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## **Food Preference Influences on Meal Selections of High School Students at Central High School, Knoxville, Tennessee**

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To the Graduate Council:

I am submitting herewith a thesis written by Robbie Fowler Needham entitled "Food Preference Influences on Meal Selections of High School Students at Central High School, Knoxville, Tennessee." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Nutrition.

Mary Ann Bass, Major Professor

We have read this thesis and recommend its acceptance:

Betty L Beach, Grayce E. Goertz, William D. Barber

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

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Mary Ann Bass

Mary Ann Bass, Major Professor

We have read this thesis and  
recommend its acceptance:

Betty L. Bosch

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Accepted for the Council:

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Vice Chancellor

Graduate Studies and Research

FOOD PREFERENCE INFLUENCES ON MEAL SELECTIONS OF  
HIGH SCHOOL STUDENTS AT CENTRAL HIGH SCHOOL  
KNOXVILLE, TENNESSEE

A Thesis  
Presented for the  
Master of Science  
Degree  
The University of Tennessee

Robbie Fowler Needham

December 1974

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## ABSTRACT

For the purpose of this research it was hypothesized that teenagers use food preferences when making meal selections. The sample included all students attending six sections of study hall at Central High School, Knoxville, Tennessee. Three hundred and ten pairs of usable questionnaires were obtained and both sexes from each of the three grades (10, 11, and 12) were represented.

A questionnaire containing both definitions and menu choices for three days was administered two weeks prior to the service of the meals. Students were asked to indicate their meal preference and to describe food items listed. The questionnaire was readministered after the service of the meals and the students indicated the items which were actually selected.

Data obtained were analyzed using an analysis of variance. Influences of grade and sex on meal selections were analyzed separately. It was found that 64% of all students sampled retained their choice of plates and 56% retained their choice of desserts. Students in the 12th grade were found more likely to choose their preselection than students of the 10th and 11th grades. Females were more likely to change plate choices but less likely to change dessert choices. Additional research is needed to investigate the influence of sex and grade on the meal selection.

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## CHAPTER I

### INTRODUCTION

The need for food is one of the most basic of man's drives. When food is scarce man will eat anything that he considers food, but when food is plentiful he becomes more selective.

Knowledge and understanding of what foods mean to people and how this influences their decisions and actions can help foodservice personnel plan and prepare meals that are more acceptable to their clientele (Fewster et al., 1973).

The teen ages (13-19) always have been known as the years of change. These years cover a period often characterized by breaking away from the traditional. Food habits and preferences during this period also have been described as unconventional, and poor nutrition often has resulted (Shinn, 1972; Everson, 1960; Law et al., 1972). The teenager, especially the female, often was described as the poorest fed member of our society.

Feeding programs aimed at this age group and emphasizing good nutrition have not met with a high degree of success. The most successful programs realized the importance of food preferences and placed emphasis on a variety of choices. Such a feeding program has been observed at Central High School in Knoxville, Tennessee.

Central High School was a new, modern, comprehensive school with approximately 1400 students and 72 teachers. It was located in north Knoxville in an area that was primarily residential. The main theme carried throughout the school was flexibility. The dining area, as an example, was a commons area which was used five periods of the day as a study hall.

The cafeteria at Central offered both the federally funded Type A menu and a la carte (Klein, 1974). The students were given a wide variety of choices each day selecting from at least four different plate lunches, five desserts, and numerous a la carte items.

The purpose of this research was to study the food preferences of six classes of students at Central High School, and to discover if food preferences were exercised when menu selections were made. Environmental factors were studied in order to assist in the explanation of changes between menu items the students thought they would select and menu items they actually selected.

## CHAPTER II

### REVIEW OF LITERATURE

#### Food Behavior of Teenagers

Throughout life each person's different food experiences have helped to form present eating habits (Brown, 1967). Food habits were found to be an integral part of an individual's way of life and were closely related to other behavioral patterns (Schorr et al., 1972; Dickins, 1965; Vawter and Konishi, 1958). Parents, peers, place of residence, income, and size of family have been found to be but a few of the many factors which influence an individual's actual food choices. The most important influences for teenagers were noted by McElroy and Taylor (1966) as health, money, enjoyment, status, sociability, and independence from parents.

Wyman (1972) and Spindler and Acker (1963) reported that six out of every ten teenage girls and four out of every ten teenage boys had poor diets. One explanation was that adolescence was a time of great turmoil. Young people overate in spurts, crash dieted frequently, and skipped meals. For some adolescents, eating habits became a tool of rebellion. Teenagers ate what the group wanted them to eat, not what parents advised. They may have enjoyed unusual combinations of foods or limited themselves to a few favorites.

The recognition that eating and nutrition were not only physical, but were social in nature, was essential for a successful feeding program (Martin, 1973; Anon., 1971a). Studies have indicated that peer influence was the determining factor in what teenagers ate rather than food aversions or preferences (Jefferson and Erdman, 1970). Eating hurriedly between classes may produce stress which also may influence the student's food attitudes (Axler and Schwarz, 1972; Spindler and Acker, 1963).

Youth's preferences have been described as variable rather than static (Axler and Schwarz, 1972). Food items liked today may not be accepted tomorrow. Although high school students wanted change, a slight change in an old favorite was usually preferred to a drastic one. For example, the basic hamburger with a new garnish had a better chance of appealing to young people than a completely new dish. Because appeal to the teenager could not be based on subtle flavor changes, emphasis should be placed on the eye appeal of the food (Axler and Schwarz, 1972). Appearance, color, texture, and form as well as smell and taste were especially meaningful (Axler and Schwarz, 1972; Shipe, 1972).

Schorr et al. (1972) found that teenagers enjoyed a wide variety of foods. Students liked more foods than they disliked.

In 1973, Walker et al. reported the trend in consumption of fruits and vegetables per capita was downward. These categories of food were the most likely to be rejected by school children and the greatest amount of food waste occurred within these groups. Military men also listed vegetables along with unfamiliar foods in the "least liked" category (Moskowitz et al., 1972).

Preparation and serving greatly affected the acceptance of all foods. Some foods, however, were not acceptable even though they were of high quality and the methods of preparation and service were excellent (Meiselman et al., 1972). Some of the foods which were unpopular on the Armed Forces Master Menu included liver, certain vegetables and casseroles, and some soups and salads (Meiselman et al., 1972; Branch and Meiselman, 1973).

Food items adolescents most often liked included milk, ice cream, steak, roast beef, hamburgers, pork chops, ham, chicken, turkey, orange juice, oranges, apples, french fried potatoes, corn, peas, bread, cake, pie, and cookies (Schorr et al., 1972; Einstein and Hornstein, 1970; Kennedy, 1952). Liver was overwhelmingly regarded as the most unpopular item. Other unpopular items included spinach, squash, cabbage, beets, turnips, eggplant, stewed tomatoes, and buttermilk. Reasons given by subjects for not liking certain foods were

related to taste, odor, appearance, physiologic and psychologic reactions, unfamiliarity, and family attitudes and practices (Schuck, 1961). Females had relatively stronger food aversions than males (Wallen, 1943). Disliked foods were more common among females than males.

Since none of the well liked food items were rich sources of vitamin A, many teenagers tend to be deficient in this nutrient (Schorr et al., 1972). Other nutritive deficiencies included ascorbic acid, calcium, and iron (Stasch et al., 1970).

#### School Lunch's Role in Food Preferences

Several have reported that youth prefer to have a choice (Batson, 1971; Anon., 1971b; Law et al., 1972). Teenagers quickly pointed out what they liked or what they didn't like (Shinn, 1972). They were involved in formulating their own life styles separate from their parents. They wanted choice at home, in the classroom, and in the cafeteria.

Decision making was a key part of the educational process (Shinn, 1972; Anon., 1973a; Martin, 1973). Students wanted and needed to be involved in the decision making for school foodservices, i.e., selection of foods to be purchased, menu planning, or cafeteria decor (Martin, 1973). The school lunch program had obligations to the students in addition to pleasing them (Axler and Schwarz, 1972). Unless students were

pleased, they would not eat the nutritionally sound, balanced meal prepared. It had been noted that if school lunch was to meet the needs of today's independent teenagers, flexibility must be built into the program (Shinn, 1972; Leverton, 1968).

The U.S. Department of Agriculture's school lunch regulations provided a flexible framework of meal requirements from which a variety of lunches may be planned (Moss, 1971). Menus could be adapted to appeal to students' likes in specific localities and favorite foods could be included (Moss, 1971; Brand, 1973). Students with ethnic backgrounds responded better when served foods to which they were accustomed (Brand, 1973; Bartolotta, 1971). A better understanding between students of different ethnic backgrounds often developed when they became more familiar with their classmates' native foods.

Freedom of choice consistent with the Type A lunch pattern was offered in many high schools (Moss, 1971). This free choice approach can be handled in many ways. In some cases, the Type A lunch was provided by offering a controlled choice from among several main dishes, fruits, vegetables, and desserts (Moss, 1971; Anon., 1973a; Montoya, 1973; Hightower and Rhodes, 1974). This could be served by buffet or conventional methods. In other cases, from two to seven different Type A lunches were offered with at least one of

them designed as a low calorie lunch while still meeting the program's nutritional requirements (Batson, 1971; Shinn, 1972; Moss, 1971; Hightower and Rhodes, 1974; Bartolotta, 1971; Anon., 1973b). The most popular variation of the Type A pattern was the sandwich plate (Gibson, 1973; Anon., 1974).

A combination of several different approaches was used. At Rule High School in Knoxville, Tennessee, students chose between several different hot and cold plates, including traditional hot lunches, sandwiches, and salads (Klein, 1974). The various components of these lunches also were available on an a la carte basis.

No matter which pattern or combination of patterns was used the objective of the school lunch program remained the same—to provide an acceptable, well balanced, nutritious, low cost meal.

#### Prediction of Food Choices from Prestated Food Preferences

For a quantity feeding program to succeed, foods must be selected that appeal to the majority of the clientele. One method of predicting if people will eat a food, or how much of it they will eat, was to ask them how well they liked the food (Eindhoven and Peryam, 1959). Hertweck and Byrne (1972) found that customers want a menu which was closely related to their food preferences.



Feeding programs needed a continuing feedback system that reported on the changing food preference patterns of the consumer population (Meiselman, 1972). The Marketing and Menu Services Division of the University of Massachusetts used questionnaires, rap sessions, and comment cards to determine changing food preferences of the students to assist in the development of a satisfactory menu.

Many problems in food preference measurement relating to menu planning were still unresolved (Meiselman, 1972). For example, if a person liked chocolate sundaes more than hamburger, he always would not accept sundaes more often as a meal component. Some foods with relatively low preference ratings (salad dressings, etc.) could be acceptable every day, and more highly preferred foods (roast beef, apple pie) might have to be served less often to maintain their high preference ratings. Some relatively high preference foods were served too often, thus lowering their appeal, while relatively low preference foods were served too rarely (Meiselman, 1972; Meiselman et al., 1972). The result was a menu that lacked variety. If a food was highly accepted by 10-20% of the customer population, deletion probably should not be considered.

One prominent aspect of eating was that foods are usually eaten together as a meal, rather than singly (Eindhoven)

and Peryam, 1959). When two foods were served together, the individual foods partially lose their identity and a new entity, the combination, with its own unique, associated preference was formed. Preference for the combination might not be predictable from the preferences of the components. For example, baked ham had a higher acceptance rating when served with mashed or candied sweet potatoes than it did when paired with french fries, even though french fries were more popular.

Combination effects had important implications for menu planning (Eindhoven and Peryam, 1959). Ratings appeared to reflect a preference for the main dish rather than for the menu as a whole. The menu planner needs to consider the most acceptable combination of main dish and accompaniments.

## CHAPTER III

### PROCEDURES

The purpose of this research was to study the food preferences of six classes of students at Central High School, and to discover if food preferences were exercised when menu selections were made. During the spring of 1974 a questionnaire containing both open-end and closed-end questions was administered two weeks prior to the service of three meals to determine the perceived choices of meals. It was readministered following the service of all the meals to determine the actual choices made.

Permission for and cooperation with this study were obtained from the director of school foodservices for Knoxville, manager of the high school cafeteria, and the high school principal. Observation, participant observation, and informal interviewing were techniques used to obtain general information about Central High School, its food service, and students during the six months prior to the collection of data (Madge, 1965; Compton and Hall, 1972). Additional information about the curriculum, student body, and feeding program was obtained from the faculty, members of the student body, cafeteria staff, and the director of

school foodservices for Knoxville. This information and background materials on the School Lunch Program helped the researcher to gain perspective into her area of research.

### Sample

The sample included all students attending six sections of study hall at Central High School. The library and commons area were used for study halls. These were in session throughout the day with the exception of one period when the commons area was used as a dining area. To insure a random sample, the research was conducted in three sections of the commons area study hall and three sections of the library study hall. Both sexes from each of the three grades (10, 11, and 12) were represented. Three hundred and ten pairs of usable questionnaires were obtained out of a possible 588. Absence from school or excused activities on either one or both days that the questionnaire was administered accounted for the discrepancy between the two above numbers.

### Questionnaire

Development of questionnaire. The questionnaire containing open-end and closed-end questions was designed by the researcher (Appendix A). Food items and definitions listed were taken directly from the menu supplied by the

Central High School Cafeteria Manager. From the menu of three consecutive days, the students were asked to indicate their meal preference from a selection of five plates and five desserts. The second section included menu items that the students were asked to describe. The questionnaires were coded to insure the anonymity of the students and as a means of pairing for analyses.

The questionnaire was pretested at Central High School using approximately 125 study hall students (one section library and one section commons area) not included in the actual data collection.

The research instrument was revised for clarification, and a more efficient method of coding was developed.

Implementation of questionnaire. The class roll was obtained from each study hall teacher in advance. Each student was assigned a number to insure anonymity and each study hall was assigned a code.

The questionnaire was administered the first time and the students indicated their food preferences from the selections given. Approximately two weeks later, selections listed on the questionnaire were served in the cafeteria. After the third meal was served, the questionnaire was distributed a second time and students were asked to indicate which foods they actually selected.

### Analysis of Data

Questionnaires were paired according to the student's code. Frequencies of various choices of plates and desserts were compiled using counts of individuals selecting them and individuals who changed from their preselection. The actual counts were used as measurements of data in statistical analyses. This was considered permissible because the number of students queried was sufficiently large to permit the counts to approximate a normal distribution. Choices and interactions of choices with days, students' sex, and students' grade were evaluated with an analysis of variance using a nested (split-plot) factorial design. Sex and grade were considered to be main plots with days representing sub-plots and choices within days representing, sub-sub-plots. Grades sampled were 10th, 11th, and 12th with males and females considered separately in each grade.

The data were categorized into 15 treatments for plates, and 15 treatments for desserts. Each consisted of five for those who did not change from their preselection, such as, they preselected hot plate (A) and actually chose hot plate (A), or they preselected and actually chose cookies (C). Five more treatments were assigned for those who changed choices from the plate or dessert in question, and five were assigned for those who changed to this plate or dessert. For example, one treatment was switching from the preselection

of cake (A) or a la carte (E) to any other choice, and one was switching from a preselection of any of the other plates or desserts to the actual selection of cake (A) or a la carte (E). Similarly, there were two treatments each for the other plates and desserts.

## CHAPTER IV

### RESULTS AND DISCUSSION

A shortage of french fried potatoes necessitated a menu change on the second day represented by the questionnaire. Because the validity of the results was questionable, plate choices on this day were not included in the statistical analyses.

The daily mean number of students in each of the 15 treatments for plates is compared in Table I. The category representing those who preselected and actually selected hot plate (A) had significantly more students than any other category. It was also clear that hot plate (A) was chosen more frequently than any other plate. Both of the categories representing actual selection of hot plate (B) were significantly greater than those for students actually selecting salad plate (D). It also appeared that low calorie plate (C) and a la carte (E) were chosen significantly less frequently than hot plate (B). Low calorie plate (C), salad plate (D), and a la carte (E) could not be ranked statistically.

Students retained their choice of hot plate (A) or hot plate (B) significantly more frequently than they changed choices to or from hot plate (A) or hot plate (B). This was not true for low calorie plate (C), salad plate (D), or a la



TABLE I  
DAILY MEAN NUMBER OF STUDENTS WHO PRESELECTED  
AND SELECTED EACH OF FIVE PLATES

| Mean <sup>1</sup>   | Plate Choice                       |
|---------------------|------------------------------------|
| 105.5 <sup>a</sup>  | Hot Plate (A) to Hot Plate (A)     |
| 40.5 <sup>b</sup>   | Others to Hot Plate (A)            |
| 39.5 <sup>b</sup>   | Hot Plate (A) to Others            |
| 36.5 <sup>b</sup>   | Hot Plate (B) to Hot Plate (B)     |
| 21.0 <sup>c</sup>   | Others to Hot Plate (B)            |
| 19.0 <sup>cd</sup>  | Hot Plate (B) to Others            |
| 19.0 <sup>cd</sup>  | Low Calorie (C) to Others          |
| 16.0 <sup>cd</sup>  | Others to A La Carte (E)           |
| 14.5 <sup>cd</sup>  | Salad Plate (D) to Others          |
| 13.0 <sup>cde</sup> | A La Carte (E) to Others           |
| 8.5 <sup>de</sup>   | Others to Low Calorie (C)          |
| 8.0 <sup>de</sup>   | Low Calorie (C) to Low Calorie (C) |
| 8.0 <sup>de</sup>   | A La Carte (E) to A La Carte (E)   |
| 3.0 <sup>e</sup>    | Others to Salad Plate (D)          |
| 2.5 <sup>e</sup>    | Salad Plate (D) to Salad Plate (D) |

<sup>1</sup>Means not followed by the same letter were different at the .05 probability level based on Duncan's New Multiple Range Comparison.

carte (E). In fact, they switched from salad plate (D) to another choice significantly more often than they retained or switched to this choice. One possible explanation was that salad plate (D) was more appealing on paper especially to weight conscious teenage girls than it was in the cafeteria.

The daily mean number of students in each of the 15 treatments for desserts is compared in Table II. The category representing those who preselected and actually selected cake (A) had significantly more students than any other category. Not only did students retain their choice of cake (A) most frequently, they switched to cake (A) significantly more often, and they changed from cake (A) to another choice significantly less often. These results are not surprising since cake was a traditional favorite (Meiselman et al., 1972; Moskowitz et al., 1972). Cookies (C) another favorite was the second most popular. Jello (D) and fresh fruit (E) appeared to be less popular than pie (B). The category representing those students who preselected and actually selected cookies (C) was significantly greater than the categories representing those who changed to or from cookies (C). However, they switched from fresh fruit (E) significantly more often than they retained that choice or changed to that dessert. One possible explanation for this change could be the usage of the general term "Fresh Fruit" on the

TABLE II  
DAILY MEAN NUMBER OF STUDENTS WHO PRESELECTED  
AND SELECTED EACH OF FIVE DESSERTS

| Mean <sup>1</sup>   | Dessert Choice                     |
|---------------------|------------------------------------|
| 62.6 <sup>a</sup>   | Cake (A) to Cake (A)               |
| 43.0 <sup>b</sup>   | Cookies (C) to Cookies (C)         |
| 42.4 <sup>b</sup>   | Others to Cake (A)                 |
| 26.6 <sup>c</sup>   | Cookies (C) to Others              |
| 25.7 <sup>c</sup>   | Fresh Fruit (E) to Others          |
| 23.0 <sup>cd</sup>  | Others to Cookies (C)              |
| 22.0 <sup>cd</sup>  | Cake (A) to Others                 |
| 21.0 <sup>cd</sup>  | Others to Pie (B)                  |
| 18.7 <sup>cde</sup> | Pie (B) to Pie (B)                 |
| 18.3 <sup>cde</sup> | Pie (B) to Others                  |
| 16.3 <sup>def</sup> | Others to Jello (D)                |
| 15.4 <sup>def</sup> | Jello (D) to Others                |
| 11.3 <sup>ef</sup>  | Others to Fresh Fruit (E)          |
| 9.0 <sup>f</sup>    | Fresh Fruit (E) to Fresh Fruit (E) |
| 8.3 <sup>f</sup>    | Jello (D) to Jello (D)             |

<sup>1</sup>Means not followed by the same letter were different at the .05 probability level based on Duncan's New Multiple Range Comparison.

questionnaire. The students may have indicated this choice based on a preference for a specific fruit and when this fruit was not offered, they selected another dessert.

Table III shows the percentages of students who made the choice they had previously indicated they would, and those who changed their choices. A total of 64% of all students sampled retained their choice of plates while 36% changed to another choice. However, only 56% of the students sampled retained their choice of desserts while 44% changed to another selection. These results seemed to indicate the ability of the majority of the students sampled to choose in advance the meals they preferred in the school cafeteria. They, however, seem to have more difficulty in choosing the dessert. One reason for the large percentage of change could be the students' inability to predict the degree of hunger that they would feel when the food was served. Since the desserts ranged from cakes and pies to gelatins and fresh fruit, the satiety value varied greatly. A hungry student might change his mind from a less filling gelatin to a more filling pie. The eye appeal of the food also could have caused the students to change from one selection to another. A plate which did not appeal to the students on paper may have been very appealing at the serving counter. Still another factor causing change from the preselection could be the foods that the students were served at home. A

TABLE III

PERCENTAGES OF STUDENTS WHO ACTUALLY CHOSE PRESELECTION  
AND WHO CHANGED CHOICES, BY SEX AND GRADE

| Grade and Sex  | Plates             |         | Desserts           |         |
|----------------|--------------------|---------|--------------------|---------|
|                | Retained<br>Choice | Changed | Retained<br>Choice | Changed |
|                | %                  | %       | %                  | %       |
| 10th Male      | 69                 | 31      | 54                 | 46      |
| 10th Female    | 58                 | 42      | 59                 | 41      |
| 11th Male      | 55                 | 45      | 46                 | 54      |
| 11th Female    | 63                 | 37      | 51                 | 49      |
| 12th Male      | 68                 | 32      | 60                 | 40      |
| 12th Female    | 70                 | 30      | 68                 | 32      |
| Total Male     | 65                 | 35      | 54                 | 46      |
| Total Female   | 63                 | 37      | 58                 | 42      |
| Total Students | 64                 | 36      | 56                 | 44      |

student who was served fried chicken for dinner Monday night was likely to choose something else for lunch Tuesday.

The percentages indicate that of the three grades sampled, the students from the 12th grade retained their choice more frequently for both the plates and the desserts. Reasons could be maturity and experience. No explanation is proposed for why the 10th grade retained their choice more frequently than did the 11th grade.

The difference in the percentage of students changing their minds within the grades was reflected by significant interactions between grade and choice in the analysis of variance. The F ratios were 2.59 ( $p < 0.01$ ) for plates and 2.51 ( $p < 0.05$ ) for desserts.

There was also a difference in frequency of mind changing between the two sexes. Table III shows the percentages of males and females who switched from or retained their initial choice of plates or desserts. Chi-square analysis of the actual counts revealed that females switched from their initial plate choice significantly more often than males. However, males switched dessert choices more frequently than females. These tendencies also were shown by significant interactions in the analysis of variance. The interaction F ratio for sex and choice was 4.55 ( $p < 0.005$ ) for plates and 2.80 ( $p < 0.05$ ) for desserts.

One source of sex difference was the 10th grade where females changed their minds on plate choices much more often than did males. Tenth grade males however changed selections of desserts more frequently than did females. Males of the 11th and 12th grades changed their plate choices more often than did their female classmates. Females of all grades retained their choice of desserts more frequently than did males. The 11th grade male is the student most likely to change from his preselection. The 12th grade female is the least likely to change from a preselection.

The mean number of males and females in each of the 15 treatments for plates is compared in Table IV. The category representing those who preselected and actually selected hot plate (A) was larger than the other categories. The second largest group for both sexes represented changing from other selections to hot plate (A). Because roast beef, a favorite at Central High School, was listed as hot plate (A) this category proved more appealing. The second most popular selection for both sexes was hot plate (B). Low calorie plate (C) appeared to be more appealing on paper since more students changed from this selection to another than retained their original selection. A difference in selection because of sex was more pronounced with salad plate (D) than with any other plate. No males preselected and selected salad plate (D) and only a small number changed their selection to salad

TABLE IV  
DAILY MEANS FOR PLATE CHOICES BY SEX

| Plate Choice                       | Male | Female |
|------------------------------------|------|--------|
| Hot Plate (A) to Hot Plate (A)     | 65.5 | 40.0   |
| Others to Hot Plate (A)            | 24.0 | 16.5   |
| Hot Plate (A) to Others            | 23.5 | 16.0   |
| Hot Plate (B) to Hot Plate (B)     | 22.5 | 14.0   |
| Others to Hot Plate (B)            | 13.5 | 7.5    |
| Hot Plate (B) to Others            | 12.0 | 7.0    |
| Low Calorie (C) to Low Calorie (C) | 6.0  | 2.0    |
| Others to Low Calorie (C)          | 7.0  | 1.5    |
| Low Calorie (C) to Others          | 11.0 | 8.0    |
| Salad Plate (D) to Salad Plate (D) | 0.0  | 2.5    |
| Others to Salad Plate (D)          | .6   | 2.5    |
| Salad Plate (D) to Others          | 4.0  | 10.5   |
| A La Carte (E) to A La Carte (E)   | 2.5  | 5.5    |
| Others to A La Carte (E)           | 6.5  | 9.5    |
| A La Carte (E) to Others           | 6.5  | 6.5    |



plate (D). Females indicated interest in this plate by preselection, however, a large number changed to another selection. Reasons could be that this plate was not available or another selection was more appealing. A la carte (E) was more popular with females than with males. More females retained their choice of a la carte (E) or changed to this selection than did males.

The mean number of males and females in each of the 15 treatments for desserts is compared in Table V. The category representing those who preselected and actually selected cake (A) was larger than the other categories. The second largest group for the males represented those who changed from another selection to cake (A). The second largest group for the females represented those who preselected and actually selected cookies (C). Cookies (C) were more popular with females than the more filling pie (B). Males showed an interest in the less filling desserts (jello and fresh fruit) during preselection but changed to another selection later. A large number of females also preselected fresh fruit (E) but changed to another selection. As mentioned earlier, the students may have indicated this selection based on a preference for one particular fruit.

The mean number of 10th, 11th, and 12th graders in each of the 15 treatments for plate choices is compared in Table VI. The category representing those who preselected and

TABLE V  
DAILY MEANS FOR DESSERT CHOICES BY SEX

| Dessert Choices                    | Male | Female |
|------------------------------------|------|--------|
| Cake (A) to Cake (A)               | 38.7 | 24.0   |
| Others to Cake (A)                 | 25.7 | 16.7   |
| Cake (A) to Others                 | 14.7 | 7.3    |
| Pie (B) to Pie (B)                 | 12.7 | 6.0    |
| Others to Pie (B)                  | 12.3 | 8.7    |
| Pie (B) to Others                  | 11.3 | 7.0    |
| Cookies (C) to Cookies (C)         | 22.0 | 21.0   |
| Others to Cookies (C)              | 16.3 | 6.7    |
| Cookies (C) to Others              | 14.7 | 12.0   |
| Jello (D) to Jello (D)             | 5.7  | 2.7    |
| Others to Jello (D)                | 10.3 | 6.0    |
| Jello (D) to Others                | 13.0 | 2.3    |
| Fresh Fruit (E) to Fresh Fruit (E) | 4.0  | 5.0    |
| Others to Fresh Fruit (E)          | 7.0  | 4.3    |
| Fresh Fruit (E) to Others          | 12.7 | 13.0   |

TABLE VI  
DAILY MEANS FOR PLATE CHOICES BY GRADE

| Plate Choice                       | Grade |    |    |
|------------------------------------|-------|----|----|
|                                    | 10    | 11 | 12 |
|                                    | %     | %  | %  |
| Hot Plate (A) to Hot Plate (A)     | 31    | 27 | 31 |
| Others to Hot Plate (A)            | 9     | 13 | 13 |
| Hot Plate (A) to Others            | 12    | 12 | 9  |
| Hot Plate (B) to Hot Plate (B)     | 10    | 10 | 12 |
| Others to Hot Plate (B)            | 6     | 7  | 4  |
| Hot Plate (B) to Others            | 6     | 5  | 5  |
| Low Calorie (C) to Low Calorie (C) | 3     | 2  | 2  |
| Others to Low Calorie (C)          | 3     | 2  | 1  |
| Low Calorie (C) to Others          | 6     | 6  | 4  |
| Salad Plate (D) to Salad Plate (D) | 0     | 1  | 1  |
| Others to Salad Plate (D)          | 1     | 1  | 1  |
| Salad Plate (D) to Others          | 2     | 5  | 6  |
| A La Carte (E) to A La Carte (E)   | 2     | 1  | 4  |
| Others to A La Carte (E)           | 5     | 5  | 3  |
| A La Carte (E) to Others           | 4     | 2  | 5  |

actually selected hot plate (A) was larger than the other categories for each of the three grades. The second largest group for the 11th and 12th grades represented changing from other selections to hot plate (A). The second largest group for the 10th grade represented changing from hot plate (A) to other selections. Hot plate (B) was the second most popular plate in all three grades. All other categories contained substantially fewer numbers. More 10th than 12th grade students expressed an interest in the low calorie plate (C). All three grades changed from this selection more often than they retained or changed to this choice. More 11th and 12th grade students expressed an interest in the salad plate (D) than did 10th graders. Again students changed from this selection more frequently than they retained or changed to this selection. Students in grades 10 and 11 changed from other selections to a la carte (E) more frequently than 12th grade students. Students in grade 12 retained their choice of a la carte (E) more frequently than did 11th graders.

The mean number of 10th, 11th, and 12th graders in each of the 15 treatments for dessert choices is compared in Table VII. The category representing those who preselected and actually selected cake (A) was larger than the other categories for each of the three grades. The second largest category for the 10th grade represented those students who

TABLE VII  
DAILY MEANS FOR DESSERT CHOICES BY GRADE

| Dessert Choice                     | Grade          |                |                |
|------------------------------------|----------------|----------------|----------------|
|                                    | 10             | 11             | 12             |
|                                    | $\frac{8}{18}$ | $\frac{8}{13}$ | $\frac{8}{20}$ |
| Cake (A) to Cake (A)               | 18             | 13             | 20             |
| Others to Cake (A)                 | 12             | 11             | 12             |
| Cake (A) to Others                 | 6              | 7              | 5              |
| Pie (B) to Pie (B)                 | 5              | 5              | 4              |
| Others to Pie (B)                  | 6              | 8              | 2              |
| Pie (B) to Others                  | 4              | 6              | 6              |
| Cookies (C) to Cookies (C)         | 10             | 11             | 16             |
| Others to Cookies (C)              | 7              | 5              | 7              |
| Cookies (C) to Others              | 7              | 9              | 6              |
| Jello (D) to Jello (D)             | 3              | 1              | 3              |
| Others to Jello (D)                | 4              | 5              | 5              |
| Jello (D) to Others                | 5              | 4              | 4              |
| Fresh Fruit (E) to Fresh Fruit (E) | 3              | 2              | 3              |
| Others to Fresh Fruit (E)          | 3              | 4              | 2              |
| Fresh Fruit (E) to Others          | 6              | 9              | 7              |

preselected another dessert but changed to cake (A). Cookies (C) seemed to have more appeal with the 12th grade; they preselected and selected cookies (C) second most often. Students in all three grades seemed to preselect fresh fruit (E) but frequently changed to another selection.

The form used for the identification of specific menu items did not provide the information desired. Many students misunderstood the term "describe"; therefore a large number of questionnaires had limited value. The usable data are presented in Table VIII (Appendix B). Some standardized terms such as hoagie sandwich or devil's food cake were understood by most of the students. Other terms such as succotash and 1,2,3,4 cake were not understood by the majority of the students. More specific research needs to be conducted to determine if students understand the food terms listed on the menu.

The results of this study indicate that students use their food preferences in making meal selections. A total of 64% of all students sampled retained their choice of plates and 56% retained their choice of desserts. This study indicates that food preferences of students can be used as a guideline for menu planning. A choice of menu items is very important, especially a choice of desserts. A variety of desserts can be included on the menu of any feeding program with a minimum of effort. Additional research to investigate the actual factors influencing choice of desserts is indicated.

Students of the 12th grade were more likely to choose their preselections than students of the 10th and 11th grades. Several possible reasons are listed, however, more research is needed at specific grade levels to further isolate age difference.

Females were more likely to change plate choices but less likely to change dessert choices. Additional research is needed to investigate the difference in choice related to the sex of the student.

High school students use their food preferences in making meal selections. Food preferences of students should be used as a guideline for menu planning. A choice of menu items is very important to teenagers, especially a choice of desserts.

## CHAPTER V

### SUMMARY

For the purpose of this research it was hypothesized that teenagers use food preferences when making meal selections. The sample included all students attending six sections of study hall at Central High School, Knoxville, Tennessee. Three hundred-ten pairs of usable questionnaires were obtained and both sexes from each of the three grades (10, 11, and 12) were represented.

A questionnaire containing both definitions and menu choices for three days was administered two weeks prior to the service of the meals. Students were asked to indicate their meal preference and to describe food items listed. The questionnaire was readministered after the service of the meals and the students indicated the items which were actually selected.

It was found that hot plate (A) was chosen more frequently than any other plate. Salad plate (D) was the least popular choice.

Cake (A) proved to be the most popular dessert. Cookies (C) were the second most popular. Jello (D) and fresh fruit (E) were the least popular. A total of 64% of all students



retained their choice of plates while only 56% retained their choice of desserts. One reason for the large percentage of change could have been the students' inability to predict the degree of hunger that they will feel when the food is served.

A difference in selection because of sex was more pronounced with salad plate (D) than with any other plate. More females indicated an interest in this plate than did males. A La Carte (E) also was more popular with females than with males.

Hot plates (A) and (B) were the most popular with all three grades. More 11th and 12th graders expressed an interest in salad plate (D) than did 10th graders.

Cake (A) was the most popular with both sexes and all three grades. Cookies (C) seemed to have more appeal with the 12th grade than with the 10th or 11th. The form used for the identification of specific menu items did not provide the information desired. Many students misunderstood the term "describe," therefore this section of the questionnaire had limited value. Some standardized terms such as hoagie sandwich or devil's food cake were understood by most of the students. Other terms such as succotash and 1, 2, 3, 4 cake were not understood by the majority of the students. More specific research needs to be conducted to determine if students understand the food terms listed on the menu.

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## APPENDIXES

No. \_\_\_\_\_  
 Sex:   M     F    
         O     O    
 Grade: 10 11 12  
             O     O     O  

Food Science and Food Systems Administration  
 College of Home Economics  
 The University of Tennessee, Knoxville

Mrs. Mary B. Hunter  
 Mrs. Robbie Needham  
 Dr. Ann Bass  
 Spring 1974

INSTRUCTIONS: We are interested in what you would like to eat in your cafeteria. Please indicate the one plate and one dessert that you would select if you were given the following choices by filling in the corresponding circle. Please circle unfamiliar foods.

| Plate                      | A  | B  | C  | D   | E   | F                     |
|----------------------------|--|--|--|---|---|-----------------------|
| A B C D E F<br>O O O O O O | Wiener on Bun<br>Pinto Beans<br>Cole Slaw                          | School Boy on Bun<br>Peas<br>Potato or Corn<br>Chips               | Sliced Ham<br>Peas<br>Applesauce<br>Fruit Jello              | Chefs' Salad<br>Plate w/<br>Crackers                | A la Carte<br>(each item<br>priced<br>separately) | None of the<br>Others |
| A B C D E F<br>O O O O O O | Chicken Pot Pie<br>Corn<br>Tossed Vegetable<br>Salad<br>Hot Rolls  | Hoagie Sand-<br>wich<br>French Fries<br>Tomato Slice<br>Applesauce | Chicken<br>Salad on<br>Lettuce<br>Broccoli<br>Pear Half      | Fruit and<br>Cottage<br>Cheese Plate<br>w/ crackers | A la Carte  | None of the<br>Others |
| A B C D E F<br>O O O O O O | Roast Beef<br>w/ Gravy<br>Peas<br>Whipped<br>Potatoes<br>Hot Rolls | Tocos<br>Cole Slaw<br>Corn   | Broiled<br>Fish Filet<br>Succotash<br>Tomato<br>Cup<br>Jello | Chefs' Salad<br>Plate w/<br>Crackers                | A la Carte  | None of the<br>Others |

  

| Dessert                | A  | B                         | C                   | D     | E              | Study Hall's                  |
|------------------------|--|---------------------------|---------------------|-------|----------------|-------------------------------|
| A B C D E<br>O O O O O | Devil's Food<br>Cake w/<br>Divinity<br>Icing | Cherry<br>Cobbler         | Oatmeal<br>Cookies  | Jello | Fresh<br>Fruit | 1 Time-<br>Teacher-<br>Place- |
| A B C D E<br>O O O O O | 1, 2, 3, 4, cake<br>w/ chocolate<br>Icing    | Peanutbutter<br>Apple Bar | Quickie<br>Candy    | Jello | Fresh<br>Fruit | 2 Time-<br>Teacher-<br>Place- |
| A B C D E<br>O O O O O | Oatmeal Cake<br>w/ Caramel<br>Icing          | Peanutbutter<br>Pie       | Cornmeal<br>Cookies | Jello | Fresh<br>Fruit | 3 Time-<br>Teacher-<br>Place- |

PLEASE COMPLETE SECOND PAGE.



DESCRIBE THE FOLLOWING FOOD ITEMS:

School Boy on a Bun -

Hoagie Sandwich -

Tacos -

Broccoli -

Succotash -

Chefs' Salad -

1,2,3,4 Cake -

Quickie Candy -

Devils' Food Cake -

Divinity Icing -

## APPENDIX B

TABLE VIII  
IDENTIFICATION OF MENU ITEMS

| Food Item           | Identified | Could Not Identify |
|---------------------|------------|--------------------|
| School Boy on a Bun | 154        | 53                 |
| Hoagie Sandwich     | 159        | 46                 |
| Tacos               | 158        | 46                 |
| Broccoli            | 107        | 97                 |
| Succotash           | 40         | 164                |
| Chefs' Salad        | 130        | 73                 |
| 1,2,3,4 Cake        | 21         | 184                |
| Quickie Candy       | 97         | 107                |
| Devil's Food Cake   | 118        | 85                 |
| Divinity Icing      | 63         | 140                |

## VITA

Robbie Fowler Needham was born in Jackson, Tennessee, on September 26, 1949. She attended Beech Bluff High School and was graduated in 1967. In June 1969 she received an Associate of Science degree from Jackson State Community College, majoring in Home Economics. In June 1971 she received a Bachelor of Science degree from The University of Tennessee at Martin, majoring in Home Economics Education. For two years she served as School Foodservice Supervisor for the Lauderdale County Board of Education in Ripley, Tennessee.

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