

FACTORS AFFECTING FOOD CHOICES OF TEEN-AGE GIRLS

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## INTRODUCTION

The nutritional status of teens has been the subject of much research since a number of factors influence their food choices. For example, sociability, peer group influence, and time were cited as the major factors influencing the food choices of teens (9, 10, 19-23).

A number of researchers have pointed out current problems that indicate a need for nutrition education (9, 24, 60). The effect of certain nutrition education programs on the improvement of dietary intakes of teens have been determined (24, 78, 79).

Review of the literature validates the hypothesis that nutritional knowledge alone does not guarantee sound food choices. Many researchers have noted the effects of certain sociological and psychological aspects of food and eating on nutritional status (30, 39, 56).

This study was designed to determine the dietary intake of teen-age girls before and after a course in foods and nutrition, to determine the change in nutrition knowledge over the same period, and to determine the relationships that existed between knowledge and intake. In addition, the influence of a number of sociological and psychological factors were studied and the interrelationships among all factors were explored.



## REVIEW OF LITERATURE

Assessment of Nutritional Status of Teen-age Girls

Research has shown that dietary intakes of teen-age girls are deficient with respect to certain nutrients. Odland et al. (1) calculated the mean daily intake of calories and nine nutrients from seven day dietary records of Montana female students and found that the intakes of 78% of the students were below  $2/3$  of the Recommended Daily Allowances in one or more nutrients, and that the intakes of  $1/3$  of the students were less than  $2/3$  of the Recommended Daily Allowances in either iron, calcium, or ascorbic acid. Other researchers also found that the nutrients most commonly deficient in the diets of teen-age girls were iron, calcium, ascorbic acid, and Vitamin A (2-5). Fisher and Dodds (3) pointed out that the 17-19 year old female had a lower mean daily calcium consumption than the younger teen-age girl. According to Eppright et al. (6), the greatest deviation from the RDA occurred at age sixteen, and the two nutrients that were most deficient were calcium and iron. After age twelve, the mean intakes of the girls were only  $2/3$  of the RDA. They found, however, that most girls increased the intake of ascorbic acid during their teen-age years.

Numerous researchers observed that low nutritional status was the result of the food selection and the eating patterns of teens. Meal-skipping, snacks that did not compensate for meals missed, and small quantities of foods eaten were cited by many of the investigators as causes for nutritionally deficient diets. Erratic eating habits, skipping breakfast, and the poor distribution of protein throughout the daily diet

were the bases of the problems involving amino acid intake (1, 7-17).

In the schools of Greensboro, North Carolina, Edwards et al. (8) found that only 16% of the 6200 teens studied had one serving of green or yellow vegetable per day, 35% had one serving of an ascorbic acid rich food per day, and 66% had two or more glasses of milk per day. Odland (1) noted positive correlation between the number of breakfasts containing fruit, cereal, and animal protein and the number of students who met at least 2/3 of the RDA for any nutrient or a number of nutrients.

Huenemann et al. (12) observed highly irregular eating patterns among approximately 1/3 of the teen-age subjects during four separate weeks, and that those teens who ate regularly tended to have good over-all diets. They found also that foods from the dairy group and the meat group contributed the most calories per day to the diet.

After re-evaluating the data of her own studies on the status of teen-age nutrition in the light of the 1963 RDA, Leverton (18) found that certain conclusions were no longer valid. In the 1949-50 Nebraska study, she had reported that 50% of the 13-15 year olds studied had thiamine intakes of less than 70% of the RDA, but that by the 1963 standards, no thiamine intake was that low. Similarly, she had reported in the earlier study that 50% of the subjects met the riboflavin requirement but according to the 1963 revision of RDA, 92% met or surpassed the riboflavin requirement. Since there was no downward revision of calcium or iron requirements in the 1963 RDA, these nutrients still were low or deficient.

#### Factors Affecting Food Intake

Numerous factors affect food intake. Among these, time, sociability and peer group influence, home environment, money, palatability, and

psychological factors are recognized as relevant to nutritional intake.

By using a questionnaire to obtain information about some of the reasons for eating habits of teens, Spindler and Acker (19) found that time was a prime factor. Others also noted time as a factor in the omission of breakfast and found that the increase of time demands made on teens because of social activities resulted in the substitution of snacking for the regular eating of meals (10, 20-22).

McElroy and Taylor (23) found that sociability ranked third in a scale of six values teens considered important with regard to food choices; whereas Spindler (9) found that friendship and sociability appeared to be the most important value of teens. Furthermore, she found that older teens tended to have poorer diets than younger teens because of the influence of peers. Similarly, Cooksey and Ojeman (21) stated that two of the reasons adolescents tended to skip breakfast were the unavailability of others with whom to eat and the teens' ideas of the opinion of the peer group with regard to breakfast omission. Although high interest in family centered activity and in eating with the family existed (10), girls who valued sociability highly were inclined to consider health unimportant and tended to have poor diets (24). A number of researchers noted fear of overweight as a factor affecting the food choices of teens (9, 19, 24, 25).

Hinton et al. (26) found that sound family relations and emotional stability were characteristic of girls with good food habits; whereas, a significant, negative relationship existed between such factors as family criticism of food choices and of eating too much, too often, or too slowly and good food habits. Brown (27) cited early background and the influence

of the mother as factors determining an individual's food intake. Likewise, Camp and Eppright (28) found that a home situation which developed an objective attitude toward food positively influenced the acceptance of foods. Stasch et al. (14) found that the influence of the mother had a more profound effect on the breakfast habits of New Mexico college freshmen than did nutrition education. Similarly, Litman et al. (29) noted that Minnesota school children cited the mother most often as the authority figure with regard to food. Lewin (30) also found that the mother's concepts about food exerted the most influence on the food choices of the family and that children tended to value foods in the same way she did. McCarthy (31) related the food aversions of the family with 35% of the food aversions of the children. According to Spindler and Acker (19), teens thought that parents should be the authority figures and take the responsibility for seeing that children ate an adequate diet.

Although McElroy (23) found that teens considered money second in importance in the selection of food, Brown (27) reported that college students did not regard family income as influential a factor in determining food choices as home environment. Warnick and Zaehring (13) noted that low income was not a primary reason for poor diets of teens. By observing the kinds of foods chosen for lunches and snacks, they concluded that most subjects had liberal amounts of spending money.

A number of studies to determine popular and unpopular food items have been undertaken to facilitate the planning of menus at college residence halls (11, 32-36). Dickens (37) found that a complexity of factors determined the popularity of food items. Pilgrim (38) and Lamb et al. (35) observed that the more that is done to food by way of method of

preparation, the less acceptable the food item. Other researchers (33-35, 39) noted that the following factors were influential in determining whether food items were popular or unpopular: color, texture, degree of doneness, smell, physiologic reactions, and taste. Numerous investigators have observed that taste sensitivity tended to play only a minor role in food acceptance (40-45). Knickrehm et al. (46) and Brozek (47) found that lack of variety negatively influenced food acceptance.

Investigators have noted that gratifying feeding experiences and generally pleasurable early experiences with food are the strongest factors affecting food preferences and healthy emotional development (48-55). The emotional meanings associated with foods have been described by several researchers. Hamburger (56) described security foods, such as milk, as those foods chosen in time of stress to recall pleasant associations of childhood. Reward foods were those given as special treats or tokens of affection. Litman (29) found that the consumption of green vegetables, milk, meat, potatoes, fruits, and juices by Minnesota children was most likely to elicit praise from their mothers.

Moore (57) noted that symbolically food spoke of communion and hospitality. He observed that certain foods were associated with different groups of people. For example, meat was a masculine food; whereas, a salad was a feminine food. Hawke (52) noted that food was often used to reduce feelings of unhappiness and tension among lonely, unhappy, or bored individuals.

Brown (27) found evidence that college students tended to develop aversions to those foods which they had been forced to eat as children, but that they attributed their acceptance of many foods to being taught to

taste a small amount of any food before deciding they disliked it. Smith and Ross (58) reported that individuals with a number of food aversions were usually characterized by their fear and anxiety and that those subjects tended to avoid eating foods which they had never before tasted. Spindler (9) and Storvick and Fincke (59) cited the need of the teen to assert his independence as a psychological factor motivating his food choices.

#### Role of Nutrition Education Relative to Improving Nutrition Status

Not only the low intake of specific nutrients, but also the prevalence of other health related problems has indicated the need for nutrition education. Education toward the reduction or prevention of obesity was cited as an important aspect of a nutrition education program (24, 60). Johnston (61) suggested that teens be made aware that, although their caloric needs were high during their teens, this would not be the case in adulthood. Therefore, they should be taught how to judge the adequacy of their diet in relationship to their particular phase in the life cycle.

The phenomenon of teen-age marriages, with the consequence of teen-age pregnancies, was also a matter of concern. Spindler (9) reported that one out of every four mothers bearing a child is under 20 years of age. Stearns (62) found that teen-age mothers were the least successful in producing healthy, full term infants. In a more recent report, Huenemann (63) noted that because of the condition of undernutrition in many teen-age girls with regard to iron, calcium, ascorbic acid, and vitamin A, pregnancy presents a potential risk. She pointed out a need for further study on teen-age pregnancies since not much has been done in this area. Eagan (64) concluded that earlier marriages meant that nutrition educators

had to reach young people before their middle or late teens.

Recent studies determined the effect of malnutrition on the development of the central nervous system, and, consequently, on the learning process. Leverton (65) reported that the degree of damage done to the central nervous system depended upon when the malnutrition occurred, the length of time of the condition, and the severity of the malnutrition. She pointed out the implications of these findings regarding school health programs and stressed the importance of classroom teaching of nutrition.

Parrish (66) and Everson (7) noted that the trend toward meal skipping and toward the substitution of snacks for meals among teens constituted another problem area to be dealt with through nutrition education. Acknowledging this fact, Huenemann et al. (12) questioned whether attempting to change the eating patterns of teens was an essential and realistic goal, or if nutrition educators should concentrate more on teaching teens how to buy nutritious snacks and convenience foods rather than the traditional emphasis on meal planning.

Certain consumer centered problems also indicated a need for education. Todhunter (67) and Harker and Kupsinel (68) stated that the great variety of products on the market made selection much more difficult so that the consumer needed help to judge the validity of the claims of various manufacturers. Parrish (66) observed that the increased popularity of diet and health fad foods was another consumer-centered problem.

The problems involved in nutrition education stem from the fact that nutrition is not only the scientific study of food and nutrients and their use by the body, but is also concerned with "certain social, economic, cultural, and psychological implications of food and eating" (69).

Babcock (51) stated that the nutrition educator is dealing with unconscious and covert attitudes toward food in addition to the conscious and overt attitudes. Sipple (70) concluded that a concrete problem which the nutrition educator faced was the problem of re-education--of trying to change existing food habits. Venable (71) noted that one must learn how the habit has been formed before it can be altered and stated that the most difficult type of learning is learning to change habits because the bases for these habits are cultural, psychological, and sociological. The inability of teachers to determine the educational needs of the students and the lack of proper timing in the educative process further complicates the problem of nutrition education (72). A number of investigators agreed that the key to effective nutrition education is to motivate teens toward adopting good health as a personal value (24, 73-75). The fact that such motivation is lacking was attested to by the discrepancies between knowledge and practice found by a number of researchers (11, 32, 33, 76, 77).

However, Covan et al. (78) found a positive relationship between nutrition education and the practice of choosing food for health. Whitehead (79) made dietary surveys of a research and a control group to determine the effect of nutrition education on dietary intake. Her data showed that specifically planned nutrition education programs resulted in improvements in food choices. Likewise, Hinton et al. (24) obtained results that indicated that the food choices of teen-age girls were related to knowledge of nutrition.

One of the most basic goals of nutrition education cited was to help the student better understand the role of nutrition in the maintenance of good health so that he would be aided in choosing foods for health



throughout the life cycle (68, 73, 80-84). Other goals mentioned were the enjoyment of food for its social and cultural contributions (68), the relation of nutrition to immediate goals (82), the fostering of a pleasant home environment since this influenced food habits (24), and the helping of teens to find ways other than the selection of food to express status, independence, and sociability (24).

Hinton et al. (26) suggested that the scope of a nutrition education program should be such that it deals with all factors of the development of teen-age girls. Parrish (66) stated that an environmental factor to be considered was the characteristics of the food habits of a society that is affluent, urbanized, and mobile.

A number of nutrition educators have advised involving teens in learning and decision making activities in an attempt to encourage sound dietary practices (9, 71, 85). Spurling et al. (20) and Whitehead (86) cited the need for a nutrition education program to be aided in the planning, participation, and evaluation stages by teachers, pupils, parents, and community leaders as well as nutritionists and to be supported by those community agencies charged with upgrading the health of community members. Eppright et al. (87) suggested specific evaluation techniques to help the nutrition educator determine whether the educational objectives desired have been met.

A survey of Massachusetts high school students revealed that most pupils found other aspects of a health education course to be equally or more interesting than nutrition (88). Their reasons for low interest in nutrition were as follows: (1) nutrition was "boring," (2) the subject matter was repetition of what they had learned earlier, (3) the course

demanded the memorization of "useless facts and technical vocabulary," (4) the method of teaching was superficial and at too low a level, and (5) the presentation was done poorly and in a dull manner. Some investigators have suggested a discussion-problem solving method instead of a lecture technique to alleviate some of the aforementioned problems (67, 88-91) and have cited the need for training programs for nutrition educators (77, 92).

#### Methods of Dietary Study

A number of techniques have been employed to obtain dietary data. Trulson and McCann (93) found that similar group means were obtained when a one week record was compared with another record after an interval of time, although individual variations were considerable. In comparing the food record, the questionnaire, the diet interview, and the weighing of food, they concluded that none of these four methods of evaluation was totally reliable in describing the characteristic intake of the subject.

Huenemann and Turner (94) found that diet histories obtained by the interview method had little quantitative value. Consequently, the dependability of such data used in research programs involving small samples would be extremely uncertain. Young et al. (95) reported that the dietary history gave distinctly larger values than the 7-day record for all population groups studied. They found it most difficult to accurately predict the individual intake estimated by a 7-day record from the dietary history. In another study, Young et al. (96) compared the uses of the dietary history and 24-hour recall and the 7-day record and the 24-hour recall. They concluded that the estimated intake for an individual obtained from each pair of methods were so varied that the two methods

could not be used interchangeably. Furthermore, although the diet history gave higher mean values than did 24-hour recall, the mean values of the 7-day record and 24-hour recall tended to give more similar estimates for most nutrients. They concluded that when a sample of approximately 50 or more persons are being studied and when a ten percent error can be tolerated, 24-hour recall can be substituted for the 7-day record provided the mean intakes are the bases of comparison. They (97) noted that these shorter record keeping periods are of advantage insofar as larger samples can be studied and the willingness of participants may be greater since less is required of them. Others (98, 99) also found that 24-hour recall yielded consistent dietary estimates, and that the weekday food intakes of girls on self chosen diets differed markedly from weekend intakes (100). Chaney and Ross (101) designed a scorecard by which the diet could be evaluated. According to this scorecard, a point system allotted the following maximal scores for each of the Basic 4 Food Groups: Group 1 (milk group), 25 points; Group 2 (meat group), 25 points; Group 3 (fruit and vegetable group), 30 points; and Group 4 (bread and cereal group), 20 points.

#### Validity of Survey Research

The process of survey research has been examined by a number of investigators. Young (102) noted the necessity of rapport between the interviewer and the respondent and a non-threatening environment to obtain reliable information. Church et al. (103) further investigated the effects of the interviewer-interviewee relationship on the accuracy of the information obtained, and concluded that comparable data could be gathered by interviewers who had similar training and backgrounds.

Wakefield (104) explained the importance of each stage of the interview relative to the gathering of unbiased data. To alleviate a feeling of anxiety on the part of the interviewee, the purpose of the interview should be established. She noted that more candid answers would be forthcoming if the participants were assured that all data would be kept confidential. She highlighted the following behavioral patterns on the part of the interviewer as sources of bias: "inappropriate appearance, taking liberty with questions, variations in the interviewer's probing techniques, and interviewer expectation that may cause him to interpret the responses in an improper manner." On the other hand, the participant may give inaccurate information because of "concealment, distortion, or a conforming bias; bias in memory; ignorance; and half-hearted engagement in the interview." The interaction between the interviewer and the participant may be the source of bias if the rapport is poor, the interview is too unstructured, or either of the two parties involved rejects the other.

## METHODS AND PROCEDURES

### Selection of the Subjects

The sample was originally intended to be 77 sophomore, junior, and senior girls who had elected a one year food management course at Lourdes High School, Oshkosh, Wisconsin, during the 1969-70 school year. Due to class absences, the largest number of students who completed all the forms used to collect the data (Appendices) was 59. The final sample, then, consisted of these 59 subjects.

### Method of Securing Data

Dietary Recall Scorecard. The 24-hour dietary recall was used at the beginning and at the end of the course to assess dietary intake (Appendix A). The adequacy of the individual diet was determined by evaluating the diet according to a point system (101) (Appendix B). The percentage of the minimum recommended amount of each of the Basic Four food groups and of the total diet fulfilled by each subject was calculated and each student was assigned a rank of low, medium or high. A low rank indicated that the student had met less than 1/3 of the requirements; a medium rank, 1/3-2/3 of the requirements; and a high rank, 2/3 or more of the requirements. The changes in the total diet intake during the course were studied and the influence of rank (at the beginning of the course) on these changes was also determined. The significance of the change in rank for each of the four food groups and for the total diet was determined.

Perceived Nutritional Content of Foods. At the beginning and at the end of the course, a check list was used to ascertain the subjects'

knowledge of nutrition (87) (Appendix C). The changes in knowledge were studied and the influence of rank, as determined by the total diet score at the beginning of the course, were determined. Using the total diet scores, the relationship between the changes in food intake and the changes in nutrition knowledge were studied and the influence of rank on this correlation was determined.

Individual and Family Acceptability of Selected Foods. A checklist of a number of selected foods allowed the subject to choose one or more of the following categories: served by the family, eat often, like, eat dislike, won't eat, or won't try. The foods on the checklist were chosen arbitrarily and included some foods that did not fit into the Basic Four food groups. A variety of methods of preparation of some foods also was included (Appendix D).

Food Likes and Dislikes. The students were asked to list their 10 favorite foods and 10 foods they disliked. The specification of the preparation of the foods was allowed.

Attitudinal Changes Toward Selected Unpopular Foods. Ten of the foods that appeared most frequently on the subjects' lists of unpopular or disliked foods were determined. The students were asked to put these foods into one of the following categories: eat it when offered: enjoy, eat it when offered: do not enjoy, do not eat, or have never tasted. They were then asked to select three foods they had checked do not enjoy, do not eat, or have never tasted, and, over a two week period, to use as many opportunities as possible to eat or taste these foods, either alone in small quantities, or in combination with foods they liked. They were then

to record the number of tasting trials they had and the attitude toward the food at the end of the trial period (87) (Appendix E).

Foods Associated with Various Age Groups. The students were asked to list the foods they associated with teen-age boys, babies, young girls (3-7), women (30-60), young boys (3-7), teen-age girls, college students, men (30-60), children (7-12), and men or women (over 60).

Foods Associated with Selected Occasions. Subjects were asked to plan menus for the following occasions: a teen-age pre-game party, a post prom party, a ladies' card party, a family dinner, a dinner prepared by the girl for a teen-age couple, a family holiday dinner, a luncheon prepared by the babysitter for children ages 5, 7, and 11, and a birthday party for grandparents.

Foods Eaten Away From Home. Subjects were asked at what times and for what reasons they ate away from home, where they ate, with whom, and how often. In addition, they were asked to report if the foods chosen by those with whom they were eating were similar to or different from their own food choices and to estimate the amount of money they spent in a weekly or monthly period (Appendix F).

Attitudes Toward Selected Foods Relative to Perceived Caloric Content. Selected foods from each of the Basic Four food groups and other foods not included in the Basic Four were judged by the subjects to be high in calories, moderate in calories, or low in calories (Appendix G). A comparison was made between the rank of the subject, determined by the percentage

of the Basic Four foods contained in the first 24-hour recall, and the perceived caloric value of the selected foods.

Foods Associated with Physical and Emotional States. Subjects were asked to list the foods they liked to eat when they felt down, happy, excited, angry, worried, relaxed, lonely, sick, cold, hot, or tired.



## RESULTS AND DISCUSSION

Dietary Recall Scorecard

The differences between the first and the second 24-hour recalls are shown in table 1 and figures 1 and 2. None of the changes for food intake were significant at the 10% level, except for the Group 4 changes.

Rank was based on the percentage of the minimum recommended amounts of each of the Basic Four food groups and of the total diet fulfilled by each subject on the first 24-hour recall. The ranks tended to remain the same for both 24-hour recalls for Group 1 ( $P < 0.01$ ), Group 2 ( $P < 0.10$ ), Group 3 ( $P < 0.05$ ), and the total diet ( $P < 0.05$ ). The results for Group 4, however, were completely different from those of the other groups since the major shifting was from higher to lower ranks.

Subjects whose intakes ranked low on the first 24-hour recall tended to make significantly ( $P < 0.01$ ) greater gains than those whose intakes ranked medium or high for Food Groups 1, 3, 4, and the total diet. With respect to Group 4, however, there was a significant difference ( $P < 0.01$ ) between the mean values of the low and the medium ranks and those of the medium and the high ranks; whereas, in Groups 1 and 3, the differences between the low and the medium ranks only were significant.

Rank did not relate strongly to the changes in intake in Group 2, and fewer subjects ranked high on the second trial than on the first; whereas, the opposite was true of the medium and the low ranks. The difference between the low and the medium ranks was not significant at the 10% level, but both the low and the medium ranks were significantly ( $P < 0.01$ ) above the high rank with regard to the differences in the intake scores.

TABLE I

Percent differences between first and second 24-hour recall for each  
of the Basic Four food groups and the total diet

Rank	Group 1		Group 2		Group 3		Group 4		Total diet	
	recall 1	recall 2	recall 1	recall 2	recall 1	recall 2	recall 1	recall 2	recall 1	recall 2
Low	47	49	8	8	23	25	19	44	14	23
Medium	34	28	33	49	52	46	23	25	58	58
High	11	23	59	43	25	29	58	31	29	19

**THIS BOOK  
CONTAINS  
NUMEROUS PAGES  
WITH DIAGRAMS  
THAT ARE CROOKED  
COMPARED TO THE  
REST OF THE  
INFORMATION ON  
THE PAGE.**

**THIS IS AS  
RECEIVED FROM  
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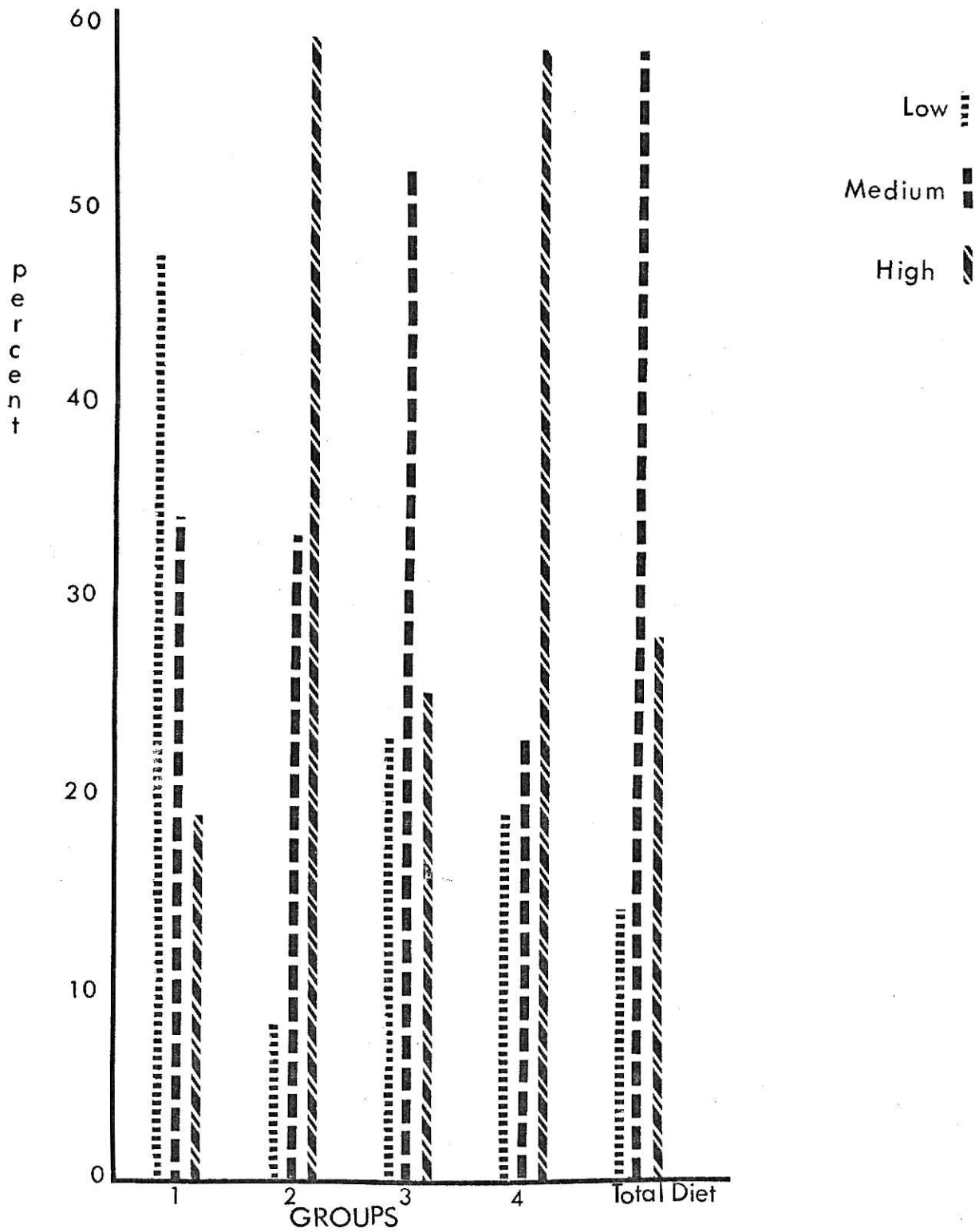


Fig. 1 Mean scores for first 24-hour recall of all subjects according to percent of intake of each of the Basic Four food groups and the total diet.

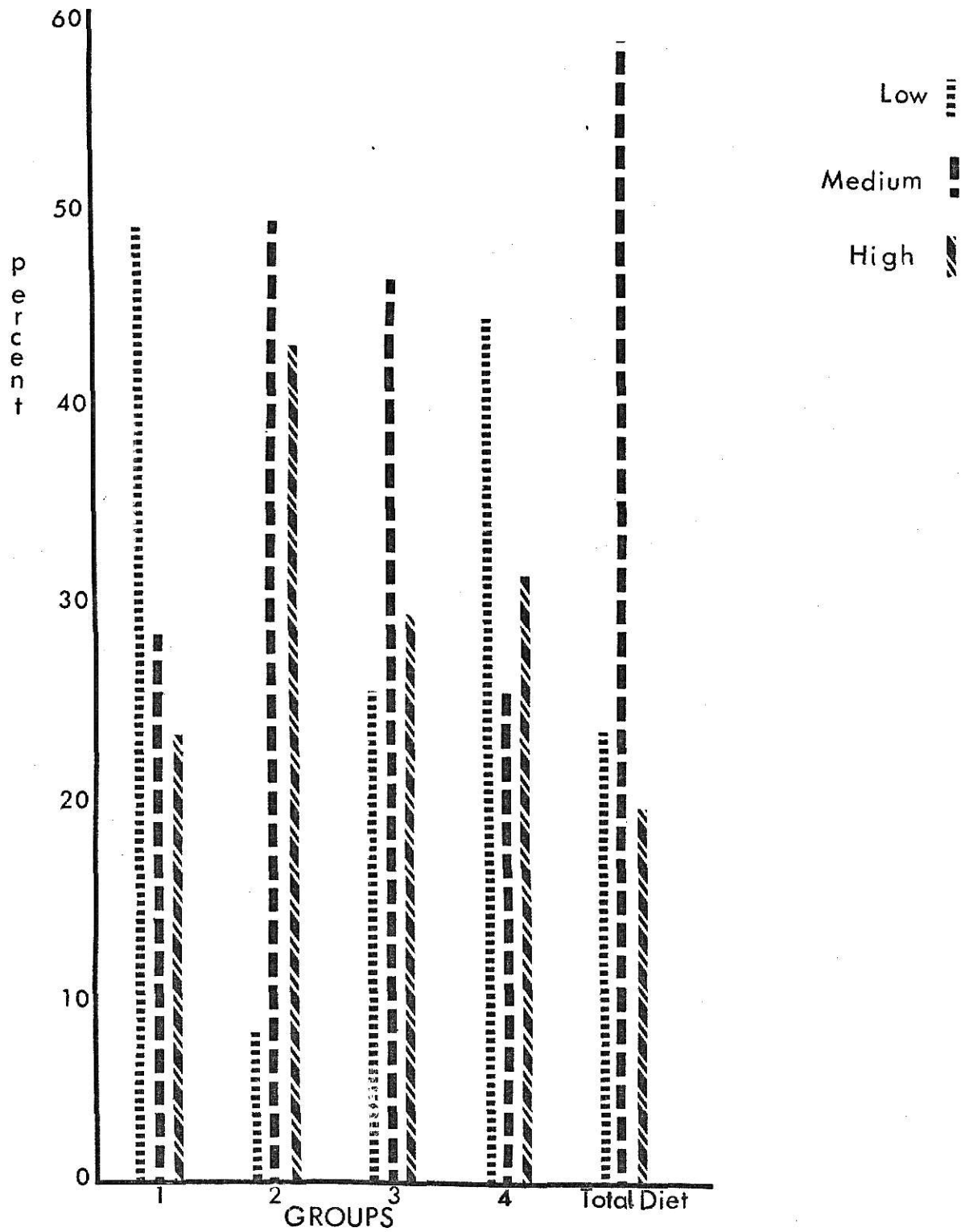


Fig. 2 Mean scores for second 24-hour recall of all subjects according to percent of intake of each of the Basic Four food groups and the total diet.

However, the mean gain in the medium rank was significant only at the 10% level.

#### Perceived Nutritional Content of Food

The mean grades for each rank on the nutrition knowledge tests 1 and 2 are shown in table 2.

TABLE 2  
Mean grades in nutrition knowledge tests  
1 and 2 according to rank

Rank	Test 1, %	Test 2, %
Low	71.1	73.9
Medium	73.1	74.9
High	71.2	74.5

Although the differences in nutrition knowledge were not significant at the 5% level, they were significantly different at the 10% level. Rank, based on the total diet scores, was unrelated to the changes in the knowledge scores.

The correlation coefficients for change in intake and change in knowledge were the same, but they were also near zero, and therefore, not significant ( $r = -0.137$ ).

#### Individual and Family Acceptability of Selected Foods

The meat-poultry-fish food item served most often was fish; however, the most popular food in this class was beef steak; whereas, lamb was the least popular meat product. The preferred method of preparation of potatoes was baked, although French fries were served as often. Although

fried eggs were served by as many families as were scrambled eggs, scrambled eggs were served more often and were the preferred preparation. Pies and cookies ranked highest as the favorite desserts. Generally, subjects were more apt to try and to like desserts than any other class of foods presented on the checklist. Of all the foods studied, fish was listed as being served most often; pie and cookies, most liked; poached eggs, most disliked; and poached eggs and lamb, the least likely to be tried (table 3).

#### Food Likes and Dislikes

Data on food likes and dislikes are shown in table 4. The 10 most popular and the 10 least popular food items are checked (x) in order of frequency of choice as to popularity.

#### Attitudinal Changes Toward Selected Unpopular Foods

The 10 most unpopular foods reported by the class are included in table 5. The students were asked to rate the foods as enjoyed, didn't enjoy, didn't eat, and never tasted. The percent of responses are recorded in table 5.

They were asked to try three of the foods they had rated don't enjoy, don't eat, or never tasted during a two week trial period, and to report the number of trials as well as whether they enjoyed any of the foods by the end of the two week trial period. The results of the two week trials are shown in figure 3.

Brussel sprouts and asparagus were tried by the greatest number of subjects during the trial period; and 10% (6) of the subjects reported that they enjoyed asparagus at the end of the trial period, whereas only 8% (5)

TABLE 3

Individual and family acceptability of selected foods

Food item	Served	Often	Like	Eat	Dislike	Won't eat	Won't try
	Percent						
Roast pork	92	51	71	10	12	7	3
Beef steak	100	71	85	7	7	2	0
Roast beef	100	78	73	8	3	3	0
Lamb	31	14	7	3	20	17	14
Chicken	98	81	78	7	3	2	2
Turkey	95	57	75	7	2	3	2
Fish	88	93	78	7	5	2	0
Potatoes							
Baked	98	78	75	8	5	2	0
Fried	73	69	73	3	7	3	2
Creamed	32	19	22	3	22	7	10
French fried	92	78	71	0	2	0	0
Boiled	75	54	54	7	14	3	0
Escalloped	85	51	63	8	12	7	3
Eggs							
Fried	95	54	63	7	19	7	2
Scrambled	95	59	69	14	10	5	2
Eggnog	53	27	32	14	19	10	8
Omelet	46	25	24	0	25	19	10
Poached	53	25	20	5	37	17	14
Hard and soft cooked	83	44	51	7	24	12	7



TABLE 3 (concluded)

Food item	Served	Often	Like	Eat	Dislike	Won't eat	Won't try
	Percent						
Pie	100	76	90	2	3	0	0
Cake	100	73	75	0	2	2	0
Cookies	97	81	90	2	2	0	0
Pudding	88	66	85	3	3	0	0
Vegetables	98	76	81	0	8	3	3
Fruit	98	81	85	2	3	0	0
Salad	98	71	81	2	5	2	3
Soup	95	59	80	8	7	5	3
Sandwiches	86	64	83	2	5	2	2

TABLE 4  
Food likes and dislikes

Food item	Popular	Unpopular	Frequency of choice	
			%	Number
Pizza	x		66	39
French fries	x		53	31
Beef steak	x		51	30
Fruit	x		48	28
Chicken	x		42	25
Hamburger	x		42	25
Sweets and desserts	x		37	22
Fish	x		36	21
Snack foods <sup>1</sup>	x		29	17
Lobster	x		29	17
Liver		x	63	37
Peas		x	32	19
Eggs		x	31	18
Asparagus		x	20	12
Beets		x	19	11
Beans		x	19	11
Cooked carrots		x	17	10
Milk		x	14	8
Cooked cereal		x	10	6
Brussel sprouts		x	10	6

<sup>1</sup>Items such as potato chips, popcorn, peanuts, corn chips.

TABLE 5  
Attitudes toward selected unpopular foods

Food item	Enjoy, %	Don't enjoy, %	Don't eat, %	Never tasted, %
Liver	31	20	39	10
Peas	67	17	14	2
Eggs	74	12	14	0
Asparagus	32	20	28	20
Cooked carrots	61	16	18	5
Beans	64	8	20	8
Beets	39	17	25	19
Cooked cereal	56	16	25	3
Milk	81	12	7	0
Brussel sprouts	32	10	17	41

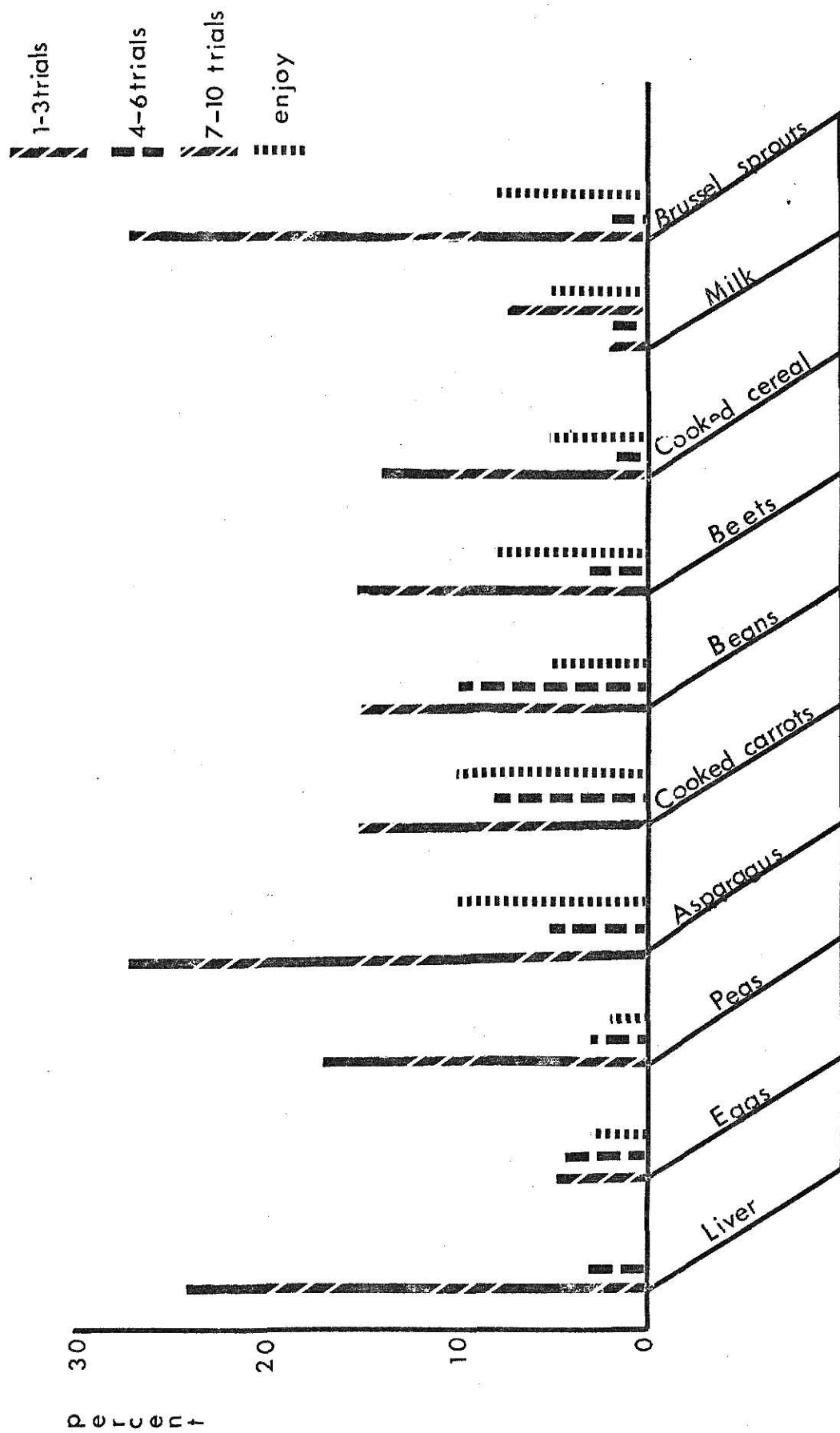


Fig. 3 Percent of students who tried and enjoyed unpopular foods.

reported liking Brussel sprouts. No one reported enjoying liver at the end of the trial period, although some subjects reported liking every other food listed (figure 3).

#### Foods Associated with Various Age Groups

Sweets and desserts were the only food items associated with every age group. Candy, specifically, was associated with girls (3-7), boys (3-7), and children (7-12) by 53%, 36%, and 15% of the subjects, respectively. This was higher than for any other age group.

Certain trends that have been pointed out by other researchers (51, 57) also appeared; namely, that meat is a masculine food and that salads are a feminine food. Vegetable consumption was associated with adults as opposed to children and teens. Milk was associated with babies more so than with any other age group, and the association became consistently less as the ages rose, except in the case of teen-age boys. The foods most often associated with teens are shown in Table 6.

#### Foods Associated with Selected Occasions

Similar to foods associated with various age groups, sweets and desserts appeared on each of the eight menus for the selected occasions. As would be expected, many of the favorite foods of teens as well as those foods associated with teens appeared on the menus planned for a teen-age pre-game party, a post prom party, and a dinner for a teen-age couple. There were a number of evidences of traditional foods for various occasions; namely, finger sandwiches and punch for formal occasions (post prom party), fowl for a holiday dinner, and cake and ice cream for a birthday

TABLE 6  
Foods associated with teen-age groups

Food item	Teen-age girls, %	Teen-age boys, %	College students, %
Hamburgers	61	64	69
Soda	54	39	25
French fries	44	36	34
Pizza	53	36	37
Snack foods <sup>1</sup>	36	32	10
Hot dogs	10	19	5
Milk	5	19	3
Beer	0	15	48
Malts	5	10	10
Sweets and desserts	15	12	3

<sup>1</sup>Items such as potato chips, popcorn, peanuts, corn chips.

party. Occasions that seemed suited to fit the traditional meal pattern were apt to contain foods from each of the Basic Four food groups (table 7).

#### Foods Eaten Away From Home

Of those subjects who reported eating away from home, 21 (36%) said that most of the food eaten away from home was eaten at drive-in type restaurants; whereas, 11 (19%) said they ate at sit-down restaurants and 7 (12%) said the only time they ate away from home was when they ate in the school cafeteria. Five girls (8%) cited dining at a friend's home as the most typical example of eating away from home.

TABLE 7  
Foods associated with selected occasions

Occasion	Food item, %										
	Milk	Meat	Fowl	Salad	Potatoes	Other vegetables	Sweets	Ice cream	Rolls and butter	Coffee	Relishes
Dinner											
Teen-age couple	58	67	10	54	49	42	42				42
Family	80	71	25	46	88	85	64				64
Holiday, family	69	19	81	63	86	73	64				64
Grandparents, birthday	56	64	17	59	73	56	81				81
Dinner											
Ice cream											
Rolls and butter											
Coffee											
Relishes											
Teen-age couple	36		24		0						0
Family	0		29		54						0
Family, holiday	0		34		61						46
Grandparents, birthday	54		0		76						0
Luncheon for children											
Milk	93		59	53	32	27	22				
Sandwiches											
Sweets											
Soup											
Snack foods <sup>2</sup>											
Hot dogs											
Luncheon for children											
Relishes											
Ice cream											
Fruit											
Luncheon for children											
Snack foods	20		19	19							
Soda											
Sweets											
Relishes											
Sloppy Joes											
Teen-age parties											
Pre-game	33		73	66			48				
Post prom	63		39	31			0				

TABLE 7 (concluded)

Occasion	Food item, %						
	Milk	Hamburgers	Jello	Hot dogs	Punch	Finger sandwiches	Finger sandwiches
Teen-age parties							
Pre-game	31	31	29	29	0	0	0
Post prom	0	0	0	0	49	44	44
	Relishes		Salads				
Teen-age parties							
Pre-game	0						
Post prom	24						
	Coffee		Sweets		Finger sandwiches		Salads
Ladies' card party	100	78	32	31	31	19	19
	Rolls and butter		Snack foods				
Ladies' card party	17						17

<sup>1</sup> Birthday cake.

<sup>2</sup> Items such as potato chips, popcorn, peanuts, corn chips.



Eighteen (31%) of the subjects who did eat away from home reported that this was for supper; 14 (24%), during an evening activity, and 7 (12%) for hot lunch at school. Girl friends were most often cited as those with whom the subjects ate (49%), followed by parents and family (17%), a mixed group (8%), and dates (5%). The importance of sociability and the peer group, and, to a lesser degree, time was evidenced by the fact that 63% of the subjects stated being out with friends or family as the reasons for eating out and 19% cited lack of time to go home as the reason. The frequency of eating away from home is shown in table 8.

TABLE 8  
Frequency of eating away from home

Frequency	%	Number
1-2 times every 2 months	22	13
1-3 times weekly	20	12
5-7 times weekly	19	11
1-2 times monthly	10	6
Weekends	5	3
3-4 times monthly	5	3
3-5 times weekly	3	1

Those foods most often selected when eating with peers were hamburgers (31%), French fries (36%), and soda (42%). Unanimously, the subjects tended to eat the same thing as eaten by persons with whom they ate. The most common deviation from such foods was the substitution of fish for hamburgers, although this substitution was reported by only 5% of the

subjects. In most cases, the amount of money spent by the subjects was \$0.50 - \$1.00 for hamburger, French fries, and soda; however, if fish was substituted for hamburger, the cost reported was over \$3.00.

#### Attitudes Toward Selected Foods Relative to Perceived Caloric Content

The attitudinal comparisons of the three ranks are shown in table 9. In general, it seemed that rank was not an influential factor. The least defined attitudinal pattern occurred in the judging of the Group 4 foods. Disregarding the rank of the subject, the foods perceived as most fattening and as least fattening are shown in table 10.

Since those foods perceived as most fattening are high in caloric content, and since many of them are included in the list of favorite foods (table 4), these data indicate the need for education in the selection of foods relative to the prevention of obesity.

#### Foods Associated with Physical and Emotional States

Of those emotional states that could be classified as negative; namely, down, angry, worried, and lonely, the most common response was that no food was desired. Only loneliness prompted the desire for food; i.e., snack foods; however, the second and third most frequent responses in this category were "no preference stated" and "anything," respectively. These same two responses, in the same order, were also the second and third items listed under angry and worried. Fruit was listed as a common response for down, angry, and lonely (table 11).

The positive emotional states; i.e., happy and relaxed, tended to elicit somewhat similar responses (table 11). Pizza was cited by about the same number of subjects in both cases; however, snack foods were

TABLE 9

Attitudes toward selected foods relative to perceived caloric content

Food item	Low rank, % <sup>1</sup>			Medium rank, %			High rank, %		
	Calories			Calories			Calories		
	high	moderate	low	high	moderate	low	high	moderate	low
Group 1									
Milk	7	56	37	5	65	30	0	75	25
Cheese	0	67	33	25	60	15	8	67	25
Ice cream	74	22	4	60	30	10	58	34	8
Group 2									
Meat	8	51	41	10	45	45	0	58	42
Eggs	0	22	78	0	50	50	0	50	50
Hamburger	8	59	33	5	75	20	17	83	0
Fish	0	48	52	5	55	40	8	50	42
Chicken	3	67	30	5	40	55	17	75	8
Group 3									
Potatoes	48	44	8	45	35	20	58	33	8
Fruit	0	19	81	5	0	95	0	25	75
Celery	4	4	92	0	5	95	0	0	100
Vegetables, creamed	26	41	33	25	50	25	33	50	17
Vegetables, plain	4	37	59	10	35	55	0	25	75
Lettuce	0	4	96	5	5	90	0	17	83
Group 4									
Noodles	33	30	37	40	45	15	66	17	17
Bread	48	44	8	35	50	15	25	75	0
Cereal	33	37	30	0	60	40	17	58	25

<sup>1</sup>Subjects' rank on nutrient intake (first 24-hour recall).

TABLE 10

## Foods perceived as most and least fattening

Food item	Most	Least	Frequency of choice	
			%	Number
Snack foods <sup>1</sup>	x		83	49
Pizza	x		75	44
French fries	x		73	43
Butter	x		73	43
Ice cream	x		64	38
Sweets and desserts	x		61	36
Sauces and gravies	x		66	39
Potatoes	x		51	30
Soda	x		48	28
Olives	x		44	26
Fruits		x	78	46
Jello		x	66	39
Fruit salad		x	64	38
Vegetable salad		x	61	36
Vegetables		x	61	36
Eggs		x	58	34
Fish		x	44	26

<sup>1</sup>Items such as potato chips, popcorn, peanuts, corn chips.

TABLE 11

Foods associated with physical and emotional states

State	Food item, %					
	Nothing	Anything	No preference	Crunchy foods	Snack foods <sup>1</sup>	
Down	22	0	0	10		10
Angry	17	12	19	0		0
Worried	38	9	13	0		0
Lonely	0	12	16	0		17
Excited	17	0	12	0		9
Happy	0	16	0	0		10
Relaxed	0	0	0	0		38
Hot	0	0	0	0		0
Cold	0	0	0	0		0
Sick	0	0	0	0		0
Tired	19	0	9	0		0
	Fruit	Cookies	Pizza	Ice cream	Cake	Hamburger
Down	10	10	0	0	0	0
Angry	5	0	0	0	0	0
Worried	0	0	0	0	0	0
Lonely	9	0	0	0	0	0
Excited	0	0	10	0	0	12
Happy	0	0	14	14	12	10
Relaxed	0	0	13	0	0	0
Hot	0	0	0	34	0	0
Cold	0	0	0	0	0	0
Sick	0	0	0	9	0	0
Tired	9	8	0	0	0	0

<sup>1</sup>Food items such as potato chips, popcorn, peanuts, corn chips.

TABLE 11 (concluded)

State	Food item, %					
	Soda	Milk	Soup	French fries	Sandwiches	Candy
Down	0	0	0	0	0	0
Angry	0	0	0	0	0	4
Worried	0	0	0	0	0	0
Lonely	0	0	0	0	0	0
Excited	16	0	0	10	10	0
Happy	10	0	0	0	0	0
Relaxed	17	0	0	0	0	0
Hot	32	0	0	0	0	0
Cold	0	0	40	0	0	0
Sick	0	0	45	0	0	0
Tired	8	8	8	0	0	0
	Cold drink	Cocoa	7-up	Toast	Crackers	
Down	0	0	0	0	0	0
Angry	0	0	0	0	0	0
Worried	0	0	0	0	0	0
Lonely	0	0	0	0	0	0
Excited	0	0	0	0	0	0
Happy	0	0	0	0	0	0
Relaxed	0	0	0	0	0	0
Hot	52	0	0	0	0	0
Cold	0	68	0	0	0	0
Sick	0	0	27	10	9	0
Tired	0	0	0	0	0	0

associated with relaxation by 38% of the subjects, but were mentioned by only 10% of the subjects as being associated with a state of happiness.

Since the state of excitement has both positive and negative aspects or connotations, it would be expected that foods associated with both kinds of emotional states would be associated with it. Like most of the other negative emotional states, this state contained such items as nothing (17%) and no preference stated (12%); but it also contained soda (16%) and pizza (14%).

Generally, the physical conditions of hot and cold elicited responses of cold foods and hot foods, respectively. The specific foods associated with these and other physical states are shown in table 11.

## SUMMARY

The composite changes in total food intake before and after the course were not significant, although the subjects who ranked low on the first 24-hour recall made significantly greater gains than those who ranked medium or high. The changes in knowledge before and after the course were not significant at the 5% level, but were significantly different at the 10% level. Rank was unrelated to the changes in the knowledge scores.

Of all the foods on the checklist for individual and family acceptability, fish was listed as being served most often; pie and cookies, most liked; poached eggs, most disliked; and poached eggs and lamb, the least likely to be tried. Liver, the most commonly named unpopular food, was not enjoyed by any of the subjects who tried it during a two week trial period, although every other unpopular food was marked "enjoy" by some of the subjects at the end of the trial period.

Sweets and desserts were associated with every age group cited. Meat was most often associated with men; salads, with women. Vegetable consumption was associated with adults as opposed to children and teens. Milk was associated with babies more often than with any other age group, and the association became consistently less as the ages rose, except for teen-age boys.

Many of the favorite foods of teens as well as those foods associated with teens were cited on the menus planned for a teen-age pre-game party, a post prom party, and a dinner for a teen-age couple. Occasions suited to fit the traditional meal pattern were apt to contain foods from each of the



four food groups. The influence of traditional foods for various occasions was evidenced by the fact that the subjects tended to associate fowl with holiday meals and cake and ice cream with a birthday party.

Most subjects ate at drive-in restaurants when eating away from home; had this food for supper or during an evening activity, and ate with girl friends. The two most frequently cited reasons for eating away from home were "out with family or friends" and "not enough time to go home to eat." Hamburger, French fries, and soda were the most common foods eaten away from home.

Certain emotional states; namely, down, angry, worried, and excited, prompted no desire for food, while other choices were "anything" and "no preference." Snack foods, soda, and fruit appeared on a number of lists. Physical states of hot and cold elicited responses of cold foods and hot foods, respectively.

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APPENDICES

## APPENDIX A

List all the foods you have eaten in the past 24 hours. As accurately as possible, tell how much of each item you ate.

TIME	FOOD	AMOUNT
Breakfast		
Between breakfast and lunch		
Lunch		
Between lunch and dinner		
Dinner		
Between dinner and breakfast		

APPENDIX B<sup>1</sup>

## Basic Four Scorecard

Food group	Credits	Score
Milk	4 cups	25
	3 cups	18
	2 cups	12
	1 cup	6
Meat	2 servings including at least 1 of meat, poultry or fish	25
	1 serving of any of the above	15
	1 serving of another food in the meat group	10
Fruit-vegetable	1 citrus serving	10
	1 serving dark green or deep yellow	10
	2 servings of any other fruit or vegetable	10
Bread and cereal	4 servings	20
	3 servings	15
	2 servings	10
	1 serving	5
Totals		100

<sup>1</sup> Adapted from: Chaney, M. S., and M. L. Ross 1971 In: Nutrition. Houghton Mifflin Co., Boston, Massachusetts. p. 18.

## APPENDIX B (concluded)

## Food Equivalents

Group 1: Maximum = 25 points

1 cup = 8 ounces

1 cup cube cheddar cheese =  $\frac{2}{3}$  cup milk

$\frac{1}{2}$  cup cottage cheese =  $\frac{1}{3}$  cup milk

2 tablespoons cream cheese = 1 tablespoon milk

$\frac{1}{2}$  cup ice cream =  $\frac{1}{4}$  cup milk

Group 2: Maximum = 25 points

1 serving = 2-3 ounces lean cooked meat, poultry, fish, all without bone

1 serving = 2 eggs

1 serving = 1 cup cooked dry beans, dry peas, or lentils

1 serving = 4 tablespoons peanut butter

Group 3: Maximum = 30 points

1 serving =  $\frac{1}{2}$  cup vegetable or fruit, or an ordinary size serving

Group 4: Maximum = 20 points

1 serving = 1 slice bread

1 serving = 1 ounce ready to eat cereal

1 serving =  $\frac{1}{2}$  to  $\frac{3}{4}$  cup cooked cereal, rice, macaroni, or cornmeal

APPENDIX C<sup>1</sup>

In order to plan meals, we need to know what foods are especially good sources of the food nutrients. Below is a chart of foods and nutrients. Check (x) in the blank for the nutrients which are contained in each of these foods in important amounts in the quantities used.

Food	Carbo- hydrates	Proteins	Minerals (1 or more)	Vitamins (1 or more)	None of these
Milk					
Butter					
Eggs					
Meat					
Citrus fruit					
Vegetables, yellow					
Candy					
Salad oil					

<sup>1</sup> Adapted from: Eppright, E., M. Pattison and H. Barbour 1963 In: Teaching Nutrition. Iowa State University Press, Ames, Iowa. p. 202.

## APPENDIX D

## Individual and family acceptability of selected foods

Foods	Served by family	Eat often	Like	Eat	Dislike	Won't eat	Won't try
Roast pork							
Beef steak							
Chicken							
Turkey							
Roast beef							
Lamb							
Fish							
Potatoes:							
Baked							
Fried							
Creamed							
French fried							
Boiled							
Escalloped							
Eggs:							
Fried							
Scrambled							
Eggnog							
Omelet							
Poached							
Hard or soft cooked							
Salads							
Soups							
Sweets and desserts							
Fruits							
Vegetables							

## APPENDIX E

## Foods eaten away from home

Food item	Where eaten	When eaten	With whom	What other person ate	Cost	Reasons	How often
		Coming to school____				No one at home to eat with____	
		After school____				No one at home to prepare food____	
		For supper____				Not enough time to go home____	
		At work____				Was out with family or friends____	
		After work____				Didn't like what was served at home____	
		At school activity____				Other reasons (specify)____	
		Evening activity____					
		Hot lunch____					
		Other lunch____					
		Other (describe)____					



## APPENDIX F

Attitudes toward selected foods relative to perceived caloric content

Food item	Calories		
	High	Moderate	Low
Meat			
Potatoes			
Fruits			
Cheese			
Noodles, spaghetti, etc.			
Celery			
Eggs			
Milk			
Pizza			
Jello			
Hamburger			
Bread			
Fish			
Cereals			
French fries			
Chicken			
Vegetables, creamed			
Vegetables, plain			
Sweets and desserts			
Salad			
Soup			
Lettuce			
Soda			
Potato chips and other similar snack foods			
Sauces and gravies			
Olives			
Butter			

APPENDIX G<sup>1</sup>

## Attitudinal changes toward selected unpopular foods

Below is a list of foods to use in checking how well you are progressing toward eating a variety of foods. Check (x) in the column which best describes where you are now.

Food item	Eat it when offered		Don't eat	Never tasted
	Enjoy	Don't enjoy		
Cooked carrots				
Cooked cereal				
Liver				
Asparagus				
Beans				
Beets				
Peas				
Brussel sprouts				
Eggs				
Milk				

<sup>1</sup> Adapted from: Eppright, E., M. Pattison and H. Barbour 1963 In: Teaching Nutrition. Iowa State University Press, Ames, Iowa. pp. 211-212.



FACTORS AFFECTING FOOD CHOICES OF TEEN-AGE GIRLS

by

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B. S., Mount Mary College, 1968

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AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

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Fifty-nine out of a possible 77 sophomore, junior, and senior girls who had elected a one year food management course at Lourdes High School, Oshkosh, Wisconsin during the 1969-70 school year were interviewed. Data relative to dietary intake and nutritional knowledge before and after the course, individual and family acceptability of selected foods, food likes and dislikes, attitudinal changes toward selected unpopular foods, foods associated with various age groups and various occasions, foods eaten away from home, attitudes toward selected foods relative to perceived caloric content, and foods associated with selected physical and emotional states was obtained for each subject.

The composite changes in total food intake before and after the course were not significant, although the subjects who ranked low on the first 24-hour recall made significantly greater gains than those who ranked medium or high. The changes in knowledge before and after the course were not significant at the 5% level, but were significantly different at the 10% level. Rank was unrelated to the changes in the knowledge scores.

Of all the foods on the checklist for individual and family acceptability, fish was listed as being served most often; pie and cookies, most liked; poached eggs, most disliked; and poached eggs and lamb, the least likely to be tried. Liver, the most commonly named unpopular food, was not enjoyed by any of the subjects who tried it during a two week trial period, although every other unpopular food was marked "enjoy" by some of the subjects at the end of the trial period.

Sweets and desserts were associated with every age group cited. Meat was most often associated with men; salads, with women. Vegetable consumption was associated with adults as opposed to children and teens. Milk was

associated with babies more often than with any other age group, and the association became consistently less as the ages rose, except for teen-age boys.

Many of the favorite foods of teens as well as those foods associated with teens were cited on the menus planned for a teen-age pre-game party, a post prom party, and a dinner for a teen-age couple. Occasions suited to fit the traditional meal pattern were apt to contain foods from each of the four food groups. The influence of traditional foods for various occasions was evidenced by the fact that the subjects tended to associate fowl with holiday meals and cake and ice cream with a birthday party.

Most subjects ate at drive-in restaurants when eating away from home, had this food for supper or during an evening activity, and ate with girl friends. The two most frequently cited reasons for eating away from home were "out with family or friends" and "not enough time to go home to eat." Hamburger, French fries, and soda were the most common foods eaten away from home.

Certain emotional states prompted no desire for food, while other choices were "anything" and "no preference." Snack foods, soda, and fruit appeared on a number of lists. Physical states of hot and cold elicited responses of cold foods and hot foods, respectively.