

FACTORS AFFECTING FOOD PREFERENCES, HABITS AND INTAKE

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FOOD PREFERENCES

Food preferences may be defined as the particular foods an individual likes or dislikes (1). They may be affected by many factors including: personal environment, culture, religion, region, sex and food characteristics. Numerous studies have been done to ascertain the food preferences of college students.

It has been found that preference for a new food was affected by prior exposure to unfavorable opinions, unfavorable personal expectation, perception of peer attitudes, hunger and fatigue at time of initial use, and food aversions held presently or during childhood (2). Lee (3) felt that differences in culture influenced preferences for food. Religious injunction, the prestige value of the food and palatability (defined as the appearance, texture, smell, color and flavor of a food) are all factors in determining preference (1).

Studies of preferences in the rural southeast have shown that foods which are unusual, urban, store-bought, processed, refined, light-colored, canned and changed in appearance are held in particular regard (6). The Committee of Food Habits (7) reported that in the southeast, personal liking for food and food's agreeing with the individual are more strongly emphasized, whereas in California there is more emphasis on health. Hall and Hall (8), studying regional differences of students at 3 universities in dissimilar geographic areas, commented on the similarities of preference. Shuck (9) noted that students from town homes had higher food acceptability ratings than those

from farm homes.

Sex and age differences have been studied (4,5,8). Hall and Hall (8) found that women have more food aversions than men, but women are familiar with more foods than men. Schuck (9) found that a higher proportion of men than women indicated a willingness to eat most vegetables and meats frequently.

Certain characteristics of food lend to its preference or aversion. The most often cited reasons for disliking a given food were its poor taste, texture, smell, general appearance, method of preparation, and unfamiliarity (8,10). Repetition of eating food overcomes food dislikes, according to the Committee of Food Habits (7); however, Siegal (11) found that "when a food item is repeatedly eaten, its palatability rating declines." Pilgrim (12) did a study using 4 daily menus for 6 weeks in which food preferences were expressed on a rating scale. He found that most canned meats declined significantly and that 2/3 of the canned vegetables declined. Dry cereals rose in preference, while fruits, desserts, and staples showed little change. This would agree with Siegal (8) who found that various items of a repetitive diet differ in the decline of preference rating. Vegetables and organ meats were disliked as groups. Cereals, as a group, had very limited acceptability. Butter-milk ranked high as a dislike despite the fact that other dairy products such as whole milk and butter had high acceptability. It was found that foods which were disliked were in the seldom- or never-eaten group (8,9,10).

The characteristics preferred in foods were color, crisp crunchy texture, well-done vegetables and fried foods (10). Fruits had high preference ratings. Schuck (9) found a higher proportion of women than men was willing to eat fruits often. Fruits in various forms that were liked and enjoyed by 75% or more of the women studied included: oranges, grapefruit, lemons, pineapple salad, pineapple juice, applesauce, baked apples, raw apples and bananas. Similar fruit preferences were noted for college students in Hawaii (13). Schuck (9) found that the best liked fruits in descending order were: strawberries, apples, peaches, pears and grapes. Bananas, oranges, cherries and plums also were well liked. All of the Hawaiian students listed apples, oranges, orange juice and strawberries as "like or will eat" on the questionnaire. Five to 10% of the South Dakota women studied were unwilling to eat apricots, cantaloupe and rhubarb. Fewer than 70% of the Hawaiian students liked cantaloupe.

The proportion of persons taking a serving of food and the average amount of food consumed in certain situations can be ascertained by knowing food preferences (12). Therefore, it is important to know the food preferences of the college students in order that: 1) dietitians may plan more readily acceptable meals and 2) nutrition education can be structured to help the student to combine a greater number of food likes into well-balanced, adequate diets.

FOOD HABITS AND FOOD INTAKE

Food habits are the patterns of eating adopted by individuals and groups based upon their past experience and various cultural and socioeconomic factors. Different food habits may be practiced with different age groups and at different meals. Thus we are studying how individuals and groups are consuming items or groups of food during a specific time and at a specific place. Consumption would include the qualitative detail of the food pattern, what foods are eaten at what seasons, what days, for what meals, under what circumstances and in what combinations. Certain foods are regarded as appropriate only for certain social classes and certain occasions. Also the cultural equivalents as opposed to the nutritional equivalents have to be defined (6,7,14).

Traditional food patterns tend to be maintained, especially by older people and women (15) and local organizations (16). Differences in the availability of food, changes in the traditional taste for food, disruption of customary sanctions and shifts in social status often are involved in changing food habits (15) as well as ease of preparation and economic considerations (1,17). In certain cases food habits are changed by concern over obesity and/or health or nutrition education (1, 17,18,19,20).

In the United States it is noticed that for urban communities where change takes place faster, seasonal variations in diet are disappearing due to canned and frozen food, especially

for the upper classes (7). All classes show variations in their level of diet, weekdays and Sunday meals and extra routine and routine menus. Racial differences in diet follow the pattern of class differences, with Whites eating a greater variety and quantity than the Negroes, and the owners from both races eating more than the laborers.

Nutrient analysis of adolescent diets generally has shown them to be inadequate. Wharton (21) studied 421 Illinois students, ages 13 to 18, and found their diet low in calcium, iron, vitamin A, and ascorbic acid. The boys' diets were higher than the girls for protein, calcium, phosphorous, iron and riboflavin, whereas the girls consumed a greater proportion of calories, niacin and ascorbic acid. Hinton et al. (22) studied 12- to 14-year-old girls in Iowa and found similar inadequacies. Hampton et al. (23) found calcium and iron to be the "most neglected nutrients." Eppright et al. (24) found the diets of Iowa school children below the Recommended Dietary Allowances in calcium. Warnick and Zaehring (25) studied the diets of 274 teenagers, 15 and 16 years old. They found that 30% of the subjects had diets that furnished less than 1/2 of the Recommended Dietary Allowances. Edwards et al. (26) surveyed 6200 teenagers in North Carolina. They found that only 16% included 1 serving of green or yellow vegetables; only 35% had 1 serving of ascorbic acid-rich foods and only 66% had 2 or more servings from the milk group. However, Leverton (27) reevaluated many of the previous studies using the 1963 Recommended Dietary

Allowances, and felt that in many instances the teenager was better nourished than previously suspected. Researchers noted that teenagers who frequently ate between meals are more adequately nourished (21,22,23,28,29). Wharton (21) found that girls ate more snacks than boys and that in groups where snacks were 20% or more of the caloric intake, the diets were more adequate in all nutrients except vitamin A and ascorbic acid. The between-meal eating of high school students increased their intake of calories, protein, calcium and phosphorus (29). Subjects who ate less than 3 times a day had poorer diets, whereas those who ate frequently had "overall good diets" (23).

Breakfast or its lack has been a subject of much concern. It has been found that breakfast contributed 1/5 of the daily nutrient intake of high school students from Maine, New York, and Rhode Island (29). At the University of Washington, 42% of the women missed breakfast. Of those who came, only 36% chose cereal; 84% chose the breakfast entree; and 59% chose bread (30). Haseba and Brown (31) found that college students in Hawaii ate breakfast more often when it was easily available and involved little overt effort, no direct expenditure and no significant amount of time. Those who did not come were aware of the nutritional value of breakfast.

Lunch attendance at the University of Washington was fairly stable, and was the best attended meal with only 11% absent (30). Christakis et al. (32) found that children who ate lunch in school had significantly better diets than those

who ate at home or elsewhere. Morris and Bowers (33) noted that diets of women living in dormitories were consistently superior in quantity and quality to those living in boarding houses or apartments.

Dinner was the favorite meal of teenagers studied by Huenemann et al. (28). Nygreen (30) found that dinner was the most variable meal for the University of Washington coeds, especially on nights with social functions and dates, and that an average of 19% usually missed dinner.

Nygreen (30) studied the intake of women in residence halls and found that if 3 meals a day for the 7 days were eaten, the Recommended Dietary Allowances were met. However, she felt that the 42% who missed breakfast, and the 16% who refused breakfast fruits received far less than the calculated amount of ascorbic acid. Also, the 30% who did not drink milk received less riboflavin than was calculated. Morris and Bowers (33) found that dietary records of the 100 women studied at Utah State Agricultural College showed consistent deficiencies in phosphorous, iron, vitamin B and ascorbic acid. Fry (34) evaluated the diets of 144 women, ages 18 to 25, using 90% of the Recommended Dietary Allowances as a standard. On this basis, 84% of the calcium intakes, 83% of the iron intakes, 25% of the vitamin A intakes, 31% of the ascorbic acid intakes, 58% of the riboflavin intakes and 34% of the niacin intakes were below this level. Fry also concluded that early adolescent food habits are continued to post adolescence.

FACTORS AFFECTING FOOD INTAKE

Food intake is a complex subject affected by values, social class, previous experience, food classification and nutrition education. Lewin (35) found that "A system of values is the basis of some of the forces which determine decisions about food and bring about conflicts of varying intensities." McElroy and Taylor (36) studied adolescents' values in selecting food. The boys ranked health, money, sociability, enjoyment, independence and status as the order of importance in making decisions involving food choices. More inconsistency was noted in the areas of enjoyment, independence and sociability. Class differences in values also can be noted. In the high income group, health is the predominant value, with money and taste at a lower approximately equal level. In the middle income group, money is the predominant value with health considerably lower and taste a great deal lower. The low-income group also ranks money first; health is a much more distant consideration (35).

Brown (37) had 101 college students record their food habits and their basis for the preschool, grade school, high school and college years. Those factors which seemed to be the most important in the development of food habits were: parental influence (especially the mother), variety and appearance, parental policies concerning food served at meal time, place of residence, income of the family, size of the family, pressures of life, influence of peers, influence of eating situations beyond the home, living arrangements outside the home, the ease

with which meals can be secured, and the student's own income and schedule. Intake also is affected by weekday vs. weekend (38), sensitivity to odor and taste (39); housing (40); the hour of the day, the eating group, and the socioeconomic status (35); the state of health (41); and the degree of interest in health, variety and avoidance of monotony (42).

Established food habits tend to persist as regulators of food selection, whereas new habits tend to form in agreement with body needs, according to P. T. Young (43). He feels that feeding habits are organized on the basis of affective arousals such as palatability, or the after-effects of eating or of being deprived of nutritive substances. Camp and Eppright (44) noted that hunger is affected by nutritional, physiological and psychological conditions, and that a diet fortified with vitamin B₁ and low in bulk would be advantageous to the appetite. They also noted that an objective attitude towards food and well-regulated home conditions also were of great importance. Pumpian-Mindlin (45) also felt that the emotional attitudes of the family toward food are important.

Jelliffe (46) felt that food classifications were important because intake was directly affected by it. He classified food into five categories: 1) cultural superfoods, 2) prestige foods, 3) sympathetic magic foods, 4) body image foods and 5) physiologic group foods. Cussler and deGive (6) agreed with this viewpoint and listed foods people considered light and heavy, highly esteemed and less highly esteemed. Lewin (35) made the

point that certain food is characterized as "food for human beings" then as "food for us," and is further channeled down to "food for the husband" and "food for the children." The most typical "husband's food" is meat. In the Negro group studied, vegetables and desserts preceded meat as a "husband's food" (35). Jelliffe (46) pointed out the mental association many people have between rare meat and male athletic prowess. Whether the function of the dinner meal is to be filling, tasty, fussy, healthful or economical, meat is seen as a favorite food for all groups (35). Vegetables are usually ranked first as a "children's food" except for the Negro group which ranked desserts first and vegetables second. Salads are thought of as a food for dinner. The high income and middle income groups also used salad for lunch, whereas soups are more frequently mentioned by the lower income groups.

Nutrition education affects intake. However, Whitehead (20) cautioned that although "to some extent practice reflects knowledge of nutrition, but that knowledge alone does not insure good eating habits." Whitehead (47) did a study of Kansas City, Missouri school children and found that two years of nutrition education gave better results than one year, but that after two years much of the influence had dissipated. Wilson and Lamb (48) discovered that the largest group of participants who accepted false beliefs about food were college graduates. However, they also found that participants whose education had included home economics and nutrition did not accept the food

fallacies accepted by the other college graduates. Wilson and Esselbaugh (19) conducted an experiment in nutrition education. They taught 6 out of 10 families about foods and nutrition. They reported consistent improvement in food patterns and specific nutrient intake for the six "educated" families as compared with the four control families who received no educational help and whose intake showed very little improvement.

METHODS OF ASSESSING INTAKE

Many methods of assessing intake have evolved, depending on the study design. The 7-day food record is one of the most commonly used (23,28,29,24,34). Hinton et al. (22) used a combination of 7 days in the winter and 3 days in the summer to estimate seasonal variation of intake. Wharton (21) used 3-day records to evaluate the intakes of 421 subjects. Market research, factor analysis, attitude surveys, motivation studies and field observations also have been used (49). A. E. Schaeffer (50) preferred the use of the questionnaire for large surveys, although he suggested that other methods, such as analysis of food composites, also be used for greater accuracy. Whitehead (20) developed a point system for evaluating food habits which could be used by school teachers. Epstein et al. (51) used a modified 24-hour dietary history which was based on Burke's (52) dietary history which is actually an interview plus a food intake record. Christakis et al. (32) used the 24-hour recall method plus an interview. Food preferences affecting

intake may be obtained by a check list (8,10) or an action scale (53). Values affecting intake may be ranked (36,37). Groen (54) suggested estimating intake from a questionnaire and then using tables to arrive at a figure for basal metabolic calories which could then be subtracted from total intake. Maxfield and Konishi (55) used 7-day diaries plus pedometer readings to estimate the effect of physical activity on intake. Government statistics may be used to estimate consumption of a large population group (56,57).

Evaluation of the different dietary methods has been done to determine their reliability and validity in various study designs. Young et al. (58) collected 28-day records to test for weekly variation in intake. Leverton and Marsh (38) found a difference between week-day and weekend intake. Young et al. (59,60) evaluated the dietary history vs. the 7-day record, and the dietary history vs. the 7-day record vs. 24-hour recall. In both studies the dietary history gave increased intake. For the mean of a group, the 7-day record and the 24-hour recall tend to give approximately the same estimates and under certain circumstances may be used interchangeably. Campbell and Dodds (61) used the 24-hour recall method and found that it took longer to administer and older people forgot more of what they ate. Moore et al. (62) used graduated food models and found them helpful for interviewees in estimating size of portion and for couples to reach agreement on size of serving. Trulson (63,64) compared data from dietary interviews, 7-day records, 3 or

more 24-hour recalls, weighed diets and questionnaires. She found the 7-day record and the interview gave more similar information but that the differences in mean values of nutrients obtained by the 5 methods were not consistent. It was recommended that for practical purposes only 1 method should be used for any particular study. Thomas et al. (65), however, recommended using both 7-day records and 24-hour recall and cross checking. Stevens et al. (66) studied the 24-hour recall vs. dietary patterns and found the nutrient values obtained within 20% of each other. Van den Berg and Meyer (67) pointed out that obese women have a tendency to under-report their intake. Young et al. (68) reported that approximately 2/3 of the subjects estimate their food intake closely enough that the calculated nutrient value was within 20% of the measured intake. Hankin et al. (69) found much individual variability in intake. Eppright (70) collected dietary information from children and reported that the nutrient intake of girls is more variable than that of boys. They also indicated that nutrient intake seems more likely to be over-estimated than under-estimated. Huene-mann et al. (71) found that a quick "gross" method might be used to obtain simple data, but it was not as accurate as more refined tools. Eppright et al. (70) stated that any 1 combination of 3 days during the week may represent the week-day intake as accurately as another, but that weekend habits will differ. Chalmers et al. (72) in deciding how many and which days to use for a dietary record, concluded that a group could be characterized

by a 1-day record. Tinsley et al. (73) suggested a form for a 3-day diet history. Church et al. (74) found that different interviewers with similar background and training obtained comparable data. Browe et al. (75) listed the advantages of using a questionnaire and included: ease of administration, relatively low cost, minimum need for specially trained personnel and ease of application to large-scale surveys. Wellin (76) felt that "surveys are helped or hindered to the degree that cultural phenomena within the group studied are taken into account."

SELF CONCEPT AND BODY IMAGE

Self concept and body image are complex concepts based on many factors including: sex, race, body composition, age, mental attitude and personality. Huenemann et al. (77) found that teenagers were generally dissatisfied with their size and shape. The boys desired to gain weight and/or size, and the girls wished to lose weight and reduce certain measurements. Unrealistic views of their fatness or leanness, which differed considerably from the actual measurements, were held by many of the teenagers, especially the Caucasian girls. The Negro girls more accurately envisioned themselves. Racial differences in the concept of ideal body size and shape were noted. Dwyer et al. (78) reported that dieting behavior was related to perception of overweight as well as actual body weight, fatness and build. Many girls who did not need to reduce for health reasons

were trying to reduce for purposes of appearance. In this study, 15% of the girls surveyed were found to be obese by skinfold measurements. However, on the day surveyed, 30% of the girls were on diets and 60% reported having been on a diet some time previously. Stunkard and Mendelson (79) noted that a disturbance in body image occurs in some emotionally disturbed obese persons. In these persons, obesity usually occurred before adulthood, and these feelings of grotesqueness and loathsomeness may persist long after weight reduction is successful. Bruch (80) referred to these people as "thin fat people" and theorized about the "preferred weight" (81). She noted that interference with the "preferred weight" may result in a sense of discomfort and dissatisfaction. Adjustment to reality, emotional stability, conformity and good family relationships characterized the adolescent girls with good food habits studied by Hinton et al. (82,83). They also mentioned that poor psychologic adjustment adversely affects eating behavior and urged that children be helped to understand and accept themselves. Poor eating behavior was noted for girls in this study who were early maturing and above average in weight for their age. Approximately every other girl in the overweight-for-age group was concerned about her weight. Those who were under- and average-weight-for-age showed little concern.

Many researchers feel that there is a difference in the personality of the obese women. Suzek (84) stated that the majority of obese women studied showed a high degree of

narcissistic strength and interpersonal dominance. Young et al. (85) classified the obese women who came to weight control clinic into 3 groups: 1) those who appeared relatively stable, 2) those who gave repeated evidence of being insecure, tense or anxious and 3) those who appeared to have deeper emotional problems. Those in the first group had a high degree of success in weight reduction, whereas those in the second group were less successful and those in the third group consisted largely of failures. Stunkard and Mendelson (79), Bruch (80,81) and Young et al. (85) all mentioned the feelings of guilt and frustration that this third group meets in trying to change their body image.

Bullen et al. (86) compared the attitudes of obese and non-obese girls. They found that obese girls had no conception of the degree of their inactivity or that there might be a relationship between inactivity and overweight. The obese girls felt that they ate more than the non-obese girls and that this overeating was the cause of their obesity. Matthews (87) also studied obese and non-obese girls. In contrast, these obese girls did not feel that they ate more food than their friends. When asked to rank the foods they liked and the foods they ate most often, both groups ranked their preferences and consumption choices identically for their group. Both groups ranked meat first. The obese ranked vegetables, bread and dessert in that order, while the non-obese ranked milk, vegetables and fruits. Hampton et al. (23) reported that "obese" boys and girls tended

to eat something from the fruit and vegetable food group on fewer days than did the others. Beaudoin and Mayer (88), however, reported that the average intake of obese women does not contain a higher proportion of either carbohydrates or fat than does the normal weight control. Johnson et al. (89) reported that in the group of obese and non-obese girls studied, the obese had a significantly lower caloric intake than the non-obese subjects. The obese girls also were found to have a lower activity level and to exhibit earlier deceleration of growth in height and earlier menarche. Thus we see that differences between the obese and non-obese have been studied, but whether these differences are caused by their concept and their body image or whether these differences lead to this concept has yet to be shown.

ANTHROPOMETRIC MEASUREMENTS AND BODY COMPOSITION

Attempts at classifying various body compositions have evolved a variety of methods and measurements. Many tables have been formulated and variations have been noted for age, maturation, physical training and sex. Skinfold measurements have been used widely to indicate body composition. Researchers also appraised physical status by using: body diameters and circumferences (90); radioactivity to measure lean body mass (91,92); water displacement to measure body density (93); X-ray (94); regression equations (95); and normal ponderal index, vital index, stature index, relative amount of subcutaneous fat,

relative development of the musculature, relative size of the limb girths, relative amount of strength, and the breathing capacity of the lungs (96).

Many tables of body composition are in current use. Pryor (97) noted that "Comparing a child's body measurements with those of a large number of normal, healthy children offers a gauge of physical normality." Garn (98) reported that many of the values used in body composition research are "averages, reasonable approximations, or even reasonable guesses." Patton and Hunt (99) took physical measurements of 710 Ohio school children in 1951 and compared them with measurements of the same age children taken in 1939. The children measured in 1951 were taller and heavier. A comparison between the Baldwin-Wood and Pryor norms and Wetzel channels showed variations in the percentage distribution of these children in relation to normal. Brozek (100) noted that many of the current height-weight tables are limited because they are based on figures of an older generation.

Changes with age and maturation are indicated for the density of tissue, the ratio of total body water to lean body weight and the compressibility of outer fat. Cahn (101) found a possible association between rate of skeletal maturation and differences in stature or weight of heavy and tall children. Garn (102) stated that

fatter children grow faster and they mature earlier. More muscular, large framed parents have children who grow faster, mature earlier and are advanced in psychomotor development.

Stuart (103) observed that children who have early occurrence of maximum growth differed from those with a late occurrence. He dated the beginning of the adolescent spurt at 10 for girls and 13 for boys, and the deacceleration at 13 for girls and 15 for boys. Young et al. (104) found that envelope measurements were consistently higher as one moved from the prepuberal to the puberal and postpuberal groups. They found that for chronological age the greatest increase in mean values occurred between the 11th and 12th years for height and weight and envelope measurements. Young (105) felt that

puberal phase is a more appropriate measure of biological time than chronological age, and also that girls substantially increase their proportion of body fat during puberty and adolescence.

Ljunggren (106), speaking of sex differences in body composition, found that the amount of body fat expressed as a percentage of the total body weight was twice as large for young men as for young women when assessed by densitometry. He also mentioned that the thickness of the subcutaneous fatty layer is greater in women measured both radiographically and with calipers. Young et al. (107) also studied body density and skinfold measurements and found that both were more related to sexual and physiological development than actual chronological age.

Skinfold measurements are variable within the individual at different sites and at different ages (110). Edwards et al. (111) found that different observers tended to give slight but consistent differences in readings on any one subject to another. Edwards (112) stated that within various age and sex

groups the pattern of distribution of fat is the same for all members of the group. Garn (113) discussed several different sites for skinfold measurements, but Seltzer and Mayer (114) felt that the triceps were the most reliable site when the skinfold was used as an index of obesity.

Skinfold measurements may be used to group according to body composition; racial and ethnic differences have been noted. Dwyer et al. (78) divided the subjects into 4 categories of obese, above-average fatness, below-average and lean on the basis of triceps skinfold measurements. Powell (115) described percentiles that were established, using height, weight and skinfold measurements from college women. Wakefield and Merrow (116) found that the overweight group had the largest mean skinfold thickness and the underweight group the smallest mean thickness. Montoye et al. (117) measured the body fat of 90% of a community of 9,500 people and found that skinfold measurements gave the best estimate of total body fat. Morrow (118) found that the triceps of Vermont teenagers indicated ethnic differences between Canadian, British and American subjects. Christakis et al. (32) found the Caucasian children have higher skinfold values than the Chinese, Puerto Rican and Negro children studied. The children with excellent diet histories were in the lowest range of skinfold thickness.

METHODS AND PROCEDURES

A sample of 40 teenage women living on one floor of a women's dormitory were interviewed individually, in their room during midweek, to determine: a) the change of food habits from home to university living; b) dietary intake while on campus by 24-hour recall; c) preferences for various food groups; and d) knowledge of foods and amounts included in the Basic 4 Food Groups. The change in food habits was assessed by a structured interview which compared home and university eating patterns. The respondents replied that they ate a variety of food items more, less, as often, or not at all at the University contrasted with their home eating patterns (see Appendix 1). Actual food consumption was assessed by the 24-hour recall responses (see Appendix 2). The respondents were asked to rank a list of various food groups in the order of most to least preferred. Knowledge of the Basic 4 Food Groups was tested by asking girls to list the 4 Food Groups and the number of servings required in each group. Self concept of body configuration was compared to actual height and weight by using height, weight and frame classification and silhouettes (see Appendix 3). The sample was divided into 3 groups based on their height and weight using the insurance table figures (119). Eighteen subjects were classified as overweight, 11 as average weight and 11 as underweight. The results of comparison of home and university food habits, 24-hour food intake, food preferences and knowledge of the Basic 4 Food Groups were analyzed for overall general trends.

RESULTS AND DISCUSSION

The group as a whole felt they had changed from their previous breakfast pattern. Breakfast was consumed more often at the university. No change was noted in the lunch and dinner patterns. Twenty-eight per cent of the respondents in the overweight group, 18% of the average weight group and 9% in the underweight group stated that they never ate breakfast. The percentages of meals missed as indicated by 24-hour recall are presented in Fig. 1. The same trend is noted for each group. The overweight group missed breakfast a greater percentage of time both at home and at the university.

Milk consumption at the university tended to be lower than that stated for at home consumption. Twenty-five per cent of the total group indicated they never drank milk. Thirty-three per cent of the overweight group indicated they were drinking less milk than at home, while 18% of the average weight group felt they were drinking less milk. No one in the underweight group felt that their milk consumption had decreased. Fig. 2, based on 24-hour recall, illustrates the percentage of food groups not met according to the Basic 4 by weight groups. Milk consumption was evaluated in terms of the teenage requirement of 4 glasses a day. One hundred per cent of the average weight group and 88.8% of the overweight group had not met this standard.

Coffee and alcoholic consumption increased as follows 27% coffee, 35% alcoholic beverages. Fifty-five per cent of the

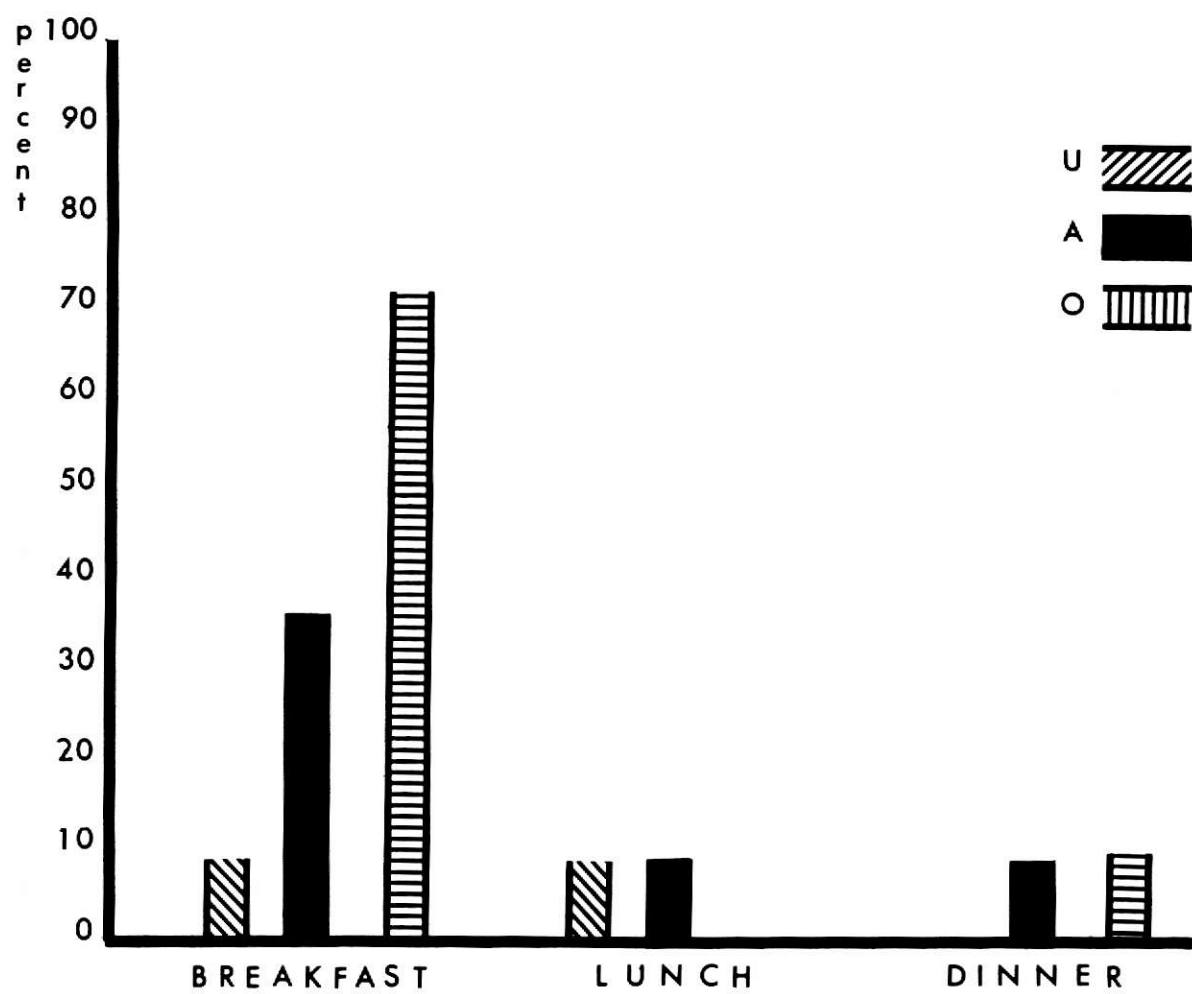


Fig. 1. Percentage of meals missed by weight category.

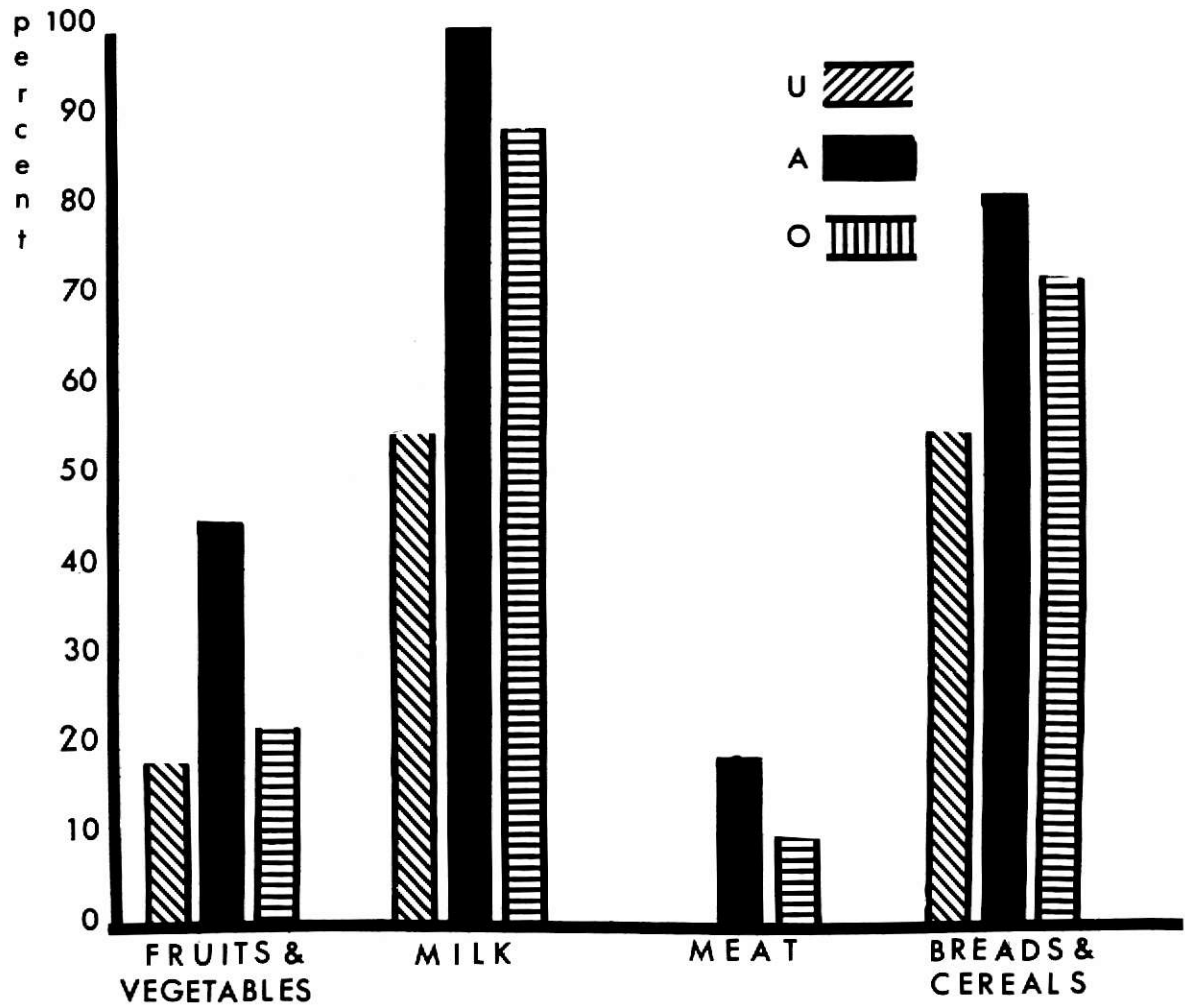


Fig. 2. Percentage of Basic 4 Food Groups missed by weight category.

group drank no coffee while 43% indicated no alcoholic consumption at all. The percentage of overweight girls never drinking coffee was 72% compared to 45% for the average weight and 36% for the underweight; 50% of the overweight girls never drank alcoholic beverages compared with 36% of the average and underweight groups.

The following responses were noted to changes in protein consumption from the home pattern to the university (Table 1).

Cheese considered as part of the milk group in the Basic 4 was felt to be consumed less at the university by 47.5% of the students, whereas, 37.5% said they were eating it as often. It was never eaten by 12.5% of the total group. Cheese and milk consumption have both dropped within the sample.

Thirty-three per cent of the overweight group felt they were eating less meat as compared with 27% of the average weight group and 18% of the underweight group (Table 1). One hundred per cent of the underweight group actually had 2 or more servings from the meat group, whereas, 18.2% of the average weight and 9.9% of the overweight group did not meet this standard (Fig. 2). Ninety-six per cent of the overweight group and 91% of the average weight group met the standard (Fig. 3). The greater percentage of students in all groups felt they were eating more fish and eggs at the university (Table 1).

All the students ate vegetables, but 5% ate no fruit. Thirty per cent of the students felt they consumed less fruit and 7.5% less vegetables. Sixty-five per cent felt they were

Table 1 Per cent responses to change in protein consumption as indicated by weight group

	More	Less	As Often	Not At All
Meat				
Overweight	17	33	50	0
Average Weight	9	27	64	0
Underweight	18	18	64	0
Fish				
Overweight	66	6	17	11
Average Weight	63	0	27	10
Underweight	45	0	55	0
Eggs				
Overweight	39	28	11	22
Average Weight	54	36	0	10
Underweight	62	18	10	10
Cheese				
Overweight	6	44	39	11
Average Weight	0	46	36	18
Underweight	0	54	36	10

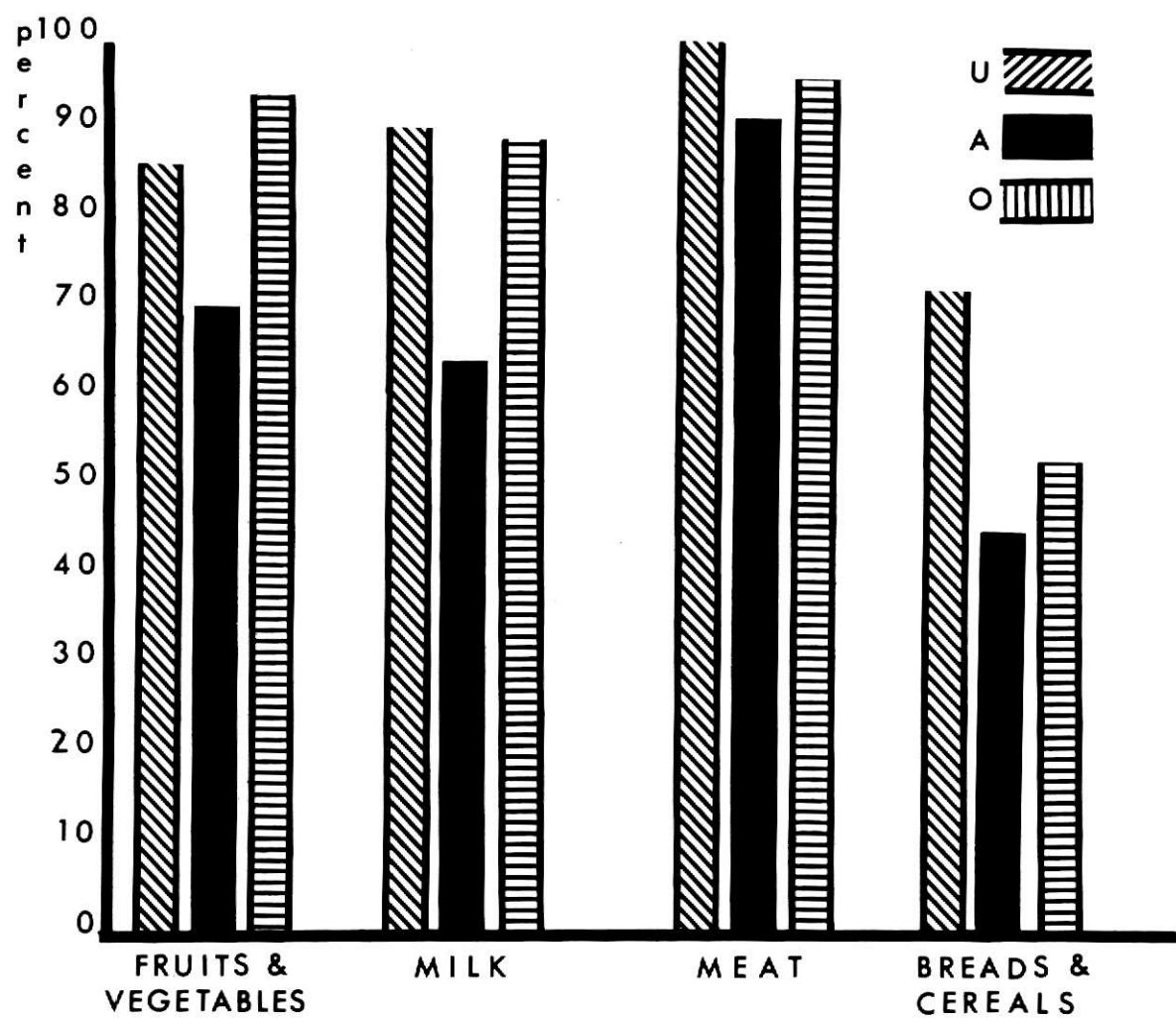


Fig. 3. Average consumption of Basic 4 Food Groups by weight category.

consuming fruit as often or more often.

Forty-two and one-half per cent of the group never ate cereals, 20% increased, 25% decreased, and 5% remained the same for cereal consumption. Of this, 33% of the overweight group indicated they increased their cereal consumption, whereas, only 9% of the average or underweight group so indicated. Bread consumption was felt to increase by 33% of the group, was less for 25% of the group, remained the same for 30% and 12% did not eat bread at all. Comparing this stated consumption to Fig. 3 it is noted that no weight group had 100% consumption of breads and cereals. The average consumption based on the 24-hour recall recorded that the underweight group ate 72% of the recommended amount, whereas, the overweight group consumed only 53% and the average weight group only 45% of the standard.

Five per cent of the students ate no dessert but 42.5% felt they ate more and 40% felt that they ate dessert as often and only 12.5% felt they ate desserts less. Two of the eleven girls in the underweight category (18%) never ate dessert, whereas, all of the girls in the average and overweight group ate dessert.

PREFERENCES

Preferences for breakfast differed from lunch and dinner. Eggs were preferred by 77.7% of the students for breakfast as a first choice, whereas, at lunch 41.3% of the respondents and at

dinner 52.7% of the respondents rated eggs as their last choice. Beef was rated as a first choice for lunch by 75% and for dinner by 77.8% of the responding students.

Fifty-three per cent of the students indicated baked goods as their first choice for desserts. In the overweight group 61% of the group rated baked goods as their first preference, whereas 54% of the average weight and only 36% of the underweight groups so indicated.

Dark green vegetables were a first preference for 38.4% of the students and salad greens were a first preference for 41%. White potatoes were the fourth choice out of 4 by 56.4% of the students.

No one particular fruit was chosen as a first choice; however, plums were rated as 6th or 7th choice out of 7 by 74.3% of the students.

It is of interest to note considering its low consumption that milk was chosen as the favorite beverage of 5 choices by 30.7%. Coffee was chosen as the number one preference for 53% of the students. Particularly interesting in wheat-growing Kansas, wheat-based cereal was chosen as the fourth choice out of 4 by 38.4% of the students.

Given a choice of preference between white bread and other, 64.1% of the students chose white bread.

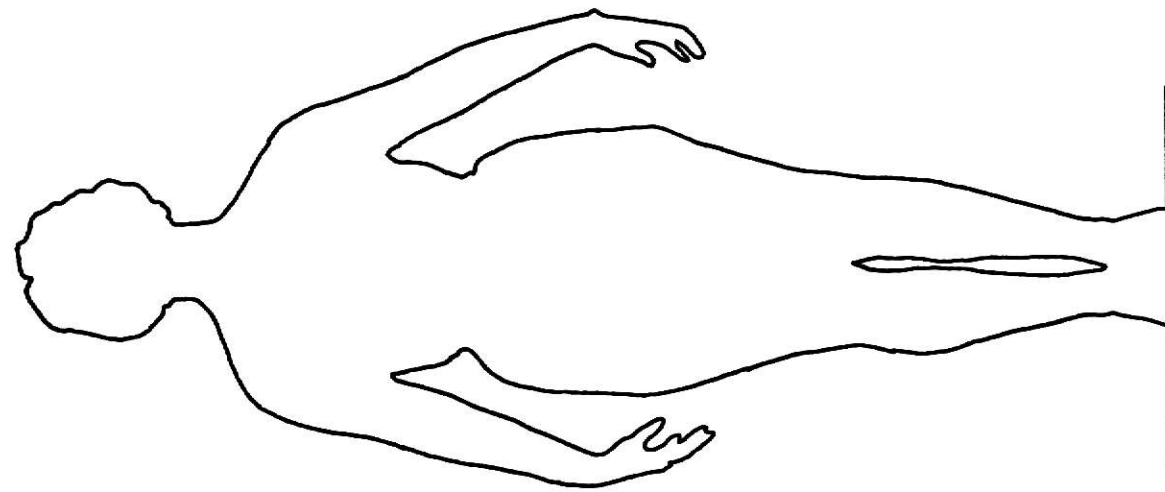
Home Economics was the major source of information of the Basic 4 Food Groups. However, when actually asked to write the food groups and the number of servings, only 3 girls, all in

the overweight category could do it successfully. Fifty-five per cent of the average weight group could not even name one group and the number of servings correctly. The diets given by the 24-hour recall method were evaluated according to the Basic 4 Food Groups and as Fig. 2 indicates there were varying percentages in each group missing the servings from each group.

SELF CONCEPT ABOUT BODY CONFIGURATION

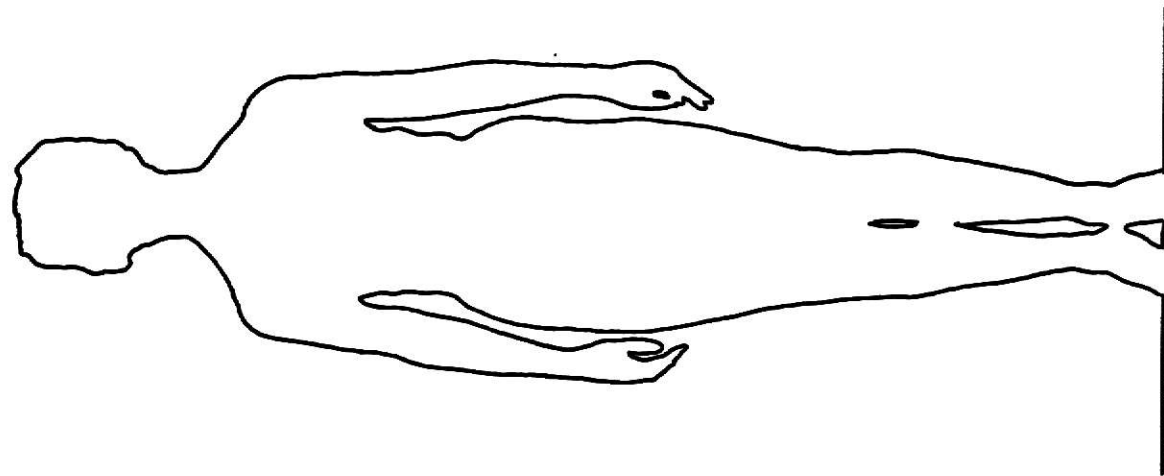
Self concept was tested in the following ways. The girls were asked to rank themselves according to height, weight, and frame. Comparing the ratings to the actual categorization 45% of the sample was placed in the overweight group, but 52.5% designated that they belonged in that category; 27.5% were in the average weight category but 40% designated that they were average; 27.5% were in the underweight category but only 7.5% designated this. Thus the sample saw themselves as heavier than they actually were (see Table 3).

Silhouettes of heavy, medium, and thin females, grouped by height, were used to visualize body configuration (Fig. 4). The respondent was shown the set that corresponded to the height she considered herself. Table 2 demonstrates the responses to the silhouettes. The greatest percentage of girls pictured themselves as average height, medium but pictured their ideals as average height, thin. Not one of the girls picked the heavy silhouette as their ideal though 37.5% of the sample chose the heavy silhouettes as most representative of their own



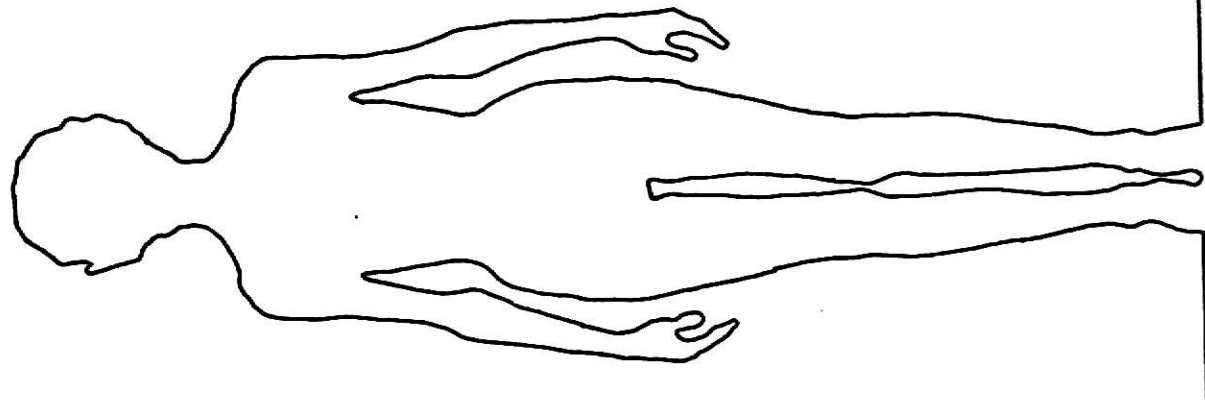
1

Tall Heavy



2

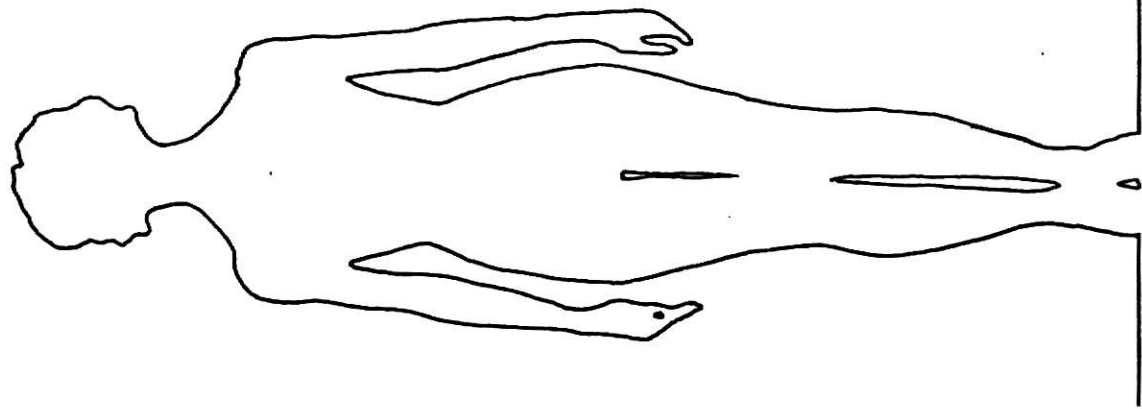
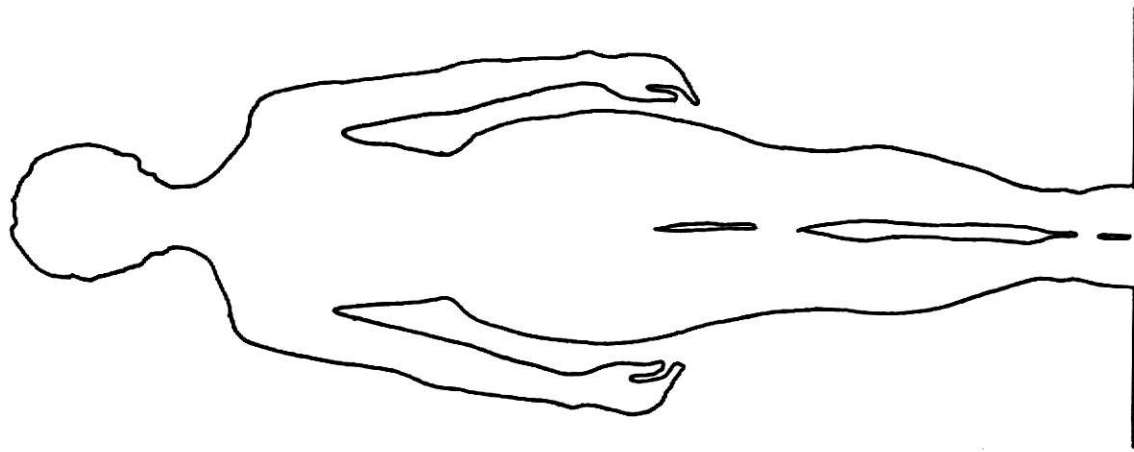
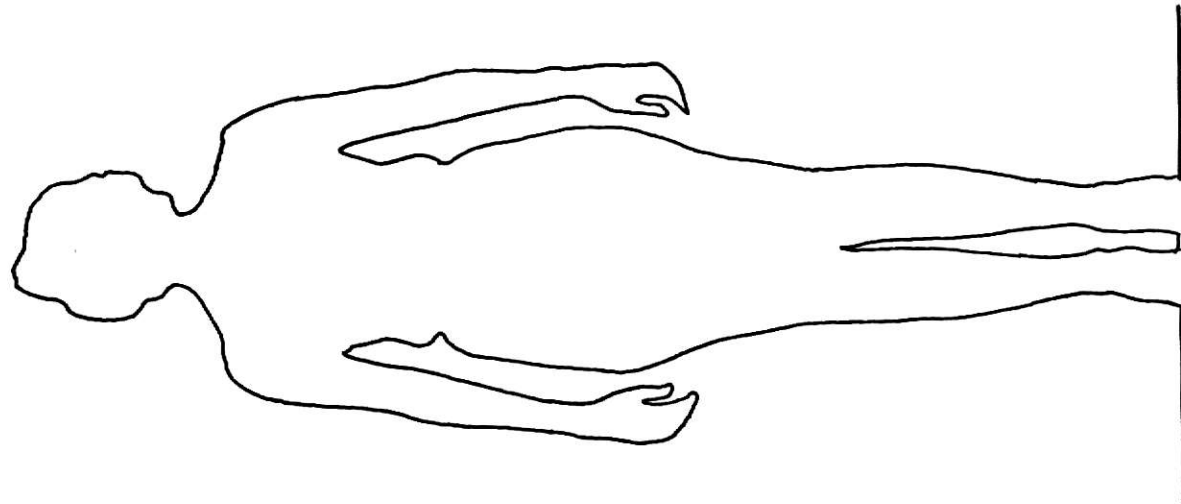
Tall Medium



3

Tall Thin

Fig. 4 Silhouettes for height and weight classification.



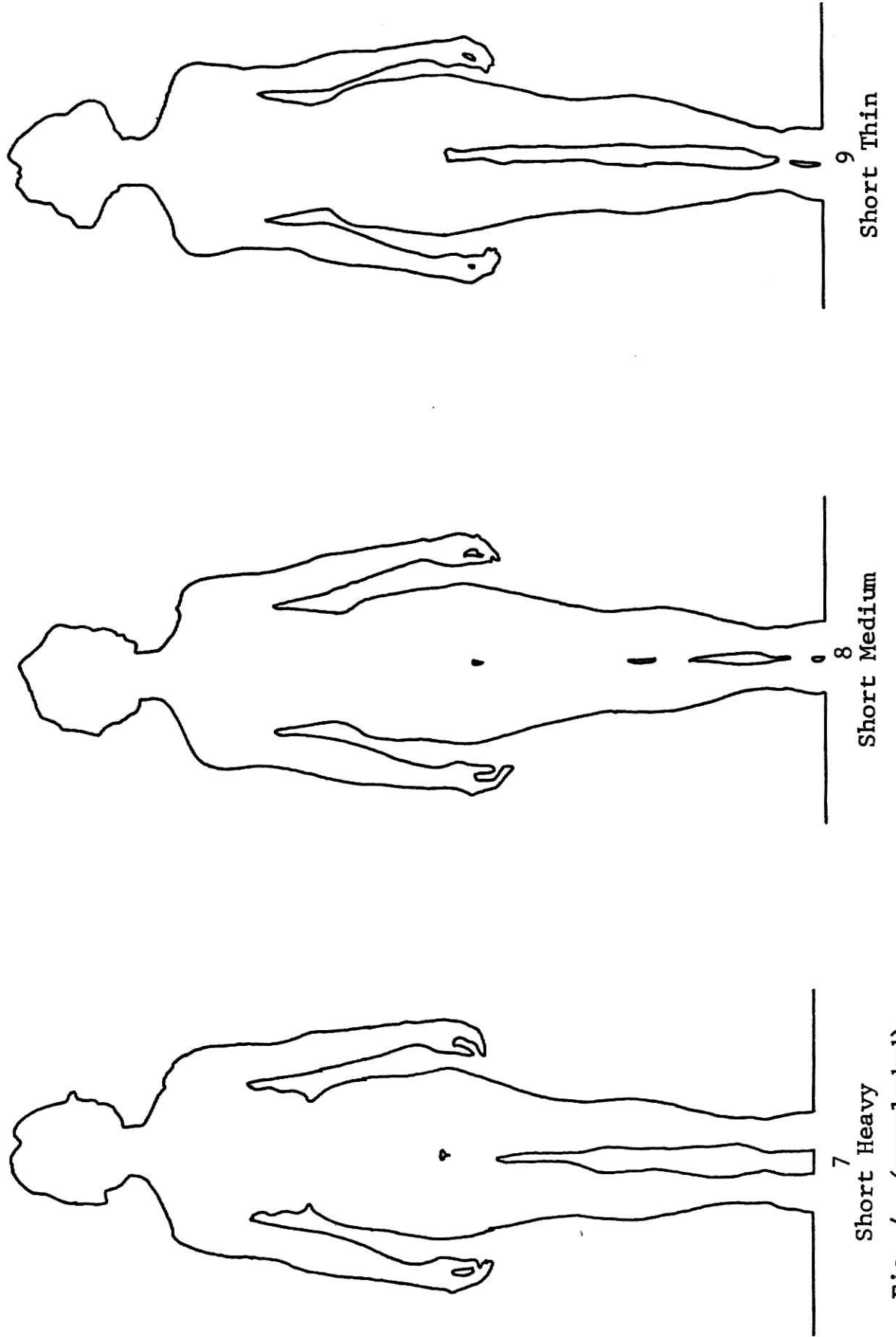


Fig. 4 (concluded)

Table 2 Number and percentage responding to self and ideal image as perceived in silhouette

Silhouette	# Self	# Ideal	% Self	% Ideal
1	5	0	12.5	0.0
2	2	6	5.0	15.0
3	1	2	2.5	5.0
4	7	0	17.5	0.0
5	14	7	35.0	17.5
6	4	18	10.0	45.0
7	3	0	7.5	0.0
8	3	6	7.5	15.0
9	1	1	2.5	2.5
	<hr/>	<hr/>	<hr/>	<hr/>
	40	40	100.0	100.0

silhouette.

A four-point scale was designed to indicate how close these girls felt they came to the ideal (Appendix). Number 1 was farthest away while number 4 was ideal. Forty-five per cent chose number 2 while 27.5% chose number 1, 20% chose number 3 and only 7.5% felt they were at the ideal. Thus there is a large proportion of general dissatisfaction with present body composition.

As indicated by Table 3 the underweight group has a higher average consumption of meat, milk, breads and cereals. The average weight group has the lowest average consumption of all the Basic 4 Food Groups. The overweight group consumed larger quantities of fruits and vegetables, and meats. These are thought to be low in calories by students. This overweight group limited their intake from the milk category and from the breads and cereals category which are thought to be fattening by students.

SUMMARY

Forty teenage coeds were interviewed to determine factors affecting food preferences, habits and intake. The girls were asked to indicate changes in food patterns between the university and home. Breakfast was consumed more frequently at the university; however, the overweight group as a whole missed breakfast substantially more often than did the underweight group. Lunch and dinner and snacking patterns remained

Table 3 Body configuration compared to averaged consumption,
based on 24-hour recall, by weight group percentages

	Overweight %	Average Weight %	Underweight %
Body configuration			
Chosen	52.5	40	7.5
Actual	45	27.5	27.5
Consumption			
Fruits and vegetables	94	70	86
Milk	24	16	50
Meat	96	91	100
Breads and Cereals	53	45	72

relatively consistent. Milk consumption decreased further at the university, from its low home consumption level. Based on the 24-hour recall, the average weight group missed more of each one of the Basic 4 Food Groups. One hundred per cent of the girls in the average weight group failed to consume 4 glasses of milk a day. Over 80% of the average weight girls did not eat 4 servings from the Bread and Cereal group. Over 40% of the entire group stated they never ate cereals at home or at the university. There was a change in protein consumption, with the group eating more fish and eggs. One-third of the overweight group felt they were consuming less meat at the university.

The protein preference for breakfast was eggs, whereas for lunch and dinner, it was beef. Baked goods were most preferred for dessert by over half the students. Salad greens were a first choice with dark green vegetables a close second. No one fruit was chosen in preference to the others. Milk, despite its low consumption, was the favorite beverage of almost one-third of the group.

The young women tend to classify themselves as heavier than they actually were. The ideal silhouette was the thin to medium weight, never overweight. There was general dissatisfaction with body configuration. When comparing the eating patterns to the weight classification it was observed that the underweight group ate a high percentage from each of the 4 Food Groups, whereas the average weight group ate the lowest percentage.

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APPENDIX

Appendix 1

How do you feel your eating patterns here at the University differ from your eating patterns at home?

	<u>MORE</u>	<u>LESS</u>	<u>AS OFTEN</u>	<u>NOT AT ALL</u>
Do you snack				
Do you eat breakfast				
Do you eat lunch				
Do you eat dinner				
Do you eat bread				
Do you drink milk				
Do you drink coffee				
Do you drink alcoholic bev.				
Do you eat meat				
Do you eat cheese				
Do you eat eggs				
Do you eat fish				
Do you eat vegetables				
Do you eat fruit				
Do you eat cereal				
Do you eat dessert				

Appendix 2

Major _____

1. What did you eat yesterday for breakfast?

Breads and Cereals _____ Additional _____

Fruit _____

Citrus Fruit _____

Protein _____

Milk _____

2. Did you eat anything else before lunch?

3. What did you eat for lunch?

Breads and Cereals _____ Additional _____

Fruits and Veg. _____

Citrus Fruit _____

D. Gr. & D. Yell. _____

Protein _____

Milk _____

4. Did you eat anything between lunch and dinner?

5. What did you eat for dinner last night?

Breads and Cereals _____ Additional _____

Fruits and Veg. _____

Citrus Fruit _____

D. Gr. and D. Yell. _____

Protein _____

Milk _____

6. Did you eat anything after dinner?

Appendix 3

Please rank in order of
most preferred to least
preferred.

1. Bread

White _____
Other _____

2. Cereal

Oat (Oatmeal
Cheerios) _____
Corn (Corn meal
Corn flakes) _____
Wheat (Wheatena
Wheaties) _____
Rice (Puffed
Rice) _____

3. Beverage

_____ Juice _____
_____ Milk _____
_____ Tea _____
_____ Coffee _____
_____ Soda Pop _____
Other _____

4. Fruit

Citrus Fruit _____
Melon _____
Apples _____
Bananas _____
Grapes _____
Plums _____
Peaches _____
Other _____

5. Vegetables

Dark Green _____
Deep Yellow _____
Salad Greens _____
White Potatoes _____
Other _____

6. Desserts

Fruit _____
Baked Goods _____
Gelatin _____
Pudding _____
Ice Cream _____
Other _____

7. Rank in order of most
preferred (1) to least
preferred (6) for each
meal (Breakfast, lunch,
dinner)

Eggs _____
Fish _____
Lamb _____
Veal _____
Pork _____
Beef _____

8. Were you taught the Basic
4 Food Groups in any of the
following:

H. Eco. Classes _____
P. Ed. Classes _____
Bio. Classes _____
Church Org. _____
Community Org. _____
4-H _____
Girl Scouts _____
Campfire Girls _____
Other _____

Appendix 3 (continued)

9. What food groups should be included in your diet daily? Please list Food Group and the # of servings.

I.

II.

III.

IV.

11. Which silhouette most closely resembles your figure?

12. Which silhouette most closely resembles your ideal?

13. How closely do you come to your ideal:

Long way to go _____
 Not quite there _____
 Almost there _____
 Ideal _____

14. Height _____
 Weight _____

10. Would you rate yourself as:

Tall _____
 Medium _____
 Short _____

Overweight _____
 Average Weight _____
 Underweight _____

Large Frame _____
 Medium Frame _____
 Small Frame _____

FACTORS AFFECTING FOOD PREFERENCES, HABITS AND INTAKE

by

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B. A., Queens College of the City University
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AN ABSTRACT OF A MASTER'S REPORT

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Forty teenage coeds were interviewed to determine factors affecting food preferences, habits and intake. The girls were asked to indicate changes in food patterns between the university and home. Breakfast was consumed more frequently at the university; however, the overweight group as a whole missed breakfast substantially more often than did the underweight group. Lunch and dinner and snacking patterns remained relatively consistent. Milk consumption decreased further at the university, from its low home consumption level. Based on the 24-hour recall, the average weight group missed more of each one of the Basic 4 Food Groups. One hundred per cent of the girls in the average weight group failed to consume 4 glasses of milk a day. Over 80% of the average weight girls did not eat 4 servings from the Bread and Cereal group. Over 40% of the entire group stated they never ate cereals at home or at the university. There was a change in protein consumption, with the group eating more fish and eggs. One-third of the overweight group felt they were consuming less meat at the university.

The protein preference for breakfast was eggs, whereas for lunch and dinner, it was beef. Baked goods were most preferred for dessert by over half the students. Salad greens were a first choice with dark green vegetables a close second. No one fruit was chosen in preference to the others. Milk, despite its low consumption, was the favorite beverage of almost one-third of the group.

The young women tend to classify themselves as heavier

than they actually were. The ideal silhouette was the thin to medium weight, never overweight. There was general dissatisfaction with body configuration. When comparing the eating patterns to the weight classification it was observed that the underweight group ate a high percentage from each of the 4 Food Groups, whereas the average weight group ate the lowest percentage.