The problems of food preferences and plate waste in the school lunch program have received increasing concern from the school food service administrators, the legislators, the news media, and well known researchers. Since the Type A pattern must be maintained, the problems of food preferences and plate waste must be examined closely. Among the questions that are of great concern are the following:

- 1) Can a questionnaire composed of menu items, checked by the students as to preference ratings, be the key to substantial plate waste reduction?
- 2) Will the highly preferred food items be the items the students desire to have included frequently in the school lunch?
- 3) Is there a willingness on the part of students to taste new food items?

These questions can be viewed as possible areas for a detailed study of the school lunch program in relation to

the reduction of plate waste, by the determination of food preferences.

Purpose of the Study

The food preference and plate waste issue is gaining wide publicity. This issue has been, and continues to be, a concern of the food service administrator in many school systems. There are possibilities that the issue can be approached by interested groups, working as a team, in an attempt to find some possible solutions to this complex problem.

Plate waste has been defined as the uneaten food, as the garbage, and as the issue. The United States Department of Agriculture has approached the problem by writing legislation to implement the so-called "offered versus served" amendment for secondary schools. The amendment states that the Type A pattern now has four food requirements: meat or a meat alternate, vegetables and/or fruit, bread, and milk. A secondary school must make all five types of food items, including both a fruit and a vegetable, available to meet the Type A lunch pattern (LaChance, 1976a).

Plate waste is no longer an in-house problem. Congress, the public, and the press are expressing concern about how to best solve the problem. Good public relations

among the groups involved can contribute to solving the complex problem. As stated in a recent issue of the School Foodservice Journal (LaChance, 1976b), "The real key to solving the plate waste problem is public relations."

A certain amount of plate waste is to be expected. Since the problem of plate waste begins with poor food practices and poor food acceptance in the home, the problem of plate waste cannot be remedied until the family is reached. Several solutions have been proposed for reaching the public with the issue. One essential is an efficiently operating school lunch program. Student advisory councils and the use of whatever gimmicks are needed to get children to clean their plates have been proposed. In addition, teachers must be encouraged to teach nutrition (LaChance, 1976b).

The present study was designed with the intent of making a possible contribution to solving the problems of food preferences and plate waste among high school students enrolled in the Wilmer-Hutchins Independent School District. The purpose of the present study was threefold:

- 1) To determine what food items offered in the Type A lunch menus have high preference ratings;
- 2) To determine if the food items having high preference ratings are the items desired by the students to be served most frequently; and

- 3) To compare the desired preference ratings of the students to actual plate waste in the lunchroom.

Review of Literature

The problem of food preference and plate waste is influenced by many factors. Since a child's food habits begins at an early age, the influence of the family cannot be ignored. Food habits are influenced by the cultural background, the attitudes about food, and the socioeconomic status of the family. Therefore, if the overall goals of the school lunch program are to be met, these factors should be considered when planning and preparing the Type A lunch. The role of the peer group begins influencing food habits at a later period in life. Among the other factors influencing food habits as the child grows older are the media, the fast food industry, fad diets, physical appearance, and nutrition education.

Investigators have found numerous ways of analyzing the food preferences and plate waste of school children. They have looked at the influence of the family on food preference: the role of food service personnel; and the procedures in planning, preparing, and serving the food items in the school lunchroom. Among other factors investigated have been techniques of analyzing food preferences and plate waste, the influences of student-selected menus,

the effect of playground activities, the effect of food position on the plate, the effect of flavored milk, and the effect of nutrition education.

Food service administrators must be made aware of the factors that influence food waste. The School Lunch Division of the Texas Education Agency (1978) has published reminders for its school districts in relation to food waste. The reminders to be considered in attempting to determine what changes are needed to improve food acceptance are as follows:

- Are menus properly planned?
- Are good quality products used to prepare the dishes?
- Are standardized tested recipes used?
- Are all ingredients measured or weighed accurately?
- Are directions followed carefully in preparing the food?
- Is the food cooked at the proper temperature?
- Does the food taste good?
- Does the food look attractive and appetizing on the plate?
- Are servings the correct size for age of the children served?
- Is a variety of food served so that children are not tired of the food because it had been served too often?

•Does the attitude of the workers encourage the children to eat well?

Since research has shown that children rank unfamiliar foods low in preference ratings, and are unlikely to eat these foods when they are served in the school lunch, David Price (1978) investigated the influence of food served in the home in determining food preferences in the school lunch program. Price determined the types of foods usually served in the homes to 8- to 12-year-old black, white, and Mexican American children living in the state of Washington. A total of 1,008 children were enrolled in the study. Data were obtained from interviews with the person in charge of food preparation in the home. This individual was usually, but not always, the mother. The respondent reported which of several major food items, such as meat, fish, fresh vegetables, dried vegetables, potatoes, and mixed dishes, were served in the home. If these types of foods were served, the respondent was requested to list the individual items usually served. Fresh tomatoes, lettuce, corn, carrots, and celery were the most popular fresh vegetables. These food items were served by at least 80 percent of the households in each ethnic group. Sweet potatoes, squash, and cabbage were served by fewer households than were the above listed vegetables. Served most often were corn, green beans, peas, and tomatoes. All

households in the sample usually served some type of meat or poultry. Chicken, hot dogs, bacon, ground beef, pork chops, sausage, ham, and beef steak were the most popular meat dishes. Nearly all households in the Price study served some type of bread products. Toast, bread, pancakes, and sweet rolls were the most popular items in this food group.

About 95 percent of the households investigated usually served some type of fresh fruit. The most popular fresh fruits were bananas, apples, oranges, watermelon, and peaches. The most popular canned fruit were peaches, pears, applesauce, and fruit cocktail. Relatively few foods were commonly served by over 50 percent of the households. The author concluded that, when planning the school lunch, the ethnic groups served should be considered.

Food preferences of 8- to 12-year-old children were investigated by Dorothy Price (1978). Data were collected in the home. The investigator determined the foods representative of the three different cultures (white, black, and Mexican-American), and incorporated these foods in the school lunch menus. Using these two sources of data, Price attempted to plan menus in the school lunch program that were high in nutrient value, that met the Type A lunch requirements, and that included cultural preferences of the representative group. Sources of predetermined nutrients,

such as calcium, iron, vitamin A, and ascorbic acid, were given special consideration. From this study, the investigator concluded that most cultural groups have common food selection patterns. However, in planning and preparing food for the school lunch program, the preferences of ethnic groups should receive consideration.

LaChance (1976b) has recommended a technique for measuring plate waste. This author maintains that visually measuring plate waste is just as effective as weighing the food. In addition, visual estimations are much simpler and less time consuming. The method advocated by LaChance requires the observer to visually gauge food waste in terms of a fraction of the original serving size. Generally, food portions are known or can be easily estimated in terms of the original volume or dimensions. The visual plate waste method can be applied to all food components; however, LaChance recommended that one begin by estimating only one or two food items. The visual estimate can be made each time a certain food appears on the cycle for as many as three times. The results can then be pooled and successfully used in measuring plate waste in the school lunch.

The United States Department of Agriculture (USDA) has developed some guidelines for determining food acceptability. These guidelines involve methods of data

collection, the staff needed, the required equipment, the suggested forms to be employed, the procedures for weighing the food plate waste, and the procedures for serving trays and checking the plate waste. The two methods advocated by the USDA for determining plate waste are visual estimates and the weighing of foods. Visual estimates have been used to approximate the percentage or fraction of food consumed. The weighing method is recommended for more specific determinations in estimating nutrient consumption (United States Department of Agriculture, 1975).

The Utah State Board of Education has become involved in the issue of plate waste. This educational organization conducted a study of plate waste in four school districts in 1976. The study included 384 students, with approximately 13,824 individual sets of data. The data represented 36 different menus. One conclusion from the study was that numerous factors have a direct or indirect effect on the amount of food left on the student's tray. Among these factors were the following: quality of the food, portion size, temperature of the food, texture of the food, length of the lunch period, lunchroom atmosphere, employee attitudes, parent attitudes, meal patterns at home, and sanitation in the school. One conclusion from this study was that the menu cycle can be improved by incorporating the desirable foods as often as practical. New foods, and

those deemed less desirable, should be introduced at planned intervals (School Foodservice, 1976).

Garrett and Vaden (1978) have studied the influence of student-selected menus on participation, plate waste, and student attitudes. There is evidence that these factors should be taken into consideration when resolving the issue of plate waste and food preferences. These researchers selected three schools, representative of a cross-section of the 29 elementary schools included in one school district. Factors considered in selecting the project included schools were enrollment, geographic location within the district, and socioeconomic characteristics of the various neighborhoods in which the elementary schools were located. Sixth graders were selected because of their ability and maturity.

Garrett and Vaden (1978) found that the percentage participation increased significantly during the experimental period. During this period, student-selected menus were served in all schools included in the project. During the experimental period, the total ounces of plate waste for these sixth grades decreased in two schools. In the third school, there was a small increase in plate waste. In the latter school, approximately 30 percent of the sixth graders were involved in assessing food preferences; whereas, in the other schools, the total student groups

were involved. A positive change in attitude toward school foodservice was observed among students enrolled in the two schools which permitted students to observe and participate in the kitchen as a part of the project.

Jansen and Harper (1976) conducted a study involving a total of 58 elementary and high schools, serving approximately 23,000 meals. The 58 participating schools, selected by the Food and Nutrition Department of the USDA, were located in the Midwestern, Southwestern, and Western regions of the United States. Half of the schools were elementary schools and half were high schools. In each school, plate waste was determined for 30 to 50 children for a period of 10 school days. The results of the study showed the highest acceptability for a menu category was for milk, with 88 and 94 percent of the children in the fifth and tenth grades, respectively, consuming milk. Most entrees and starchy foods were well accepted, with three-fourths or more of the serving typically consumed. Consumption of vegetables and salads was lower, ranging from one-third to one-half of the amounts served actually being consumed.

The most poorly consumed menu items were rutabagas and summer squash, with only 5 and 15 percent, respectively, of the food served actually being eaten. However, these items were served infrequently. Regional differences in

food acceptability were minor. In all categories, high school students consistently wasted less food than did elementary students.

Halfacre (1977) conducted a study which investigated how a food service supervisor, responsible for menu planning, can reach a goal of clean plates and can act as a catalyst in making nutrition education a part of the educational program. Halfacre found that involving children in menu planning increased meal acceptance and helped to relate the cafeteria to learning. The author reported that children learn to accept foods when they discover how these foods affect their body growth, and when they have direct involvement in planning their meals. The guidelines for a Type A lunch, including cost and requirements, were discussed with the students who participated in the study. Children were eager to learn and readily understood why fresh watermelon could not be part of the lunch in March. A couple of children suggested serving grapefruit juice. The food service department arranged a grapefruit juice break. A total of 25 of the 29 children participating in this study drank all of the sweetened grapefruit juice served.

The students in the Halfacre study (1977) failed to request green vegetables. This omission prompted a lesson on the value and importance of well-balanced meals.

The success of the project was evidenced by children cleaning their plates. Children responded positively when they were involved in the actual planning of the meals.

Head and Weeks (1977) investigated a plan for determining whether or not a decrease in the bulk content of a school menu would decrease plate waste and increase nutrient intake. Menus were planned for two nutrient levels, those supplying one-third of the Recommended Dietary Allowances and those supplying one half of the Recommended Dietary Allowances. One set of menus, planned for one nutrient level, contained only conventional school lunch items, while another set of menus contained a combination of conventional items and formulated foods, the latter serving to lower the total bulk of the food intake. Five elementary schools, representing urban and rural populations, were involved in the study. The subjects were divided into two groups. Students enrolled in grades one to three constituted one group, while students enrolled in grades four to six made up the second group. The formulated foods included a specially designed milk to which ascorbic acid and thiamin had been added in addition to the usual Vitamin A and Vitamin D used in fortification. Additionally, certain commercially available formulated products were used. Among the products used were textured vegetable protein, extra dried eggs, and orange juice and/or dried

milk. In some instances the additional products were added to the conventional items. Data on nutrient intake were provided by measuring plate waste and then determining the percentage of the nutrients served that has been consumed. The authors found that, regardless of the type of meal or amount served, student intake of Vitamin A and energy did not meet one-third of the RDA's. With but few exceptions, the actual nutrient intake by students was highest when formulated items were included in the menus. In addition, the intake of bulk in the diet was lower. Ascorbic acid intake by the older group of students was improved. A higher consumption of iron was reported for both age groups. The older students ate a higher percentage of what was served than did the younger students. The rural students ate the highest percentage of the foods served, with students in the small town school having the second best rate of consumption.

Some investigators state that the time of day scheduled for physical education is a factor contributing to plate waste. Ruppenthal (1978) studied the influence of time for play activities on plate waste in 1976. A follow-up study investigated the same factors in 1977. The follow-up visit took place at the same location as the 1976 study. Each of the studies lasted five days. Food waste for two groups of 40 children was collected, separated

into food categories, and weighed. During both collection weeks, the experimental group, on a lunch-after-recess schedule, wasted 40 to 45 percent less food than the control group, on the traditional lunch-before recess schedule. In a third waste collection period, September and October of 1977, the study included another group of children. Plate waste measurements again showed more than a 40 percent drop, associated with a schedule switch from lunch-before- to lunch-after-recess.

Christensen et al. (1979) investigated the influence of the location of food on the tray and the scheduling of playtime as two factors contributing to plate waste. Five Type A lunches were selected, and these were served in each of the three weeks covered by the study. The results of this study showed a significant drop in the amount of food wasted per child when playtime was scheduled prior to lunch, and the dessert was placed at the back of tray as compared with playtime following lunch, with the dessert placed at the front of the tray. The location of the dessert did not appear to affect food waste.

LaChance (1976a) developed a simple technique for analyzing food acceptance. Foods that received an average preference rating of 6.0 or better were invariably good menu items. Foods with very high ratings, 7.5 to 9.0, were usually highly desirable, but items that should be

carefully scheduled or avoided, since these foods are likely to have a high plate waste, a waste of both money and nutrients.

Gargano and Vaden (1978) researched the intended and actual entree selections of sophomore, junior, and senior students. The purpose of the study was to determine which entree, from among 30 pairs of entrees, would be selected when served in the school lunch. The author attempted to determine the degree of certainty about the selection of the entrees and the degree of liking or disliking for each entree item. The data collected included: actual entree selection from the cafeteria line, intended selection from a printed questionnaire listing the 30 pairs of entrees, and intended selection after viewing slides of each of the 30 pairs of entrees. The results of the study showed hot sandwiches, hamburger sandwich, and Italian or Mexican main dishes were the entree categories most liked by the students. For most items in these categories, preference scores were similar with both approaches. Baked ham, roast turkey and gravy, and macaroni and cheese were scored as well-liked in the questionnaire approach, but were not rated as high in the slide approach; conversely, fish and chips and breaded pork cutlets were scored among the most liked entrees only with the slide approach.

Guthrie (1977), investigated the impact of the policy regarding the option of using flavored milk in the school lunch program on student participation, nutrient intake, and plate waste. The results of the investigation showed that the children in grades one through five drank more of their milk when chocolate milk was offered, but they ate less of the food offered on these days. Children in grade six drank about twice as much of their milk when they had a choice of flavored milk, but the milk option did not affect their food consumption. When an option was offered, only 2 to 12 percent of the milk chosen was unflavored. The participation in the school lunch program increased when chocolate milk was the only beverage served, and also on the days when the unpopular menu was served. Test subjects increased their intake of calcium and riboflavin when there was an option of flavored milk, but their decreased consumption of food resulted in a lower intake of iron.

In an investigation by Harper et al. (1977), acceptability varied from 93.3 to 67.8 percent, with an average of 83.2 percent. Green and yellow vegetables had the lowest acceptability, averaging 37.8 percent. Desserts typically had high acceptance. The acceptability for some foods varied with the type of service provided.

A study reported by Stitt (1979) pointed out that green leafy vegetables are often rejected by children. Possible reasons given for the dislike of foods were that vegetables are not served at home, or that vegetables were disliked by one or both parents. Another reason given was the strong flavor, particularly when overcooked. These factors often prevent children from eating part of all the vegetable. Many vegetables are not eaten because the child has never tasted them. Reasons that children may not eat the food served, and thus contribute to high plate waste, were enumerated by Stitt. Among the reasons given were the following: unfamiliarity with food, dislike of texture, dislike of flavor, disagreeable color, unattractiveness of the food, too little time to eat, lack of skill in eating with tools, and peer pressure.

Shonic and Jennings (1979) studied the effects of nutrition education on nutrition knowledge, vegetable acceptability, and plate waste of fourth grade children participating in the school lunch program. The investigator concluded that although knowledge and stated food preferences increased, behavior did not change significantly. A reduction in vegetable plate waste did not take place within the school cafeteria. Among the reasons postulated for the lack of change were large volume

preparation of vegetables in the school's kitchen, serving size, and peer pressure to reject vegetables.

Tenny (1978) investigated preferences, acceptance, and plate waste of food items served in a high school cafeteria. The degree of acceptance of eight main dishes and eight vegetable, fruit, or salad items by high school students was reported. The data analysis revealed a significant correlation between food acceptance and the amount of food eaten for the eight vegetable, fruit, or salad items. The mean acceptance scores of the students for eight main dishes ranged from 7.6 for the taco to 5.8 for barbecued chicken. The mean acceptance scores of students for the eight vegetable, fruit, or salad items ranged from 7.9 for the taco salad to 6.2 for the raw vegetable salad. The majority of the students preferred the main dishes to be served either occasionally or not more than once a week. Data analysis revealed a significant difference between grade levels for the desired frequency of serving 13 of the 28 vegetable, fruit, or salad items and 7 of the 25 main dishes. In general, when responses for grade levels differed significantly, the desired frequency ratings were greater for the ninth grade students than for the other grade levels for main dishes.

CHAPTER II

PLAN OF PROCEDURE

This study was designed to determine which food items offered in the Type A lunch menus have high preference ratings among high school students enrolled in Wilmer-Hutchins High School. The study was designed:

- 1) To determine if the food items having high preference ratings are the items desired by the students to be served most frequently;
- 2) To compare the food preference ratings as checked by the students, to actual plate waste in the lunchroom;
- 3) To help assist the food service personnel in planning menus that give consideration to student preferences within the guidelines of the Type A lunch pattern.

This study included 264 students enrolled in the Wilmer-Hutchins High School of the Wilmer-Hutchins Independent School District. The data were obtained from students enrolled in grades nine, ten, eleven, and twelve. All students participated on a voluntary basis. The

school's population consisted of 1,523 blacks, 49 whites, 36 Mexican Americans, and 1 classified as "other."

The investigator explained how the information obtained would be of great benefit to the school lunch-room personnel in planning menus. The importance of student opinions was emphasized. The possible benefit of this information in planning well-liked menus within the guidelines of the Type A lunch was stressed. In addition, it was emphasized that the possible reduction in plate waste would provide funds for a greater variety of well-liked food in the menus.

The questionnaire included two additional items. One item concerned the frequency of student participation in the school lunch and the other inquired as to the willingness of the students to taste unfamiliar food items.

The LaChance (1976a) technique for evaluating the acceptability of the food items by the students was utilized. A nine-point hedonic scale was used. The opinion ratings were as follows: 1) dislike extremely, 2) dislike very much, 3) dislike moderately, 4) dislike slightly, 5) neither like or dislike, 6) like slightly, 7) like moderately, 8) like very much, and 9) like extremely. The instrument includes a list of 20 meat items, 25 salad and/or vegetable items, and 5 milk items that were commonly included in the school lunch menus.

The food items were analyzed according to recommendations of LaChance (1976a). A food that received an average rating of 6.0 or better is considered as a good menu item. Foods with very high ratings, 7.5 to 9.0, are considered good items, but should be carefully planned when incorporated in the menu cycle since these items are the foods most likely to become monotonous. Foods that receive ratings below 6.0 are items that should be incorporated in the menu cycle carefully, since these food items contribute to high plate waste and consequently, nutrient waste.

The desired frequency of serving was evaluated on a 5-point scale. The ratings were 1) never, 2) once or twice a month, 3) once every 2 weeks, 4) once a week, and 5) 2 or 3 times a week.

The second part of the study included an estimation of the actual plate waste for certain food items. The method for determining plate waste was the technique proposed by LaChance (1976b). This technique involves a visual estimation of food waste in terms of a fraction of the original serving size. The fraction of food left on the tray was rated as follows: 1) all, 2) three-fourths, 3) one-half, 4) one-fourth or less, and 5) none.

According to LaChance (1976b), the visual method of measuring plate waste can be used successful since the

food portions are usually predetermined before the meal is served. The waste can be easily visualized as a result. The USDA advocates visual estimation for determining the fraction of food returned on the student trays in determining the acceptability of a food item (United States Department of Agriculture, 1975).

Only two food items were evaluated by the investigator each study period. The students were instructed to move their trays to a specific area in the lunchroom for evaluation of plate waste. Thirty student trays were selected at random each study period by the investigator for estimation of plate waste. The investigator estimated plate waste.

The instruments may be found in the appendix.

CHAPTER III

PRESENTATION OF DATA

This study was undertaken to determine the frequency of participation in the school lunch program, the willingness to sample a disliked food item on the menu, the food preferences of the students, the desired frequency of serving certain foods, and plate waste in the Wilmer-Hutchins High School Cafeteria. A questionnaire developed for the study included 50 food items selected by the food service personnel as well-accepted food items included in the menu cycle.

A total of 264 high school students completed the questionnaire. Of this group, 49.6 percent ate daily in the school cafeteria, 37.1 percent ate two to three times a week, 4.6 percent ate once a week, 6.1 percent ate two to three times a month, and 3.0 percent ate on special days only.

Students who indicated never participating in the school lunch did not complete the remainder of the questionnaire. However, several students indicated the reasons for non-participation. One frequently given response for non-participation was enrollment in the

Vocational Education Program. Students enrolled in this program leave the campus at lunch time. Other responses included the following: dislike the taste of the food, lines too long, not enough time to eat, and the habit of not eating lunch at home.

The students were requested to check their willingness to taste disliked food items on the menus. A total of 46.6 percent gave an affirmative response, while 48.5 percent gave a negative response to this question. The remaining 4.9 percent did not respond to this item.

Food Preferences

The food preference ratings were evaluated by the technique recommended by LaChance (1976a), using a nine-point hedonic scale. The opinion ratings and assigned values were as follows: 1--dislike extremely, 2--dislike very much, 3--dislike moderately, 4--dislike slightly, 5--neither like or dislike, 6--like slightly, 7--like moderately, 8--like very much, and 9--like extremely. LaChance considered food items with a rating of 6.0 or better as a good menu item. This author considered that a food item with a rating below 6.0 should be scheduled into the menu cycle carefully. Food items rating 7.5 to 9.0 should be scheduled carefully because these food items will become monotonous easily.

Meats

Percentages were calculated for responses to the meat items in each of the nine opinion categories. The categories with the highest percentage concentrations were as follows: "like very much," "like extremely," and "dislike extremely" (Table 1). The categories checked by the lowest percentages of students were the following: "dislike moderately," "dislike slightly," "neither like or dislike," "like slightly," and "like moderately." The categories of "dislike moderately," "dislike slightly," and "neither like or dislike" had less than 10 percent of the students checking these opinions as their responses. Less than one-fifth of the students checked the categories of "like slightly" and "like moderately" for any of the meat items listed.

The meat items with the highest percentages of students checking the "like extremely" category were as follows: burrito, 44.3 percent; hamburger, 30.3 percent; barbecued beef, 23.5 percent; pizza and taco, both 20.8 percent. When the percentages checking the categories of "like very much" and "like extremely" were combined, the meat items checked by over 30 percent of the students, in descending rank order, were as follows: burritos, 72.3 percent; hamburger, 70.5 percent; fried chicken,

TABLE 1

PERCENTAGES OF 264 HIGH SCHOOL STUDENTS CHECKING THEIR PREFERENCES FOR
50 FOOD ITEMS SERVED IN THE SCHOOL CAFETERIA

Food Items	Degree of Preference									
	Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like or Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely	No Response
MEATS										
Fried										
Chicken	2.7	0.4	0.4	1.5	2.7	13.6	15.5	33.7	19.7	9.8
Beef-a-Roni	18.2	8.7	4.9	6.4	7.2	13.6	14.4	10.6	5.3	10.6
Battered Fish	8.7	4.9	1.9	4.6	4.6	16.7	19.7	19.3	11.0	8.7
Hamburger	0.8	0.4	0.0	2.3	1.9	8.3	11.0	40.2	30.3	4.9
Corny Dog	7.2	1.5	2.3	2.7	2.7	15.9	20.8	23.9	18.2	4.9
Hot Dog	3.8	1.1	1.9	5.7	2.3	19.3	18.6	23.5	17.1	6.8
Pizza	8.3	1.5	1.9	3.0	2.7	13.6	13.3	30.3	20.8	4.6
Taco	3.8	2.3	1.1	1.5	3.8	13.6	17.4	28.8	20.8	6.8
Tuna Casserole	38.6	6.4	5.7	6.8	5.0	11.4	8.3	6.8	2.7	8.3
Chicken Salad	31.4	7.6	6.1	5.7	6.4	12.5	7.6	7.2	4.2	11.4
Burrito	3.0	1.9	0.8	0.0	1.5	4.9	8.3	28.0	44.3	7.2
Barbecued Beef	5.3	1.9	1.1	2.7	4.2	11.4	17.4	28.0	23.5	4.6
Meat Balls	15.9	4.6	3.4	5.7	8.0	16.7	14.4	12.5	9.5	9.5
Lasagna	28.8	9.5	3.4	6.4	8.0	8.0	9.1	10.6	6.4	9.9
Creole Liver	58.0	10.6	2.7	3.4	4.6	3.0	1.9	2.7	1.1	12.1
Salisbury										
Steak	11.0	2.7	3.0	6.1	4.9	16.3	12.5	19.7	16.7	7.2
Chicken Fried										
Steak	9.1	2.7	1.5	3.0	4.2	14.0	15.5	23.1	19.3	7.6
Roast Beef	20.1	5.3	3.8	3.8	6.8	13.3	9.1	17.4	12.9	7.6
Beef Stew	28.8	5.3	3.8	6.1	6.4	13.3	12.9	9.1	6.1	8.3
Ravioli										
Casserole	31.1	7.2	3.0	4.9	10.2	12.1	11.7	5.3	6.4	8.0
VEGETABLES										
Spinach	30.7	4.6	2.7	4.6	5.7	14.4	9.5	14.8	7.2	6.1
Turnip Greens	30.7	6.8	2.3	4.2	6.4	13.3	9.1	11.4	9.1	6.8
Carrots	41.7	9.1	5.7	1.9	5.3	8.3	5.7	6.8	6.1	9.5

TABLE 1--Continued

Food Items	Degree of Preference									
	Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like or Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely	No Response
VEGETABLES										
French Fried										
Potatoes	4.9	0.8	0.0	0.4	1.1	5.3	9.9	34.5	38.3	4.9
Mashed										
Potatoes	4.9	0.8	0.4	0.8	3.0	7.6	12.9	35.2	26.1	8.3
Pickled Beets	47.0	6.4	3.8	3.8	6.0	5.3	6.4	5.7	6.1	9.5
Corn	7.6	1.1	1.1	1.5	3.4	15.5	14.0	26.1	21.6	8.0
Mixed										
Vegetables	39.8	6.4	4.6	3.8	5.3	9.1	8.0	7.6	7.2	8.3
Cabbage	28.8	5.7	2.3	3.8	7.2	13.3	6.8	12.5	9.1	10.6
Baked Beans	27.3	3.4	4.6	4.6	9.5	12.9	11.0	12.1	6.1	8.7
Blackeyed										
Peas	26.9	3.8	3.8	3.8	6.4	15.9	11.0	9.1	6.8	12.5
Squash										
Casserole	59.9	6.8	3.4	2.3	5.3	4.6	1.5	1.9	1.5	12.9
Green Beans	24.6	3.0	1.5	3.4	6.4	16.3	12.5	15.2	9.1	8.0
Green Peas	39.0	4.6	3.8	4.9	6.4	12.9	5.7	8.0	4.9	9.9
Lima Beans	58.0	7.2	5.3	2.3	5.7	4.9	2.3	1.5	3.0	9.9
Broccoli	50.4	5.7	3.0	2.3	4.2	6.4	6.1	7.2	8.7	6.1
Stewed										
Tomatoes	57.2	5.3	1.9	1.5	7.2	3.4	2.7	4.2	2.3	14.4
SALADS										
Tossed Green	20.1	3.0	1.5	2.7	7.2	12.5	10.2	16.7	12.9	13.3
Green Pea	44.7	8.0	2.3	5.3	6.1	4.6	4.6	6.1	4.9	13.6
Potato	12.1	2.7	1.9	3.0	2.3	13.6	11.4	19.7	20.8	12.5
Fruit	12.1	2.7	1.1	0.8	3.0	14.0	10.6	21.2	22.4	12.1
Cole Slaw	39.8	4.2	2.7	3.4	8.0	6.4	2.7	10.2	6.1	16.7
Vegetable										
Gelatin	42.4	6.1	3.4	3.0	9.1	4.2	3.0	6.1	5.3	17.4
Fruit										
Gelatin	25.4	3.4	2.3	1.5	6.4	8.3	10.2	15.9	9.9	16.7
Carrot										
Raisin	48.1	6.1	2.7	2.7	6.8	5.7	3.0	4.6	4.6	15.9

TABLE 1--Continued

Food Items	Degree of Preference									Response
	Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like or Dislike	Like Slightly	Like Moderately	Like Very Much	No Extremely	
MILK										
Plain	12.8	1.5	1.5	1.9	3.0	7.6	9.9	23.5	23.5	14.8
Chocolate	4.2	0.0	0.0	0.4	1.5	6.1	3.4	31.8	37.9	14.8
Buttermilk	56.8	7.2	1.5	2.7	3.8	1.5	1.1	3.4	2.3	19.7
Low Fat	52.7	6.1	2.3	2.7	5.7	2.3	1.9	4.6	3.8	18.2
Skimmed	52.7	6.1	2.7	2.3	6.4	2.7	1.5	4.2	3.0	18.6

53.4 percent; barbecued beef, 51.5 percent; pizza, 51.5 percent; tacos, 49.6 percent; corny dogs, 42.1 percent; hot dogs, 40.6 percent; salisbury steak, 36.4 percent; battered fish, 30.3 percent; and roast beef, 30.3 percent.

The meat items with the highest percentages of students checking the "dislike extremely" category, in descending rank order, were as follows: creole liver, 58.0 percent; tuna casserole, 38.6 percent; chicken salad, 31.4 percent; ravioli casserole, 31.1 percent; lasagna, 28.8 percent; beef-a-roni, 18.2 percent. When the categories for "dislike extremely" and "dislike very much" were combined, the meat items checked by the highest percentage of students, in descending rank order, were as follows: creole liver, tuna casserole, chicken salad, ravioli casserole, lasagna, beef stew, beef-a-roni, and roast beef.

A mean preference score was calculated for each food item (Table 2). The mean preference scores for the 20 meat items showed that hamburger, with a mean of 7.4, and burritos, with a mean of 7.3, were the best liked meat items. Other meat items having a mean of 6.0 to 6.7 were barbecued beef, taco, fried chicken, corny dog, pizza, hot dog, and chicken fried steak. The remainder of the meat items had means below 6.0.

TABLE 2

MEAN SCORES FOR FOOD PREFERENCES, DESIRED FREQUENCY
OF SERVING AND PLATE WASTE

Food Items	Preferences	Frequency of Serving	Plate Waste
MEATS			
Hamburger	7.4	3.3	4.8
Burrito	7.3	3.1	4.7
Barbecued Beef	6.7	2.6	4.9
Fried Chicken	6.6	2.8	5.0
Taco	6.6	2.8	4.5
Corny Dog	6.4	2.8	5.0
Pizza	6.4	2.8	4.9
Hot Dog	6.3	2.7	4.9
Chicken Fried Steak	6.0	2.4	4.7
Salisbury Steak	5.7	2.3	5.0
Battered Fish	5.6	2.5	4.8
Roast Beef	4.9	2.0	4.0
Meat Balls	4.8	1.9	4.8
Beef-a-Roni	4.3	2.1	4.8
Beef Stew	4.0	1.8	2.1
Lasagna	3.8	1.6	3.0
Ravioli Casserole	3.8	1.7	4.8
Chicken Salad	3.4	1.5	1.0
Tuna Casserole	3.3	1.5	2.8
Creole Liver	1.9	1.1	2.2
VEGETABLES			
French Fried Potatoes	7.3	3.2	4.9
Mashed Potatoes	6.8	2.9	4.3
Corn	6.3	2.6	3.9
Green Beans	4.7	2.0	2.4
Spinach	4.3	2.0	1.9
Baked Beans	4.2	1.8	1.9
Cabbage	4.1	1.8	3.0
Blackeyed Peas	4.0	1.8	2.8
Turnip Greens	3.4	1.9	2.7
Mixed Vegetables	3.4	1.6	2.6

TABLE 2--Continued

Food Items	Preferences	Frequency of Serving	Plate Waste
VEGETABLES			
Green Peas	3.4	1.5	2.2
Broccoli	3.2	1.5	2.4
Carrots	3.1	1.6	2.7
Pickled Beets	2.9	1.4	2.5
Lima Beans	2.1	1.1	1.1
Stewed Tomatoes	2.1	1.1	1.0
Squash Casserole	1.8	1.1	1.7
SALADS			
Fruit	5.7	2.4	3.7
Potato	5.5	2.2	2.0
Tossed Green	4.7	2.0	2.4
Fruit Gelatin	4.1	1.8	3.2
Cole Slaw	3.0	1.4	1.2
Green Pea	2.7	1.3	2.1
Vegetable Gelatin	2.6	1.3	3.4
Carrot-Raisin	2.5	1.2	1.2
MILK			
Chocolate	6.7	2.7	
Plain	5.6	2.5	
Low Fat	2.1	1.1	
Skimmed	2.0	1.0	
Buttermilk	1.7	1.0	

Creole liver, with a mean of 1.9, was the lowest rated meat item. This rating indicates this item was disliked very much. Tuna casserole had a mean preference rating of 3.3, and chicken salad had a mean preference rating of 3.4. These ratings would indicate these items were slightly to moderately disliked (Table 2).

Vegetables

When the percentages of students checking vegetable preferences were examined, the items with high percentages were in either the "dislike extremely" or "like very much" categories (Table 1). The vegetable items with the highest percentages of students checking the "like extremely" category were as follows: French fried potatoes, 38.3 percent; mashed potatoes, 26.1 percent; and corn, 21.6 percent. When the percentages checking the categories of "like very much" and "like extremely" were combined, the vegetable items that were checked by over 30 percent of the students, in descending rank order, were as follows: French fried potatoes, 72.8 percent; mashed potatoes, 61.3 percent; and corn, 47.7 percent. The remainder of the vegetable items with the highest percentages of students checking the "dislike extremely" category, in descending rank order, were as follows: squash casserole, 59.9 percent; lima beans, 58.0 percent; stewed

tomatoes, 57.2 percent; broccoli, 50.4 percent; pickled beets, 47.0 percent; carrots, 41.7 percent; mixed vegetables, 39.8 percent; green peas, 39.0 percent; turnip greens, 30.7 percent; cabbage, 28.8 percent; baked beans, 27.3 percent; blackeyed peas, 26.9 percent; and green beans, 24.6 percent.

When the categories for "dislike extremely" and "dislike very much" were combined, the vegetable items checked by over 50 percent of the students, in descending rank order, were as follows: squash casserole, lima beans, stewed tomatoes, broccoli, pickled beets, and carrots (Table 1). The categories of "dislike moderately," "dislike slightly," "neither like or dislike," "like slightly," and "like moderately" were checked by the lowest percentages of students. Less than 6 percent of the students checked the categories of "dislike moderately" and "dislike slightly." Less than 10 percent checked the "neither like nor dislike" category; approximately 16 percent or less checked the "like slightly" or the "like moderately" categories.

The mean preference scores for the 17 vegetable items showed that French fried potatoes, with a mean of 7.3; mashed potatoes, with a mean of 6.8; and corn, with a mean of 6.3; were well-liked vegetable items. The other

vegetable items had mean scores that were below 6.0 (Table 2).

Salads

The salad items with the highest percentages of students checking the "like extremely" category were potato salad, 20.8 percent; and fruit salad, 22.4 percent. When the percentages checking the categories of "like very much" and "like extremely" were combined, the salad items that were checked by over 30 percent of the students, in descending rank order, were as follows: fruit salad, 43.6 percent; and potato salad, 40.5 percent (Table 1).

The salad items with the highest percentage of students checking the "dislike extremely" category, in descending rank order, were as follows: carrot-raisin, 48.1 percent; green pea, 44.7 percent; vegetable gelatin, 42.4 percent; cole slaw, 39.8 percent; fruit gelatin, 25.4 percent; and tossed green salad, 20.1 percent. When the categories for "dislike extremely" and "dislike very much" were combined, the salad items checked by the highest percentages of students, in descending rank order, were as follows: carrot-raisin, green pea, vegetable gelatin, cole slaw, fruit gelatin, and tossed green salad.

When the remainder of the responses for food preference of the students were tabulated, the results were as follows: less than 3.4 percent, "dislike moderately"; less than 9.1 percent, "neither like or dislike"; less than 14.0 percent, "like slightly"; and less than 11.4 percent, "like moderately."

The mean preference scores ranged from 2.5 to 5.7 for the 8 salad items (Table 2). The data reveal that all the salad items had means below the value of 6.0, as recommended by LaChance (1976a) for a good menu item.

Milk

The milk items with the highest percentage of students checking the "like extremely" category were as follows: chocolate, 37.9 percent; and plain, 23.5 percent. When the percentages checking the categories of "like very much" and "like extremely" were combined, the milk items checked by over 30 percent of the student, in descending rank order, were as follows: chocolate, 69.7 percent; and plain, 47.0 percent (Table 1).

The milk items with the highest percent of students checking the "dislike extremely" category, in descending rank order, were as follows: buttermilk, 56.8 percent; and both low fat and skimmed milk, 52.7 percent. When the categories for "dislike extremely" and "dislike

very much" were combined, the milk items checked by the highest percentages of students were buttermilk, low fat milk, and skimmed milk. Only a very few students checked the other categories for milk items: "dislike moderately" and "dislike slightly," 2.7 percent or less; "neither like or dislike," 6.4 percent or less; "like slightly," 7.6 percent or less; and "like moderately," 10.0 percent or less.

The mean preference scores calculated for the 5 milk items showed that chocolate milk, with a mean of 6.7, was the best liked milk. The mean preference scores for the remainder of the milk items were 5.6 for plain milk, 2.1 for low fat milk, 2.0 for skimmed milk, and 1.7 for buttermilk (Table 2).

Desired Frequency of Serving

The desired frequency of serving the 50 listed foods was evaluated on a 5-point scale. The assigned ratings were 1--never, 2--once or twice a month, 3--once every 2 weeks, 4--once a week, and 5--2 or 3 times a week. A food rating 2.5 or above indicated a well-liked food.

Percentages were calculated for responses in each of the five frequency categories. The categories with the

highest percentages of desired frequency ratings were "once a week" and "never" (Table 3).

Meats

The meat items with the highest percentages of students checking the 2 or 3 times a week category were burritos, 34.5 percent; and hamburger, 27.3 percent. When the percentages checking the categories of "2 or 3 times a week" and "once a week" were combined, the meat items that were checked by over 30 percent of the students, in descending rank order, were as follows: hamburger, 69.7 percent; burritos, 61.8 percent; fried chicken, 54.5 percent; corny dog, 50.1 percent; taco, 48.5 percent; pizza, 48.1 percent; barbecued beef, 46.6 percent; battered fish, 44.3 percent; hot dog, 43.6 percent; chicken fried steak, 38.6 percent; and Salisbury steak, 34.8 percent (Table 3).

The meat items with the highest percentages of students checking the "never" as their desired frequency of consumption were as follows: creole liver, 52.3 percent; tuna casserole, 33.0 percent; chicken salad, 30.3 percent; lasagna, 28.0 percent; ravioli casserole, 26.9 percent; and beef stew, 24.3 percent. Smaller percentages of the students checked the "once every 2 weeks" or "once or twice a month" as the desired frequency for serving the listed meat items.

TABLE 3

PERCENTAGES OF 264 HIGH SCHOOL STUDENTS CHECKING THE
FREQUENCY WITH WHICH THEY DESIRED 50 FOOD ITEMS
SERVED IN THE SCHOOL CAFETERIA

Food Items	Desired Frequency of Serving					
	Two or Three Times a Week	Once a Week	Once Every Two Weeks	Once or Twice a Month	Never	No Response
MEATS						
Fried Chicken	17.4	37.1	9.9	6.8	4.6	24.2
Beef-a-Roni	7.2	22.7	10.6	14.4	18.6	26.5
Battered Fish	11.7	32.6	12.5	8.3	6.8	28.0
Hamburger	27.3	42.4	6.1	3.0	0.4	20.8
Corny Dog	17.1	33.0	12.9	10.2	4.2	22.7
Hot Dog	15.9	27.7	15.5	11.4	5.7	23.9
Pizza	18.2	29.9	15.2	7.2	5.3	24.2
Taco	19.7	28.8	15.5	6.8	4.9	24.2
Tuna Casserole	5.3	8.7	7.2	15.9	33.0	29.9
Chicken Salad	4.9	11.4	8.3	14.0	30.3	31.1
Burrito	34.5	27.3	6.4	4.2	3.4	24.2
Barbecued Beef	14.8	31.8	13.3	8.0	4.9	27.3
Meat Balls	6.8	16.7	13.3	18.6	14.8	29.9
Lasagna	4.9	10.6	10.6	15.5	28.0	30.3
Creole Liver	3.0	6.4	3.8	4.6	52.3	29.9
Salisbury Steak	12.1	22.7	15.5	11.4	9.9	28.4
Chicken Fried Steak	12.1	26.5	16.3	8.3	7.2	29.6
Roast Beef	8.0	17.8	14.0	12.5	19.7	28.0
Beef Stew	6.8	12.9	12.1	15.2	24.3	28.8
Ravioli Casserole	5.7	12.1	11.7	13.3	26.9	30.3

TABLE 3--Continued

Food Items	Desired Frequency of Serving					
	Two or Three Times a Week	Once a Week	Once Every Two Weeks	Once or Twice a Month	Never	No Response
VEGETABLES						
Spinach	9.9	18.9	11.0	8.0	21.6	30.6
Turnip Greens	10.2	16.7	9.5	11.0	21.6	28.8
Carrots	6.4	11.4	8.7	10.2	31.1	32.2
French Fried Potatoes	39.8	23.1	5.3	3.8	1.9	26.1
Mashed Potatoes	24.2	33.7	8.0	3.4	3.8	26.9
Pickled Beets	4.9	8.3	8.3	7.6	39.0	31.8
Corn	17.4	29.9	9.1	6.8	8.0	28.8
Mixed Vegetables	5.3	13.3	8.7	11.4	28.4	33.0
Cabbage	9.9	14.8	9.5	13.3	21.2	31.4
Baked Beans	5.3	16.3	14.0	11.4	20.8	32.2
Blackeyed Peas	6.4	16.3	12.5	11.7	21.6	31.4
Squash Casserole	1.9	6.1	4.9	6.4	45.1	35.6
Green Beans	10.6	18.9	10.2	11.7	17.4	31.1
Green Peas	6.8	8.7	10.2	8.7	31.1	34.5
Lima Beans	2.3	6.8	4.9	9.1	40.9	36.0
Broccoli	7.2	11.7	6.4	6.8	37.9	29.9
Stewed Tomatoes	3.4	5.7	3.8	9.9	40.9	36.4

TABLE 3--Continued

Food Items	Desired Frequency of Serving					
	Two or Three Times a Week	Once a Week	Once Every Two Weeks	Once or Twice a Month	Never	No Response
SALADS						
Tossed Green	14.4	18.2	8.7	7.2	15.9	35.6
Green Pea	4.9	8.0	7.6	6.8	35.6	37.1
Potato	13.6	19.3	15.9	7.6	12.1	31.4
Fruit	20.1	19.3	12.1	5.7	9.9	33.0
Cole Slaw	6.4	7.2	9.9	9.1	28.0	39.4
Vegetable						
Gelatin	5.7	4.9	9.9	8.7	32.6	38.4
Fruit						
Gelatin	10.2	16.7	10.6	8.0	18.2	36.4
Carrot						
Raisin	5.3	6.4	5.3	6.8	33.7	42.4
MILK						
Plain	33.3	13.6	6.4	3.4	6.1	37.1
Chocolate	44.3	9.1	4.7	0.8	1.9	39.8
Buttermilk	4.9	3.4	5.3	2.3	42.1	42.1
Low Fat	6.4	3.8	4.6	3.4	38.6	43.2
Skimmed	6.4	3.8	4.2	3.0	39.0	43.5

A mean score, calculated for the desired frequency for meats, showed that the following meat items were the most frequently desired items: hamburger (3.3); burritos (3.1); corny dog, fried chicken, and pizza (each 2.8); hot dog (2.7); barbecued beef (2.6); and battered fish (2.5). For the remainder of the meat items, the desired frequency ratings were below 2.5, with creole liver the least desired meat item, having a mean of 1.1 (Table 2).

Vegetables

The vegetable items with the highest percentages of students checking "never" as the desired frequency of serving were as follows: squash casserole, 45.1 percent; carrots and green peas, each 31.1 percent; lima beans and stewed tomatoes, each 40.9 percent; and broccoli, 37.9 percent. Approximately 14 percent or less checked the remaining categories of "once every 2 weeks" and "once or twice a month" as their desired frequency of serving for these food items.

A mean score was calculated for the desired frequency of serving each vegetable item listed. Three vegetable items had a mean frequency score of 2.5 or better. These were French fried potatoes, mashed potatoes, and corn (Table 2). The remainder of the vegetables had lower means for the desired frequency of serving, with

squash casserole, lima beans, and stewed tomatoes having the lowest mean scores, each having a mean of 1.1.

Salads

The percentages of students checking each of 5 categories for the desired frequency of serving were calculated for the eight salad items. The percentages of students checking the "2 or 3 times a week" category for salads ranged from 4.9 to 20.1 percent. When the percentages checking the categories of "2 or 3 times a week" and "once a week" were combined, the salad items that were checked by over 30 percent of the students, in descending rank order, were as follows: fruit salad, 39.4 percent; potato salad, 32.9 percent, and tossed green, 32.6 percent (Table 3).

The salad items with the highest percentages of students checking "never" as their desired frequency of serving were as follows: green pea, carrot-raisin, and vegetable gelatin. The remaining categories had the following percentages of students checking: "once every 2 weeks," less than 16 percent; and "once or twice a month," less than 9.1 percent for any salad item.

A mean score was calculated for the desired frequencies for the salad items. The means for all salad items were below 2.5. Tossed green, fruit, and potato

salad had means ranging from 2.0 to 2.4. For the remaining salad items, the range was between 1.2 and 1.8 (Table 2).

Milk

The milk items that had high percentages in the "2 or 3 times a week" category were chocolate, 44.3 percent; and plain milk, 33.3. When "2 or 3 times a week" and "once a week" were combined, the rank of the milk items remained the same. Buttermilk, low fat milk, and skimmed milk had high percentages checking the category of "never." The results were as follows: buttermilk, 42.1 percent; skimmed milk, 39.0 percent; and low fat, 38.6 percent (Table 3).

A mean score was calculated for each milk item. The mean scores were chocolate, 2.7; and plain, 2.5. Mean scores for buttermilk, low fat milk, and skimmed milk ranged from 1.0 to 1.1 (Table 2).

Plate Waste

One part of this study involved the measurement of actual plate waste in the school cafeteria. The measurement used for evaluating plate waste was the technique recommended by LaChance (1976b). This method of measuring plate waste is in terms of the fraction (none, one-fourth

or less, one-half, three-fourths, or all) of the original serving size left on the plate at the end of the meal.

Plate waste from each of the 30 student trays, selected at random, was recorded for 20 days by the investigator. In order to determine a mean for plate waste, the following ratings were assigned by the investigator to the amount of food left on the tray: 5--no food left; 4--approximately one-fourth or less left; 3--approximately one-half left; 2--approximately three-fourths left; and 1--all the serving left on the tray. The percentages of student trays classified in each of the five categories for plate waste were calculated for meats, vegetables, and salad (Table 4).

Meats

The meat items for which the highest percentage of the student trays showed no plate waste were as follows: corny dog and salisbury steak, 100 percent; fried chicken, 96.7 percent; battered fish and burritos, each 93.3 percent; barbecued beef, beef-a-roni, hot dog, and pizza, each 90.0 percent; hamburger, 86.7 percent; meat balls, 83.3 percent; chicken fried steak, 80.0 percent; and taco, 66.7 percent. When the categories of "none" and "one-fourth or less" were combined, the meat items with the highest percentages showing little or no plate waste were

TABLE 4

PERCENTAGES OF STUDENTS FOR WHICH VARYING AMOUNTS OF PLATE WASTE WERE RECORDED¹

Food Items	Amount of Plate Waste				
	None	One-fourth or Less	One-half	Three-fourths	All
MEATS					
Fried Chicken	96.7	3.3	0.0	0.0	0.0
Beef-a-Roni	90.0	6.7	0.0	3.3	0.0
Battered Fish	93.3	0.0	3.3	3.3	0.0
Hamburger	86.7	6.7	6.7	0.0	0.0
Corny Dog	100.0	0.0	0.0	0.0	0.0
Hot Dog	90.0	10.0	0.0	0.0	0.0
Pizza	90.0	6.7	3.3	0.0	0.0
Taco	66.7	23.3	6.7	3.3	0.0
Tuna Casserole	20.0	6.7	30.0	20.0	23.3
Chicken Salad	0.0	6.7	6.7	13.3	73.3
Burrito	93.3	6.7	0.0	0.0	0.0
Barbecue Beef	90.0	10.0	0.0	0.0	0.0
Meat Balls	83.3	10.0	6.7	0.0	0.0
Lasagna	16.7	23.3	20.0	26.7	13.3
Creole Liver	20.0	3.3	10.0	13.3	53.3
Salisbury Steak	100.0	0.0	0.0	0.0	0.0
Chicken Fried					
Steak	80.0	13.3	3.3	0.0	3.3
Roast Beef	13.3	10.0	6.7	3.3	16.7
Beef Stew	16.7	13.3	3.3	0.0	66.7
Ravioli					
Casserole	93.3	0.0	0.0	3.3	3.3

*Plate waste recorded for 30 student trays.

TABLE 4--Continued

Food Items	Amount of Plate Waste				
	None	One-fourth or Less	One-half	Three-fourths	All
VEGETABLES					
Turnip Greens	16.7	20.0	16.7	10.0	36.7
Carrots	13.3	6.7	40.0	13.3	26.7
French Fried					
Potatoes	93.3	6.7	0.0	0.0	0.0
Mashed					
Potatoes	76.7	3.3	3.3	3.3	13.3
Pickled Beets	10.0	10.0	33.3	10.0	36.7
Corn	36.7	43.3	3.3	3.3	13.3
Mixed					
Vegetables	6.7	13.3	43.3	3.3	33.3
Cabbage	36.7	0.0	23.3	6.7	33.3
Baked Beans	10.0	0.0	20.0	6.7	63.3
Blackeyed Peas	36.7	10.0	0.0	6.7	46.7
Squash					
Casserole	13.3	6.7	3.3	0.0	76.7
Spinach	6.7	6.7	16.7	10.0	60.0
Green Beans	20.0	13.3	6.7	3.3	63.3
Lima Beans	3.3	0.0	0.0	0.0	96.7
Broccoli	26.7	6.7	3.3	3.3	60.0
Stewed					
Tomatoes	0.0	0.0	0.0	0.0	100.0

TABLE 4--Continued

Food Items	Amount of Plate Waste				
	None	One-fourth or Less	One-half	Three-fourths	All
SALADS					
Tossed Green	20.0	6.7	10.0	23.3	40.0
Green Pea	10.0	3.3	23.3	16.7	46.7
Potato	40.0	3.3	26.7	6.7	23.3
Fruit	30.0	36.7	10.0	16.7	6.7
Cole Slaw	0.0	0.0	3.3	13.3	83.3
Vegetable					
Gelatin	30.0	26.7	13.3	10.0	20.0
Fruit Gelatin	43.3	10.0	10.0	0.0	36.7
Carrot					
Raisin	0.0	0.0	6.7	3.3	90.0

as follows: corny dog, salisbury steak, fried chicken, hot dog, burritos, ravioli casserole, barbecued beef, beef-a-roni, hamburger, chicken fried steak, battered fish, roast beef, meat balls, pizza, taco, lasagna, and beef stew (Table 4). These data indicate that three-fourths or more of the 20 meat items were eaten by the students whose trays were checked. The meat items for which the highest percentages of the students ate none of the meat served were as follows: chicken salad, 73.3 percent; creole liver, 53.3 percent; and beef stew, 66.7 percent. In order to determine the most rejected meat items, the plate waste categories of "all the food served" and "three-fourths of food served" were combined. The meat items for which high percentages of students left three-fourths or more of the food served on the plate were chicken salad, creole liver, beef stew, tuna casserole, and lasagna (Table 4).

In order to compare plate waste within and between food groups, a mean score for plate waste was calculated for each of the selected food items served on the 20 days during which the study was conducted. The values ranged from 5--no plate waste, to 1--none of the food item eaten. For the 20 meat items, the mean scores ranged from 5.0, for fried chicken, corny dog, and salisbury steak, to 1.0

for chicken salad. The meat items with a mean plate waste score of 2.8 or less were tuna casserole, creole liver, beef stew, and chicken salad (Table 2).

Vegetables

When plate waste for vegetables was examined, the food items for which the highest percentage of students had no plate waste were as follows: French fried potatoes, 93.3 percent; mashed potatoes, 76.7 percent; and blackeyed peas, corn, and cabbage, each 36.7 percent (Table 4). In order to determine the vegetables for which actual consumption was high, the plate waste categories of "none" and "one-fourth or less" were combined. The data indicated the vegetable items for which 30 percent or more of the trays showed little or no plate waste (three-fourths or more of the amount served being consumed) were as follows: French fried potatoes, mashed potatoes, corn, blackeyed peas, turnip greens, broccoli, and green beans (Table 4).

The category of "all," indicating all of the food left on the plate, was examined for vegetables. The vegetables for which the highest percentage of students left all the food served on the plate were as follows: stewed tomatoes, 100 percent; lima beans, 96.7 percent; squash casserole, 76.7 percent; baked beans and green beans, each 60.0 percent; blackeyed peas, 46.7 percent; pickled beets

and turnip greens, each 36.7 percent; mixed vegetables, 33.3 percent. The vegetables for which one-half of the food served was left on the plate were as follows: mixed vegetables, 43.3 percent of the students; carrots, 40.0 percent; and pickled beets, 33.3 percent. For the remainder of the 17 vegetable items, 43.3 percent or less of the students were observed to leave half of the amount served on the plate. The mean scores for plate waste for the 17 vegetable items ranged from 4.9 for French fried potatoes to 1.0 for stewed tomatoes (Table 2).

Salads

Plate waste was calculated for the 8 salad items. The salad items for which the highest percentage of students were observed as having no plate waste were as follows: fruit gelatin, 43.3 percent; potato salad, 40.0 percent; and fruit salad and vegetable gelatin salad, each 30.0 percent. When the plate waste categories of "none" and "one fourth or less" were combined, the salad for which the highest percentages of students had little or no plate waste (consumption of three-fourths or more of the amount served) were as follows: fruit salad, 66.7 percent; vegetable gelatin, 56.7 percent; fruit gelatin, 53.0 percent.

The salads for which the highest percentages of students were observed to reject all of the amount served were as follows: carrot-raisin salad, 90.0 percent; cole slaw, 83.3 percent; green pea salad, 46.7 percent; tossed green, 40.0 percent; and gelatin fruit, 36.7 percent. When the plate waste categories of "all" and "three-fourths" were combined, the salads which over 30 percent of students were observed to have these high amounts of plate waste were as follows: cole slaw, green pea salad, tossed green salad, fruit gelatin, potato salad, and vegetable gelatin. In checking the students trays, 26.7 percent or less of the students left one-half of the serving of salad.

Mean scores for plate waste for the 8 salad items were calculated. The mean scores ranged from 1.2 for carrot-raisin salad and for cole slaw to 3.7 for fruit salad (Table 2).

When students participating in this study were requested to list other food items they wished to have included in the menu cycle, meats and starchy vegetables were most frequently listed. No green vegetables or salad items were named (Table 5). This finding is in agreement with the high plate waste for these items by this group of students.

TABLE 5

OTHER FOOD ITEMS THE STUDENTS WOULD LIKE
TO HAVE INCLUDED IN THE MENU CYCLE

Food Items	Number of Times Listed	Food Items	Number of Times Listed
MEATS		MEATS	
Barbecued Smoked Links	16	Veal Cutlets	1
*Sliced Ham	8	Smothered Chicken	1
*Cheeseburger	7	*Sloppy Joe	1
*Chili Dog	7	*Meat Loaf	1
Pork Chops	7	*Texas Goulash	1
Ham Sandwich	6		
*Corn Chip Pie	5	VEGETABLES	
Shrimp	5	*Corn on the Cob	3
Barbecued Ribs	4	*Tater Tots	3
Barbecued Chicken	4	*Au Gratin Potatoes	2
*Enchiladas	4	*Scalloped Potatoes	1
Steak	4	Baked Potatoes	1
*Turkey and Dressing	2	Onion Rings	1
Chicken Dumpling	1		

*These items are included in the menu cycle.

Interrelationships Among Factors Investigated

The data from the various parts of this study were compared to summarize the relationships among student preferences, the desired frequency of serving of the various food items investigated, and actual plate waste (Figures 1 through 7). According to LaChance (1976a), food items with a score of 6.0 to 7.5 are considered good menu items. Food with high ratings of 7.5 to 9.0 are usually highly desirable, but should be carefully scheduled into the menu cycle because they will become monotonous. Foods having a rating below 6.0 should be carefully scheduled or avoided in the menu cycle. According to the LaChance technique, 9 of the 20 meat items, 3 of the 17 vegetables, chocolate milk, and none of the salad items met the criterion for a highly desirable food item.

The menu items to be considered as invariably good school lunch items were hamburgers (7.4), burrito and French fried potatoes (each 7.3), mashed potatoes (6.8), barbecued beef and chocolate milk (each 6.7), fried chicken and taco (each 6.6), corny dog and pizza (each 6.4), corn and hot dog (each 6.3), and chicken fried steak (6.0). Five of the 50 food items checked has mean scores ranging from 5.7 to 5.5, only slightly below the above named

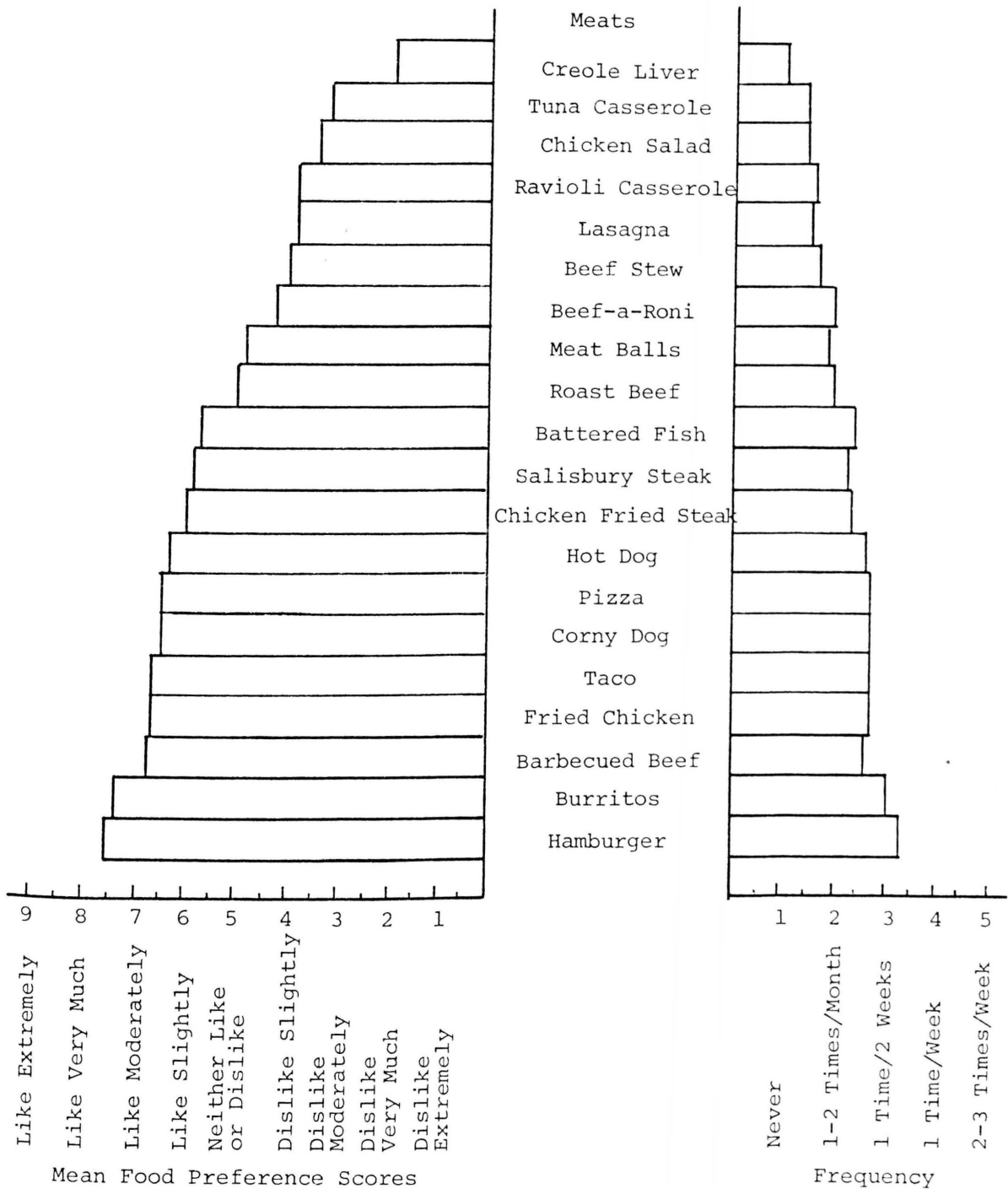


Fig. 1. Comparison of Mean Scores for Preferences and Desired Frequency of Serving for 20 Meat Items.

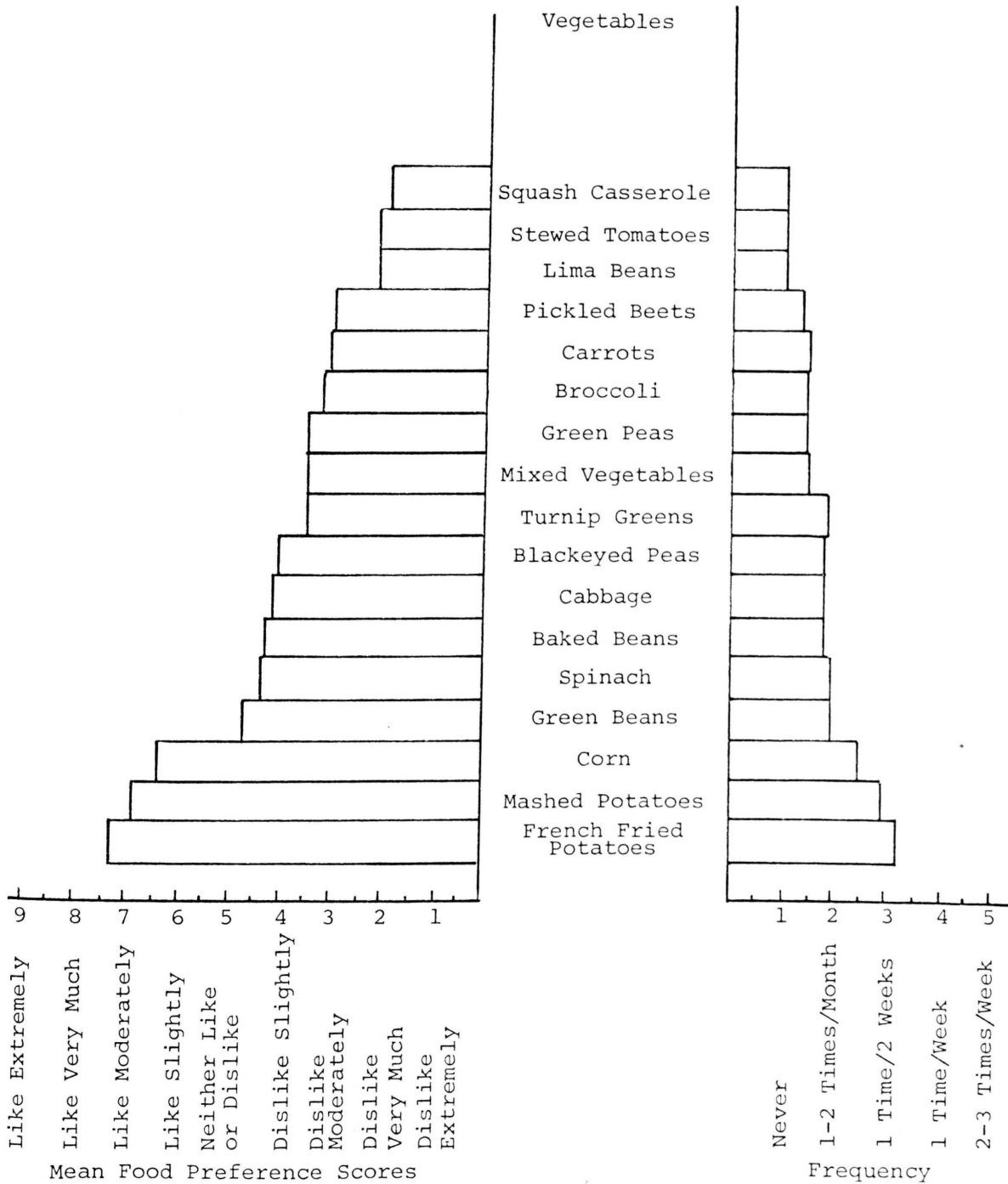


Fig. 2. Comparison of Mean Scores for Preferences and Desired Frequency of Serving for 17 Vegetable Items

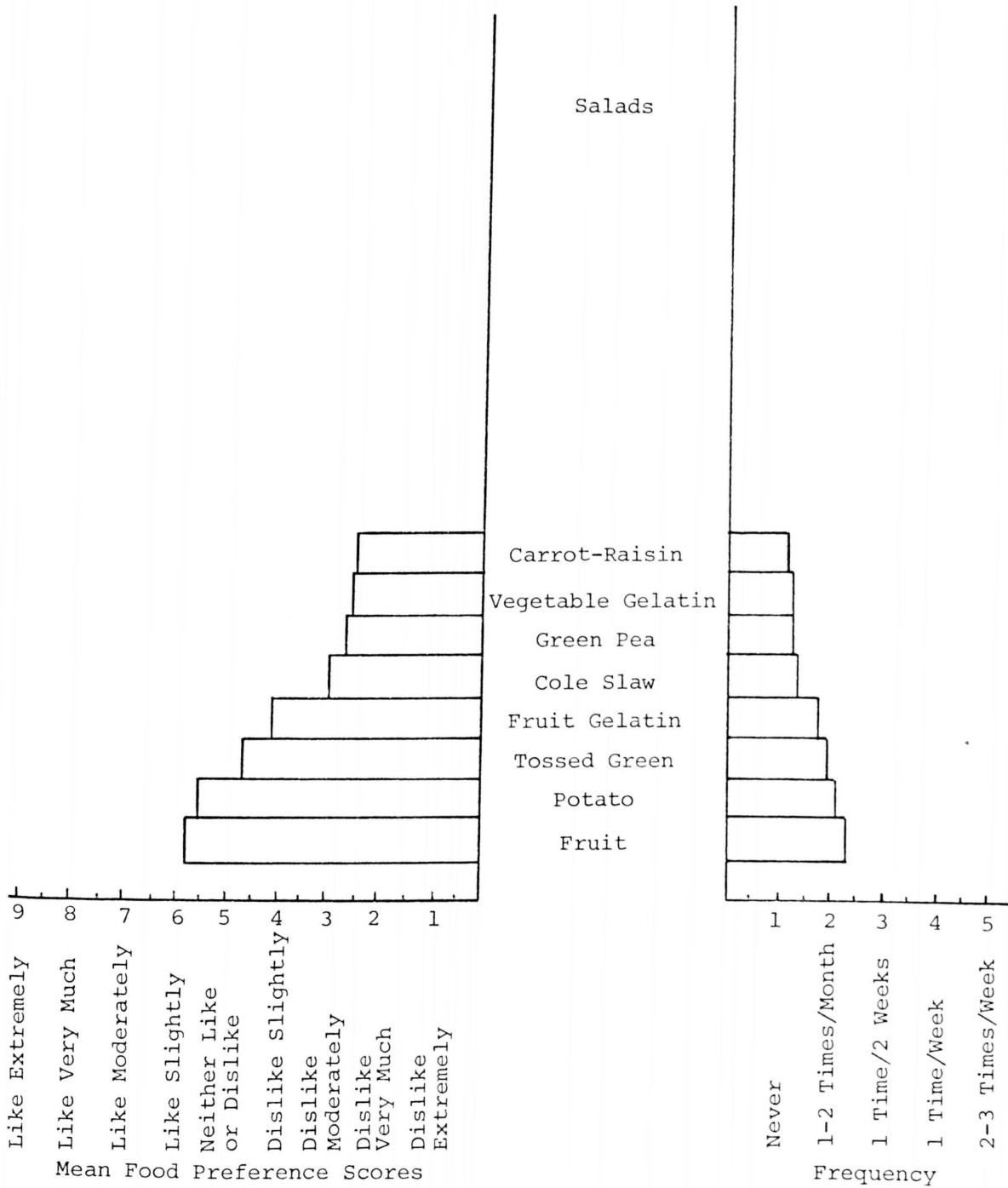


Fig. 3. Comparison of Mean Scores for Preferences and Desired Frequency of Serving for 8 Salad Items.

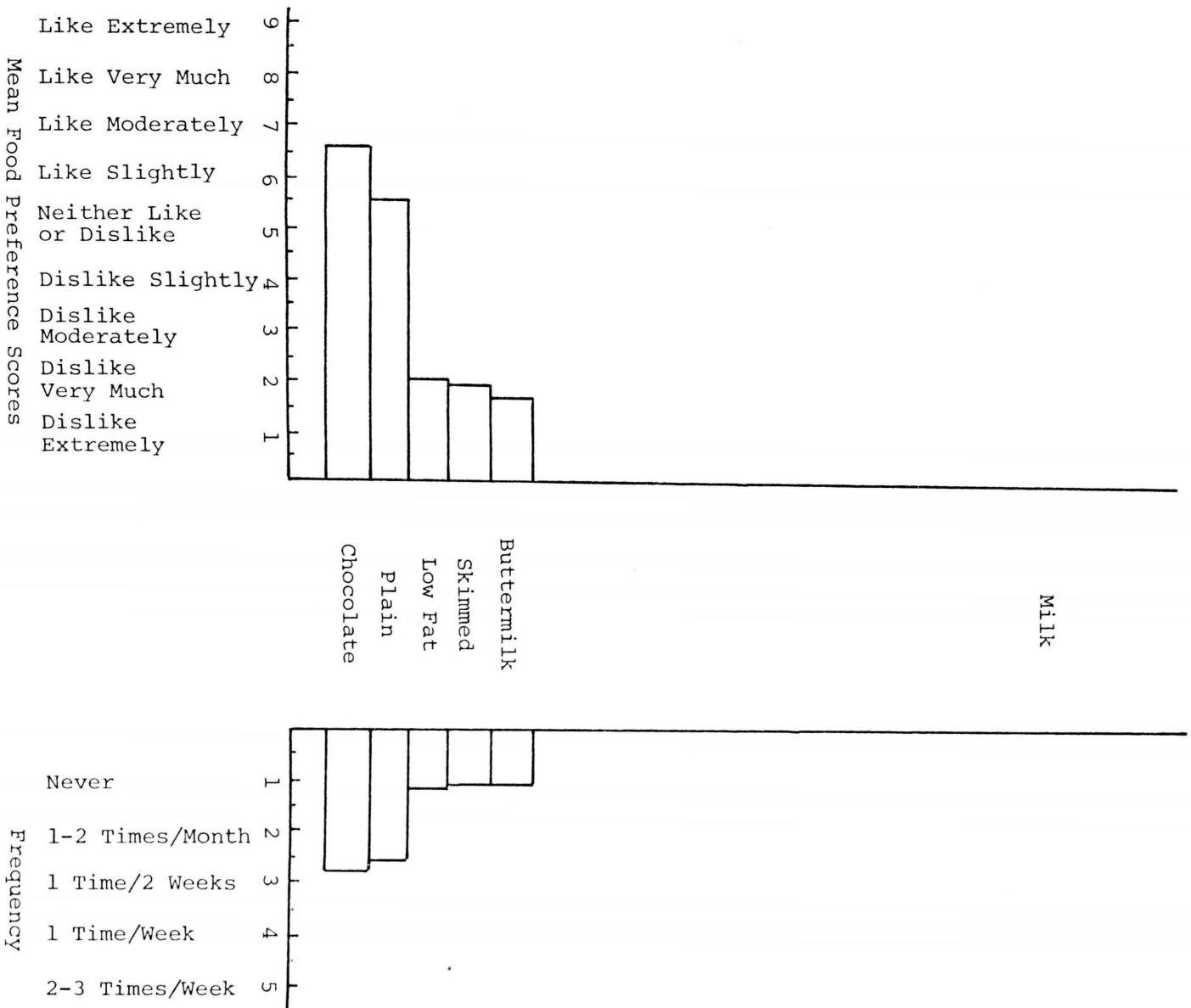


Fig. 4. Comparison of Mean Scores for Preferences and Desired Frequency of Serving for 5 Milk Items.

Meats

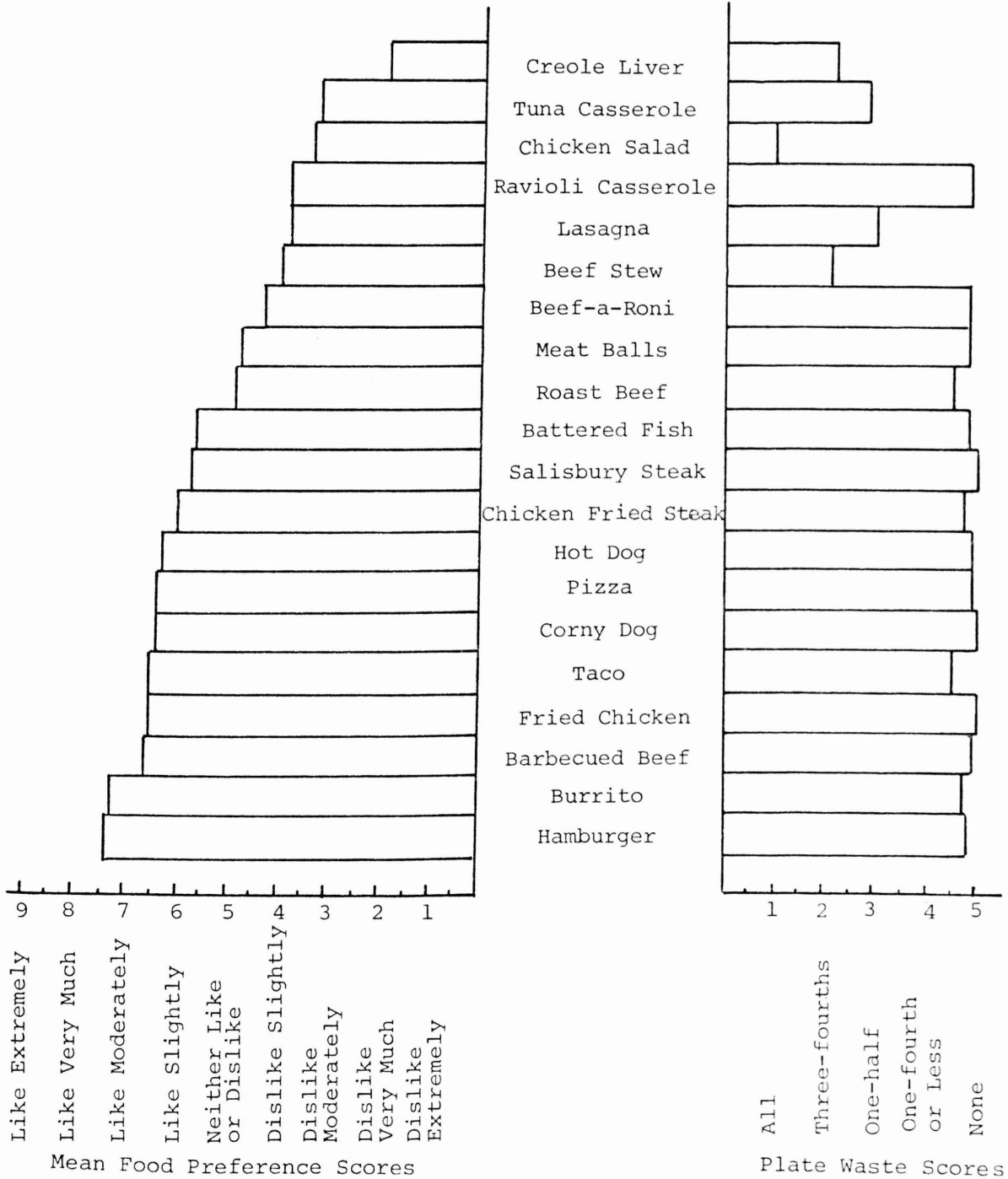


Fig. 5. Comparison of Mean Scores for Preferences and the Amount of Plate Waste for 20 Meat Items.

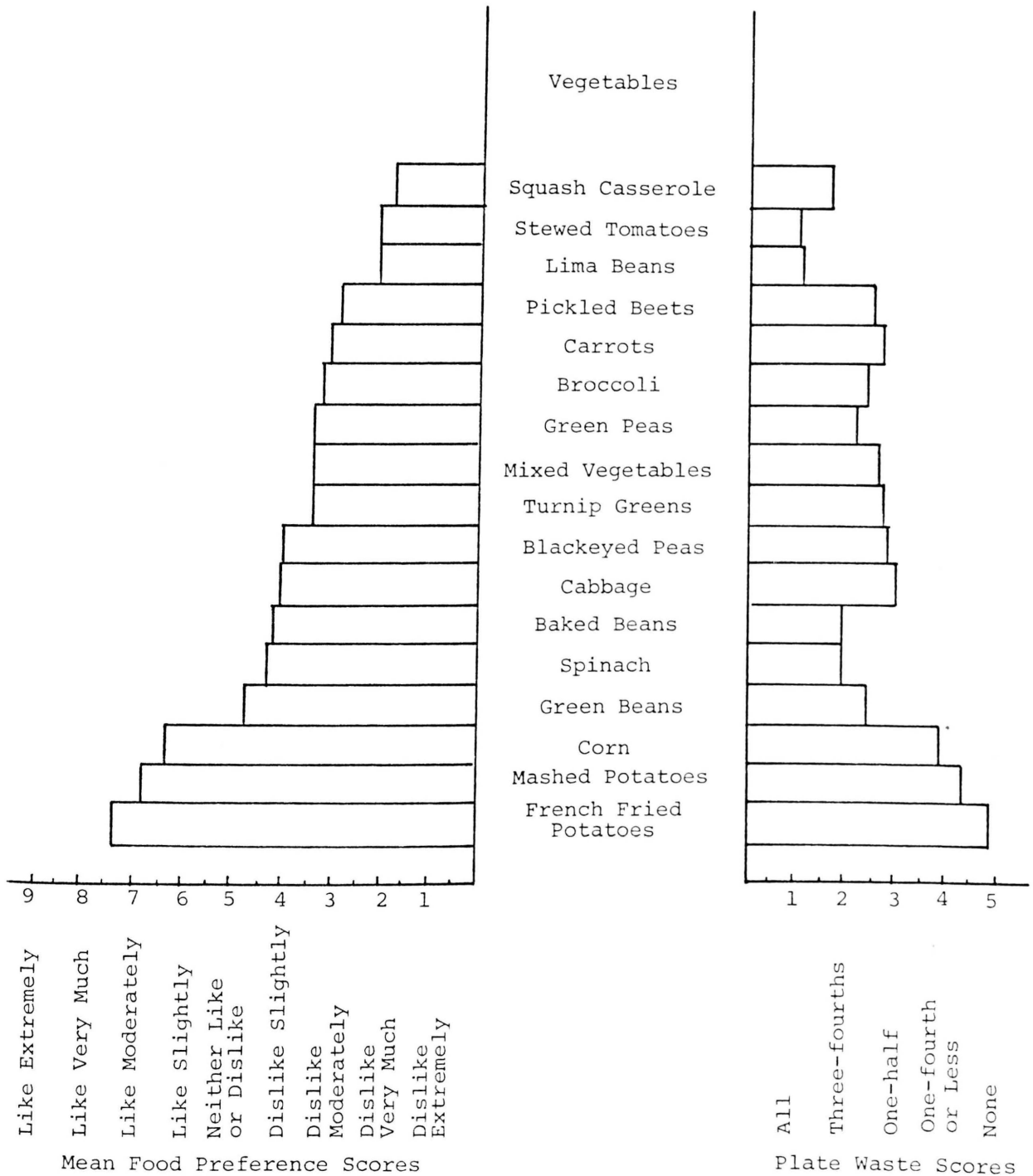


Fig. 6. Comparison of Mean Scores for Preferences and the Amount of Plate Waste for 17 Vegetable Items.

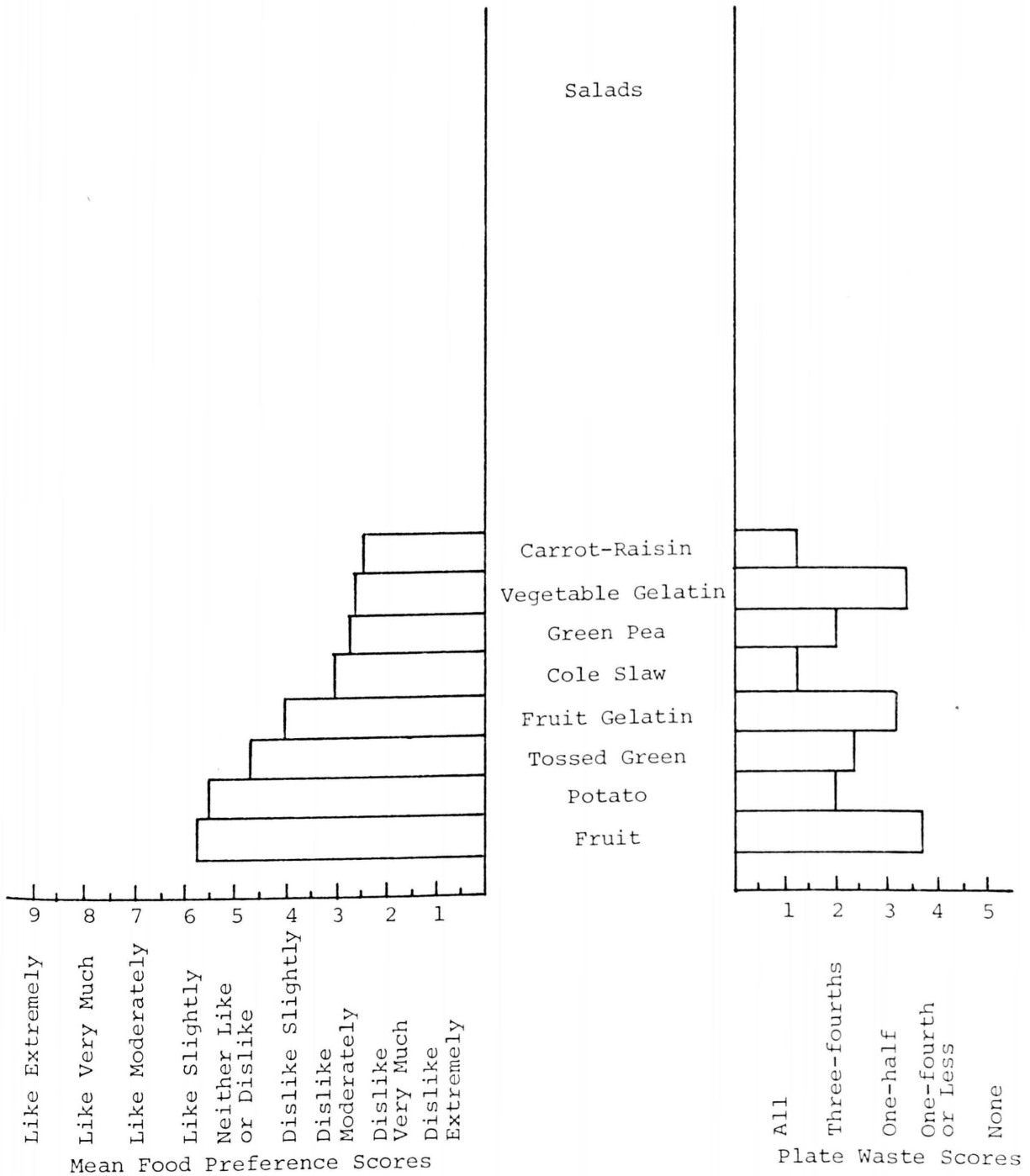


Fig. 7. Comparison of Mean Scores for Preferences and the Amount of Plate Waste for 8 Salad Items.

category. In descending rank order, these were salisbury steak, fruit salad, battered fish, plain milk, and potato salad. These five items should be scheduled into the menu carefully. None of the food items investigated had ratings between 7.5 to 9.0 for this group of students. The scores for the remainder of the food items fell below a 5.7 rating.

In analyzing the preference ratings it was found that similar percentages of students checked the like categories of "liked moderately" to "liked extremely" as checked the "disliked extremely" category. Items for which this was evident were roast beef, lasagna, spinach, turnip greens, cabbage, baked beans, blackeyed peas, green beans, and fruit gelatin. A preference rating of 6.0 or more indicated some degree of liking for the food item. A desired frequency of serving rating of 3.0 or above indicated the food was desired in the menu cycle at least once every two weeks. Foods having a preference rating of 6.0 or above and a desired frequency of serving rating of 3.0 or above were hamburgers, burritos, and French fried potatoes.

When the plate waste was examined to make a comparison with food preference and desired frequency of serving score, 17 of the 50 food items had little

(one-fourth or less) or no plate waste. Of these 17 foods, 15 were meat dishes, 2 were vegetables, and none were salads. The two vegetables were different forms of potatoes. The highest plate waste was for chicken salad and stewed tomatoes. In general, plate waste was highest for vegetables, higher than for salads or meat dishes. Of the 17 vegetables, 5 had a mean plate waste of 2.0 or less, indicating that three-fourths or more of the serving was left uneaten. Three of the salad items were also in this category. Only 30 trays were examined for plate waste on each of the 20 days of the investigation. These trays may not have been typical for the entire group.

When data from the three parts of the study are compared, the best accepted foods for this group were hamburger, burritos, barbecued beef, fried chicken, tacos, corny dogs, pizza, hot dogs, French fried potatoes, and chicken fried steak. The above listed food items did not always rank high in all three parts of the investigation. For some items, plate waste was less than would be anticipated from an examination of the scores for preference and desired frequency of serving. A food item may not have a good rating when checked by all students on an identifying form, but may have little actual plate waste when the food item is served. The students may be

unfamiliar with the names of some of the dishes served, or they may like the food better than they had anticipated.

The study illustrated that the following food items should not be included in the menu cycle: creole liver, squash casserole, lima beans, chicken salad, beef stew, cole slaw, carrot-raisin salad, buttermilk, and stewed tomatoes. One food item, lasagna, was a new item introduced into the menu cycle. Lasagna was fairly well accepted for a new food item. Lasagna should be served several times to determine actual acceptance.

The vegetables included in this study were rated low in acceptance. The low rating suggests a need for nutrition education. The student should be encouraged to taste vegetables. In addition, the students should participate in menu planning.

The findings in this investigation agree with those of earlier research studies. Halfacre (1977) conducted a study to determine if food service supervisors can reach a goal of clean plates. One conclusion from the study was that the students failed to request green vegetables. The Stitt study (1976) also showed that green vegetables are often rejected by children. One reason for rejection may be that vegetables are not frequently served at home. Other reasons may be the strong flavor of some vegetables,

unfamiliarity with the taste of some vegetables, or a dislike for the texture or color of the vegetable. The Harper et al. study (1977) showed that green and yellow vegetables have low acceptability. The Jansen and Harper study (1976) revealed that the consumption of vegetables and salads was low, ranging from one-third to one-half of the amount served actually being consumed.

Guthrie (1977) found that flavored milk was the highly preferred milk. However, the flavored milk had no effect on the amount of food eaten by the sixth grade students participating in the study. Jansen and Harper (1976) conducted a study involving acceptability of certain food items by elementary and high school students. The results of this study showed the highest acceptability for the menu categories studied was for milk, with high percentage of the students consuming milk.

Gargano and Vaden (1978) compared food preferences and selections by students from both a questionnaire and a slide approach. The two approaches had similar results for most items, but with the slide approach some items had increased acceptance. The Tenny (1978) study showed that the most popular food items with high school students were pizza, chicken fried steak, submarine sandwich, corny dog, and taco. The vegetables, fruit and salad items were

not as popular as the main dishes. The vegetable, fruit, or salad items for which students indicated a desire to be served twice a week were French fried potatoes, mashed potatoes, canned fruits, buttered corn, and tater tots. The Tenny study also revealed that the greatest percentage of students ate only occasionally in the school cafeteria. The Dorothy Price study (1978) showed that for the eight-to-twelve-year-old students studied, the most popular food items were French fried potatoes, tacos, pizza, hot dogs, hamburgers, fried chicken, fishsticks, and gelatin desserts. Among milk products, chocolate milk and whole milk were rated highest by all groups studied. Buttermilk and powdered milk were the most unacceptable milk products. Corn and carrots were favored over such vegetables as spinach, turnip greens, broccoli, and squash.

CHAPTER IV

SUMMARY

The present study was designed with the intent of making a possible contribution to solving the problem of food preferences and plate waste among high school students. Specific objectives of the study were to ascertain what food items offered in the Type A lunch menus have high preference ratings, to determine if the food items having high preference ratings are the items desired by the students to be served most frequently, and to compare the preference rating of the students to actual plate waste in the lunchroom.

The data were obtained at the Wilmer-Hutchins High School of the Wilmer-Hutchins Independent School District. Questionnaires were completed by 264 students, all of whom ate at least occasionally in the school lunchroom. The students participated in this study on a voluntary basis.

One part of the instrument developed for this study involved checking the degree of preference for certain food items and the desired frequency for serving these items in the school cafeteria. The students checked food preference for each of the 50 food items according to a

9-point hedonic scale. The list of food items included 20 meat items, 17 vegetable items, 8 salad items, and 5 milk items. The desired frequency for serving each of the 50 listed food items was checked, using a 5-point scale. The responses to be checked were as follows: 1--never, 2--once or twice a month, 3--once every 2 weeks, 4--once a week, and 5--2 or 3 times a week. The survey form included some additional questions. The students checked the frequency of their participation in the school lunch and their willingness to taste unfamiliar food items. The investigation also involved an estimation of plate waste for 45 food items--20 meats, 17 vegetables, and 8 salads. The five categories used for estimation of plate waste were as follows: 5--no plate waste, 4--one-fourth or less, 3--one-half, 2--three-fourths, 1--all of the original serving size left on the plate at the end of the meal. Thirty trays, selected at random, were checked for plate waste on each of the 20 days during which the study was conducted.

A total of 264 high school students completed the questionnaire. Of this group, 49.6 percent ate daily, 4.6 percent ate once a week, 37.1 percent two to three times a week, 6.1 percent two to three times a month, and 3.0 percent ate in the school cafeteria on special days

only. In response to the question concerning their willingness to taste disliked food items on the school menus, 46.6 percent gave an affirmative response.

The criterion used for evaluating a good menu item was based on the mean preference rating. A food item with a rating of 6.0 or better was considered as a good menu item. A food item with a rating below 6.0 should be scheduled into the menu cycle carefully. Food items rating 7.5 to 9.0 should be carefully scheduled because these food items will become monotonous easily. The investigator determined mean scores for each of the 50 menu items investigated.

The mean preference rating for the 20 listed meat items ranged from 1.9 for creole liver to 7.4 for hamburgers. Nine of the meat items had mean preference scores of 6.0 or above, indicating a preference rating of "like slightly" to "like moderately" to "like very much." The data from this investigation revealed that the invariably good meat items were hamburger (7.4), burritos (7.3), barbecued beef (6.7), fried chicken and tacos (both 6.6), corny dog and pizza (both 6.4), hot dogs (6.3), and chicken fried steak (6.0). Three vegetable items had mean preference scores of 6.0 or above, indicating a preference rating of "like slightly" to "like

moderately" to "like very much." The vegetable items with the good ratings were as follows: French fried potatoes (7.3), mashed potatoes (6.8), and corn (6.3). None of the green and deep yellow vegetables included on the questionnaire could be considered as good menu items since all had a preference rating below 4.7. However, a closer look at the responses indicated they varied considerably. The highest percentages of the responses tended to be in the category of "dislike extremely." Squash casserole had the lowest mean preference rating of any vegetable, having a mean of 1.8.

The mean preference ratings for the eight listed salad items ranged from 2.5 for carrot-raisin salad to 5.7 for fruit salad. None of the salad items had a mean preference score of 6.0 or above. The data indicate that the highest percentages of students checked either the categories of "dislike very much" or "dislike extremely," or checked the categories of "like very much" or "like extremely."

The mean preference ratings for the five listed milk items ranged from 1.7 for buttermilk to 6.7 for chocolate milk. The latter was the only milk item having a rating of 6.0 or above. A higher percentage of students

liked, than disliked plain milk. However, buttermilk, low fat milk, and skimmed milk tended to be disliked milk items.

When the students were requested to list additional food items they desired to have included on the school menu, no green or deep yellow vegetables were named. Only starchy vegetables, such as corn on the cob, tater tots, au gratin potatoes, scalloped potatoes, and baked potatoes were listed.

An examination of the data for desired frequency of serving the 50 listed items on the school lunch menu revealed only three items has a desired frequency rating of 3.0 or above. The mean desired frequency of serving ratings for the three items were as follows: hamburgers (3.3), French fried potatoes (3.2), and burritos (3.1). A rating of 3.0 or above indicated a desired frequency of at least every 2 weeks. Eighteen of the food items checked had a desired frequency rating which indicated these items could be included in the menu once or twice a month. The desired frequency ratings for the remainder of the 50 food items ranged from 1.0, for skimmed milk, to 1.9 for both meat balls and turnip greens. These findings indicate that the students did not want these foods served frequently.

The plate waste study illustrated that about 50 percent of the food items listed had low plate waste when actually served in the lunchroom. The mean plate waste score for the 20 listed meat items ranged from 1.0 for chicken salad to 5.0 for fried chicken, corny dog, salisbury steak, hot dog, pizza, barbecued beef, chicken fried steak, beef-a-roni, battered fish, ravioli casserole, hamburger, meat balls, burritos, tacos, roast beef, and lasagna. The remaining four meats ranged from 1.0 for chicken salad to 2.8 for tuna casserole. These four meat items should not be included in the menu frequently since at least "three-fourths" or "all" of the food served was left on the plate.

The mean plate waste rating for the 17 listed vegetable items ranged from 1.0, for stewed tomatoes, to 4.9 for French fried potatoes. Four of the vegetable items had mean plate waste scores of 3.0 or above, indicating that at least "one-half" or more of the serving for these food items was consumed.

The mean plate waste scores for the eight salad items ranged from 1.2 for carrot-raisin salad to 3.7 for fruit salad. Three of the salad items had mean scores of 3.0 or above, indicating that plate waste was less than "one-half" of the serving size.

The study reveals that new variations of recipes should be developed for some of the foods investigated. Also, students should be involved in menu planning through the organization of a student advisory council. Teachers should be encouraged to teach more nutrition to this age group, with emphasis on food recognition, food acceptance, and in increased consumption of milk, salads, and vegetables, particularly green and yellow vegetables. A nutrition awareness station might be established in the lunchroom. In addition, some attempt should be made to make the students aware of the high cost of plate waste.

APPENDICES

APPENDIX A
INSTRUMENTS

QUESTIONNAIRE

1. How often do you participate in the school lunch program?

Check One:

- A. _____ Daily D. _____ Two to three times a month
B. _____ Once a week E. _____ Special Menu only (Holidays)
C. _____ Two to three times F. _____ Never
 a week

2. If your answer is never explain why you do not eat the school lunch.

If your answer is never do not complete the questionnaire.

3. I am participating on volunteer basis only _____ (check the blank).

Instructions:

1. Check the one column that most nearly describes how much you like or dislike the food items listed.
2. Check the one column that most nearly describes how often you would like this food item to appear on the school lunch menu.
3. Are you willing to sample a disliked food item when it appears on the menu? Yes _____ No _____ (check one blank).

FOOD PREFERENCE STUDY

Food Items	Degree of Acceptability									Desired Frequency of Serving					Official Use Only
	Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like or Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely	2 or 3 Times a Week	Once a Week	Once Every 2 Weeks	Once or Twice a Month	Never	
Meats															
Fried Chicken															
Beef-a-Poni															
Battered Fish															
Hamburger															
Corny Dog															
Hot Dog															
Pizza															
Taco															
Tuna Casserole															
Chicken Salad															
Burrito															
Barbecue Beef															
Meatballs															
Lasagna															
Creole Liver															
Silisbury Steak															
Chicken Fried Steak															
Roast Beef															

FOOD PREFERENCE STUDY

Food Items	Degree of Acceptability									Desired Frequency of Serving					Official Use Only
	Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like or Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely	2 or 3 Times a Week	Once a Week	Once Every 2 Weeks	Once or Twice a Month	Never	
Beef Stew															
Ravioli Casserole															
Vegetables															
Spinach															
Turnip Greens															
Carrots															
French Fried Potatoes															
Mashed Potatoes															
Pickled Beets															
Corn															
Mixed Vegetables															
Cabbage															
Baked Beans															
Blackeyed Peas															
Squash Casserole															
Green Beans															
Green Peas															
Lima Beans															
Broccoli															

FOOD PREFERENCE STUDY

Food Items	Degree of Acceptability									Desired Frequency of Serving					Official Use Only
	Dislike Extremely	Dislike Very Much	Dislike Moderately	Dislike Slightly	Neither Like or Dislike	Like Slightly	Like Moderately	Like Very Much	Like Extremely	2 or 3 Times a Week	Once a Week	Once Every 2 Weeks	Once or Twice a Month	Never	
Stewed Tomatoes															
Salads															
Tossed Green Salad															
Green Pea Salad															
Potato Salad															
Fruit Salad															
Cole Slaw															
Gelatin Vegetable															
Gelatin Fruit															
Carrot Raisin Salad															
Milk															
Plain Milk															
Chocolate Milk															
Buttermilk															
Low Fat Milk															
Skimmed Milk															

ARE THERE ANY FOOD ITEMS NOT LISTED ABOVE WHICH YOU WOULD LIKE TO HAVE ON THE MENU? LIST BELOW.

PLATE WASTE

GRADE LEVEL _____

DATE _____

TABLE _____

EVALUATION _____

FOOD LEFT

Meat Item _____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ALL																														
3/4																														
1/2																														
1/4 OR LESS																														
NONE																														

Vegetables or Salad _____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ALL																														
3/4																														
1/2																														
1/4 OR LESS																														
NONE																														

APPENDIX B

LETTER OF APPROVAL

Personal information is here. To protect individuals, we have omitted this page. Pagination may be different as a result.

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