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NUTRITION KNOWLEDGE AMONG NAVY RECRUITS

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Summary

Problem

Health promotion has been an ongoing concern in the Navy's Health and Physical Readiness Program and currently is a central component of the Chief of Naval Operations' (CNO's) "Personal Excellence and National Security" program. CNO's agenda in the area of weight control and nutrition calls for the incorporation of education programs into all accession/training points; thus, a significant portion of program efforts will be oriented toward new recruits. A primary objective is to teach Navy personnel basic principles of good nutrition and established nutritional standards. To develop efficient nutrition education programs, knowledge deficits in this group should first be determined so that specific areas can be targeted for improvement.

Objective

Three objectives were to: (a) identify deficits in nutrition knowledge of recruits, (b) identify recruits with above average need for nutrition education, and (c) compare recruits' nutrition knowledge with that of typical U.S. school students.

Approach

Participants were 205 male recruits in four basic training companies formed at the Recruit Training Center, San Diego. Nutrition knowledge was measured with a shortened version of the Nutrition Achievement Test 4 developed for use with junior and senior high school students. Six demographic/background variables were included as possible correlates of nutrition knowledge.

Results

Recruits answered an average of one less question correctly than school students. However, all psychometric statistics were very similar for the recruit and student samples, indicating that the nutrition knowledge questionnaire provides a comparable assessment for students and recruits. Forty percent of recruits answered half of the 36 nutrition questions incorrectly. Only 2% answered as many as 90% of the nutrition questions correctly. Questions answered incorrectly by more than 50% of recruits involved the following types of information: (a) how one assesses nutrient

needs and whether one's diet is adequate for meeting those needs, (b) the four major food groups and number of servings per day recommended from each group, and (c) effects of alcohol and drugs on nutritional status. Recruits who got higher grades, got into less trouble in high school, were older, and were Caucasian scored higher on the nutritional knowledge test.

Conclusions

Findings suggest that nutrition education is indeed called for to meet the SECNAV objective of having all Navy personnel know basic principles of good nutrition; although, recruits are not particularly lacking in nutrition knowledge relative to U.S. school students. It is recommended that nutrition education interventions focus on the four major food groups and number of servings recommended from each to help people learn about the body's nutrient needs and what types of food satisfy those needs. Information about the effects of drugs and alcohol on nutritional status would also be useful both because a majority of recruits lacked this knowledge and because such information would dovetail with other health promotion efforts aimed at lowering drug and alcohol consumption. Detailed information on the types of nutrition misconceptions held by recruits should help Navy Education and Training (~~CNET~~) personnel develop focused nutrition education materials. Nutrition education is especially important now as the Navy Food Service Systems Office (~~NAVSSO~~) implements new guidance on menu/recipes and food choice options to Navy dining facilities. Educational efforts to teach people good nutrition and eating habits may be critical for helping people understand and accept the changes being made in this transition to newer dietary guidelines.

Introduction

Public interest in health promotion has substantially increased in recent years (1,2). The Department of Defense (DoD) has identified health promotion efforts as a method of enhancing military readiness and the quality of life of DoD personnel (3). Within the Department of the Navy (DoN), health promotion has been an ongoing concern in the Health and Physical Readiness Program (4) and currently is a central component of the Chief of Naval Operations' (CNO's) "Personal Excellence and National Security" program (5). Nutrition education and weight/fat control comprise a major element in the Navy's comprehensive health promotion program (6). A primary objective of this program element is to teach all Navy personnel basic principles of good nutrition and established nutritional standards.

CNO's agenda in the area of weight control and nutrition calls for the incorporation of education programs into all accession/training points (7). A significant portion of program efforts will, therefore, be oriented toward recruits going through basic training. Recruits are a logical target group because the highly structured recruit training setting is ideal for providing information about good nutrition to large numbers of individuals. All enlisted personnel, roughly 88% of the Navy's total force, go through basic training. Teaching young recruits about good nutrition should, therefore, be a practical way to provide information to large numbers of individuals as they begin their Navy careers.

This study assessed nutrition knowledge in Navy recruits as a first step toward identifying Navy needs in this area and to provide baseline information for evaluating future nutrition education efforts. The primary objective was to determine deficits in recruits' nutrition knowledge as potential focal points for education modules to be developed as part of weight control and nutrition education interventions. A second objective was to identify types of people with above average need for nutrition education. The relationships between selected demographic/background variables and nutrition knowledge were examined for this purpose. Finally, the nutrition knowledge of Navy recruits was compared to that of U.S. school students to determine comparability of nutrition knowledge. If recruits are comparable to U.S. school students, studies in the general population can be more confidently used to provide guidance in the development of nutrition programs within the Navy.

Methods

Participants

Participants were male recruits from four basic training companies formed at the Recruit Training Center in San Diego who were part of a larger study of health in basic training. Of 252 recruits present at the testing sessions, 205 completed at least 35 of the 36 items administered in a nutrition knowledge questionnaire. These 205 recruits formed the group analyzed in this report. Their average age was 19.1 years (S.D. = 2.24) with a range from 17-32 years. Average years of school completed was 12.1 (S.D. = 0.9). Of 166 recruits who identified their race/ethnic group, there were 77.1% Caucasians, 15.7% Blacks, 5.4% Hispanics, and 1.8% of other race/ethnic groups. Nearly all (95.7%) participants were single. All successfully completed recruit training.

Nutrition Knowledge Questionnaire

Nutrition knowledge was measured with a modification of the Nutrition Achievement Test 4 (NAT4), a 47-item questionnaire developed by the National Dairy Council and the Office of Evaluation Research at the University of Illinois using junior and senior high school students (8). The content and format were, therefore, appropriate for use with Navy recruits, most of whom have just graduated from high school.

The specific items used in this study are presented in the Appendix. These items comprised a shortened version of the NAT4 which included the 24 original odd-numbered items and 12 even-numbered items focusing on nutrient knowledge and weight control (see Appendix items 25-36). This instrument is multiple-choice format with questions followed by three plausible but incorrect responses and one response that is accurate and "better" than any of the others (8). Participants were instructed to select the best answer for each question.

Demographic/Background Measures

Previous studies have found demographic variables such as age, education, and socioeconomic status related to nutrition knowledge (9,10). This study included six demographic/background variables to examine the association with recruits' nutrition knowledge: (a) age, (b) race, (c) years of schooling, (d)

grades during high school, (e) "recruit expectations" about being able to finish recruit training and one's first enlistment term, and (f) "social deviancy" during high school. Race was scored as Caucasian (1) and Non-caucasian (2). Grades during high school were rated as occasional failures (1), average grades (2), or good grades (3). "Recruit expectations" were the average of two items about the likelihood of completing recruit training and one's first enlistment term; responses were on a 7-point Likert-type scale from 1--disagree strongly to 7--agree strongly. "Social deviancy" was a 4-item scale which averaged responses to questions about the frequency during high school that a recruit ran away from home, played hooky from school, was suspended or expelled from school, and got into trouble/arrested by police for offenses other than traffic violations; responses were on a 5-point Likert-type scale from 0--never to 4--four or more times.

Testing Procedures

Recruits completed the nutrition knowledge questionnaire during a testing session held on the day prior to their departure from the Recruit Training Command. Each training company (about 65 recruits) was tested separately in the barracks area. A testing session lasted approximately 40 minutes, although recruits were free to return to other tasks as soon as they had completed the questionnaires.

Demographic/background information was collected from the recruits on each company's first day of training. This was the initial testing session for the larger study of health in recruit training. During this 90-minute session, the nature of the study was described and informed consent obtained. All participation was voluntary.

Results

Comparisons between Recruits and Students

Descriptive statistics for recruits' responses were compared with normative statistics for U.S. school student samples. The National Dairy Council has provided normative information for a 24-item version of the questionnaire (NAT4-24) which included only the odd-numbered items from the NAT4 (personal communication with Mary Lewis of The National Dairy Council, 16 OCT 86). Normative information for the NAT4-24 was developed from a group of

563 junior and senior high school students located at five sites in the U.S. These students represented various levels of academic ability, different types of school organization, several geographic areas, and a mix of racial and ethnic backgrounds.

Recruits answered an average of one less question correctly than the school students. Although this difference is statistically significant, it is clear from Table 1 that recruits and students responded very similarly overall to the NAT4-24. All the psychometric statistics were very similar for the two groups, indicating that the NAT4-24 provides a comparable assessment of nutrition knowledge for students and Navy recruits. Several statistics in Table 1 were not available for the NAT4-24, so the NAT4 figures were used for comparison purposes. The NAT4 figures should be very similar to the normative values for the NAT4-24, as all other indicators have suggested that the shorter version of the questionnaire is a reliable alternative to the NAT4.

Table 1
Comparison of Navy Recruits and U.S. School Students on the NAT4-24

	<u>Recruits</u>	<u>Students</u>	
Mean Number of Correct Answers	14.6	15.5	t = 2.45
Standard Deviation	5.0	4.3	p <.05
Range of Scores	3-24	---	
Number of Respondents	205	563	
Number of Test Items	24	24	
Standard Error of Measurement	2.1	1.5	
Reliability (Alpha)	.83	.88	
Average Difficulty*	61%	64%	
Range of Difficulty*	34-86%	32-92%	
Average Discrimination*	.45	.41	
Range of Discrimination*	.18-.61	.12-.69	
Range of Corrected Item-Test Correlations*	.09-.55	.09-.57	

* These measures for school students are based on the NAT4 because they were not available for the NAT4-24. Questions with a difficulty index in the 30% (difficult) to 80% (easy) range are considered desirable for a good test, and all but 2 questions (Appendix items 1 and 2) fell in this range for the recruits. Items with a discrimination index and a corrected item-test correlation of .20 or higher are considered acceptable; for the recruits, only Appendix item 9 had a discrimination index (.18) and a corrected item-total correlation (.09) which were lower than .20.

Recruits' Nutrition Knowledge

The remainder of the analyses included all 36 nutrition items (NAT4-36) so all available information could be used. Table 2 presents descriptive statistics and percentile information for the NAT4-36. The percentile rank for each number indicates the proportion of the sample who got that number of items or fewer correct. For example, just over one quarter (27%) of the recruits answered 15 or fewer items correctly, and three quarters (75%) of the recruits answered 27 or fewer items correctly. No recruit answered all 36 questions correctly; indeed, only about 2% of the recruits missed as few as four questions (i.e., 10% of the test items).

Table 2
Descriptive Statistics and Percentile Ranks
for the NAT4-36 in the Recruit Sample

<u>Number Correct</u>	<u>Percentile</u>	<u>Number Correct</u>	<u>Percentile</u>	<u>Number Correct</u>	<u>Percentile</u>
1	---	13	19	25	67
2	---	14	22	26	74
3	---	15	27	27	75
4	.5	16	31	28	80
5	.5	17	36	29	84
6	1	18	40	30	88
7	2	19	44	31	92
8	2	20	46	32	98
9	5	21	48	33	99
10	10	22	53	34	99.5
11	12	23	56	35	100
12	16	24	61	36	---

Mean: 21.2 **Mode:** 25.0 **S.D.:** 7.4 **Range:** 4-35 **Alpha:** 0.88

Table 3 lists the eleven NAT4-36 questions answered incorrectly by more than 50% of the sample; the most "difficult" questions (i.e., those answered incorrectly by the most recruits) are listed first. These questions indicate areas of nutrition knowledge for which recruits need more information. The

percent of the sample selecting each of the four alternatives for each question is given in the Appendix. This information is provided for a more detailed examination of the correct knowledge and the misconceptions recruits have about nutrition.

Table 3

Nutrition Questions Answered Correctly by Fewer Than 50% of Recruits

<u>%</u> *	
33.8	You are asked to help plan a menu which will meet the nutritional needs of a teenager. You say that one way to plan nutritious meals is to use the recommended servings from the four food groups each day which are: meat group—2 servings; milk group—4 servings; fruit & vegetable group—4 servings; grain group—4 servings. (9)
36.3	With her friends after work, Sally usually fills up on sweets, skips supper because she is still full and then snacks again in the evening. How can Sally best improve her food habits without changing her whole lifestyle? Change one food habit a week to gradually improve her diet. (27)
41.2	One reason some drugs can alter nutrient needs is they: reduce absorption of nutrients. (34)
42.9	Food additives are said by some to be dangerous. One reason this is said to be true is that additives: have sometimes been found to cause cancer in animals. (15)
43.1	What natural resources affect the food supply? Water, soil, and sun. (20)
43.4	The dietary characteristic most appropriate for senior citizens is: consuming foods with fewer calories and a high nutrient density. (18)
43.4	How should you cook fresh green peas to conserve the nutrients? Cook in a small amount of water for 5 to 10 minutes. (6)
43.9	Alcohol is one type of drug as well as a food. Large consumption of alcoholic beverages affects nutritional status because alcohol: exerts a diuretic effect which tends to promote the excretion of some minerals and vitamins. (35)
43.9	How could you find out if you might have too few or too many nutrients in your diet? Analyze the nutritive value of the food you eat over a period of time. (7)
47.3	An advertisement suggested that taking a vitamin and mineral supplement would lead to superior athletic ability. Which statement is true? Supplements are not needed if body needs for vitamins and minerals are met through diet. (19)
48.8	What is the most important thing to remember when seeing or listening to an advertisement for a food product? Industry is interested in selling a product. (13)

* Percent of recruits selecting correct response; see Appendix for percent who selected each incorrect alternative. NAT4-36 question numbers are in parentheses.

Correlates of Nutrition Knowledge

Table 4 presents the Pearson Product-Moment correlation coefficients for the demographic/background variables with the NAT4-36 score. This table also presents the results of a multiple regression analysis which allowed these predictors to enter the equation predicting the NAT4-36 score in a forward stepwise procedure. Four variables accounted for significant ($p < .05$) amounts of variance in nutrition knowledge scores. Recruits who got higher grades in high school, got into less trouble in high school, were older, and were Caucasian scored higher on the NAT4-36. The multiple R for the regression equation combining these variables was $R = .442$, indicating that the four significant predictors accounted for 19.5% of the variance in recruits' nutrition knowledge.

Table 4
Background Predictors of Nutrition Knowledge (NAT4-36 Score)

Predictor	Pearson r	B-weight
High School Grades	.29	2.37
Age	.20	0.64
Social Deviancy	-.29	-2.45
Caucasian(1) vs. Non-caucasian(2)	-.15	-3.39
Years of Schooling	.08	----
Recruit Expectations	.03	----
Constant	----	10.42

Multiple R = .442 **R-Squared = .195** **Standard Error = 6.54**

Discussion

The most important finding was that nutrition education is indeed called for to meet the SECNAV objective of having all Navy personnel know basic principles of good nutrition and established nutritional standards (6). Forty percent of recruits in this study answered half of the 36 nutrition questions

incorrectly. Only 2% of the recruits answered as many as 90% of the nutrition questions correctly. More than 50% of recruits incorrectly answered questions on the following types of information: (a) how one assesses nutrient needs and whether one's diet is adequate to meet those needs, (b) the four major food groups and number of servings per day recommended from each group, (c) effects of alcohol and drugs on nutritional status, and (d) miscellaneous items related to diet/eating habits, food additives, food preparation, and advertisement of food products. These findings highlight the specific knowledge deficiencies which nutrition education programs should address.

Although Navy recruits need nutrition education, recruits are not particularly lacking in nutrition knowledge relative to typical U.S. school students. Recruits answered only one less question correctly, on the average, than did junior and senior high school students. This slight difference between school students and recruits might be accounted for by either education or sex differences in the groups, as both of these variables have been associated with nutrition knowledge (9,10,11). Recruits probably have slightly lower levels of educational achievement compared to typical high school students because the more academically oriented high school students continue their education at the college level rather than join the Navy as enlisted personnel. Additionally, the school samples included both males and females, whereas this study examined only male recruits. As female students may be more knowledgeable about nutrition than males (11), the slight average difference in student and recruit nutrition knowledge scores might be related to the lack of females in the recruit sample. Overall, the comparability in nutrition knowledge between recruits and typical U.S. school students indicates that additional attention should be given to nutrition education at the primary and secondary levels of the U.S. school system.

Finally, the results indicated that nutrition knowledge deficits may be greater among recruits who got lower grades in high school, had a history of "social deviancy" (e.g, trouble with the police, truancy) in high school, are younger, or are non-caucasian. Except for the age factor, prior research on Marine Corps recruits has indicated that individuals with similar characteristics are more likely to have lower performance on a variety of tests during recruit training or be discharged prior to completing basic training or their first term of enlistment (12).

Recommendations and Conclusions

It is recommended that nutrition education interventions focus on information about the four major food groups and the number of servings recommended from each. Such a focus should be very effective for increasing overall nutrition knowledge, as a majority of recruits incorrectly answered questions about the body's nutrient needs and types of food which satisfy those needs. Additionally, information about the effects of drugs and alcohol on nutritional status would be useful both because a majority of recruits lacked knowledge in this area and because such information would dovetail with other health promotion efforts aimed at lowering drug and alcohol consumption among Navy personnel.

The specific information on recruits' responses to the nutrition questions should also be useful for Navy Education and Training (CNET) personnel tasked with incorporating nutrition education programs into all accession/training points (7). Detailed information presented in the Appendix indicates the types of nutrition misconceptions held by recruits as well as areas in which recruits are already fairly knowledgeable. Such information should be helpful for developing nutrition education materials which are oriented specifically toward new Navy personnel. Highly focused materials are needed for incorporation into the time-limited recruit training schedule designed foremost to teach civilians how to be sailors.

Nutrition education is more important now than ever because of changes taking place in the Navy's dining facilities. The Navy Food Service Systems Office (NAVFSSO) is tasked with implementing a comprehensive food and nutrition plan for both General Mess and Private Messes Afloat (7). NAVFSSO is to provide guidance to Navy dining facilities on menu/recipes and food choice options which meet American Heart Association dietary guidelines and DHHS/USDA "Dietary Guidelines for Americans." This means that foods being offered to Navy personnel will become lower in fat, cholesterol, sodium, and calories to help members maintain healthier eating habits. However, making healthier food options the norm in Navy dining facilities may not please all individuals. People who have spent 18 or more years developing a taste for foods high in fat, sodium, and calories may, in fact, be very displeased about available food options as messes transition to the newer dietary guidelines. Educational efforts which help people learn about good nutrition and eating

habits may be critical for making people understand and accept the changes being made in this transition. Service members who are more nutrition wise will, hopefully, act on this knowledge and help the Navy reach its goals for a healthy and fit force.

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APPENDIX

NUTRITION KNOWLEDGE QUESTIONNAIRE

Percent Questions and Multiple Choice Responses*

1. WHAT WOULD BE THE SAFEST WAY TO LOSE WEIGHT? (1)
 - 13.7 1) Drink 8 glasses of water each day and eat only fruits and vegetables.
 - 1.0 2) Reduce caloric intake by skipping lunch.
 - 2.5 3) "Fast" for three days and then begin exercising.
 - 82.8 4) **REDUCE CALORIC INTAKE AND INCREASE PHYSICAL ACTIVITY.**

2. THE BEST WAY TO DECIDE IF YOUR WEIGHT IS IN AN APPROPRIATE RANGE IS TO COMPARE IT TO (3)
 - 2.0 1) your parents' weights when they were your age.
 - 86.7 2) **NATIONAL CHARTS OF DESIRABLE WEIGHTS AT YOUR HEIGHT AND AGE.**
 - 7.4 3) the amount of food you eat.
 - 3.9 4) your friends' weights.

3. YOUR BEST FRIEND SAYS A CANDY BAR IS THE BEST SNACK FOR ENERGY SO HE EATS AT LEAST ONE A DAY. YOU SAY: (5)
 - 4.9 1) Candy bars have a lot of sugar which eats up your energy.
 - 7.8 2) This is true since candy bars have a lot of sugar.
 - 64.4 3) **OTHER SNACKS PROVIDE ENERGY AND GREATER AMOUNTS OF OTHER NUTRIENTS AT THE SAME TIME.**
 - 22.9 4) Candy bars provide calories, not energy.

4. HOW DOES YOUR LEVEL OF ACTIVITY RELATE TO THE NUMBER OF CALORIES YOU NEED TO KEEP A CONSTANT WEIGHT? (7)
 - 2.9 1) If you rarely exercise you need more calories.
 - 6.8 2) If you don't eat much you need more calories.
 - 76.6 3) **IF YOU EXERCISE A LOT YOU NEED MORE CALORIES.**
 - 13.7 4) If you are very active you need fewer calories.

5. TOTAL CALORIC NEEDS ARE DETERMINED MOSTLY BY (9)
 - 59.8 1) **BASAL METABOLISM AND AMOUNT OF PHYSICAL ACTIVITY.**
 - 7.8 2) your doctor.
 - 2.0 3) the way you play sports.
 - 30.4 4) your weight and how much you eat.

6. HOW SHOULD YOU COOK FRESH GREEN PEAS TO CONSERVE THE NUTRIENTS? (11)
 - 36.6 1) Cover and boil for 10 minutes.
 - 8.8 2) Simmer in butter sauce for 15 to 20 minutes.
 - 11.2 3) Cook without liquid on the range in a saucepan.
 - 43.4 4) **COOK IN A SMALL AMOUNT OF WATER FOR 5 TO 10 MINUTES.**

7. HOW COULD YOU FIND OUT IF YOU MIGHT HAVE TOO FEW OR TOO MANY NUTRIENTS IN YOUR DIET? (13)
 - 10.7 1) Determine the amount of fat you have on your body.
 - 43.9 2) **ANALYZE THE NUTRITIVE VALUE OF THE FOOD YOU EAT OVER A PERIOD OF TIME.**
 - 24.4 3) Count the number of calories you consume each day.
 - 21.0 4) Determine if your height and weight are normal for your age.

8. TONI WAS EATING LUNCH IN THE CAFETERIA. ALTHOUGH SHE HAD NEVER TRIED CORN BREAD, SHE DIDN'T TAKE ANY BECAUSE HER FRIENDS SAID IT WASN'T GOOD. WHICH OF THE FOLLOWING STATEMENTS WOULD BE THE MOST CORRECT REASON TONI DID NOT EAT THE CORN BREAD? (15)
 - 6.8 1) If her friends don't like it, probably it isn't good for her.
 - 7.3 2) Corn bread does not taste good.
 - 68.3 3) **FRIENDS OFTEN INFLUENCE ONE'S FOOD CHOICES.**
 - 17.6 4) People the same age generally have the same tastes. If her friends don't like it, Toni won't either.

9. YOU ARE ASKED TO HELP PLAN A MENU WHICH WILL MEET THE NUTRITIONAL NEEDS OF A TEENAGER. YOU SAY THAT ONE WAY TO PLAN NUTRITIOUS MEALS IS TO USE THE RECOMMENDED SERVINGS FROM THE FOUR FOOD GROUPS EACH DAY WHICH ARE (17)
- | | | | |
|------|----|---|---|
| 22.1 | 1) | meat group--2 servings;
fruit group--2 servings; | milk group--4 servings
vegetable group--4 servings |
| 26.0 | 2) | meat group--2 servings;
fruit & vegetable group--4 servings; | milk group--2 servings;
grain group--4 servings |
| 33.8 | 3) | MEAT GROUP--2 SERVINGS;
FRUIT & VEGETABLE GROUP--4 SERVINGS; | MILK GROUP--4 SERVINGS;
GRAIN GROUP--4 SERVINGS |
| 18.1 | 4) | meat group--4 servings;
fruit & vegetable group--4 servings; | milk group--2 servings;
grain group--4 servings |
10. WHICH OF THE FOLLOWING STATEMENTS MOST CLOSELY REFLECTS WHAT WOULD HAPPEN IF THERE WERE NO GOVERNMENT REGULATIONS FOR OUR NATION'S FOOD? (19)
- 8.3 1) There might be a lot of food lying around.
14.6 2) Many people might starve.
5.9 3) You might not be able to buy food at the store.
71.2 4) THE QUALITY OF FOOD MIGHT DECLINE.
11. WHAT NEGATIVE EFFECT MIGHT TV VIEWING HAVE ON THE EATING HABITS OF A PERSON? (21)
- 77.1 1) SEEING THE COMMERCIALS FOR PRODUCTS LIKE CANDY OR SODA POP OFTEN MAKES A PERSON WANT THEM EVEN WHEN NOT HUNGRY.
8.8 2) Commercials show you what new food products are on the market.
5.4 3) Many commercials give nutritional information about a food product.
8.8 4) A documentary report on food might tell you why a food product isn't good for you.
12. MUCH RESEARCH IS BEING CONDUCTED ON THE CONNECTION BETWEEN DIET AND DISEASE. YET, SCIENTISTS DO NOT ALWAYS AGREE ON THE RESULTS. IN THE ABSENCE OF DEFINITE RESEARCH FINDINGS WHAT WOULD BE THE BEST WAY TO PLAN YOUR DIET? (23)
- 8.8 1) Eliminate all foods which have been questioned in these studies.
14.1 2) Eat whatever you want until the scientific community reaches agreement.
18.0 3) Don't eat foods with additives.
59.0 4) DON'T EAT AN EXCESS OF FOODS IN QUESTION.
13. WHAT IS THE MOST IMPORTANT THING TO REMEMBER WHEN SEEING OR LISTENING TO AN ADVERTISEMENT FOR A FOOD PRODUCT? (25)
- 48.8 1) INDUSTRY IS INTERESTED IN SELLING A PRODUCT.
22.9 2) Ads are trying to educate the public about nutrition.
21.5 3) Information presented in ads is unbiased.
6.8 4) Only ads comparing two products are accurate.
14. THE RDA (RECOMMENDED DAILY ALLOWANCES) TABLES HELP IN PLANNING DIETS BECAUSE THEY (27)
- 61.0 1) RECOMMEND THE AMOUNT OF NUTRIENTS NEEDED.
16.1 2) list what to eat, how much, and when.
13.7 3) tell what foods are not good for us.
9.3 4) recommend foods good for certain organs.
15. FOOD ADDITIVES ARE SAID BY SOME TO BE DANGEROUS. ONE REASON THIS IS SAID TO BE TRUE IS THAT ADDITIVES (29)
- 13.7 1) are sometimes added to preserve freshness.
17.6 2) often cause weight gain.
2.9 3) are dangerous chemicals.
42.9 4) HAVE SOMETIMES BEEN FOUND TO CAUSE CANCER IN ANIMALS.

16. SARA HAS STARTED PLAYING RACQUETBALL TWO HOURS A DAY. HOW WILL SHE NEED TO CHANGE HER FOOD INTAKE IF SHE WANTS TO MAINTAIN THE SAME WEIGHT? (31)
- 6.8 1) Eat a lot of candy.
 - 8.8 2) Eat less since she will be more active.
 - 71.2 3) CONSUME MORE CALORIES.
 - 13.2 4) Have extra calcium so her bones won't break.
17. WHY WOULD ONE MOST LIKELY BUY FROZEN BROCCOLI INSTEAD OF FRESH BROCCOLI? (33)
- 9.4 1) Frozen broccoli is better for you.
 - 29.1 2) The germs are killed in frozen broccoli.
 - 5.4 3) Frozen broccoli tastes better.
 - 56.2 4) FROZEN BROCCOLI IS AVAILABLE DURING ALL SEASONS.
18. THE DIETARY CHARACTERISTIC MOST APPROPRIATE FOR SENIOR CITIZENS IS (35)
- 29.3 1) a change to soft foods that are easy to chew and swallow.
 - 43.4 2) CONSUMING FOODS WITH FEWER CALORIES AND A HIGH NUTRIENT DENSITY.
 - 17.6 3) eating and drinking more in order to stay well.
 - 9.8 4) no change in the diet.
19. AN ADVERTISEMENT SUGGESTED THAT TAKING A VITAMIN AND MINERAL SUPPLEMENT WOULD LEAD TO SUPERIOR ATHLETIC ABILITY. WHICH STATEMENT IS TRUE? (37)
- 9.8 1) The supplement is needed to increase endurance.
 - 19.5 2) Vitamins and minerals have little to do with athletic performance.
 - 47.3 3) SUPPLEMENTS ARE NOT NEEDED IF BODY NEEDS FOR VITAMINS AND MINERALS ARE MET THROUGH DIET.
 - 23.4 4) Supplements are the best way for athletes to get those nutrients.
20. WHAT NATURAL RESOURCES AFFECT THE FOOD SUPPLY? (39)
- 12.7 1) water, fertilizer, and iron
 - 43.1 2) WATER, SOIL, AND SUN
 - 17.2 3) sulfur, iron, and magnesium
 - 27.0 4) climate, fertilizer, and water
21. THE MAIN SOURCES OF OUR FOOD SUPPLY ARE (41)
- 56.6 1) PLANTS AND ANIMALS.
 - 7.8 2) chemicals and grains.
 - 13.2 3) vitamins and minerals.
 - 22.4 4) dairy and meat products.
22. WHO ARE THE MAJOR PRODUCERS OF OUR FOOD SUPPLY? (43)
- 9.8 1) manufacturers
 - 9.8 2) scientists
 - 74.1 3) FARMERS
 - 6.3 4) grocery store owners
23. WHAT IS THE BEST INFORMATION SOURCE FOR THE NUTRIENT CONTENT OF A FABRICATED FOOD? (45)
- 10.2 1) a taste test
 - 12.7 2) the advertising promotion
 - 70.2 3) A LABEL CONTAINING NUTRITION INFORMATION
 - 6.8 4) friends who have eaten the product
24. THE ELDERLY GENERALLY NEED FEWER CALORIES THAN YOUNG AND MIDDLE-AGED PERSONS BECAUSE THEY (47)
- 5.9 1) are not going to live much longer.
 - 79.0 2) ARE USUALLY NOT AS ACTIVE.
 - 7.3 3) probably ate a lot when they were young.
 - 7.8 4) are not eating the right foods.

25. WHAT WOULD YOU NEED TO KNOW ABOUT A WEIGHT REDUCTION DIET BEFORE YOU COULD DECIDE IF IT WAS SAFE? (6)
- 63.4 1) THAT IT PROVIDES ALL THE ESSENTIAL NUTRIENTS YOU NEED.
 10.2 2) That you could still eat your favorite foods.
 18.5 3) That it recommends exercising as a part of the diet.
 7.8 4) How much it will cost.
26. WHAT IS MEANT BY THE STATEMENT: "X" IS MORE NUTRITIOUS THAN "Y"? (8)
- 4.9 1) "X" is fresher than "Y".
 67.5 2) "X" HAS MORE OF THE IMPORTANT NUTRIENTS THAN "Y".
 16.7 3) "X" has more vitamins and "Y" has more minerals.
 10.8 4) "X" has fewer calories than "Y".
27. WITH HER FRIENDS AFTER WORK, SALLY USUALLY FILLS UP ON SWEETS, SKIPS SUPPER BECAUSE SHE IS STILL FULL AND THEN SNACKS AGAIN IN THE EVENING. HOW CAN SALLY BEST IMPROVE HER FOOD HABITS WITHOUT CHANGING HER WHOLE LIFESTYLE? (12)
- 35.8 1) Starting the next day, eliminate all sweets and eat three meals a day.
 13.2 2) Stop getting together with friends after work.
 36.3 3) CHANGE ONE FOOD HABIT A WEEK TO GRADUALLY IMPROVE HER DIET.
 14.7 4) Take diet aids sold at the drugstore so she won't be hungry after school.
28. WHAT WOULD BE MOST IMPORTANT WHEN PLANNING A DIET FOR ATHLETES? (14)
- 15.6 1) Add large doses of vitamins to the diet.
 10.2 2) Decrease protein intake.
 18.5 3) Avoid snacks.
 55.6 4) PLAN ADEQUATE ENERGY INTAKE.
29. WHERE COULD YOU GO TO FIND HOW MANY GRAMS OF PROTEIN ARE RECOMMENDED FOR YOUR DAILY DIET? (18)
- 21.0 1) a food label
 63.4 2) THE RDA TABLES
 7.3 3) the dictionary
 8.3 4) a list of foods you have eaten today
30. WHICH OF THE FOLLOWING FOODS IS A GOOD SOURCE OF PROTEIN? (20)
- 16.6 1) bread
 12.2 2) corn flakes
 53.7 3) EGGS
 17.6 4) green beans
31. THE EASIEST WAY TO DETERMINE THE NUTRIENTS PROVIDED BY A NEW FOOD PRODUCT IS TO (26)
- 24.4 1) read the list of ingredients on the label.
 12.2 2) look up the food product in a list of new foods.
 10.2 3) write the manufacturer.
 53.2 4) READ THE NUTRITION INFORMATION PANEL ON THE LABEL.
32. HOW COULD YOU COMPARE THE NUTRITIVE VALUE OF FROZEN ORANGE JUICE AND POWDERED ORANGE FLAVORED BREAKFAST DRINK. (28)
- 7.8 1) Watch television commercials.
 68.3 2) READ THE NUTRITION LABEL.
 17.6 3) Use your common sense.
 6.3 4) Taste for sweetness of the juice.
33. WHAT INFORMATION IS MOST OFTEN PRINTED ON FOOD PACKAGES? (30)
- 7.3 1) cost of the product per ounce
 17.1 2) cooking or food preparation instructions
 63.4 3) THE INGREDIENTS AND WEIGHT
 12.2 4) statement telling how good the food is for you

34. ONE REASON SOME DRUGS CAN ALTER NUTRIENT NEEDS IS THEY (36)

- 41.2 1) **REDUCE ABSORPTION OF NUTRIENTS.**
- 20.5 2) deaden feelings so you don't know you need the nutrients.
- 27.0 3) destroy the nutrients you eat.
- 11.3 4) provide all the nutrients you need.

35. ALCOHOL IS ONE TYPE OF DRUG AS WELL AS A FOOD. LARGE CONSUMPTION OF ALCOHOLIC BEVERAGES AFFECTS NUTRITIONAL STATUS BECAUSE ALCOHOL (40)

- 22.9 1) increases the body's absorption of nutrients.
- 18.0 2) causes hunger so one consumes more nutrients than the body needs.
- 15.1 3) provides many nutrients so one must cut down on food intake.
- 43.9 4) **EXERTS A DIURETIC EFFECT WHICH TENDS TO PROMOTE THE EXCRETION OF SOME MINERALS AND VITAMINS.**

36. ANN IS TRYING TO LOSE WEIGHT. HER FRIENDS ARE GOING TO A FAST FOOD RESTAURANT AFTER WORK FOR A SNACK. SHE DOESN'T WANT TO BREAK HER DIET. THE BEST ADVICE WOULD BE TO (44)

- 27.9 1) tell her friends she can't go.
- 10.8 2) go and order french fries and a soda instead of a hamburger.
- 10.3 3) go and eat what they are eating since she can start her diet again later.
- 51.0 4) **GO AND ORDER ORANGE JUICE.**

* The percent next to each alternative is the percent of recruits who selected that response. Correct responses are in bold type. Original NAT4 item numbers are in parentheses after the question.

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) CNO's agenda in the area of weight control and nutrition calls for the incorporation of education programs into all accession/training points with the goal of teaching Navy personnel basic principles of good nutrition and established nutritional standards. Objectives of this study were to determine deficits in recruits' nutrition knowledge, identify recruits with above average need for nutrition education, and compare recruits' nutrition knowledge with that of typical U.S. school students. Participants were 205 male recruits at Recruit Training Center, San Diego. Nutrition knowledge was measured with a shortened version of the National Dairy Council's Nutrition Achievement Test 4. Six demographic/background variables were included as possible correlates of nutrition knowledge. Forty percent of recruits answered half of 36 nutrition questions incorrectly. Only 2% answered 90% of the questions correctly. Questions answered incorrectly by more than 50% of recruits involved: (a) how one assesses nutrient needs and whether those needs are being met, (b) the four major food groups and recommended servings, and (c) effects of alcohol and drugs on nutritional status. Recruits who got higher grades in high school, got into less			
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