COLLEGE STUDENTS’ SNACK FOOD CONSUMPTION BEHAVIORS AND NUTRITIONAL AWARENESS

By

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CHAPTER I

INTRODUCTION

In today's health conscious society, although prevention, health, and nutrition have become very popular, snack foods remain a major component in the daily routine of many busy people (Martin & Berry, 1979). Over 60% of Americans consume some sort of food or beverage between meals (Pao & Mickle, 1980). Since snacking has become such a way of life, it is important to assess its impact on nutritional status.

College students, who represent an important segment of the United States population, are inclined to develop poor eating habits (Khan & Lipke, 1982). Students have a tendency to follow fad or low-calorie diets, skip meals, and avoid nutritious foods (Hernon, Skinner, Andrews, & Penfield, 1986). Academic work and extracurricular activities may seem of greater importance than planning meals on a limited budget (Jakobovits, Halstead, Kelley, Roe, & Young, 1977). Convenient snack foods and carbonated beverages may take the place of more nutritious foods which require preparation time.

A basic knowledge of nutrition could be a very useful tool to direct college students toward the correct foods choices. Further investigation of the relationship among nutritional knowledge, attitudes, and practices is needed to aid in the improvement of programs designed to teach nutrition effectively (Schwartz, 1975).

Purpose and Objectives

The purpose of this study is to compare attitudes, consumption patterns, and nutritional awareness as related to snack foods of students enrolled in Basic Human Nutrition and an introductory English course.

Specific objectives include:

1. To compare nutritional knowledge regarding snack foods of students who have completed a course in nutrition and those who have not.
2. To determine the relationship between demographic variables and consumer behavior patterns relative to snack foods.
3. To identify snack food consumption patterns and practices of the students who have completed a course in nutrition and those students who have not.

Hypotheses

The following hypotheses were postulated for the study:

H_1 : There will be no significant association between the nutrition knowledge of students basede on selected variables: age, sex, marital status, race, residence, and major.

H_2 : There will be no significant association between demographic variables and consumer behavior patterns relative to snack foods.

H_3 : There will be no significant association between snack food consumption patterns and practices of the students who have completed an introductory nutrition course and those who have not.

Assumptions

The following assumptions were recognized for this study:

1. The media, techniques, and materials used by both instructors in the FNIA 1113 course were similar.
2. The sample size was sufficient to obtain valid data.

Limitations

The following limitations were recognized for this study:

1. The sample was limited only to students who completed the questionnaire at Oklahoma State University in the Spring Semester, 1988. Students were chosen from FNIA 1113 and ENGL 1113. Generalizations based on this study will only apply to the sample used.
2. The sample was biased toward the nutrition students, since more nutrition subjects were sampled than English students.

Definitions

The following definitions specify the meaning of concepts as applied to this study:

1. Nutritional knowledge: a state of awareness and understanding of nutrition gained through study and learning experience.
2. Recommended Dietary Allowance (RDA): the levels of intake

of essential nutrients that are adequate to meet the nutritional needs of normal healthy people (Recommended Dietary Allowance, 1980).

3. Nutrition education: to develop skills and the ability to apply nutrition information to the daily life
4. Snack food: any food or beverage consumed between the main meals of the day.
5. Meal: a scheduled eating period during which more than one food item is consumed.
6. Health: soundness of body and mind; freedom from defect or disease (Halsey & Morris, Eds., 1981)
7. Nutritious: containing substances necessary for life and health

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The consumption of snack foods has become a part of the American life-style with over 60% of the nation eating some sort of food or beverage between meals (Pao & Mickle, 1980). There is a growing need to assess the impact of snack foods on the health of those consuming them. This study will compare the attitudes, consumption patterns, and nutritional awareness of students enrolled at Oklahoma State University in the Introduction to Human Nutrition and Freshman Composition relative to snack foods.

Changes in Eating Patterns

The food consumption patterns of the United States population have been influenced by changes in lifestyle, affluence, greater employment of women, smaller households, and increased availability of highly processed foods (Morgan & Goungetas, 1986). Despite the growing interest in good health and nutrition, snack food sales are rising rapidly. Eating habits are changing, as evidenced by people who are consuming smaller, more frequent meals and supplementing their diets with snacks ("Snack Foods", 1986). In 1982, Americans spent an estimated $20 billion on snack foods. The snack market has grown in excess of 11% during the last decade. The solid sales performance of the snack food industry has resulted from its ability to meet the rapidly changing demands of the American consumer ("Snacks", 1983).

It is generally believed that the snack food market will grow at about the same rate as the population. The state of the economy will also affect the market. The weather and competition may influence prices of snack foods (Scales, 1982).

Societal changes are also affecting food consumption patterns. The number of items on grocery shelves has increased 10 times in the last 40 years. The structure of meals has changed, according to changing living patterns. The number of people living alone has increased by 65% in the last hundred years. By 1990, it is anticipated that at least a third of the households will not be family households. The American population is relying more on fast foods as a source of nutrition. A quarter of the food dollars spent outside of the home goes to fast food outlets (McGinnis, 1980). Mona Doyle (cited in Towle, 1987), president of the Consumer Network, a consumer research company, remarked:

> Snack foods are life-style driven. They are healthful if you want them to be or they can satisfy cravings. Because of this, the line between a snack food and a real meal has grown fuzzier. Snack foods fit our fragmented life styles (p. F15).

Snacks can be classified as those foods consumed between the three main meals of the day. Some individuals consider snacks to be somewhat of a health threat (Cala, Morgan, & Zabik, 1981). Snacking may result in nutritionally unsound diets, because of the belief that "empty calorie" foods are mainly consumed between meals (Morgan, 1983). This belief is reinforced by the prominent advertising and large sales volume of potato chips, pretzels, soft drinks, candy and other items which are associated with snacking (Thomas & Call, 1973).

The consumption of a high percentage of nonnutritious snack foods will affect the nutritional status of the individual. Overeating and an unbalanced diet have been associated with many nutrition problems. Dietary habits have been linked to such problems as hypertension, heart disease, dental caries, diabetes, obesity and cancer (Ekvall & Vallo, 1983).

Snacking can, however, be healthful. High-energy, low-fat foods can contribute valuable nutrients to a diet that might otherwise be inadequate. Experts recommend whole grains, fresh ingredients and fiber, and the minimization of fats, sugar, and salt (Kenney & Yorkshire, 1986).

Snacking Habits

The Nationwide Food Consumption Survey (NFCS) 1977-78 (Pao & Mickle, 1980) found that approximately 61% of those individuals surveyed consumed at least one snack per day. Of those reporting snacks, 53% had one snack, 28% had two, 11% had three, and 8% consumed four or more snacks per day. Snacks provided 20% of the day's energy for those consuming at least one snack, 25% of the carbohydrate, 16% of the fat, and 12% of the protein. Snacks provided about 15% of the day's vitamins and iron, but about 20% of the calcium, phosphorus, and magnesium.

Trends in Americans' snacking habits tend to differ according to regions of the United States. The North Central population tend to snack the most, while the Southern citizens snack 10% less than the rest of the nation. Westerners prefer healthy snacks, like fruit.

Snack food preferences are changing, according to the results of a study sampling 2200 households. Those items increasing in popularity include yogurt, frozen juice bars, and Mexican and Oriental snacks. Two of every five snacks consumed are sweet, while one of five are salty. Seventy-six percent of snacks are eaten at home. Also, dieters were more likely to snack. More children and teenagers (up to 70%) eat snacks than adults. Singles under 45 snack 30% more often than the rest of the population and are the biggest snack eaters outside the home, which can be attributed to the popularity of fast foods. Women, age 25 - 54 are the biggest snackers over 25 and prefer "healthy" snacks. Men prefer salty snacks and generally consume more snacks outside the home.

Economic status also affects snack food consumption. The middle income population snacks most often, followed by those with high, and then low incomes. Dual-career families snack less than traditional families ("Snacking Trends", 1985).

A study conducted by MRCA Information Services ("Snacking Study", 1987) found that sweets were the favored snack among children ages 2 to 18, while adults most often chose beverages. Beverages were the most popular snack food overall with a 36% share of the 1986 snack market. Sweets ranked second with a 30% share of the market, while healthy and salty snacks took 16% and 14%, respectively.

A person's age plays a significant part in the choice of snack foods. Young children, ages 2 to 5, snack most often. Young adults, ages 18 to 24, snack the least often. Americans, age 55 and above, most often choose healthy snacks, while teens and children favor salty snacks.

The most popular snacks according to the study were (1) fruit and fruit products, (2) candy and gum, (3) ice cream and frozen novelties, and (4) cookies. Other snacks that gained in popularity included tortilla chips, granola bars, hot cereals, and bran muffins.

Snacking Patterns

Birch, Zimmerman, and Hind (1981) studied the effects of snack foods presented in social-affective context on the formation of preschool children's preferences. Snack foods were offered as a reward, paired with adult attention, in a nonsocial context, and at snack time. The snack foods used included peanuts, raw carrots, animal crackers, raisins, dried apples, Wheat Thins, vanilla wafers, and cheese goldfish crackers.

The children's food preferences were enhanced when the snack was presented as a reward or with noncontingent attention. Contrastingly, no changes in food preference were found when foods were presented in a nonsocial context or at snack time.

The results of this study demonstrate that the context in which snack foods are presented to children will affect food preferences. The results also suggest that preferences for sweet foods may be similarly affected. The positive contexts, however, could be used to increase the preferences for food that is more nutritionally desirable, yet not as highly preferred.

A survey conducted of fifth- and sixth-grade children in New York found that although snacks made substantial contributions to their diets, the quality of these contributions may be lower than those of meals eaten by the same children. These children received approximately 18% of their day's calories from snacks ("Determining Snacking Patterns", 1984).

Morgan, Leveille, and Zabik (1982) studied children's consumption of salted snack foods to determine if consumption of such foods leads to inadequate diets. Salted snack foods included potato chips, popcorn, corn chips, pretzels, tortilla chips, cheese twists, and bacon rinds. The objective was to determine if consumption levels of salted snack foods was related to socioeconomic characteristics of the children. Salted snack foods were consumed by 83% of the children. The amount of salted snack foods consumed by the children increased as the age of the children increased. No relationship was found between salted snack food consumption and socioeconomic variables. The consumption of salted snack foods had little impact on the nutrient intake of the children.

Cala, Morgan, and Zabik (1981) assessed the role of snacking in the diets of 657 U.S. children ages 5 to 12, from middle and upper-middle class families. The most frequently consumed food group was beverages other than milk, followed by fruits and vegetables and milk. The snacks were found to contribute positively to the children's diets, providing more than 20% of the RDA for eight of the 15 nutrients for which there is an established RDA. Snacks made the most significant contribution for protein, riboflavin, vitamins B_{12}, C, and A, calcium, phosphorus, and magnesium. The researchers also found that 100% of the RDA of all nutrients, except calories, magnesium, and zinc were met by the children's consumption of meals only. The amount of all nutrients, except vitamins B_{12} and A, increased in consumption as the number of snacks consumed per day increased. On the days when no snacks were consumed, a decreased intake of fat, sugars, and sodium was found and the meals consumed were higher in calories.

In a study of 225 adolescents from eastern Tennessee, Ezell, Skinner, and Penfield (1985) found that 89% of the students ate at least one snack a day. Morning snacks were more likely to include candies and salty snacks from the school vending machines. Breads and cereals were most often consumed in the afternoon and evening. Carbonated beverages and desserts were popular at all times. The nutrient density provided by the snacks were low at all times but lowest in the morning. Iron, calcium, and vitamin A were present in the lowest amounts. The researchers recommended encouraging adolescents to consume foods high in these nutrients for both meals and snacks. They also suggested emphasizing the selection of appropriate snacks during nutrition education programs.

The snacking patterns and nutrient contributions of snacks to the diets of 1224 adolescent girls from eight southern states was studied (McCoy et al., 1986). Snacking most commonly occurred in the afternoon in the home regardless of race, income group, or age. Snacks contributed 52% of the RDA for riboflavin, 43% of the RDA for vitamin C, and 39% of the RDA for thiamin. Snacking also contributed significant amounts of other vitamins, minerals, proteins, carbohydrates, and fats.

A study of the food habits of Puerto Rican-American girls from Chicago was conducted by Duyff, Sanjur, and Nelson (1975). It was found that ethnic food patterns made a significant contribution to the diets. An intake of low-nutritive, high-calorie foods such as soft drinks, potato and tortilla chips, and candy was noted.

Thomas and Call (1973) examined the Ten State Nutrition Survey, which was conducted in the 1960s, to determine if eating between meals was a problem for teenagers. The researchers found that the existing data which emphasizes the high consumption of empty-calorie foods by teenagers has been exaggerated. Foods eaten between meals by teenagers provided a relatively good balance of nutrients. They stressed the importance of nutrition education to teach teenagers to choose appropriate snacks which supply needed nutrients, especially calcium and iron.

Huenemann, Shapiro, Hampton, and Mitchell (1968) studied the eating practices of 122 junior and senior high school students over a two year period. Snacking was common among the students and tended to contribute to their nutrient intakes. The most frequently consumed snacks for boys were cereal and breads. Girls most frequently consumed pies, pastries, cakes, and cookies for their snacks. Vegetable snacks were eaten infrequently by both groups.

Edwards, Hogan, Spahr, and the Gilford County Nutrition Committee (1964) studied the snacking habits of seventh, ninth, tenth, and twelfth grade students in Greensboro, North Carolina schools. The younger students tended to choose fruit, bread and cereal, and milk for mid-morning and mid-afternoon snacks. Students for the older groups tended to prefer soft drinks and foods from the dessert and candy groups. The researchers stressed the need for a greater emphasis on nutritious snacking at the tenth grade level and above.

Hernon, Skinner, Andrews, and Penfield (1986) studied the food consumption patterns of college students enrolled in an introductory nutrition course. Participants completed a 3-day food record and calculated the nutrient content of the foods consumed. Women with an intake of calories less than 1200 had lower intakes of protein, carbohydrate, fat, calcium, iron, thiamin, riboflavin, and niacin. They consumed less meat and eggs, legumes, bread, starchy vegetables, milk products, and desserts than women with energy intakes above 1200 calories. The diets of the men included in the study met the RDAs for all nutrients, and the diets of women whose intakes exceeded 1200 calories met the RDAs for all nutrients except iron. The intakes of women less than 1200 calories failed to meet the RDAs for calcium, iron, thiamin, riboflavin, and niacin.

A group of dietetics students administered questionnaires to university students to determine snack and beverage preferences (Nelson & King, 1982). Fresh fruits were most highly preferred (72 first preference votes), followed by sandwiches (25 votes), and bakery items. Among beverages, fruit drinks were most frequently selected (66 votes), followed by carbonated beverages (59 votes), and milk (29 votes). These findings indicate that many students actually prefer nutritious snacks as opposed to chips, candy, and carbonated beverages.

The nutrient intakes and food-related behaviors of Cornell University students was studied by Jakobovits, Halstead, Kelley, Roe, and Young (1977). Subjects included junior and senior women from various colleges within the university and different living situations. Each participant completed a seven-day food record and a questionnaire on eating practices. On an average, the subjects ate 5.14 times a day, including meals and snacks. Evening was found to be the most popular snack time. No relationship was found between the number of meals missed and the number of snacks consumed.

Khan and Lipke (1982) studied the nutritional impact of snacking on college students by comparing the nutrients received from meals and snacks by nutrition and non-nutrition majors. Frequency of snack consumption, types of foods and beverages, and the RDAs of selected nutrients were also compared. The results of the study showed that non-nutrition majors ate more often than nutrition majors and women ate more often than men. Snacks were most often consumed between regular meal hours. Beverages were most often consumed as snacks, with carbonated drinks being the most common. Students chose candy and gum most often as snacks in the morning and afternoon. In the evening, salted snack items were most popular. Without snacks, energy intakes for all students, iron and calcium for women, and vitamin A and thiamin for male nutrition majors would not meet recommended levels. The researchers concluded that if snacks and meals were properly planned, students would meet the RDAs for almost all nutrients.

Bailey and Goldberg (1989) assessed the eating patterns of women at a New England university by examining 3-day diet records kept by 59 students enrolled in an introductory nutrition course for non-majors. Meal frequencies over the three days were as follows:

	Mean ± SD
Breakfast	2.2 ± 0.9
Morning Snack	1.1 ± 1.1
Lunch	2.4 ± 0.7
Afternoon Snack	1.5 ± 1.1

Dinner	2.9 ± 0.3
Evening Snack	2.0 ± 0.9

Upon analysis of meal frequencies, four eating patterns were identified. In the first, a high frequency for both meals and snacks was identified, although subjects had a tendency to eat a morning snack rather than a full breakfast. These subjects who eat regularly were referred to as "regular eaters". The second pattern shows an emphasis on breakfast and morning snacks, with little stress on dinner and evening snacks. These subjects were called "morning eaters". The third component showed a high frequency for breakfast and dinner with reduced concern for lunch and snacks, but a strong concern for being overweight. These subjects were referred to as "concerned eaters". The final component demonstrates a moderate frequency for breakfast, evening snack, and dinner with little stress on lunch and afternoon snacks. Subjects were called "lunch avoiders". "Concerned eaters" reacted to dissatisfaction with their body weight by skipping meals. Little connection was found between meal behavior and either food intake or body weight for the other groups.

Shopping Behaviors

Media advertising and marketing greatly influences the purchasing behaviors of consumers. A large part of advertising is attributed to highly processed foods. The consumption of such nonnutritious foods could have a detrimental effect on nutritional status (Ekvall & Vallo, 1983).

In 1986, approximately $1.7 billion was spent by Americans on "healthy" snacks, such as granola bars, microwave popcorn, and trail mixes. There is some debate, however, as to whether these snacks are actually "healthy".

Granola bars, which are more like candy, contain extra sugar, fat, and calories. Dehydrated fruit snacks have added sugar, little fiber, and are less nutritious than fresh fruit counterparts. Microwave popcorn contains added fat, salt, and calories, as well as being higher priced ('Healthy' Snacks, 1987).

Snack food generated $24.8 billion in manufacturer sales in 1986, an increase of 6.5% from 1985. Top revenue producers were candy (29.9% of sales), cookies and crackers (22.8%), and potato chips (12%). Sales of popcorn and dried fruits increased 26% and 21.5% in 1987, respectively, due to the fact that consumers perceive them as "healthful" (Towle, 1987). Popcorn, chips, corn products, pretzels, nuts, and other snack foods account for nearly $3 million in supermarket sales annually and are enjoyed by most children and adults alike (Flynn, 1987).

College students form one distinct target group for mass marketers. Students are major purchasers of audio equipment, cosmetics, beer, and junk food. Nearly one of every four college students spends at least $31 weekly at supermarkets. Grocery buying is a popular pasttime, and beer and potato chips are high on college students' shopping lists. Almost 40% of male students drink beer regularly, while over one-third of females eat potato chips frequently (Sherrid & Lanier, 1986).

Martin and Berry (1979) conducted a study to determine the cariogenicity of machine-vended snack foods as compared to counterparts available in health food stores. Foods found to be low in promoting caries include: Diet Cola, Frito-Lay Fritos, Hershey's Milk Chocolate, El Molino Mills Cara Coa, and Cabell's Whole Milk. Snack foods found to be high in promoting caries included: Hoffman's All Natural Carob Hi-Protein Energy Bar, Welchade Grape Drink, Rainbow Honey Bun, and Wagner's Sunflower Nuts. The results indicated that food obtained from vending machines tend to be no more cariogenic than health food store items.

Nutritional Knowledge

Johnson and Hart (1977) conducted a study to measure nutrition misconceptions of junior and senior high school students and to determine if enrollment in health education courses would affect misconception scores. It was determined that health education does not independently affect the nutritional beliefs of students.

Schwartz, Dalrymple, and Vivian (1974) conducted a study of 313 women who were 1969 graduates of Ohio high schools to determine the relationship between enrollment in home economics courses and present nutritional knowledge, attitudes, and practices. Of the respondents, 171 graduates had been enrolled in home economics courses, while 142 had not been enrolled in these courses. The researchers found that enrollment in high school home economics courses was not consistently associated with nutritional knowledge, attitudes, and practices. Graduates had gained nutritional knowledge from other sources such as the media or personal contacts.

First-year students at a Canadian university were studied by McCarthy and Sabry (1973) to determine the prevalence of nutrition misconceptions. A true-false questionnaire was developed which represented seven areas of nutrition knowledge, including health foods, weight loss and gain, nutrient functions, metabolism, and food purchase. Students who had been enrolled in home economics in secondary school had fewer misconceptions than did those without home economics education.

To determine the effect of the mass media on teenagers' nutrition knowledge, Axelson and DelCampo (1978) studied 400 ninth grade students. Half were exposed to a nutrition education program campaign using television, radio, and brochures. The remaining half served as control. A quiz was administered to the students both before and after the experiment. It was found that teenagers' nutritional knowledge can be improved through a short-term, mass media promotional campaign, if it has personal appeal to the audience.

Carruth, Briley, and Roy (1971) administered a pre-test to determine the initial nutrition knowledge level of students prior to instruction in a basic nutrition course at Texas Tech University. Some students were permitted to be exempt from the course by making a predetermined test score. A final examination was given to both groups of students, those with nutrition instruction and those without. The results showed that the students subjected to instruction scored lower on the pre-test but higher on the final examination. The exempted students scored higher on the pre-test but only made acceptable scores on the final since they had received no instruction.

Summary

Recent societal and economic changes have influenced the eating patterns of the American population. The snack food market is continuing to grow and adapt to the needs and wants of the consumer. Recent studies have indicated that snacking can make significant contributions to the diets of both children and adults. It remains important, however, to teach snackers to choose appropriate foods which supplement the diet with valuble nutrients.

Enrollment in nutrition courses may positively affect the nutrition knowledge of students. It is important to assess the application of this knowledge to everyday life. Therefore, the focus of this study will be to identify snacking habits and consumer behavior patterns of the subjects and to compare the nutritional knowledge of those who are enrolled in Basic Human Nutrition and those who have had no nutrition education.

CHAPTER III

METHODOLOGY

Population and Sample

The population for this study included undergraduate students enrolled in two courses at Oklahoma State University in the Spring of 1988: Basic Human Nutrition and Freshman Composition. The questionnaire was administered to over 300 students, and a total of 279 were usable, 196 from the nutrition course and 83 from the English course.

Research Design

The researcher obtained data from a selected experimental group and a nonequivalent comparison group. The experimental group had been exposed to a 16 week nutrition course, while the control group received no nutrition instruction. In the discussion that follows, the groups will be referred to as the experimental group and the control group.

Data Collection

Instrument

To meet the objectives of the study, a survey instrument was developed by the researcher. The instrument consisted of three parts.

Part I was composed of nine objective questions to obtain demographic information. Part II consisted of 12 objective questions to obtain information on snack food selection. Part III consisted of 26 statements about nutrition and snacking to obtain psychographic data to which the subject could agree, disagree, or have no opinion (Appendix A). The questionnaire was pretested on an unassociated group of students to identify vague or ambiguous questions.

Procedure

The researcher administered the questionnaire to the students in the nutrition course at the end of the semester. Oral and written instructions were given by the researcher, and the students returned the surveys as they were completed. Students were awarded points toward their grade as an incentive to return the questionnaire.

Permission was obtained from the English department to administer the questionnaires to the students. Questionnaires were delivered the the department to be disseminated by the instructors, and were then returned to the researcher.

Data Analysis

The data were subjected to analysis by Statistical Analysis System (SAS) from which frequencies were obtained. Data sets created were summarized and a chi-square analysis was completed.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to compare the attitudes, consumption patterns, and nutritional awareness of students enrolled in Basic Human Nutrition (FNIA 1113) and Freshman Composition (ENGL 1113) relative to snack foods. This chapter describes the characteristics of the sample and the results of the testing of the hypothesis.

Description of the Sample

Sex, Age, Major, Marital Status, and Race

Table I shows a description of the sample in the study (N = 279) which was comprised of 196 students from Basic Human Nutrition and 83 students from Freshman Composition. Of those from the nutrition course, 42 (21.43%) were male and 154 (78.57%) were female. Males from the English course numbered 47 (56.63%), and females numbered 36 (43.37%). Approximately 75.51% (N = 148) of the experimental group were age 21 and under, while 24.49% (N = 48) were over 21. Approximately 81.93% (N = 68) of the control group were age 21 and under, while 18.07% (N = 15) were over 21.

Of those in the FNIA 1113 course, 137 (69.90%) were Home Economics majors, while 59 (30.10%) were majoring in other fields. Only 1 (1.20%) student in ENGL 1113 was a Home Economics major, while the remaining 82 (98.90%) were of other majors. Most of the subjects in the nutrition course (N = 186, 94.90%) were single, while only 10 (5.10%) were married. Seventy-nine (95.18%) subjects enrolled in the English course were single, while only 4 (4.84%) were married. Most of the subjects from the nutrition course (N = 184, 93.88%) were Caucasian, whereas 12 (6.12%) were of other ethnic backgrounds such as Asian, black, and Hispanic. Similarly, most students in the English course (N = 75, 95.59%) were Caucasian, while only 6 (7.41%) were of other racial identification.

Place of Residence, Number and Age of Household Members, and Preparer of the Food

Of the subjects in the nutrition course, 63 (32.14%) lived in the OSU residence halls and the remaining 133 (67.86%) lived in apartments, family homes, etc. Of the students enrolled in the English course, 42 (50.60%) lived in the OSU residence halls and 41 (49.40%) lived in other housing situations. More than half (N = 101, 51.53%) of the experimental group lived in one- or two-member households, while 95 (48.47%) live with 3 or more others. Thirty-eight (45.78%) students in the control group lived in one- of two-member households, while 45 (54.22%) live with 3 or more others.

The majority (N = 116, 60.42%) of the experimental group had members in their households in the 20 - 29 year old range. The majority (N = 47, 56.63%) of the control group had members in their households in the 15 - 19 year old age group. Most of the experimental group (N = 108, 55.38%) prepared their own food, while 36 (43.37%) in the control group prepared their own food.

TABLE I

FREQUENCY AND PERCENTAGE DISTRIBUTION OF THE SAMPLE ACCORDING TO DEMOGRAPHIC VARIABLES

Variable	Frequency		Percentage	
	experimental group	control group	experimental group	control group
Total subjects	196	83	70.25	29.75
Sex				
Male	42	47	21.43	56.63
Female	154	36	78.57	43.37
Age				
under 18	1	0	0.50	0.00
18 - 21	147	68	75.00	81.90
22 - 25	33	8	16.80	9.60
26 - 30	7	2	3.60	2.40
31 - 40	6	2	3.10	2.40
over 40	2	3	1.00	3.60
Major				
FNIA / HRAD	51	1	26.80	1.20
Other Home Economics	86	0	43.90	0.00
Other major	59	82	30.10	98.80
Marital status				
Single	181	78	92.30	94.00
Married	10	4	5.10	4.80
Widowed	0	0	0.00	0.00
Divorced	4	1	2.00	1.20
Separated	1	0	0.50	0.00
Race				
Caucasian	184	75	93.90	90.40
Asian	4	1	2.00	1.20
American Indian	2	2	1.00	2.40
Black	4	4	2.00	4.80
Hispanic	1	0	0.50	0.00
Other	1	0	0.50	0.00
Place of residence				
Family Home	16	6	8.20	7.20
Apt./duplex/rented home	82	20	41.80	24.10
Residence halls	63	42	32.10	50.60
Fraternity/Sorority	34	12	17.30	14.50
Other	1	3	0.50	3.60

TABLE I (cont.)

Variable	Frequency		Percentage	
	experimental group	control group	experimental group	control group
Number of members in the household				
1	30	19	15.30	22.90
2	71	19	36.20	22.90
3	27	11	13.80	13.30
4	24	16	12.20	19.30
5 or more	44	18	22.40	21.70
Age of members in the household				
15 and under	26	13	13.27	15.66
15 - 19	89	47	46.35	56.63
20 - 29	116	31	60.42	37.35
30 - 39	12	8	6.25	9.64
40 - 49	22	21	11.46	25.30
50 - 59	15	14	7.81	16.87
60 and over	4	4	2.09	4.82
Preparer of food				
By the subject	108	36	55.10	43.40
Other family member	4	3	2.00	3.60
Roommate	1	0	0.50	0.00
School cafeteria	45	32	23.00	38.60
Other	37	12	18.90	14.50

Consumer Behavior Characteristics

Purchasing Behaviors

Table II shows that a majority of the students (FNIA 1113: 62.24%, ENGL 1113: 55.42%) from both courses purchased snack foods on 3 days or less per week. Of the students in the experimental group, 63 (32.31%) shop alone, while 132 (67.69%) shop with family members or roommates. Thirty-one subjects in the control group (37.35%) shop alone, whereas 52 (62.65%) shop with family members or roommates.

The factor that influenced most subjects from the experimental group to purchase snack foods was availability/convenience (N = 127, 64.80%), followed by a family member/roommate (N = 32, 16.67%) and other unspecified motives (N = 32, 16.67%). The factor that influenced the most subjects from the control group to purchase snack foods was availability/convenience (N = 49, 56.76%), followed by other unspecified factors (N = 23, 28.05%) and price (N = 11, 13.41%).

Over 60% (N = 118) of the experimental group purchased snack foods at supermarkets, while 117 (59.69%) also purchased at convenience stores. Over 53% (N = 104) purchased snack foods from vending machines. More than half (N = 45, 54.22%) of the control group purchased snacks from convenience stores, while 42 (50.20%) also purchased from vending machines. Nearly 41% (N = 34) bought snacks at supermarkets.

Consumption Behaviors

The value of snack foods consumed by most of the subjects (FNIA: N = 166, 84.69%, ENGL: N = 69, 83.13%) was two dollars or less per day. Only 15.31% of the experimental group and 16.87% of the control group consumed snacks valued at more than two dollars a day. Most of the subjects (FNIA: N = 126, 59.18%, ENGL: N = 47, 56.63%) consumed one or two meals per day, while 40.82% of the experimental group and 43.37% of the control group consumed 3 or more meals a day. The number of snacks consumed was most commonly (FNIA: N = 166, 84.69%, ENGL: N = 71, 85.54%) two or less per day, while only 15.31% of the experimental group and 14.46% of the control group consumed 3 or more snacks per day. Nearly 86% (N = 167) of the experimental group and approximately 83% (N = 67) of the control group may substitute snacks for meals, while the remainder of the students never substitute snacks for meals.

A majority of the experimental group (N = 144, 74.23%) consumed snacks when studying, while 133 (68.56%) consumed snacks when watching television. The third most popular time to consume snacks was between classes (N = 85, 43.81%). Most of the control group (N = 58, 70.73%) consumed snacks when studying, while 49 (59.76%) consumed snacks when watching television. The next most common period during which subjects consumed snacks was at parties (N = 34, 41.46%).

The majority of students from both groups felt bored when snacking occurred (FNIA: N = 145, 73.98%, ENGL: N = 43, 51.81%). The next most popular feeling when snacking was when under stress (FNIA: N = 87, 44.39%, ENGL: N = 34, 40.96%), followed closely by snacking when feeling restless (FNIA: N = 83, 42.35%, ENGL: N = 29, 34.94%).

Types of Snacks Consumed

The most popular type of snack consumed by both groups was chocolate/sweets (FNIA: 58.67%, ENGL: 65.06%); however, the groups differed in the second most popular snack. The experimental group (54.08%) chose popcorn, while the control group (55.42%) chose chips. This preference was reversed for the third most popular snack with 50.00% of the experimental group choosing chips and 50.60% of the control group choosing popcorn. The fourth most popular snack food for each group (FNIA: 48.47%, ENGL: 44.58%) was fruits and vegetables. Wheat products (such as crackers, bread, and cereals) were the fifth most typical snack food consumed by the experimental group (41.33%), while English subjects (31.33%) choose pizza. Other snacks consumed included cheese, ice cream, yogurt, and nuts.

The most popular beverage consumed at snack time for the experimental group was water (61.22%), while the control group most often chose caffeinated soft drinks (55.42%). The second most popular beverage for the experimental group was caffeinated soft drinks (47.96%), followed by diet caffeinated soft drinks (35.71%), fruit juice concentrate (34.18%), tea (25.00%), and milk (20.41%). The second most popular snacktime beverage for the control group was water (54.22%), followed by fruit juice concentrate (38.55%), milk (26.51%), diet caffeinated soft drinks (21.69%), and alcohol (18.07%).

TABLE II

FREQUENCY AND PERCENTAGE DISTRIBUTION OF THE SAMPLE ACCORDING TO CONSUMER BEHAVIOR VARIABLES

Variable	Frequency		Percentage	
	experimental group	control group	experimental group	control group
Number of days snack foods are purchased per week				
3 or less	122	46	62.24	55.42
4 or more	74	37	37.74	44.58
Shopping habits				
Shop alone	63	31	32.31	37.35
Other	132	52	67.69	62.65
Factors that influence the purchase of snack foods				
Availability/ convenience	127	49	64.80	56.76
Family member/roommate	32	4	16.67	4.88
Magazine/newspaper ads	3	2	1.56	2.44
TV/radio ads	12	2	6.77	2.44
Price	30	11	15.63	13.41
Recommendation by others	12	4	6.25	4.88
other	32	23	16.67	28.05
Place of snack food purchase				
Convenience store	117	45	59.69	54.22
Supermarket	118	34	60.20	40.96
Student union	47	16	23.98	19.28
Vending machine	104	42	53.06	50.20
Local retail and discount outlets	33	8	16.84	9.64
Quick-order restaurant	48	15	24.49	18.07
Sit-down restaurant	6	2	3.06	2.41
Value of snacks consumed per day				
$2 or less	166	69	84.69	83.13
more than $2	30	14	15.31	16.87
Number of meals consumed per day				
1 or 2	126	47	59.18	56.63
3 or more	80	36	40.82	43.37
Number of snacks consumed per day				
2 or less	166	71	84.69	85.54
more than 3	30	12	15.31	14.46

TABLE II (cont.)

Variable	Frequency		Percentage	
	experimental group	control group	experimental group	control group
Substitution of snacks for meals				
never	28	14	14.36	17.28
seldom, often, always	167	67	85.64	82.72
When snacks are consumed				
Sporting events	48	30	24.49	36.14
Traveling	83	33	42.78	40.24
Studying	144	58	74.23	70.73
At parties	71	34	36.60	41.46
Watching TV	133	49	68.56	59.76
Between classes	85	29	43.81	35.37
At work	33	14	17.01	17.07
Feelings when snacks are consumed				
Bored	145	43	73.98	51.81
Frustrated	35	15	17.86	18.07
Under stress	87	34	44.39	40.96
Tired	44	19	22.45	22.89
Happy	53	25	27.04	30.12
Sad	22	9	11.22	10.84
Depressed	59	18	30.10	21.69
Lonely	44	15	22.45	18.07
Restless	83	29	42.35	34.94
Types of snacks consumed				
Chocolate/sweets			58.67	65.06
Wheat products			41.33	30.12
Cheese			28.06	27.71
Ice cream/ice milk			22.96	22.89
Yogurt			21.94	14.46
Fruit/vegetables			48.47	44.58
Popcorn			54.08	50.60
Pizza			18.88	31.33
Nuts			12.76	18.07
Chips			50.00	55.42
Types of beverages consumed				
Milk			20.41	26.51
Tea			25.00	16.87
Coffee			6.63	2.41
Fruit juice concentrate			34.18	38.55
Caffeinated soft drinks			47.96	55.42
Decaffeinated soft drinks			6.12	7.23
Diet caffeinated soft drinks			35.71	21.69
Diet decaffeinated soft drinks			9.18	8.43
Alcohol			9.18	18.07
Water			61.22	54.22

Nutrition Knowledge

Statements about nutrition awareness were grouped accordingly: (1) sodium, (2) sugar, (3) fat, (4) processed snacks, (5) nutritious snacking, and (6) purchasing behaviors. The percentage of subjects who agreed with these atatements on a Likert scale can be examined in Appendix C.

Both groups were interested in increasing nutrition knowledge and stated that they consumed a variety of foods for both meals and snacks. Many of the subjects were influenced to purchase by family members or roommates and the price of the snack food. Only a few subjects stated that they avoid processed snacks or those containing additives and preservatives.

Testing of the Hypotheses

Hypotheses were tested using a chi-square analysis. The significance level accepted was $p \leq 0.05$.

Hypothesis One:

H_1: There will be no significant association between nutrition knowledge of students as associated with selected variables: age, sex, marital status, race, residence, and major.

Table III shows that the age of the respondent was significantly associated with six of the 26 nutrition knowledge statements. Subjects over 21 years of age agreed with the statements "I try to avoid snacks high in sodium" ($p = .004$), "I try to avoid processed snacks" ($p = .026$), "I am interested in increasing my nutrition knowledge" ($p = .021$), and "I purchase more snack foods for my family/roommate then I do for myself" (p = .030). The vitamin and mineral content of snack foods was important to subjects over 21 (p = .044). The consumption of snacks high in simple carbohydrates was associated with students over 21 (p = .022).

The demographic variable sex was significantly associated with four of the 26 statements. Females agreed with the statements "I consume too many sugary snacks" (p = .011) and "Reading the nutrient information on the labels of snack foods will help the consumer make a wise choice since the manufacturer must, by law, print the facts" (p = .003). Females consumed snacks while under stress (p = .000) and agreed that family members or roommates influence the purchase of snack foods (p = .043).

Marital status was significantly associated with six of the 26 nutrition knowledge statements. Married subjects tended to agree that the vitamin and mineral content of snack foods (p = .036) and the avoidance of additives and preservatives in snacks (p = .003) is important. Married subjects were also concerned with the nutritional content of the snack foods (p = .005) and increasing their nutrition knowledge (p = .039). Married subjects were associated with the statement "I purchase more snack foods for my family/roommate than I do for myself" (p = .000) and also "My family/roommate influences my choice of snack foods" (p = .025).

Race was significantly associated with only two of the 26 nutrition knowledge statements. Subjects other than Caucasians were associated with the statement "I try to avoid snacks high in cholesterol" (p = .009) and the statement "The calories in 'natural' snacks such as granola bars or dried fruits aren't nearly as fattening as calories in 'junk-food' snacks" (p = .021).

The subject's major was associated with four of the 26 statements. Avoiding snacks high in cholesterol (p = .005) and avoiding processed snacks (p = .035) was associated with majors other than Home Economics. Other majors were influenced to purchase by the vitamin and mineral content of the snack food (p = .028). Home Economics majors were associated with the statement "My snack food purchases represent my impulse buying practices" (p = .047).

Place of residence was not found to be significantly associated with any nutrition knowledge statement; therefore, the researcher failed to reject this portion of the hypothesis. There was, however, a significant association found between other demographic variables and nutrition knowledge statements; therefore, the researcher rejects this portion of the hypothesis.

TABLE III

SIGNIFICANT ASSOCIATIONS BETWEEN NUTRITION KNOWLEDGE STATEMENTS AND DEMOGRAPHIC VARIABLES

Statements	Demographic Variable	df	x2	p
I try to avoid snacks high in sodium.				
	Age	1	8.261	.004
I try to avoid snacks high in cholesterol.				
	Major	1	7.849	.005
	Race	1	6.727	.009
I try to avoid processed snacks.				
	Age	1	4.958	.026
	Major	1	4.453	.035
The vitamin and mineral content of snack foods influences my selection.				
	Age	1	4.044	.044
	Major	1	4.810	.028
	Marital status	1	4.374	.036
I consume snacks high in simple carbohydrate.				
	Age	1	5.222	.022
I consume too many sugary snacks.				
	Sex	1	6.420	.011
I avoid snack foods containing additives and preservatives.				
	Marital status	1	8.900	.003
The calories in "natural" snacks such as granola bars or dried fruits aren't nearly as fattening as calories in "junk-food" snacks.				
	Race	1	5.333	.021
Reading nutrient information on the labels of snack foods will help the consumer make a wise choice since the manufacturer must, by law, print the facts.				
	Sex	1	8.801	.003
The nutritional content of the snack food is important to me.				
	Marital status	1	7.911	.005

TABLE III (cont.)

Statements	Demographic Variable	df	x^2	p
My consumption of snack food is related to my stress situation.				
	Sex	1	12.612	.000*
I am interested in increasing my nutrition knowledge.				
	Age	1	5.357	.021
	Marital status	1	4.252	.039
My snack food purchases represent my impulse buying practices.				
	Major	1	3.929	.047
I purchase more snack foods for my family/roommate than I do for myself.				
	Age	1	4.720	.030
	Marital status	1	17.759	.000*
My family/roommate influences my choice of snack foods.				
	Sex	1	4.100	.043
	Marital status	1	5.024	.025

* significant at $p \leq 0.05$

Hypothesis Two:

H_2: There will be no significant association between demographic variables and consumer behavior patterns relative to snack foods.

Table IV demonstrates that the demographic variable age was found to be significantly associated with ten consumer behavior patterns. Purchasing snack foods on three days or less per week (p = .009) and shopping with family members or roommates (p =.000) was associated with subjects who were 21 years of age or under. Respondents over 21 shopped alone (p = .000) and purchased snack foods at retail and discount outlets (p = .027) and sit-down restaurants (p = .006). Consuming snacks when studying (p = .001) and when bored (p = .023) was associated with subjects 21 years of age and under, while those over 21 tended to consume snacks while at work (p = .002). Subjects over 21 tended to consume coffee as a snacktime beverage (p = .022), while subjects 21 and under were associated with the consumption of diet decaffeinated soft drinks (p = .005) and water (p = .000).

The demographic variable sex was significantly associated with 18 consumer behaviors. Males tended to shop alone, while females shopped with family members or roommates (p = .001). The snack food purchases of females were influenced by availability/convenience (p = .050) and family members or roommates (p = .001). Females tended to consume 1 or 2 meals a day, while males consumed 3 or more meals a day (p = .004). Males were correlated with snacking at sporting events (p = .000), while females snacked when studying (p = .000), when bored (p = .006), and when depressed (p = .001).

Gender was also found to be significantly associated with the types of snacks consumed by the subjects. Females tended to choose yogurt (p = .035) and popcorn (p = .000), while males consumed nuts (p = .000), milk (p = .000), caffeinated soft drinks (p = .016), and alcohol (p = .001). Females were associated with the consumption of beverages such as decaffeinated soft drinks (p = .050), diet caffeinated soft drinks (p = .000), diet decaffeinated soft drinks (p = .007), and water (p = .005).

Marital status was associated with only two consumer behaviors. Single respondents tended to consume one or two meals a day, while married subjects consumed three or more meals a day (p = .001). Single subjects snacking while watching television (p = 014).

The demographic variable race was associated with four consumer behavior patterns. Caucasian respondents tended to purchase snacks at convenience stores (p = .030) and to consume snacks while watching television (p = .013), when bored (p = .028), and when frustrated (p = .039).

The respondent's place of residence was significantly associated with 14 consumer behaviors. Snack food purchases of students who live in the OSU residence halls were influenced to by recommendations from others (p = .040). Vending machines (p = .001) and sit-down restaurants (p = .027) were points of purchase for those living in the residence halls. Respondents living in the residence halls tended to consume one or two meals a day (p = .002) and may substitute meals for snacks (p = .039). Place of residence was also significantly associated with when snacks were consumed. Living in the residence halls correlated with consuming snacks when studying (p = .001), while respondents from other living situations consumed snacks while at work (p = .004). The consumption of cheese (p = .017) and pizza (p = .014) was associated with living in the residence halls. The consumption of several beverages such as tea (p = .023), coffee (p = .046), fruit juice concentrate (p = .046), fruit flavored drinks (p = .020), and water (p = .047) was also associated with living in the residence halls.

The demographic variable major was significantly associated with five consumer behavior characteristics. Home Economics majors were influenced to purchase by store marketing (p = .007), purchased at supermarkets (p = .001), consumed one or two meals a day (p = .042), consumed when bored (p = .001), and choose chips at snacktime (p = .005).

The demographic variables gender, place of residence, and age were found to be associated with the most consumer behavior characteristics; however, major, racial identification, and marital status were also associated. As a result of these significant correlations, the researcher rejects the second hypothesis.

TABLE IV

SIGNIFICANT ASSOCIATION BETWEEN CONSUMER BEHAVIOR PATTERNS AND DEMOGRAPHIC VARIABLES

Behavior	Demographic Variable	df	x2	p
Number of days snack foods are purchased per week				
	Age	1	6.833	.009
Shopping habits				
	Sex	1	10.469	.001
	Age	1	12.549	.000*
	Number in household	1	11.439	.001
Factors that influence the purchase of snack foods				
Availability/convenience				
	Sex	1	3.839	.050
Family member/roommate				
	Sex	1	10.489	.001
Store marketing				
	Major	1	7.289	.007
Recommendation by others				
	Residence	1	4.203	.040
Place of snack food purchase				
Convenience store				
	Race	1	4.709	.030
	Number in household	1	8.073	.004
Supermarket				
	Major	1	11.038	.001
Vending machine				
	Residence	1	10.431	.001
Retail and discount outlets				
	Age	1	4.864	.027
Sit-down restaurant				
	Age	1	7.508	.006
	Residence	1	4.899	.027

TABLE IV(cont.)

Behavior	Demographic Variable	df	x2	p
Number of meals consumed per day				
	Sex	1	8.213	.004
	Major	1	4.142	.042
	Marital status	1	11.821	.001
	Residence	1	10.070	.002
	Number in household	1	9.658	.002
Substitution of snacks for meals				
	Residence	1	4.258	.039
When snacks are consumed				
Sporting events				
	Sex	1	14.097	.000*
Studying				
	Sex	1	20.178	.000*
	Age	1	10.71	.001
	Residence	1	11.105	.001
Watching TV				
	Marital status	1	6.000	.014
	Race	1	6.142	.013
At work				
	Age	1	9.960	.002
	Residence	1	8.285	.004
Feelings when snacks are consumed				
Bored				
	Sex	1	7.464	.006
	Age	1	5.180	.023
	Major	1	11.044	.001
	Race	1	4.844	.028
Frustrated				
	Race	1	4.240	.039
	Number in household	1	4.654	.031
	Sex	1	6.189	.013
Tired				
	Number in household	1	5.769	.016
Happy				
	Number in household	1	4.398	.036

TABLE IV (cont.)

Behavior	Demographic Variable	df	x2	p
Depressed				
	Sex	1	11.039	.001
Types of snacks consumed				
Wheat products				
	Number in household	1	5.140	.023
Cheese				
	Residence	1	5.667	.017
Ice cream/ice milk				
	Number in household	1	3.845	.050
Yogurt				
	Sex	1	4.465	.035
Popcorn				
	Sex	1	15.328	.000*
Pizza				
	Residence	1	6.004	.014
	Number in household	1	5.769	.016
Nuts				
	Sex	1	14.087	.000*
Chips				
	Major	1	7.959	.005
Types of beverages consumed				
Milk				
	Sex	1	14.260	.000*
Tea				
	Residence	1	5.192	.023
Coffee				
	Age	1	5.261	.022
	Residence	1	3.989	.046
Fruit juice concentrate				
	Residence	1	3.998	.046
Fruit flavored drinks				
	Residence	1	5.444	.020

TABLE V (cont.)

Behavior	Demographic Variable	df	x^2	p
Caffeinated soft drinks				
	Sex	1	5.758	.016
Decaffeinated soft drinks				
	Sex	1	3.828	.050
Diet caffeinated soft drinks				
	Sex	1	19.737	.000*
Diet decaffeinated soft drinks				
	Sex	1	7.200	.007
	Age	1	8.009	.005
Alcohol				
	Sex	1	11.358	.001
Water				
	Sex	1	7.722	.005
	Age	1	12.749	.000*
	Residence	1	3.947	.047

* significant at $p \leq 0.05$

Hypothesis Three:

H_3: There will be no significant association between snack food consumption patterns and practices of the students who have completed an introductory nutrition course and those who have not.

Table V indicates that students in the experimental group were influenced by a family member/roommate to purchase of snack foods ($p = .008$), while the control group was associated with other unspecified motives ($p = .031$). Purchasing snack foods at a supermarket ($p = .003$) and consuming snacks when bored ($p = .000$) was associated with enrollment in FNIA 1113. Enrollment in ENGL 1113 was correlated with consuming snacks at sporting events ($p = .047$).

The types of snacks consumed was also associated with enrollment in these courses. The control group was associated with the consumption of pizza ($p = .023$), fruit flavored drinks ($p = .009$), and alcohol ($p = .036$), while the experimental group consumed diet caffeinated drinks ($p = .021$).

An association was found between snack food practices and enrollment in Basic Human Nutrition and Freshman Composition. The researcher, therefore, rejects the null hypothesis.

TABLE V

SIGNIFICANT ASSOCIATIONS BETWEEN SNACK FOOD PRACTICES AND ENROLLMENT IN FNIA 1113 AND ENGL 1113

Practice	Enrollment	df	x^2	p
Factors that influence the purchase of snack foods				
Family member/roommate				
	FNIA 1113 / ENGL 1113	1	6.997	.008
Other				
	FNIA 1113 / ENGL 1113	1	4.640	.031
Place of snack food purchase				
Supermarket				
	FNIA 1113 / ENGL 1113	1	8.704	.003
When snacks are consumed				
Sporting events				
	FNIA 1113 / ENGL 1113	1	3.932	.047
Feelings when snacks are consumed				
Bored				
	FNIA 1113 / ENGL 1113	1	13.043	.000*
Types of snacks consumed				
Pizza				
	FNIA 1113 / ENGL 1113	1	5.168	.023
Types of beverages consumed				
Fruit flavored drinks				
	FNIA 1113 / ENGL 1113	1	6.835	.009
Diet caffeinated soft drinks				
	FNIA 1113 / ENGL 1113	1	5.314	.021
Alcohol				
	FNIA 1113 / ENGL 1113	1	4.417	.036

* significant at $p \leq 0.05$

CHAPTER V

SUMMARY, RECOMMENDATIONS, AND IMPLICATIONS

The snack food industry is continually growing and adapting to the needs of the American consumer. Advertising and the media play an important role in determining the interests of those consuming snack foods. Therefore, it is increasingly important that the consumption habits and consumer behavior patterns of those consuming snack foods be evaluated.

This study was conducted to determine if completing a course in nutrition would have an effect on the nutrition knowledge and behaviors as related to snack foods of students; therefore, subjects were chosen from FNIA 1113 (Basic Human Nutrition) and ENGL 1113 (Freshman Composition). The relationship between consumer behavior patterns and demographic variables were analyzed.

The review of literature indicated that snacking may have a positive effect on the nutritional intake of those consuming them. Researchers did indicate a need to educate snackers about the appropriate choices for snack foods. Research also indicated that completing nutrition courses could affect the nutrition knowledge of the students.

The sample consisted of students enrolled in Basic Human Nutrition and Freshman Composition at Oklahoma State University, Spring 1988. The research instrument was administered during the last week of the semester.

The sample of 279 students was composed of 196 students from FNIA 1113 and 83 from ENGL 1113. Of those from the nutrition course, 21.43% were male and 78.57% were female, while 56.63% of the students from the English course were male and 43.37% were female. Three-fourths of the experimental group and nearly 82% of the control group were 21 or under. Of those in FNIA 1113 nearly 70% were Home Economics majors, while only one student in ENGL 1113 was a Home Economics major. Approximately 95% of the subjects from both courses were single and Caucasian. Approximately half of the control group lived in the OSU residence halls, while only 32% of the nutrition students lived in the residence halls.

Availablility/convenience influenced most respondents (FNIA 1113: 64.80%, ENGL: 56.76%) to purchase snacks. A supermarket was the most popular place for purchase of the experimental group (60.20%), while most subjects in the control group purchased snacks at convenience stores (54.22%). Approximately 85% of the subjects consumed two or less snacks a day. Snacks were most often consumed while studying (FNIA 1113: 74.23%, ENGL 1113: 70.73%) and when feeling bored (FNIA: 73.98%, ENGL: 51.81%). While chocolate/sweets were the most popular snack for both groups (FNIA: 58.67%, ENGL: 65.06%), the experimental group most often consumed water (61.22%) and the control group favored caffeinated soft drinks (55.42%).

Associations of selected variables was determined using a chi-square analysis. Significant associations were found between nutrition knowledge statements and the demographic variables age, sex, marital status, race, and major. Significant associations were also found between the demographic variables and consumer behavior patterns. Snack food eating patterns and practices were found to be associated with the completion of a course in nutrition. Therefore, the researcher rejected H_2 and H_3, but only part of H_1, since no association was found between place of residence and nutrition knowledge statements.

Recommendations

The results of this study indicated several recommendations for future studies:

1. Administer a pretest and a posttest to both groups of students to have a comparison of the change in knowledge as a result of exposure to nutrition coursework.
2. A 24-hour recall could be used on a representative sample of subjects from both groups to determine actual snacking patterns.
3. The sample should be more representative of the actual population of Oklahoma State University.
4. The questionnaire should include more questions about food misrepresnetation to pinpoint specific bahaviors of the subjects.
5. Terms used in the questionnaire should be defined in a clear manner. Words such as "household", "variety of foods", or "healthy snacks" may be misinterpreted.
6. Gum or hard candy should be included as a snack food choice.
7. Questions #7, #8, and #9 may not be relevant and should be excluded from further research using this questionnaire.

8. Nutrition awareness statements could be grouped into fewer statements according to the U. S. Dietary Goals.

Implications

Results of this study indicated that nutrition knowledge and snacking habits may be affected as a result of formal classroom instruction in Basic Human Nutrition. However, one must consider that since nutrition education makes the student more aware of what is correct, the student's answers may be biased. Students enrolled in a nutrition course may be more critical of their behaviors because of this knowledge.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE

SNACK FOOD SURVEY AND CONSUMER BEHAVIOR PATTERNS
CONSUMER PREFERENCE STUDY

This study focuses on the nutritional awareness, attitudes, interests, and opinions of individuals concerning snack foods. Your answers will be kept confidential. Please do not sign your name to this questionnaire. Your time and effort in answering this questionnaire are certainly appreciated. Please answer all questions as truthfully as possible and to the best of your knowledge. Thank you.

The survey questionnaire is divided into three sections:

Demographic Information
Snack Food Selection
Nutritional Awareness Information

DEMOGRAPHIC INFORMATION

1. Are you:
   _____(1) male
   _____(2) female

2. What is your age?
   _____(1) under 18
   _____(2) 18 - 21
   _____(3) 22 - 25
   _____(4) 26 - 30
   _____(5) 31 - 40
   _____(6) over 40

3. What is your major?
   _____(1) FNIA/HRAD
   _____(2) Other Home Economics field
   _____(3) other

4. What is you present marital status?
   _____(1) single
   _____(2) married
   _____(3) widowed
   _____(4) divorced
   _____(5) separated

5. Which of the following best describes your racial or ethnic identification?
   _____(1) Caucasian (white)
   _____(2) Asian
   _____(3) Native American/American Indian
   _____(4) Black
   _____(5) Hispanic
   _____(6) Other . . . . . specify______________________

6. Where do you reside?

_____(1) family home
_____(2) apartment/duplex/rented home
_____(3) residence halls
_____(4) fraternity/sorority house
_____(5) other . . . . . specify______________________

7. How many members live in your household?

_____(1) 1
_____(2) 2
_____(3) 3
_____(4) 4
_____(5) 5 or more

8. How many of those living in your household are: (answer all that apply)

_____(1) under 15
_____(2) 15 - 19
_____(3) 20 - 29
_____(4) 30 - 39
_____(5) 40 - 49
_____(6) 50 - 59
_____(7) 60 or over
_____(8) does not apply since I live alone

9. Who prepares your food?

_____(1) I prepare my own food
_____(2) other family member
_____(3) roommate
_____(4) school cafeteria
_____(5) other . . . . . specify______________________

SNACK FOOD SELECTION

Definitions of terms used in this study are listed below. As you respond to each statement use this definition to refer to specific eating periods.

SNACK FOOD - any food or beverage consumed between meals
MEAL - a scheduled eating period during which you consume more than one food item

10. ON AN AVERAGE, how many DAYS during the week do you purchase snack items? (check only one answer)

_____(1) less than one
_____(2) one
_____(3) two
_____(4) three
_____(5) four
_____(6) five
_____(7) six
_____(8) seven
_____(9) none

11. Do you most frequently: (check only one answer)
    - _____(1) shop alone
    - _____(2) shop with family member(s)
    - _____(3) shop with roommate(s)
    - _____(4) don't shop
    - _____(5) other . . . . specify______________________________

12. What influences you to purchase snack foods?
    - _____(1) availablility/convenience
    - _____(2) family member/roommate
    - _____(3) magazine/newspaper ads
    - _____(4) television/radio ads
    - _____(5) store marketing
    - _____(6) price
    - _____(7) recommendation by others
    - _____(8) other . . . . specify______________________________

13. Where do you purchase snack foods?
    (check all that apply)
    - _____(1) convenience stores
    - _____(2) supermarket
    - _____(3) student union or other campus store
    - _____(4) vending machines
    - _____(5) local retail and discount outlets
    - _____(6) quick-order restaurant
    - _____(7) sit-down restaurant

14. Approximately what is the VALUE of the snack foods and beverages that you consume EACH DAY? (check only one)
    - _____(1) less than $1
    - _____(2) $1 - $2
    - _____(3) $2 - $3
    - _____(4) $3 - $4
    - _____(5) $4 - $5
    - _____(6) $5 - $10
    - _____(7) $10 - $20
    - _____(8) more than $20

15. How many meals do you consume per day?
    - _____(1) 1
    - _____(2) 2
    - _____(3) 3
    - _____(4) more than 3

16. Do you substitute snacks for meals?
    - _____(1) never
    - _____(2) seldom
    - _____(3) often
    - _____(4) always

17. On an average, how many snacks do you consume per day?

_____(1) less than 1
_____(2) 1
_____(3) 2
_____(4) 3
_____(5) 4
_____(6) more than 4
_____(7) none

18. When do you consume snacks? (check all that apply)

_____(1) sporting events
_____(2) traveling
_____(3) studying
_____(4) at parties
_____(5) watching TV
_____(6) between classes
_____(7) at work
_____(8) does not apply - I don't snack

19. What do you usually feel like when you snack? (check any that apply)

_____(1) bored
_____(2) frustrated
_____(3) under stress
_____(4) tired
_____(5) happy
_____(6) sad
_____(7) depressed
_____(8) lonely
_____(9) restless
_____(10) does not apply - I don't snack

20. What do you usually consume for snacks? (check all that apply)

_____(1) chocolate/sweets
_____(2) wheat products
_____(3) cheese
_____(4) ice cream/ice milk
_____(5) yogurt
_____(6) fruits/vegetables
_____(7) popcorn
_____(8) pizza
_____(9) nuts
_____(10) chips
_____(11) does not apply - I don't snack

21. What do you usually drink at snack time? (check all that apply)

______(1) milk
______(2) tea
______(3) coffee
______(4) fruit juice concentrates
______(5) fruit flavored drinks
______(6) caffeinated soft drinks
______(7) decaffeinated soft drinks
______(8) diet caffeinated soft drinks
______(9) diet decaffeinated soft drinks
______(10) alcoholic beverages
______(11) water
______(12) does not apply - I don't snack

NUTRITION AWARENESS INFORMATION

22. Have you had any nutrition-related classes previously?

______(1) yes
______(2) no

23. If yes, where?

______(1) junior high school
______(2) high school
______(3) college/university
______(4) government agencies
______(5) 4-H
______(6) other . . . . specify______________________________

24. For the following statements please circle the number that best indicates your response. For each statement, the number 5 indicates that you strongly agree and the number 1 indicates that you strongly disagree. If the statement does not apply to your situation or you nave no opinion please indicate that by circling the number 3.

	SA				SD
a. I try to avoid snacks high in sodium.	5	4	3	2	1
b. I try to avoid snacks high in sugar.	5	4	3	2	1
c. I try to avoid snacks high in cholesterol.	5	4	3	2	1
d. I try to avoid snacks high in fat.	5	4	3	2	1
e. I try to avoid processed snacks.	5	4	3	2	1
f. I consume snack foods that are enriched or whole-grain breads and cereals.	5	4	3	2	1
g. The vitamin and mineral content of snack foods influences my selection.	5	4	3	2	1
h. I eat a variety of foods for both meals and snacks.	5	4	3	2	1

i. I consume snacks high in simple carbohydrate.	5	4	3	2	1
j. I try to avoid empty calorie snack foods.	5	4	3	2	1
k. I consume snack foods high in nutrients.	5	4	3	2	1
l. I consume too many sugary snacks.	5	4	3	2	1
m. I avoid snack foods containing additives and preservatives.	5	4	3	2	1
n. Consuming highly salted snacks contributes to hypertension.	5	4	3	2	1
o. The calories in "natural" snacks such as granola bars or dried fruits aren't as fattening as calories in "junk-food" snacks.	5	4	3	2	1
p. Reading nutrient information on the labels of snack foods will help the consumer make a wise choice since the manufacturer must, by law, print the facts.	5	4	3	2	1
q. The consumer should always consume fortified snacks.	5	4	3	2	1
r. The price of a snack food determines if I purchase it.	5	4	3	2	1
s. The nutritional content of the snack food is important to me.	5	4	3	2	1
t. The brand or name of the snack product is important to me.	5	4	3	2	1
u. My consumption of snack food is related to my stress situation.	5	4	3	2	1
v. I am interested in increasing my nutrition knowledge.	5	4	3	2	1
w. My snack food purchases represent by impulse buying practices.	5	4	3	2	1
x. I prepare my own snack foods.	5	4	3	2	1
y. I purchase more snack foods for my family/roommate than I do for myself.	5	4	3	2	1
z. My family/roommate influences my choice of snack foods.	5	4	3	2	1

APPENDIX B

CHI-SQUARE TABLES

CODES FOR CHI-SQUARE TABLES

Corresponding to Table III:

NUT1	I try to avoid snacks high in sodium.
NUT3	I try to avoid snacks high in cholesterol.
NUT5	I try to avoid processed snacks.
NUT7	The vitamin and mineral content of snack foods influences my selection.
NUT9	I consume snacks high in simple carbohydrate.
NUT12	I consume too many sugary snacks.
NUT13	I avoid snack foods containing additives and preservatives.
NUT15	The calories in "natural" snacks such as granola bars or dried fruits aren't as fattening as calories in "junk-food" snacks.
NUT16	Reading nutrient information on the labels of snack foods will help the consumer make a wise choice since the manufacturer must, by law, print the facts.
NUT19	The nutritional content of the snack food is important.
NUT21	My consumption of snack food is related to my stress situation.
NUT22	I am interested in increasing my nutrition knowledge.
NUT23	My snack food purchases represent my impulse buying practices.
NUT25	I purchase more snack foods for my family/roommate than I do for myself.
NUT26	My family/roommate influences my choice of snack foods.

Corresponding to Table IV:

DAYSPUR	Number of days snack foods were purchased

FREQ	Shopping habits
INFL1	Avaliability/convenience
INFL2	Family member/roommate
INFL5	Store marketing
INFL7	Recommendations by others
PURCH1	Convenience store
PURCH2	Supermarket
PURCH4	Vending
PURCH5	Retail and discount outlets
PURCH7	Sit-down restaurant
MEALS	Number of meals consumed per day
SUBST	Substitution of meals for snacks
CONSUME1	Sporting events
CONSUME3	Studying
CONSUME5	Watching TV
CONSUME7	At work
MOOD1	Bored
MOOD2	Frustrated
MOOD4	Tired
MOOD5	Happy
MOOD7	Depressed
TYPES2	Wheat products
TYPES3	Cheese
TYPES4	Ice cream/ice milk
TYPES5	Yogurt
TYPES7	Popcorn
TYPES8	Pizza
TYPES9	Nuts

TYPES10	Chips
DRINK1	Milk
DRINK2	Tea
DRINK3	Coffee
DRINK4	Fruit juice concentrates
DRINK5	Fruit-flavored drinks
DRINK6	Caffeinated soft drinks
DRINK7	Decaffeinated soft drinks
DRINK8	Diet Caffeinated soft drinks
DRINK9	Diet Decaffeinated soft drinks
DRINK10	Alcohol
DRINK11	Water

Corresponding to Table IV:

INFL2	Family mamber/roommate
INFL8	Other
PURCH2	Supermarket
CONSUME1	Sporting events
MOOD1	Bored
TYPES8	Pizza
DRINK5	Fruit-flavored drinks
DRINK8	Diet caffeinated soft drinks
DRINK10	Alcohol

```
AGE       NUT1

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |    138 |     78 |    216
         |  128.2 |   87.8 |
         |.748914 |1.09355 |
         |  49.64 |  28.06 |  77.70
         |  63.89 |  36.11 |
         |  83.64 |  69.03 |
---------+--------+--------+
       2 |     27 |     35 |     62
         |   36.8 |   25.2 |
         |2.60912 |3.80977 |
         |   9.71 |  12.59 |  22.30
         |  43.55 |  56.45 |
         |  16.36 |  30.97 |
---------+--------+--------+
TOTAL         165      113     278
            59.35    40.65  100.00

FREQUENCY MISSING = 1


  STATISTICS FOR TABLE OF AGE BY NUT1

STATISTIC                       DF     VALUE       PROB
-------------------------------------------------------
CHI-SQUARE                       1     8.261      0.004
```

```
RACE      NUT3

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |    153 |    106 |    259
         |  147.7 |  111.3 |
         |.187791 |.249335 |
         |  55.23 |  38.27 |  93.50
         |  59.07 |  40.93 |
         |  96.84 |  89.08 |
---------+--------+--------+
       2 |      5 |     13 |     18
         |   10.3 |    7.7 |
         | 2.7021 |3.58766 |
         |   1.81 |   4.69 |   6.50
         |  27.78 |  72.22 |
         |   3.16 |  10.92 |
---------+--------+--------+
TOTAL         158      119     277
            57.04    42.96  100.00

FREQUENCY MISSING = 2


  STATISTICS FOR TABLE OF RACE BY NUT3

STATISTIC                       DF     VALUE       PROB
-------------------------------------------------------
CHI-SQUARE                       1     6.727      0.009
```

```
MAJOR     NUT5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       2 |    115 |     23 |    138
         |  107.7 |   30.3 |
         |.492082 |1.75052 |
         |  41.37 |   8.27 |  49.64
         |  83.33 |  16.67 |
         |  53.00 |  37.70 |
---------+--------+--------+
       3 |    102 |     38 |    140
         |  109.3 |   30.7 |
         |.485052 |1.72551 |
         |  36.69 |  13.67 |  50.36
         |  72.86 |  27.14 |
         |  47.00 |  62.30 |
---------+--------+--------+
TOTAL         217       61     278
            78.06    21.94  100.00

FREQUENCY MISSING = 1


  STATISTICS FOR TABLE OF MAJOR BY NUT5

STATISTIC                       DF     VALUE       PROB
-------------------------------------------------------
CHI-SQUARE                       1     4.453      0.035
```

```
MAJOR     NUT3

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       2 |     90 |     48 |    138
         |   78.4 |   59.6 |
         |1.70628 |2.24661 |
         |  32.37 |  17.27 |  49.64
         |  65.22 |  34.78 |
         |  56.96 |  40.00 |
---------+--------+--------+
       3 |     68 |     72 |    140
         |   79.6 |   60.4 |
         |1.68191 |2.21451 |
         |  24.46 |  25.90 |  50.36
         |  48.57 |  51.43 |
         |  43.04 |  60.00 |
---------+--------+--------+
TOTAL         158      120     278
            56.83    43.17  100.00

FREQUENCY MISSING = 1


STATISTICS FOR TABLE OF MAJOR BY NUT3

STATISTIC                       DF     VALUE       PROB
-------------------------------------------------------
CHI-SQUARE                       1     7.849      0.005
```

```
AGE       NUT5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |    175 |     41 |    216
         |  168.6 |   47.4 |
         |.242608 |.863048 |
         |  62.95 |  14.75 |  77.70
         |  81.02 |  18.98 |
         |  80.65 |  67.21 |
---------+--------+--------+
       2 |     42 |     20 |     62
         |   48.4 |   13.6 |
         |.845215 |3.00675 |
         |  15.11 |   7.19 |  22.30
         |  67.74 |  32.26 |
         |  19.35 |  32.79 |
---------+--------+--------+
TOTAL         217       61     278
            78.06    21.94  100.00

FREQUENCY MISSING = 1


 STATISTICS FOR TABLE OF AGE BY NUT5

STATISTIC                       DF     VALUE       PROB
-------------------------------------------------------
CHI-SQUARE                       1     4.958      0.026
```

```
AGE       NUT7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |    165 |     50 |    215
         |  158.9 |   56.1 |
         |.233153 | 0.6606 |
         |  59.78 |  18.12 |  77.90
         |  76.74 |  23.26 |
         |  80.88 |  69.44 |
---------+--------+--------+
       2 |     39 |     22 |     61
         |   45.1 |   15.9 |
         |.821768 |2.32834 |
         |  14.13 |   7.97 |  22.10
         |  63.93 |  36.07 |
         |  19.12 |  30.56 |
---------+--------+--------+
TOTAL         204       72     276
            73.91    26.09  100.00

FREQUENCY MISSING = 3


 STATISTICS FOR TABLE OF AGE BY NUT7

STATISTIC                       DF     VALUE       PROB
-------------------------------------------------------
CHI-SQUARE                       1     4.044      0.044
```

```
        MAJOR       NUT7

        FREQUENCY|
        EXPECTED |
        CELL CHI2|
        PERCENT  |
        ROW PCT  |
        COL PCT  |       1|       2|  TOTAL
        ---------+--------+--------+
               2 |    110 |     28 |    138
                 |  102.0 |   36.0 |
                 |.627451 |1.77778 |
                 |  39.86 |  10.14 |  50.00
                 |  79.71 |  20.29 |
                 |  53.92 |  38.89 |
        ---------+--------+--------+
               3 |     94 |     44 |    138
                 |  102.0 |   36.0 |
                 |.627451 |1.77778 |
                 |  34.06 |  15.94 |  50.00
                 |  68.12 |  31.88 |
                 |  46.08 |  61.11 |
        ---------+--------+--------+
        TOTAL        204       72      276
                   73.91    26.09   100.00

        FREQUENCY MISSING = 3


        STATISTICS FOR TABLE OF MAJOR BY NUT7

STATISTIC                             DF      VALUE       PROB
--------------------------------------------------------------
CHI-SQUARE                             1      4.810      0.028
```

```
        AGE         NUT9

        FREQUENCY|
        EXPECTED |
        CELL CHI2|
        PERCENT  |
        ROW PCT  |
        COL PCT  |       1|       2|  TOTAL
        ---------+--------+--------+
               1 |    150 |     65 |    215
                 |  142.6 |   72.4 |
                 |.388888 |.765232 |
                 |  54.35 |  23.55 |  77.90
                 |  69.77 |  30.23 |
                 |  81.97 |  69.89 |
        ---------+--------+--------+
               2 |     33 |     28 |     61
                 |   40.4 |   20.6 |
                 |1.37067 |2.69713 |
                 |  11.96 |  10.14 |  22.10
                 |  54.10 |  45.90 |
                 |  18.03 |  30.11 |
        ---------+--------+--------+
        TOTAL        183       93      276
                   66.30    33.70   100.00

        FREQUENCY MISSING = 3


         STATISTICS FOR TABLE OF AGE BY NUT9

STATISTIC                             DF      VALUE       PROB
--------------------------------------------------------------
CHI-SQUARE                             1      5.222      0.022
```

```
          MARITAL     NUT13

          FREQUENCY|
          EXPECTED |
          CELL CHI2|
          PERCENT  |
          ROW PCT  |
          COL PCT  |       1|       2|  TOTAL
          ---------+--------+--------+
                 1 |    223 |     35 |    258
                   |  219.1 |   38.9 |
                   |.069051 |.389044 |
                   |  81.99 |  12.87 |  94.85
                   |  86.43 |  13.57 |
                   |  96.54 |  85.37 |
          ---------+--------+--------+
                 2 |      8 |      6 |     14
                   |   11.9 |    2.1 |
                   |1.27251 |7.16953 |
                   |   2.94 |   2.21 |   5.15
                   |  57.14 |  42.86 |
                   |   3.46 |  14.63 |
          ---------+--------+--------+
          TOTAL        231       41      272
                     84.93    15.07   100.00

          FREQUENCY MISSING = 7


         STATISTICS FOR TABLE OF MARITAL BY NUT13

  STATISTIC                             DF      VALUE       PROB
  --------------------------------------------------------------
  CHI-SQUARE                             1      8.900      0.003
```

```
        MARITAL     NUT7

        FREQUENCY|
        EXPECTED |
        CELL CHI2|
        PERCENT  |
        ROW PCT  |
        COL PCT  |       1|       2|  TOTAL
        ---------+--------+--------+
               1 |    197 |     65 |    262
                 |  193.7 |   68.3 |
                 |.057877 |.163984 |
                 |  71.38 |  23.55 |  94.93
                 |  75.19 |  24.81 |
                 |  96.57 |  90.28 |
        ---------+--------+--------+
               2 |      7 |      7 |     14
                 |   10.3 |    3.7 |
                 |1.08312 |3.06884 |
                 |   2.54 |   2.54 |   5.07
                 |  50.00 |  50.00 |
                 |   3.43 |   9.72 |
        ---------+--------+--------+
        TOTAL        204       72      276
                   73.91    26.09   100.00

        FREQUENCY MISSING = 3


       STATISTICS FOR TABLE OF MARITAL BY NUT7

STATISTIC                             DF      VALUE       PROB
--------------------------------------------------------------
CHI-SQUARE                             1      4.374      0.036
```

```
        SEX         NUT12

        FREQUENCY|
        EXPECTED |
        CELL CHI2|
        PERCENT  |
        ROW PCT  |
        COL PCT  |       1|       2|  TOTAL
        ---------+--------+--------+
               1 |     49 |     38 |     87
                 |   39.3 |   47.7 |
                 |2.41643 | 1.9872 |
                 |  17.69 |  13.72 |  31.41
                 |  56.32 |  43.68 |
                 |  39.20 |  25.00 |
        ---------+--------+--------+
               2 |     76 |    114 |    190
                 |   85.7 |  104.3 |
                 |1.10647 |.909928 |
                 |  27.44 |  41.16 |  68.59
                 |  40.00 |  60.00 |
                 |  60.80 |  75.00 |
        ---------+--------+--------+
        TOTAL        125      152      277
                   45.13    54.87   100.00

        FREQUENCY MISSING = 2


         STATISTICS FOR TABLE OF SEX BY NUT12

STATISTIC                             DF      VALUE       PROB
--------------------------------------------------------------
CHI-SQUARE                             1      6.420      0.011
```

```
        RACE        NUT15

        FREQUENCY|
        EXPECTED |
        CELL CHI2|
        PERCENT  |
        ROW PCT  |
        COL PCT  |       1|       2|  TOTAL
        ---------+--------+--------+
               1 |    170 |     88 |    258
                 |  165.5 |   92.5 |
                 |.124765 |.223065 |
                 |  61.59 |  31.88 |  93.48
                 |  65.89 |  34.11 |
                 |  96.05 |  88.89 |
        ---------+--------+--------+
               2 |      7 |     11 |     18
                 |   11.5 |    6.5 |
                 | 1.7883 |3.19726 |
                 |   2.54 |   3.99 |   6.52
                 |  38.89 |  61.11 |
                 |   3.95 |  11.11 |
        ---------+--------+--------+
        TOTAL        177       99      276
                   64.13    35.87   100.00

        FREQUENCY MISSING = 3


        STATISTICS FOR TABLE OF RACE BY NUT15

STATISTIC                             DF      VALUE       PROB
--------------------------------------------------------------
CHI-SQUARE                             1      5.333      0.021
```

```
SEX        NUT16

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |     39 |     48 |     87
         |   28.3 |   58.7 |
         |4.07519 |1.96132 |
         |  14.08 |  17.33 |  31.41
         |  44.83 |  55.17 |
         |  43.33 |  25.67 |
---------+--------+--------+
       2 |     51 |    139 |    190
         |   61.7 |  128.3 |
         |1.86601 |0.89808 |
         |  18.41 |  50.18 |  68.59
         |  26.84 |  73.16 |
         |  56.67 |  74.33 |
---------+--------+--------+
TOTAL          90      187      277
            32.49    67.51   100.00

FREQUENCY MISSING = 2


 STATISTICS FOR TABLE OF SEX BY NUT16

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     8.801     0.003
```

```
MARITAL    NUT19

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |    139 |    124 |    263
         |  133.9 |  129.1 |
         |.196301 |.203518 |
         |  50.18 |  44.77 |  94.95
         |  52.85 |  47.15 |
         |  98.58 |  91.18 |
---------+--------+--------+
       2 |      2 |     12 |     14
         |    7.1 |    6.9 |
         |3.68765 |3.82323 |
         |   0.72 |   4.33 |   5.05
         |  14.29 |  85.71 |
         |   1.42 |   8.82 |
---------+--------+--------+
TOTAL         141      136      277
            50.90    49.10   100.00

FREQUENCY MISSING = 2


 STATISTICS FOR TABLE OF MARITAL BY NUT19

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     7.911     0.005
```

```
SEX        NUT21

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |     58 |     29 |     87
         |   44.3 |   42.7 |
         |4.24737 |4.40353 |
         |  20.94 |  10.47 |  31.41
         |  66.67 |  33.33 |
         |  41.13 |  21.32 |
---------+--------+--------+
       2 |     83 |    107 |    190
         |   96.7 |   93.3 |
         |1.94485 |2.01635 |
         |  29.96 |  38.63 |  68.59
         |  43.68 |  56.32 |
         |  58.87 |  78.68 |
---------+--------+--------+
TOTAL         141      136      277
            50.90    49.10   100.00

FREQUENCY MISSING = 2


 STATISTICS FOR TABLE OF SEX BY NUT21

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1    12.612     0.000
```

```
AGE        NUT22

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |     55 |    161 |    216
         |   48.3 |  167.7 |
         |.915641 |.264045 |
         |  19.86 |  58.12 |  77.98
         |  25.46 |  74.54 |
         |  88.71 |  74.88 |
---------+--------+--------+
       2 |      7 |     54 |     61
         |   13.7 |   47.3 |
         |3.24227 |.934981 |
         |   2.53 |  19.49 |  22.02
         |  11.48 |  88.52 |
         |  11.29 |  25.12 |
---------+--------+--------+
TOTAL          62      215      277
            22.38    77.62   100.00

FREQUENCY MISSING = 2


 STATISTICS FOR TABLE OF AGE BY NUT22

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     5.357     0.021
```

```
MARITAL    NUT22

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |     62 |    201 |    263
         |   58.9 |  204.1 |
         |.166806 |.048102 |
         |  22.38 |  72.56 |  94.95
         |  23.57 |  76.43 |
         | 100.00 |  93.49 |
---------+--------+--------+
       2 |      0 |     14 |     14
         |    3.1 |   10.9 |
         |3.13357 |.903635 |
         |   0.00 |   5.05 |   5.05
         |   0.00 | 100.00 |
         |   0.00 |   6.51 |
---------+--------+--------+
TOTAL          62      215      277
            22.38    77.62   100.00

FREQUENCY MISSING = 2


 STATISTICS FOR TABLE OF MARITAL BY NUT22

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     4.252     0.039
```

```
MAJOR      NUT23

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       2 |     64 |     74 |    138
         |   72.2 |   65.8 |
         |.939517 |1.03204 |
         |  23.10 |  26.71 |  49.82
         |  46.38 |  53.62 |
         |  44.14 |  56.06 |
---------+--------+--------+
       3 |     81 |     58 |    139
         |   72.8 |   66.2 |
         |.932757 |1.02462 |
         |  29.24 |  20.94 |  50.18
         |  58.27 |  41.73 |
         |  55.86 |  43.94 |
---------+--------+--------+
TOTAL         145      132      277
            52.35    47.65   100.00

FREQUENCY MISSING = 2


 STATISTICS FOR TABLE OF MAJOR BY NUT23

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     3.929     0.047
```

```
AGE       NUT25

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |    192 |     23 |    215
         |  187.0 |   28.0 |
         |.136057 |.907044 |
         |  69.57 |   8.33 |  77.90
         |  89.30 |  10.70 |
         |  80.00 |  63.89 |
---------+--------+--------+
       2 |     48 |     13 |     61
         |   53.0 |    8.0 |
         |.479544 |3.19696 |
         |  17.39 |   4.71 |  22.10
         |  78.69 |  21.31 |
         |  20.00 |  36.11 |
---------+--------+--------+
TOTAL         240       36      276
            86.96    13.04   100.00

FREQUENCY MISSING = 3


   STATISTICS FOR TABLE OF AGE BY NUT25

STATISTIC                     DF     VALUE      PROB
----------------------------------------------------
CHI-SQUARE                     1     4.720     0.030
```

```
SEX       NUT26

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |     63 |     24 |     87
         |   55.5 |   31.5 |
         | 1.0198 |1.79484 |
         |  22.83 |   8.70 |  31.52
         |  72.41 |  27.59 |
         |  35.80 |  24.00 |
---------+--------+--------+
       2 |    113 |     76 |    189
         |  120.5 |   68.5 |
         |0.46943 |.826197 |
         |  40.94 |  27.54 |  68.48
         |  59.79 |  40.21 |
         |  64.20 |  76.00 |
---------+--------+--------+
TOTAL         176      100      276
            63.77    36.23   100.00

FREQUENCY MISSING = 3


   STATISTICS FOR TABLE OF SEX BY NUT26

STATISTIC                     DF     VALUE      PROB
----------------------------------------------------
CHI-SQUARE                     1     4.110     0.043
```

```
AGE       DAYSPUR

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |    139 |     77 |    216
         |  130.1 |   85.9 |
         |.613871 |.929102 |
         |  49.82 |  27.60 |  77.42
         |  64.35 |  35.65 |
         |  82.74 |  69.37 |
---------+--------+--------+
       2 |     29 |     34 |     63
         |   37.9 |   25.1 |
         | 2.1047 |3.18549 |
         |  10.39 |  12.19 |  22.58
         |  46.03 |  53.97 |
         |  17.26 |  30.63 |
---------+--------+--------+
TOTAL         168      111      279
            60.22    39.78   100.00


   STATISTICS FOR TABLE OF AGE BY DAYSPUR

STATISTIC                     DF     VALUE      PROB
----------------------------------------------------
CHI-SQUARE                     1     6.833     0.009
```

```
MARITAL   NUT25

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |    233 |     29 |    262
         |  227.8 |   34.2 |
         |.117499 |.783328 |
         |  84.42 |  10.51 |  94.93
         |  88.93 |  11.07 |
         |  97.08 |  80.56 |
---------+--------+--------+
       2 |      7 |      7 |     14
         |   12.2 |    1.8 |
         |2.19891 |14.6594 |
         |   2.54 |   2.54 |   5.07
         |  50.00 |  50.00 |
         |   2.92 |  19.44 |
---------+--------+--------+
TOTAL         240       36      276
            86.96    13.04   100.00

FREQUENCY MISSING = 3


   STATISTICS FOR TABLE OF MARITAL BY NUT25

STATISTIC                     DF     VALUE      PROB
----------------------------------------------------
CHI-SQUARE                     1    17.759     0.000
```

```
MARITAL   NUT26

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |    171 |     91 |    262
         |  167.1 |   94.9 |
         |.092328 | 162498 |
         |  61.96 |  32.97 |  94.93
         |  65.27 |  34.73 |
         |  97.16 |  91.00 |
---------+--------+--------+
       2 |      5 |      9 |     14
         |    8.9 |    5.1 |
         |1.72786 |3.04104 |
         |   1.81 |   3.26 |   5.07
         |  35.71 |  64.29 |
         |   2.84 |   9.00 |
---------+--------+--------+
TOTAL         176      100      276
            63.77    36.23   100.00

FREQUENCY MISSING = 3


   STATISTICS FOR TABLE OF MARITAL BY NUT26

STATISTIC                     DF     VALUE      PROB
----------------------------------------------------
CHI-SQUARE                     1     5.024     0.025
```

```
SEX       FREQ

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |     42 |     47 |     89
         |   30.1 |   58.9 |
         |4.71079 | 2.4066 |
         |  15.11 |  16.91 |  32.01
         |  47.19 |  52.81 |
         |  44.68 |  25.54 |
---------+--------+--------+
       2 |     52 |    137 |    189
         |   63.9 |  125.1 |
         |2.21831 |1.13327 |
         |  18.71 |  49.28 |  67.99
         |  27.51 |  72.49 |
         |  55.32 |  74.46 |
---------+--------+--------+
TOTAL          94      184      278
            33.81    66.19   100.00

FREQUENCY MISSING = 1


   STATISTICS FOR TABLE OF SEX BY FREQ

STATISTIC                     DF     VALUE      PROB
----------------------------------------------------
CHI-SQUARE                     1    10.469     0.001
```

```
MEMBERS      FREQ

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       1|       2|  TOTAL
---------+--------+--------+
       1 |     60 |     78 |    138
         |   46.7 |   91.3 |
         |3.81266 |1.94777 |
         |  21.58 |  28.06 |  49.64
         |  43.48 |  56.52 |
         |  63.83 |  42.39 |
---------+--------+--------+
       2 |     34 |    106 |    140
         |   47.3 |   92.7 |
         |3.75819 |1.91995 |
         |  12.23 |  38.13 |  50.36
         |  24.29 |  75.71 |
         |  36.17 |  57.61 |
---------+--------+--------+
TOTAL          94      184     278
            33.81    66.19  100.00

FREQUENCY MISSING = 1


STATISTICS FOR TABLE OF MEMBERS BY FREQ

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1     11.439     0.001
```

```
SEX          INFL2

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     84 |      3 |     87
         |   75.6 |   11.4 |
         |0.94054 |6.21801 |
         |  30.66 |   1.09 |  31.75
         |  96.55 |   3.45 |
         |  35.29 |   8.33 |
---------+--------+--------+
       2 |    154 |     33 |    187
         |  162.4 |   24.6 |
         |.437577 |2.89287 |
         |  56.20 |  12.04 |  68.25
         |  82.35 |  17.65 |
         |  64.71 |  91.67 |
---------+--------+--------+
TOTAL         238       36     274
            86.86    13.14  100.00

FREQUENCY MISSING = 5


STATISTICS FOR TABLE OF SEX BY INFL2

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1     10.489     0.001
```

```
RESIDE       INFL7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    163 |      6 |    169
         |  159.1 |    9.9 |
         |.094049 |1.51654 |
         |  59.49 |   2.19 |  61.68
         |  96.45 |   3.55 |
         |  63.18 |  37.50 |
---------+--------+--------+
       2 |     95 |     10 |    105
         |   98.9 |    6.1 |
         |.151374 |2.44091 |
         |  34.67 |   3.65 |  38.32
         |  90.48 |   9.52 |
         |  36.82 |  62.50 |
---------+--------+--------+
TOTAL         258       16     274
            94.16     5.84  100.00

FREQUENCY MISSING = 5


STATISTICS FOR TABLE OF RESIDE BY INFL7

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      4.203     0.040
```

```
SEX          INFL1

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     40 |     49 |     89
         |   32.7 |   56.3 |
         |1.65225 |.957556 |
         |  14.39 |  17.63 |  32.01
         |  44.94 |  55.06 |
         |  39.22 |  27.84 |
---------+--------+--------+
       2 |     62 |    127 |    189
         |   69.3 |  119.7 |
         |.778045 |.450912 |
         |  22.30 |  45.68 |  67.99
         |  32.80 |  67.20 |
         |  60.78 |  72.16 |
---------+--------+--------+
TOTAL         102      176     278
            36.69    63.31  100.00

FREQUENCY MISSING = 1


STATISTICS FOR TABLE OF SEX BY INFL1

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      3.839     0.050
```

```
MAJOR        INFL5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       2 |    129 |      7 |    136
         |  132.5 |    3.5 |
         | 093789 |3.57739 |
         |  47.08 |   2.55 |  49.64
         |  94.85 |   5.15 |
         |  48.31 | 100.00 |
---------+--------+--------+
       3 |    138 |      0 |    138
         |  134.5 |    3.5 |
         |0.09243 |3.52555 |
         |  50.36 |   0.00 |  50.36
         | 100.00 |   0.00 |
         |  51.69 |   0.00 |
---------+--------+--------+
TOTAL         267        7     274
            97.45     2.55  100.00

FREQUENCY MISSING = 5


STATISTICS FOR TABLE OF MAJOR BY INFL5

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      7.289     0.007
```

```
RACE         PURCH1

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    105 |    154 |    259
         |  109.4 |  149.6 |
         |.176738 |.129239 |
         |  37.91 |  55.60 |  93.50
         |  40.54 |  59.46 |
         |  89.74 |  96.25 |
---------+--------+--------+
       2 |     12 |      6 |     18
         |    7.6 |   10.4 |
         |2.54306 |1.85961 |
         |   4.33 |   2.17 |   6.50
         |  66.67 |  33.33 |
         |  10.26 |   3.75 |
---------+--------+--------+
TOTAL         117      160     277
            42.24    57.76  100.00

FREQUENCY MISSING = 2


STATISTICS FOR TABLE OF RACE BY PURCH1

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      4.709     0.030
```

```
MEMBERS     PURCH1

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     70 |     69 |    139
         |   58.3 |   80.7 |
         | 2.3523 |1.69889 |
         |  25.09 |  24.73 |  49.82
         |  50.36 |  49.64 |
         |  59.83 |  42.59 |
---------+--------+--------+
       2 |     47 |     93 |    140
         |   58.7 |   81.3 |
         | 2.3355 |1.68675 |
         |  16.85 |  33.33 |  50.18
         |  33.57 |  66.43 |
         |  40.17 |  57.41 |
---------+--------+--------+
TOTAL         117      162      279
            41.94    58.06   100.00


     STATISTICS FOR TABLE OF MEMBERS BY PURCH1

STATISTIC                  DF      VALUE       PROB
---------------------------------------------------
CHI-SQUARE                  1      8.073      0.004
```

```
MAJOR       PURCH2

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       2 |     49 |     89 |    138
         |   62.8 |   75.2 |
         |3.03922 |2.53935 |
         |  17.56 |  31.90 |  49.46
         |  35.51 |  64.49 |
         |  38.58 |  58.55 |
---------+--------+--------+
       3 |     78 |     63 |    141
         |   64.2 |   76.8 |
         |2.97455 |2.48532 |
         |  27.96 |  22.58 |  50.54
         |  55.32 |  44.68 |
         |  61.42 |  41.45 |
---------+--------+--------+
TOTAL         127      152      279
            45.52    54.48   100.00


     STATISTICS FOR TABLE OF MAJOR BY PURCH2

STATISTIC                  DF      VALUE       PROB
---------------------------------------------------
CHI-SQUARE                  1     11.038      0.001
```

```
RESIDE      PURCH4

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     96 |     78 |    174
         |   82.9 |   91.1 |
         |2.05435 |1.87143 |
         |  34.41 |  27.96 |  62.37
         |  55.17 |  44.83 |
         |  72.18 |  53.42 |
---------+--------+--------+
       2 |     37 |     68 |    105
         |   50.1 |   54.9 |
         |3.40435 |3.10123 |
         |  13.26 |  24.37 |  37.63
         |  35.24 |  64.76 |
         |  27.82 |  46.58 |
---------+--------+--------+
TOTAL         133      146      279
            47.67    52.33   100.00


     STATISTICS FOR TABLE OF RESIDE BY PURCH4

STATISTIC                  DF      VALUE       PROB
---------------------------------------------------
CHI-SQUARE                  1     10.431      0.001
```

```
SEX         PURCH5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     82 |      7 |     89
         |   75.9 |   13.1 |
         |.486721 |2.82536 |
         |  29.39 |   2.51 |  31.90
         |  92.13 |   7.87 |
         |  34.45 |  17.07 |
---------+--------+--------+
       2 |    156 |     34 |    190
         |  162.1 |   27.9 |
         |.227991 |1.32346 |
         |  55.91 |  12.19 |  68.10
         |  82.11 |  17.89 |
         |  65.55 |  82.93 |
---------+--------+--------+
TOTAL         238       41      279
            85.30    14.70   100.00


     STATISTICS FOR TABLE OF SEX BY PURCH5

STATISTIC                  DF      VALUE       PROB
---------------------------------------------------
CHI-SQUARE                  1      4.864      0.027
```

```
AGE         PURCH7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    213 |      3 |    216
         |  209.8 |    6.2 |
         |0.04861 |1.64667 |
         |  76.34 |   1.08 |  77.42
         |  98.61 |   1.39 |
         |  78.60 |  37.50 |
---------+--------+--------+
       2 |     58 |      5 |     63
         |   61.2 |    1.8 |
         |.166664 |5.64574 |
         |  20.79 |   1.79 |  22.58
         |  92.06 |   7.94 |
         |  21.40 |  62.50 |
---------+--------+--------+
TOTAL         271        8      279
            97.13     2.87   100.00


     STATISTICS FOR TABLE OF AGE BY PURCH7

STATISTIC                  DF      VALUE       PROB
---------------------------------------------------
CHI-SQUARE                  1      7.508      0.006
```

```
RESIDE      PURCH7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    172 |      2 |    174
         |  169.0 |    5.0 |
         |0.05287 |1.79097 |
         |  61.65 |   0.72 |  62.37
         |  98.85 |   1.15 |
         |  63.47 |  25.00 |
---------+--------+--------+
       2 |     99 |      6 |    105
         |  102.0 |    3.0 |
         |.087613 | 2.9679 |
         |  35.48 |   2.15 |  37.63
         |  94.29 |   5.71 |
         |  36.53 |  75.00 |
---------+--------+--------+
TOTAL         271        8      279
            97.13     2.87   100.00


     STATISTICS FOR TABLE OF RESIDE BY PURCH7

STATISTIC                  DF      VALUE       PROB
---------------------------------------------------
CHI-SQUARE                  1      4.899      0.027
```

```
SEX       MEALS

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |     41 |     48 |     89
         |   52.0 |   37.0 |
         |2.32557 |3.26782 |
         |  14.70 |  17.20 |  31.90
         |  46.07 |  53.93 |
         |  25.15 |  41.38 |
---------+--------+--------+
       2 |    122 |     68 |    190
         |  111.0 |   79.0 |
         |1.08934 |1.53072 |
         |  43.73 |  24.37 |  68.10
         |  64.21 |  35.79 |
         |  74.85 |  58.62 |
---------+--------+--------+
TOTAL         163      116      279
            58.42    41.58   100.00


      STATISTICS FOR TABLE OF SEX BY MEALS

STATISTIC                        DF      VALUE      PROB
--------------------------------------------------------
CHI-SQUARE                        1      8.213     0.004
```

```
MARITAL   MEALS

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |    161 |    104 |    265
         |  154.8 |  110.2 |
         |.246625 |0.34655 |
         |  57.71 |  37.28 |  94.98
         |  60.75 |  39.25 |
         |  98.77 |  89.66 |
---------+--------+--------+
       2 |      2 |     12 |     14
         |    8.2 |    5.8 |
         |4.66826 | 6.5597 |
         |   0.72 |   4.30 |   5.02
         |  14.29 |  85.71 |
         |   1.23 |  10.34 |
---------+--------+--------+
TOTAL         163      116      279
            58.42    41.58   100.00


      STATISTICS FOR TABLE OF MARITAL BY MEALS

STATISTIC                        DF      VALUE      PROB
--------------------------------------------------------
CHI-SQUARE                        1     11.821     0.001
```

```
RESIDE    SUBST

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |     32 |    139 |    171
         |   26.0 |  145.0 |
         |1.37345 |.246517 |
         |  11.59 |  50.36 |  61.96
         |  18.71 |  81.29 |
         |  76.19 |  59.40 |
---------+--------+--------+
       2 |     10 |     95 |    105
         |   16.0 |   89.0 |
         |2.23676 |.401471 |
         |   3.62 |  34.42 |  38.04
         |   9.52 |  90.48 |
         |  23.81 |  40.60 |
---------+--------+--------+
TOTAL          42      234      276
            15.22    84.78   100.00

FREQUENCY MISSING = 3


      STATISTICS FOR TABLE OF RESIDE BY SUBST

STATISTIC                        DF      VALUE      PROB
--------------------------------------------------------
CHI-SQUARE                        1      4.258     0.039
```

```
MAJOR     MEALS

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       2 |     89 |     49 |    138
         |   80.6 |   57.4 |
         |.870255 |1.22286 |
         |  31.90 |  17.56 |  49.46
         |  64.49 |  35.51 |
         |  54.60 |  42.24 |
---------+--------+--------+
       3 |     74 |     67 |    141
         |   82.4 |   58.6 |
         |.851739 |1.19684 |
         |  26.52 |  24.01 |  50.54
         |  52.48 |  47.52 |
         |  45.40 |  57.76 |
---------+--------+--------+
TOTAL         163      116      279
            58.42    41.58   100.00


      STATISTICS FOR TABLE OF MAJOR BY MEALS

STATISTIC                        DF      VALUE      PROB
--------------------------------------------------------
CHI-SQUARE                        1      4.142     0.042
```

```
RESIDE    MEALS

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       1|       2|  TOTAL
---------+--------+--------+
       1 |     89 |     85 |    174
         |  101.7 |   72.3 |
         |1.57563 |2.21403 |
         |  31.90 |  30.47 |  62.37
         |  51.15 |  48.85 |
         |  54.60 |  73.28 |
---------+--------+--------+
       2 |     74 |     31 |    105
         |   61.3 |   43.7 |
         |2.61104 |3.66897 |
         |  26.52 |  11.11 |  37.63
         |  70.48 |  29.52 |
         |  45.40 |  26.72 |
---------+--------+--------+
TOTAL         163      116      279
            58.42    41.58   100.00


      STATISTICS FOR TABLE OF RESIDE BY MEALS

STATISTIC                        DF      VALUE      PROB
--------------------------------------------------------
CHI-SQUARE                        1     10.070     0.002
```

```
SEX       CONSUME1

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     51 |     38 |     89
         |   64.1 |   24.9 |
         |2.68393 |6.91629 |
         |  18.28 |  13.62 |  31.90
         |  57.30 |  42.70 |
         |  25.37 |  48.72 |
---------+--------+--------+
       2 |    150 |     40 |    190
         |  136.9 |   53.1 |
         |1.25721 |3.23974 |
         |  53.76 |  14.34 |  68.10
         |  78.95 |  21.05 |
         |  74.63 |  51.28 |
---------+--------+--------+
TOTAL         201       78      279
            72.04    27.96   100.00


      STATISTICS FOR TABLE OF SEX BY CONSUME1

STATISTIC                        DF      VALUE      PROB
--------------------------------------------------------
CHI-SQUARE                        1     14.097     0.000
```

```
SEX       CONSUME3

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     39 |     49 |     88
         |   23.6 |   64.4 |
         |10.0592 |3.68505 |
         |  14.13 |  17.75 |  31.88
         |  44.32 |  55.68 |
         |  52.70 |  24.26 |
---------+--------+--------+
       2 |     35 |    153 |    188
         |   50.4 |  137.6 |
         |4.70856 |1.72492 |
         |  12.68 |  55.43 |  68.12
         |  18.62 |  81.38 |
         |  47.30 |  75.74 |
---------+--------+--------+
TOTAL          74      202      276
            26.81    73.19   100.00

FREQUENCY MISSING = 3


STATISTICS FOR TABLE OF SEX BY CONSUME3

STATISTIC                     DF     VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1    20.178     0.000
```

```
RESIDE    CONSUME3

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     58 |    114 |    172
         |   46.1 |  125.9 |
         |3.06252 |1.12191 |
         |  21.01 |  41.30 |  62.32
         |  33.72 |  66.28 |
         |  78.38 |  56.44 |
---------+--------+--------+
       2 |     16 |     88 |    104
         |   27.9 |   76.1 |
         |5.06493 |1.85547 |
         |   5.80 |  31.88 |  37.68
         |  15.38 |  84.62 |
         |  21.62 |  43.56 |
---------+--------+--------+
TOTAL          74      202      276
            26.81    73.19   100.00

FREQUENCY MISSING = 3


STATISTICS FOR TABLE OF RESIDE BY CONSUME3

STATISTIC                     DF     VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1    11.105     0.001
```

```
RACE      CONSUME5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     83 |    173 |    256
         |   87.8 |  168.2 |
         |0.26506 |0.13842 |
         |  30.29 |  63.14 |  93.43
         |  32.42 |  67.58 |
         |  88.30 |  96.11 |
---------+--------+--------+
       2 |     11 |      7 |     18
         |    6.2 |   11.8 |
         |3.76975 |1.96864 |
         |   4.01 |   2.55 |   6.57
         |  61.11 |  38.89 |
         |  11.70 |   3.89 |
---------+--------+--------+
TOTAL          94      180      274
            34.31    65.69   100.00

FREQUENCY MISSING = 5


STATISTICS FOR TABLE OF RACE BY CONSUME5

STATISTIC                     DF     VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1     6.142     0.013
```

```
AGE       CONSUME3

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     47 |    166 |    213
         |   57.1 |  155.9 |
         |1.78932 |.655493 |
         |  17.03 |  60.14 |  77.17
         |  22.07 |  77.93 |
         |  63.51 |  82.18 |
---------+--------+--------+
       2 |     27 |     36 |     63
         |   16.9 |   46.1 |
         |6.04961 |2.21619 |
         |   9.78 |  13.04 |  22.83
         |  42.86 |  57.14 |
         |  36.49 |  17.82 |
---------+--------+--------+
TOTAL          74      202      276
            26.81    73.19   100.00

FREQUENCY MISSING = 3


STATISTICS FOR TABLE OF AGE BY CONSUME3

STATISTIC                     DF     VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1    10.711     0.001
```

```
MARITAL   CONSUME5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     85 |    177 |    262
         |   89.2 |  172.8 |
         | 0.2007 |.103658 |
         |  30.80 |  64.13 |  94.93
         |  32.44 |  67.56 |
         |  90.43 |  97.25 |
---------+--------+--------+
       2 |      9 |      5 |     14
         |    4.8 |    9.2 |
         |3.75596 |1.93989 |
         |   3.26 |   1.81 |   5.07
         |  64.29 |  35.71 |
         |   9.57 |   2.75 |
---------+--------+--------+
TOTAL          94      182      276
            34.06    65.94   100.00

FREQUENCY MISSING = 3


STATISTICS FOR TABLE OF MARITAL BY CONSUME5

STATISTIC                     DF     VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1     6.000     0.014
```

```
AGE       CONSUME7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    185 |     28 |    213
         |  176.7 |   36.3 |
         |.387157 |1.88636 |
         |  67.03 |  10.14 |  77.17
         |  86.85 |  13.15 |
         |  80.79 |  59.57 |
---------+--------+--------+
       2 |     44 |     19 |     63
         |   52.3 |   10.7 |
         |1.30896 | 6.3777 |
         |  15.94 |   6.88 |  22.83
         |  69.84 |  30.16 |
         |  19.21 |  40.43 |
---------+--------+--------+
TOTAL         229       47      276
            82.97    17.03   100.00

FREQUENCY MISSING = 3


STATISTICS FOR TABLE OF AGE BY CONSUME7

STATISTIC                     DF     VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1     9.960     0.002
```

```
     RESIDE      CONSUME7

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
            1 |    134 |     38 |    172
              |  142.7 |   29.3 |
              |.531613 | 2.5902 |
              |  48.55 |  13.77 |  62.32
              |  77.91 |  22.09 |
              |  58.52 |  80.85 |
     ---------+--------+--------+
            2 |     95 |      9 |    104
              |   86.3 |   17.7 |
              |.879207 |4.28379 |
              |  34.42 |   3.26 |  37.68
              |  91.35 |   8.65 |
              |  41.48 |  19.15 |
     ---------+--------+--------+
     TOTAL         229       47      276
                 82.97    17.03   100.00

     FREQUENCY MISSING = 3


    STATISTICS FOR TABLE OF RESIDE BY CONSUME7

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      8 285     0.004
```

```
     AGE         MOOD1

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
            1 |     63 |    153 |    216
              |   70 5 |  145.5 |
              |.788151 |.381499 |
              |  22.58 |  54.84 |  77.42
              |  29.17 |  70.83 |
              |  69 23 |  81.38 |
     ---------+--------+--------+
            2 |     28 |     35 |     63
              |   20.5 |   42.5 |
              |2.70223 |  1.308 |
              |  10 04 |  12.54 |  22.58
              |  44.44 |  55.56 |
              |  30.77 |  18.62 |
     ---------+--------+--------+
     TOTAL          91      188      279
                 32.62    67.38   100.00


  .  STATISTICS FOR TABLE OF AGE BY MOOD1

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      5.180     0.023
```

```
     RACE        MOOD1

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
            1 |     79 |    180 |    259
              |   83.2 |  175.8 |
              |.213657 |.101146 |
              |  28.52 |  64.98 |  93.50
              |  30.50 |  69.50 |
              |  88.76 |  95.74 |
     ---------+--------+--------+
            2 |     10 |      8 |     18
              |    5.8 |   12.2 |
              |3.07428 |1.45538 |
              |   3.61 |   2.89 |   6.50
              |  55.56 |  44.44 |
              |  11.24 |   4.26 |
     ---------+--------+--------+
     TOTAL          89      188      277
                 32.13    67.87   100.00

     FREQUENCY MISSING = 2


     STATISTICS FOR TABLE OF RACE BY MOOD1

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      4.844     0.028
```

```
     SEX         MOOD1

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
            1 |     39 |     50 |     89
              |   29.0 |   60.0 |
              |3.42514 |1.65791 |
              |  13.98 |  17 92 |  31.90
              |  43.82 |  56.18 |
              |  42.86 |  26.60 |
     ---------+--------+--------+
            2 |     52 |    138 |    190
              |   62.0 |  128.0 |
              |1.60441 |.776602 |
              |  18.64 |  49.46 |  68.10
              |  27.37 |  72.63 |
              |  57.14 |  73.40 |
     ---------+--------+--------+
     TOTAL          91      188      279
                 32.62    67.38   100.00


     STATISTICS FOR TABLE OF SEX BY MOOD1

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      7 464     0.006
```

```
     MAJOR       MOOD1

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
            2 |     32 |    106 |    138
              |   45.0 |   93.0 |
              |3.76087 |1 82042 |
              |  11.47 |  37.99 |  49.46
              |  23.19 |  76.81 |
              |  35.16 |  56.38 |
     ---------+--------+--------+
            3 |     59 |     82 |    141
              |   46.0 |   95.0 |
              |3.68085 |1.78169 |
              |  21.15 |  29.39 |  50.54
              |  41.84 |  58.16 |
              |  64.84 |  43.62 |
     ---------+--------+--------+
     TOTAL          91      188      279
                 32.62    67.38   100.00


     STATISTICS FOR TABLE OF MAJOR BY MOOD1

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1     11.044     0.001
```

```
     RACE        MOOD2

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
            1 |    209 |     50 |    259
              |  212.2 |   46.8 |
              |.049737 |.225806 |
              |  75.45 |  18.05 |  93.50
              |  80.69 |  19.31 |
              |  92.07 | 100.00 |
     ---------+--------+--------+
            2 |     18 |      0 |     18
              |   14.8 |    3.2 |
              |0.71566 | 3.2491 |
              |   6.50 |   0.00 |   6.50
              | 100.00 |   0.00 |
              |   7.93 |   0.00 |
     ---------+--------+--------+
     TOTAL         227       50      277
                 81.95    18.05   100.00

     FREQUENCY MISSING = 2


     STATISTICS FOR TABLE OF RACE BY MOOD2

STATISTIC                     DF      VALUE      PROB
-----------------------------------------------------
CHI-SQUARE                     1      4.240     0.039
```

```
MEMBERS     MOOD2

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    121 |     18 |    139
         |  114.1 |   24.9 |
         |.418562 |1.91701 |
         |  43.37 |   6.45 |  49.82
         |  87.05 |  12.95 |
         |  52.84 |  36.00 |
---------+--------+--------+
       2 |    108 |     32 |    140
         |  114.9 |   25.1 |
         |.415572 |1.90332 |
         |  38.71 |  11.47 |  50.18
         |  77.14 |  22.86 |
         |  47.16 |  64.00 |
---------+--------+--------+
TOTAL         229       50     279
            82.08    17.92  100.00


        STATISTICS FOR TABLE OF MEMBERS BY MOOD2

STATISTIC                     DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1      4 654     0.031
```

```
MEMBERS     MOOD4

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    116 |     23 |    139
         |  107.6 |   31.4 |
         |.653671 |2.24116 |
         |  41.58 |   8.24 |  49.82
         |  83.45 |  16.55 |
         |  53.70 |  36.51 |
---------+--------+--------+
       2 |    100 |     40 |    140
         |  108.4 |   31.6 |
         |.649002 |2.22515 |
         |  35.84 |  14.34 |  50.18
         |  71.43 |  28.57 |
         |  46.30 |  63.49 |
---------+--------+--------+
TOTAL         216       63     279
            77.42    22.58  100.00


        STATISTICS FOR TABLE OF MEMBERS BY MOOD4

STATISTIC                     DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1      5.769     0.016
```

```
SEX         MOOD7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     76 |     13 |     89
         |   64.4 |   24.6 |
         |2.07483 |5.44307 |
         |  27.24 |   4.66 |  31.90
         |  85.39 |  14.61 |
         |  37.62 |  16.88 |
---------+--------+--------+
       2 |    126 |     64 |    190
         |  137.6 |   52.4 |
         |.971895 |2.54965 |
         |  45.16 |  22.94 |  68.10
         |  66.32 |  33.68 |
         |  62.38 |  83.12 |
---------+--------+--------+
TOTAL         202       77     279
            72.40    27.60  100.00


        STATISTICS FOR TABLE OF SEX BY MOOD7

STATISTIC                     DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     11.039     0.001
```

```
SEX         MOOD3

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     60 |     29 |     89
         |   50.4 |   38.6 |
         |1.82787 |2.38694 |
         |  21.51 |  10.39 |  31.90
         |  67.42 |  32.58 |
         |  37.97 |  23.97 |
---------+--------+--------+
       2 |     98 |     92 |    190
         |  107.6 |   82.4 |
         |.856261 |1.11809 |
         |  35.13 |  32.97 |  68.10
         |  51.58 |  48.42 |
         |  62.03 |  76.03 |
---------+--------+--------+
TOTAL         158      121     279
            56.63    43.37  100.00


        STATISTICS FOR TABLE OF SEX BY MOOD3

STATISTIC                     DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1      6.189     0.013
```

```
MEMBERS     MOOD5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    108 |     31 |    139
         |  100.1 |   38.9 |
         |.616967 |1.58988 |
         |  38.71 |  11.11 |  49.82
         |  77.70 |  22.30 |
         |  53.73 |  39.74 |
---------+--------+--------+
       2 |     93 |     47 |    140
         |  100.9 |   39.1 |
         |0.61256 |1.57852 |
         |  33.33 |  16.85 |  50.18
         |  66.43 |  33.57 |
         |  46.27 |  60.26 |
---------+--------+--------+
TOTAL         201       78     279
            72.04    27.96  100 00


        STATISTICS FOR TABLE OF MEMBERS BY MOOD5

STATISTIC                     DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1      4.398     0.036
```

```
MEMBERS     TYPES2

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     77 |     62 |    139
         |   86.2 |   52.8 |
         |.979876 |1.59923 |
         |  27.60 |  22.22 |  49.82
         |  55.40 |  44.60 |
         |  44.51 |  58.49 |
---------+--------+--------+
       2 |     96 |     44 |    140
         |   86.8 |   53.2 |
         |.972876 |1.58781 |
         |  34.41 |  15.77 |  50.18
         |  68.57 |  31.43 |
         |  55.49 |  41.51 |
---------+--------+--------+
TOTAL         173      106     279
            62.01    37.99  100.00


        STATISTICS FOR TABLE OF MEMBERS BY TYPES2

STATISTIC                     DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1      5.140     0.023
```

```
RESIDE     TYPES3

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    134 |     40 |    174
         |  125.4 |   48.6 |
         |.596218 |1.53641 |
         |  48.03 |  14.34 |  62.37
         |  77.01 |  22.99 |
         |  66.67 |  51.28 |
---------+--------+--------+
       2 |     67 |     38 |    105
         |   75.6 |   29.4 |
         |.988018 |2.54605 |
         |  24.01 |  13.62 |  37.63
         |  63.81 |  36.19 |
         |  33.33 |  48.72 |
---------+--------+--------+
TOTAL         201       78      279
            72.04    27.96   100.00


       STATISTICS FOR TABLE OF RESIDE BY TYPES3

STATISTIC                      DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                      1      5.667     0.017
```

```
SEX        TYPES5

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     78 |     11 |     89
         |   71.5 |   17.5 |
         |.599459 |2.44143 |
         |  27.96 |   3.94 |  31.90
         |  87.64 |  12.36 |
         |  34.82 |  20.00 |
---------+--------+--------+
       2 |    146 |     44 |    190
         |  152.5 |   37.5 |
         |.280799 |1.14362 |
         |  52.33 |  15.77 |  68.10
         |  76.84 |  23.16 |
         |  65.18 |  80.00 |
---------+--------+--------+
TOTAL         224       55      279
            80.29    19.71   100.00


       STATISTICS FOR TABLE OF SEX BY TYPES5

STATISTIC                      DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                      1      4.465     0.035
```

```
RESIDE     TYPES8

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    143 |     31 |    174
         |  134.7 |   39.3 |
         |.510204 |1.74927 |
         |  51.25 |  11.11 |  62.37
         |  82.18 |  17.82 |
         |  66.20 |  49.21 |
---------+--------+--------+
       2 |     73 |     32 |    105
         |   81.3 |   23.7 |
         |.845481 |2.89879 |
         |  26.16 |  11.47 |  37.63
         |  69.52 |  30.48 |
         |  33.80 |  50.79 |
---------+--------+--------+
TOTAL         216       63      279
            77.42    22.58   100.00


       STATISTICS FOR TABLE OF RESIDE BY TYPES8

STATISTIC                      DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                      1      6.004     0.014
```

```
MEMBERS    TYPES4

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    114 |     25 |    139
         |  107.1 |   31.9 |
         |.442586 |1.48681 |
         |  40.86 |   8.96 |  49.82
         |  82.01 |  17.99 |
         |  53.02 |  39.06 |
---------+--------+--------+
       2 |    101 |     39 |    140
         |  107.9 |   32.1 |
         |.439424 |1.47619 |
         |  36.20 |  13.98 |  50.18
         |  72.14 |  27.86 |
         |  46.98 |  60.94 |
---------+--------+--------+
TOTAL         215       64      279
            77.06    22.94   100.00


       STATISTICS FOR TABLE OF MEMBERS BY TYPES4

STATISTIC                      DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                      1      3.845     0.050
```

```
SEX        TYPES7

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     57 |     32 |     89
         |   41.8 |   47.2 |
         |5.53714 |4.90111 |
         |  20.43 |  11.47 |  31.90
         |  64.04 |  35.96 |
         |  43.51 |  21.62 |
---------+--------+--------+
       2 |     74 |    116 |    190
         |   89.2 |  100.8 |
         |2.59371 |2.29579 |
         |  26.52 |  41.58 |  68.10
         |  38.95 |  61.05 |
         |  56.49 |  78.38 |
---------+--------+--------+
TOTAL         131      148      279
            46.95    53.05   100.00


       STATISTICS FOR TABLE OF SEX BY TYPES7

STATISTIC                      DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                      1     15.328     0.000
```

```
MEMBERS    TYPES8

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    116 |     23 |    139
         |  107.6 |   31.4 |
         |.653671 |2.24116 |
         |  41.58 |   8.24 |  49.82
         |  83.45 |  16.55 |
         |  53.70 |  36.51 |
---------+--------+--------+
       2 |    100 |     40 |    140
         |  108.4 |   31.6 |
         |.649002 |2.22515 |
         |  35.84 |  14.34 |  50.18
         |  71.43 |  28.57 |
         |  46.30 |  63.49 |
---------+--------+--------+
TOTAL         216       63      279
            77.42    22.58   100.00


       STATISTICS FOR TABLE OF MEMBERS BY TYPES8

STATISTIC                      DF      VALUE      PROB
------------------------------------------------------
CHI-SQUARE                      1      5.769     0.016
```

```
SEX         TYPES9

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     66 |     23 |     89
         |   76.2 |   12.8 |
         | 1.3754 |  8.218 |
         |  23.66 |   8.24 |  31.90
         |  74.16 |  25.84 |
         |  27.62 |  57.50 |
---------+--------+--------+
       2 |    173 |     17 |    190
         |  162.8 |   27.2 |
         |.644265 |3.84949 |
         |  62.01 |   6.09 |  68.10
         |  91.05 |   8.95 |
         |  72.38 |  42.50 |
---------+--------+--------+
TOTAL         239       40      279
            85.66    14.34   100.00


         STATISTICS FOR TABLE OF SEX BY TYPES9

STATISTIC                       DF       VALUE        PROB
------------------------------------------------------------
CHI-SQUARE                       1      14.087       0.000
```

```
SEX         DRINK1

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     57 |     32 |     89
         |   69.2 |   19.8 |
         |2.15802 |7.55306 |
         |  20.43 |  11.47 |  31.90
         |  64.04 |  35.96 |
         |  26.27 |  51.61 |
---------+--------+--------+
       2 |    160 |     30 |    190
         |  147.8 |   42.2 |
         |1.01086 |3.53801 |
         |  57.35 |  10.75 |  68.10
         |  84.21 |  15.79 |
         |  73.73 |  48.39 |
---------+--------+--------+
TOTAL         217       62      279
            77.78    22.22   100.00


         STATISTICS FOR TABLE OF SEX BY DRINK1

STATISTIC                       DF       VALUE        PROB
------------------------------------------------------------
CHI-SQUARE                       1      14.260       0.000
```

```
AGE         DRINK3

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    208 |      8 |    216
         |  204.4 |   11.6 |
         |.063864 |1.12401 |
         |  74.55 |   2.87 |  77.42
         |  96.30 |   3.70 |
         |  78.79 |  53.33 |
---------+--------+--------+
       2 |     56 |      7 |     63
         |   59.6 |    3.4 |
         |.218964 |3.85376 |
         |  20.07 |   2.51 |  22.58
         |  88.89 |  11.11 |
         |  21.21 |  46.67 |
---------+--------+--------+
TOTAL         264       15      279
            94.62     5.38   100.00


         STATISTICS FOR TABLE OF AGE BY DRINK3

STATISTIC                       DF       VALUE        PROB
------------------------------------------------------------
CHI-SQUARE                       1       5.261       0.022
```

```
MAJOR       TYPES10

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       2 |     55 |     83 |    138
         |   66.8 |   71.2 |
         |2.07613 |1.94637 |
         |  19.71 |  29.75 |  49.46
         |  39.86 |  60.14 |
         |  40.74 |  57.64 |
---------+--------+--------+
       3 |     80 |     61 |    141
         |   68.2 |   72.8 |
         |2.03195 |1.90496 |
         |  28.67 |  21.86 |  50.54
         |  56.74 |  43.26 |
         |  59.26 |  42.36 |
---------+--------+--------+
TOTAL         135      144      279
            48.39    51.61   100.00


         STATISTICS FOR TABLE OF MAJOR BY TYPES10

STATISTIC                       DF       VALUE        PROB
------------------------------------------------------------
CHI-SQUARE                       1       7.959       0.005
```

```
RESIDE      DRINK2

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    127 |     47 |    174
         |  134.7 |   39.3 |
         |.441239 |1.51282 |
         |  45.52 |  16.85 |  62.37
         |  72.99 |  27.01 |
         |  58.80 |  74.60 |
---------+--------+--------+
       2 |     89 |     16 |    105
         |   81.3 |   23.7 |
         |.731196 |2.50696 |
         |  31.90 |   5.73 |  37.63
         |  84.76 |  15.24 |
         |  41.20 |  25.40 |
---------+--------+--------+
TOTAL         216       63      279
            77.42    22.58   100.00


         STATISTICS FOR TABLE OF RESIDE BY DRINK2

STATISTIC                       DF       VALUE        PROB
------------------------------------------------------------
CHI-SQUARE                       1       5.192       0.023
```

```
RESIDE      DRINK3

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    161 |     13 |    174
         |  164.6 |    9.4 |
         |.080702 |1.42036 |
         |  57.71 |   4.66 |  62.37
         |  92.53 |   7.47 |
         |  60.98 |  86.67 |
---------+--------+--------+
       2 |    103 |      2 |    105
         |   99.4 |    5.6 |
         |.133735 |2.35373 |
         |  36.92 |   0.72 |  37.63
         |  98.10 |   1.90 |
         |  39.02 |  13.33 |
---------+--------+--------+
TOTAL         264       15      279
            94.62     5.38   100.00


         STATISTICS FOR TABLE OF RESIDE BY DRINK3

STATISTIC                       DF       VALUE        PROB
------------------------------------------------------------
CHI-SQUARE                       1       3.989       0.046
```

```
RESIDE     DRINK4

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    120 |     54 |    174
         |  112.3 |   61.7 |
         |.533927 |.970776 |
         |  43.01 |  19.35 |  62.37
         |  68.97 |  31.03 |
         |  66.67 |  54.55 |
---------+--------+--------+
       2 |     60 |     45 |    105
         |   67.7 |   37.3 |
         |.884793 |1.60871 |
         |  21.51 |  16.13 |  37.63
         |  57.14 |  42.86 |
         |  33.33 |  45.45 |
---------+--------+--------+
TOTAL         180       99     279
            64.52    35.48  100.00


        STATISTICS FOR TABLE OF RESIDE BY DRINK4

STATISTIC                       DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                       1     3.998     0.046
```

```
RESIDE     DRINK5

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |    154 |     20 |    174
         |  147.2 |   26.8 |
         |.315759 |  1.733 |
         |  55.20 |   7.17 |  62.37
         |  88.51 |  11.49 |
         |  65.25 |  46.51 |
---------+--------+--------+
       2 |     82 |     23 |    105
         |   88.8 |   16.2 |
         |.523258 |2.87183 |
         |  29.39 |   8.24 |  37.63
         |  78.10 |  21.90 |
         |  34.75 |  53.49 |
---------+--------+--------+
TOTAL         236       43     279
            84.59    15.41  100.00


        STATISTICS FOR TABLE OF RESIDE BY DRINK5

STATISTIC                       DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                       1     5.444     0.020
```

```
SEX        DRINK6

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     35 |     54 |     89
         |   44.3 |   44.7 |
         |1.96761 |1.95356 |
         |  12.54 |  19.35 |  31.90
         |  39.33 |  60.67 |
         |  25.18 |  38.57 |
---------+--------+--------+
       2 |    104 |     86 |    190
         |   94.7 |   95.3 |
         |.921672 |.915088 |
         |  37.28 |  30.82 |  68.10
         |  54.74 |  45.26 |
         |  74.82 |  61.43 |
---------+--------+--------+
TOTAL         139      140     279
            49.82    50.18  100.00


        STATISTICS FOR TABLE OF SEX BY DRINK6

STATISTIC                       DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                       1     5.758     0.016
```

```
SEX        DRINK7

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     87 |      2 |     89
         |   83.3 |    5.7 |
         |.168177 |2.43856 |
         |  31.18 |   0.72 |  31.90
         |  97.75 |   2.25 |
         |  33.33 |  11.11 |
---------+--------+--------+
       2 |    174 |     16 |    190
         |  177.7 |   12.3 |
         |.078778 |1.14228 |
         |  62.37 |   5.73 |  68.10
         |  91.58 |   8.42 |
         |  66.67 |  88.89 |
---------+--------+--------+
TOTAL         261       18     279
            93.55     6.45  100.00


        STATISTICS FOR TABLE OF SEX BY DRINK7

STATISTIC                       DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                       1     3.828     0.050
```

```
SEX        DRINK8

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     77 |     12 |     89
         |   60.9 |   28.1 |
         |4.23939 |9.20141 |
         |  27.60 |   4.30 |  31.90
         |  86.52 |  13.48 |
         |  40.31 |  13.64 |
---------+--------+--------+
       2 |    114 |     76 |    190
         |  130.1 |   59.9 |
         |1.98582 |4.31013 |
         |  40.86 |  27.24 |  68.10
         |  60.00 |  40.00 |
         |  59.69 |  86.36 |
---------+--------+--------+
TOTAL         191       88     279
            68.46    31.54  100.00


        STATISTICS FOR TABLE OF SEX BY DRINK8

STATISTIC                       DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                       1    19.737     0.000
```

```
SEX        DRINK9

FREQUENCY|
EXPECTED |
CELL CHI2|
PERCENT  |
ROW PCT  |
COL PCT  |       0|       1|  TOTAL
---------+--------+--------+
       1 |     87 |      2 |     89
         |   81.0 |    8.0 |
         |.440599 |4.47648 |
         |  31.18 |   0.72 |  31.90
         |  97.75 |   2.25 |
         |  34.25 |   8.00 |
---------+--------+--------+
       2 |    167 |     23 |    190
         |  173.0 |   17.0 |
         |.206386 |2.09688 |
         |  59.86 |   8.24 |  68.10
         |  87.89 |  12.11 |
         |  65.75 |  92.00 |
---------+--------+--------+
TOTAL         254       25     279
            91.04     8.96  100.00


        STATISTICS FOR TABLE OF SEX BY DRINK9

STATISTIC                       DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                       1     7.220     0.007
```

```
SEX       DRINK10

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     70 |     19 |     89
         |   78.5 |   10.5 |
         |.914883 |6.82004 |
         |  25.09 |   6.81 |  31.90
         |  78.65 |  21.35 |
         |  28.46 |  57.58 |
---------+--------+--------+
       2 |    176 |     14 |    190
         |  167.5 |   22.5 |
         |.428551 |3.19465 |
         |  63.08 |   5.02 |  68.10
         |  92.63 |   7.37 |
         |  71.54 |  42.42 |
---------+--------+--------+
TOTAL        246       33      279
           88.17    11.83   100.00


     STATISTICS FOR TABLE OF SEX BY DRINK10

STATISTIC                    DF     VALUE      PROB
---------------------------------------------------
CHI-SQUARE                    1    11.358     0.001
```

```
SEX       DRINK11

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     47 |     42 |     89
         |   36.4 |   52.6 |
         |3.10983 |2.14861 |
         |  16.85 |  15.05 |  31.90
         |  52.81 |  47.19 |
         |  41.23 |  25.45 |
---------+--------+--------+
       2 |     67 |    123 |    190
         |   77.6 |  112.4 |
         |1.45671 |1.00645 |
         |  24.01 |  44.09 |  68.10
         |  35.26 |  64.74 |
         |  58.77 |  74.55 |
---------+--------+--------+
TOTAL        114      165      279
           40.86    59.14   100.00


     STATISTICS FOR TABLE OF SEX BY DRINK11

STATISTIC                    DF     VALUE      PROB
---------------------------------------------------
CHI-SQUARE                    1     7.722     0.005
```

```
RESIDE    DRINK11

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     79 |     95 |    174
         |   71.1 |  102.9 |
         |.878535 |.606988 |
         |  28.32 |  34.05 |  62.37
         |  45.40 |  54.60 |
         |  69.30 |  57.58 |
---------+--------+--------+
       2 |     35 |     70 |    105
         |   42.9 |   62.1 |
         |1.45586 |1.00587 |
         |  12.54 |  25.09 |  37.63
         |  33.33 |  66.67 |
         |  30.70 |  42.42 |
---------+--------+--------+
TOTAL        114      165      279
           40.86    59.14   100.00


     STATISTICS FOR TABLE OF RESIDE BY DRINK11

STATISTIC                    DF     VALUE      PROB
---------------------------------------------------
CHI-SQUARE                    1     3.947     0.047
```

```
AGE       DRINK9

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |    191 |     25 |    216
         |  196.6 |   19.4 |
         |.162058 |1.64651 |
         |  68.46 |   8.96 |  77.42
         |  88.43 |  11.57 |
         |  75.20 | 100.00 |
---------+--------+--------+
       2 |     63 |      0 |     63
         |   57.4 |    5.6 |
         |.555626 |5.64516 |
         |  22.58 |   0.00 |  22.58
         | 100.00 |   0.00 |
         |  24.80 |   0.00 |
---------+--------+--------+
TOTAL        254       25      279
           91.04     8.96   100.00


     STATISTICS FOR TABLE OF AGE BY DRINK9

STATISTIC                    DF     VALUE      PROB
---------------------------------------------------
CHI-SQUARE                    1     8.009     0.005
```

```
AGE       DRINK11

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
       1 |     76 |    140 |    216
         |   88.3 |  127.7 |
         |1.70251 |1.17628 |
         |  27.24 |  50.18 |  77.42
         |  35.19 |  64.81 |
         |  66.67 |  84.85 |
---------+--------+--------+
       2 |     38 |     25 |     63
         |   25.7 |   37.3 |
         |5.83717 |4.03296 |
         |  13.62 |   8.96 |  22.58
         |  60.32 |  39.68 |
         |  33.33 |  15.15 |
---------+--------+--------+
TOTAL        114      165      279
           40.86    59.14   100.00


     STATISTICS FOR TABLE OF AGE BY DRINK11

STATISTIC                    DF     VALUE      PROB
---------------------------------------------------
CHI-SQUARE                    1    12.749     0.000
```

```
GROUP     INFL2

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |     78 |      4 |     82
         |   71.2 |   10.8 |
         |.644191 |4.25882 |
         |  28.47 |   1.46 |  29.93
         |  95.12 |   4.88 |
         |  32.77 |  11.11 |
---------+--------+--------+
NUTR     |    160 |     32 |    192
         |  166.8 |   25.2 |
         |.275123 |1.81887 |
         |  58.39 |  11.68 |  70.07
         |  83.33 |  16.67 |
         |  67.23 |  88.89 |
---------+--------+--------+
TOTAL        238       36      274
           86.86    13.14   100.00

FREQUENCY MISSING = 5


     STATISTICS FOR TABLE OF GROUP BY INFL2

STATISTIC                    DF     VALUE      PROB
---------------------------------------------------
CHI-SQUARE                    1     6.997     0.008
```

```
GROUP     INFL8

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |      59|      23|     82
         |    65.5|    16.5|
         | .652631| 2.59866|
         |   21.53|    8.39|  29.93
         |   71.95|   28.05|
         |   26.94|   41.82|
---------+--------+--------+
NUTR     |     160|      32|    192
         |   153.5|    38.5|
         | .278728| 1.10984|
         |   58.39|   11.68|  70.07
         |   83.33|   16.67|
         |   73.06|   58.18|
---------+--------+--------+
TOTAL          219       55     274
             79.93    20.07  100.00

FREQUENCY MISSING = 5


STATISTICS FOR TABLE OF GROUP BY INFL8

STATISTIC                      DF      VALUE      PROB.
-------------------------------------------------------
CHI-SQUARE                      1      4.640      0.031
```

```
GROUP     CONSUME1

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |      53|      30|     83
         |    59.8|    23.2|
         | .772322| 1.99021|
         |   19.00|   10.75|  29.75
         |   63.86|   36.14|
         |   26.37|   38.46|
---------+--------+--------+
NUTR     |     148|      48|    196
         |   141.2|    54.8|
         |  327055| .842795|
         |   53.05|   17.20|  70.25
         |   75.51|   24.49|
         |   73.63|   61.54|
---------+--------+--------+
TOTAL          201       78     279
             72.04    27.96  100.00


STATISTICS FOR TABLE OF GROUP BY CONSUME1

STATISTIC                      DF      VALUE      PROB
-------------------------------------------------------
CHI-SQUARE                      1      8.932      0.047
```

```
GROUP     TYPES8

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |      57|      26|     83
         |    64.3|    18.7|
         | .819812| 2.81078|
         |   20.43|    9.32|  29.75
         |   68.67|   31.33|
         |   26.39|   41.27|
---------+--------+--------+
NUTR     |     159|      37|    196
         |   151.7|    44.3|
         | .347165| 1.19028|
         |   56.99|   13.26|  70.25
         |   81.12|   18.88|
         |   73.61|   58.73|
---------+--------+--------+
TOTAL          216       63     279
             77.42    22.58  100.00


STATISTICS FOR TABLE OF GROUP BY TYPES8

STATISTIC                      DF      VALUE      PROB
-------------------------------------------------------
CHI-SQUARE                      1      5.168      0.023
```

```
GROUP     PURCH2

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |      49|      34|     83
         |    37.8|    45.2|
         | 3.33121| 2.78332|
         |   17.56|   12.19|  29.75
         |   59.04|   40.96|
         |   38.58|   22.37|
---------+--------+--------+
NUTR     |      78|     118|    196
         |    89.2|   106.8|
         | 1.41067| 1.17865|
         |   27.96|   42.29|  70.25
         |   39.80|   60.20|
         |   61.42|   77.63|
---------+--------+--------+
TOTAL          127      152     279
             45.52    54.48  100.00


STATISTICS FOR TABLE OF GROUP BY PURCH2

STATISTIC                      DF      VALUE      PROB
-------------------------------------------------------
CHI-SQUARE                      1      8.704      0.003
```

```
GROUP     MOOD1

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |      40|      43|     83
         |    27.1|    55.9|
         | 6.17403| 2.98849|
         |   14.34|   15.41|  29.75
         |   48.19|   51.81|
         |   43.96|   22.87|
---------+--------+--------+
NUTR     |      51|     145|    196
         |    63.9|   132.1|
         | 2.61451| 1.26554|
         |   18.28|   51.97|  70.25
         |   26.02|   73.98|
         |   56.04|   77.13|
---------+--------+--------+
TOTAL           91      188     279
             32.62    67.38  100.00


STATISTICS FOR TABLE OF GROUP BY MOOD1

STATISTIC                      DF      VALUE      PROB
-------------------------------------------------------
CHI-SQUARE                      1     13.043      0.000
```

```
GROUP     DRINK5

FREQUENCY|
EXPECTED |
CELL CHI2|
 PERCENT |
 ROW PCT |
 COL PCT |       0|       1|  TOTAL
---------+--------+--------+
FNIA     |      63|      20|     83
         |    70.2|    12.8|
         | .739997| 4.06138|
         |   22.58|    7.17|  29.75
         |   75.90|   24.10|
         |   26.69|   46.51|
---------+--------+--------+
NUTR     |     173|      23|    196
         |   165.8|    30.2|
         | .313366| 1.71987|
         |   62.01|    8.24|  70.25
         |   88.27|   11.73|
         |   73.31|   53.49|
---------+--------+--------+
TOTAL          236       43     279
             84.59    15.41  100.00


STATISTICS FOR TABLE OF GROUP BY DRINK5

STATISTIC                      DF      VALUE      PROB
-------------------------------------------------------
CHI-SQUARE                      1      6.835      0.009
```

```
     GROUP      DRINK8

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
     FNIA     |     65 |     18 |     83
              |   56.8 |   26.2 |
              |1.17738 |2.55544 |
              |  23.30 |   6.45 |  29.75
              |  78.31 |  21.69 |
              |  34.03 |  20.45 |
     ---------+--------+--------+
     NUTR     |    126 |     70 |    196
              |  134.2 |   61.8 |
              |.498583 |1.08215 |
              |  45.16 |  25.09 |  70.25
              |  64.29 |  35.71 |
              |  65.97 |  79.55 |
     ---------+--------+--------+
     TOTAL         191       88      279
                 68.46    31.54   100.00


    STATISTICS FOR TABLE OF GROUP BY DRINK8

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     5.314     0.021
```

```
     GROUP      DRINK10

     FREQUENCY|
     EXPECTED |
     CELL CHI2|
      PERCENT |
      ROW PCT |
      COL PCT |       0|       1|  TOTAL
     ---------+--------+--------+
     FNIA     |     68 |     15 |     83
              |   73.2 |    9.8 |
              |.367045 |2.73615 |
              |  24.37 |   5.38 |  29.75
              |  81.93 |  18.07 |
              |  27.64 |  45.45 |
     ---------+--------+--------+
     NUTR     |    178 |     18 |    196
              |  172.8 |   23.2 |
              |.155432 |1.15868 |
              |  63.80 |   6.45 |  70.25
              |  90.82 |   9.18 |
              |  72.36 |  54.55 |
     ---------+--------+--------+
     TOTAL         246       33      279
                 88.17    11.83   100.00


    STATISTICS FOR TABLE OF GROUP BY DRINK10

STATISTIC                     DF     VALUE      PROB
------------------------------------------------------
CHI-SQUARE                     1     4.417     0.036
```

APPENDIX C

NUTRITION KNOWLEDGE STATEMENTS

PERCENTAGE DISTRIBUTION OF THE SAMPLE ACCORDING TO NUTRITION KNOWLEDGE STATEMENTS

Statements	Percentage experimental group	 control group
I try to avoid snacks high in sodium.	41.33	39.02
Consuming highly salted snacks contributes to hypertension.	39.80	30.86
I consume snacks high in simple carbohydrate.	35.71	28.75
I try to avoid snacks high in sugar.	44.90	39.02
I consume too many sugary snacks.	57.14	49.36
I try to avoid snacks high in cholesterol.	41.33	47.56
I try to avoid snacks high in fat.	48.47	48.78
I try to avoid processed snacks.	21.94	21.95
I avoid snack foods containing additives and preservatives.	14.06	17.50
I prepare my own snack foods.	30.61	36.25
I consume snack foods that are enriched or whole-grain breads and cereals.	35.38	37.80
The vitamin and mineral content of snack foods influences my selection.	24.62	29.63
I eat a variety of foods for both meals and snacks.	70.92	74.07
I try to avoid empty calorie snack foods.	36.22	30.00
I consume snack foods high in valuble nutrients.	36.98	34.57
The calories in "natural" snacks such as granola bars or dried fruits aren't nearly as fattening as calories in "junk-food" snacks.	37.24	32.10

Appendix C (cont.)

Statements	Percentage experimental group	 control group
The consumer should always consume fortified snacks.	35.71	35.80
The nutritional content of the snack food is important to me.	48.47	50.62
I am interested in increasing my nutrition knowledge.	83.16	64.20
The price of a snack food determines if I purchase it.	65.82	53.09
Reading nutrient information on the labels of snack foods will help the consumer make a wise choice since the manufacturer must, by law, print the facts.	70.92	59.26
The brand or name of the snack product is important to me.	39.80	40.00
My snack food purchases represent my impulse buying practices.	50.51	40.74
I purchase more snack foods for my family/roommate than I do for myself.	13.78	11.25
My family/roommate influences my choice of snack foods.	38.46	30.86
My consumption of snack food is related to my stress situation.	54.08	37.04

2

VITA

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Candidate for the Degree of

Master of Science

Thesis: COLLEGE STUDENTS' SNACK FOOD CONSUMPTION BEHAVIORS AND NUTRITIONAL AWARENESS

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