



As part of a multistate project, 200 Californians were asked about the roles of fat and fiber in the diet and their own consumption practices. Nearly all of the people surveyed said concerns about health and weight influenced what they ate.

Californians' eating habits differ from their dietary attitudes

Christine M. Bruhn □ Dana Wong □ Howard G. Schutz

While California consumers are knowledgeable about general dietary recommendations, a recent survey found many are not aware of the recommended daily servings of fruit and vegetables, and do not always follow through on meal-time practices to lower dietary fat and increase fiber. Nutrition education should be targeted to correct misunderstandings about diet, and emphasize the values of eating fruit and vegetables and exercising to maintain good health.

National surveys indicate that more than 80% of Americans are concerned about the effects of diet on health. In the last 10 years, up to two-thirds of Americans said they had reduced their fat consumption, were eating less meat and more poultry, and eating more fruits and vegetables. However, marketplace consumption figures suggest that consumers may have overstated their compliance with dietary guidelines.

As part of a multistate project, a questionnaire was developed addressing consumer's knowledge and understanding of types of fats, sources of fats and fibers, consumption practices,

and knowledge and adherence to the dietary guidelines for Americans established by the U.S. Department of Agriculture and U.S. Department of Health and Human Services. The questionnaire also identified con-

straints and motivating factors influencing dietary consumption changes.

The questionnaire, which was designed by scientists and evaluated by nutrition experts, was pilot-tested, and revised twice. Final question-

TABLE 1. Demographics of respondents compared to California households

	Respondents	California
 %	
Highest level of education (n = 200)		
Grade school or some high school	6	15
High school graduate or GED	18	30
Some college / trade or vocational school	34	35
College graduate	25	20
Graduate work	17	10
Present marital status (n = 200)		
Married or living together	68	52
Separated, Divorced	15	12
Widow / Widower	4	6
Never Married	13	30
Age (n = 200)		
18 - 24 years	2	6
25 - 39	22	35
40 - 49	25	20
50 - 64	24	20
65 and older	27	19
Gross annual household income (n = 188)		
less than \$10,000	5	12
\$10,000 - \$19,999	11	15
\$20,000 - \$29,999	16	15
\$30,000 - \$39,999	16	13
\$40,000 - \$49,999	14	12
more than \$50,000	38	33
Ethnicity (n = 199)		
White / Caucasian / Anglo	81	62
Hispanic / Latino	7	16
Asian / Asian American	6	7
Black / African-American	4	7
Other	2	8

naires and postage-paid return envelopes were mailed in 1993 to a statistical sample of California households, with 300 questionnaires sent to women and 300 to men 18 years or older. Sample size was proportionate to the population in each zip code. Survey participation was voluntary and confidential. Of 600 surveys distributed, 205 usable questionnaires were returned with an adjusted return rate (discounting undeliverable questionnaires) of 42%.

Respondents primarily Caucasian

The gender and age ranges of the sample were evenly distributed. However, the majority of respondents were Caucasian, and formal education was higher than the state average (table 1). Three-quarters had at least some college education and most were currently employed. The sample included both urban and rural residents, and income was evenly distributed. In terms of health, 20% indicated they had been diagnosed with high blood pressure and 17% with high blood cholesterol. Less than 10% listed other conditions such as cancer or diabetes; some people may have had diseases without their knowledge. More than 80% did not follow a special diet for health reasons and the majority considered their health good or excellent.

Factors influencing diet

Nearly all (97%) of the respondents said concerns about health and weight influenced what they ate, with 58% indicating health and 45% noting that weight strongly influenced their dietary choices. Over half (54%) said food likes and dislikes played an important role in what they ate, 39% listed spouse influence, and 34% preparation time. Almost one-quarter said the cost of food influenced their food choice; however, almost three-fourths believed that eating healthier does not cost more.

The majority indicated they had made changes to improve their health and weight. These changes included reading the label for fat and chole-

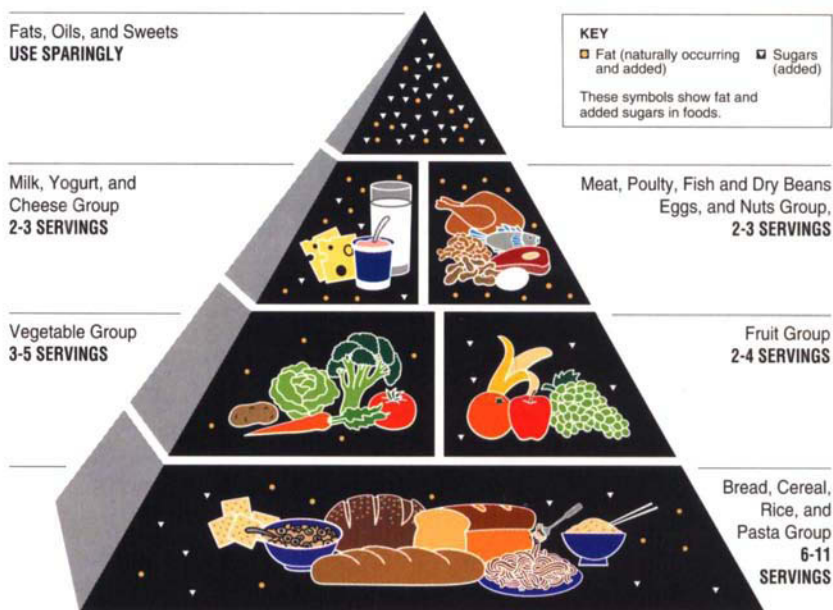


Fig. 1. The Food Guide Pyramid: A guide to daily food choices. Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services

sterol content, eating more fruits and vegetables, and reducing the amount of fat in their diet (table 2).

Diet and health beliefs

Although respondents were concerned about links between nutrition and disease, most rated other factors, such as family history and obesity, as more influential in developing cancer or heart disease (table 3). Only one-third ranked poor diet as very important in developing cancer; smoking and family history were correctly ranked highest. More than 90% strongly agreed or agreed that they were more likely to get heart disease if there was a lot of fat or saturated fat in

their diet. The value of produce and grains seemed well accepted, with 85% agreeing that eating plenty of vegetables, fruits, and grain products would reduce their chance of getting heart disease. Conversely, only 57% believed that eating plenty of fiber would reduce the risk of heart disease.

Health authorities note there are both pro- and anticarcinogenic properties from dietary fat. About half of the respondents (52%) believed consuming a high-fat diet increases the risk of getting cancer. More than two-thirds correctly recognized they may reduce the likelihood of getting cancer by eating plenty of vegetables, fruits, grain products and fiber. Respondents also

Compared to a few years ago, how often do you ...?	More		Less		Number of respondents
	%				
Read fat and/or cholesterol content of food labels	70	4			195
Eat vegetables	63	4			205
Trim fat off meat	62	8			191
Eat fruits	62	3			205
Cook with vegetable oils	58	10			196
Use skim milk or nonfat dried milk	55	10			169
Decrease fat and oil in recipes	52	14			200
Eat cereal/grains	52	3			199
Broil meats, fish, poultry	46	8			194
Barbecue meats, fish, poultry	30	22			188
Use egg substitutes and/or egg whites instead of whole eggs	22	19			149
Add cheese to your food	8	40			193
Add sour cream	7	53			163
Add butter/margarine to food	5	48			197
Eat foods with gravy	3	54			180

TABLE 3. California consumers' attitudes toward influences of diet on health

Do you think foods you eat put you at risk for...?						
	Yes		No		Don't know	n
	%					
Heart Disease	88	8	7	1	2	203
Cancer	68	15	16	0	4	200

How important are the following things in increasing your chances of developing heart disease?						
	Very important		Not important		n	
	%					
Smoking	82	8	7	1	2	191
Obesity	75	15	6	0	4	193
Family History	70	14	8	3	5	200
Exercise	53	25	18	2	2	194
Poor Diet	49	27	17	3	4	199

How important are the following things in increasing your chances of developing cancer?						
	Very important		Not important		n	
	%					
Smoking	79	12	3	2	4	200
Family History	64	16	11	3	6	200
Poor Diet	30	26	25	12	7	202
Obesity	21	12	34	16	17	201
Exercise	20	16	33	19	12	202

TABLE 4. Californians' knowledge about fat, saturated fat and fiber

	Correct	n
	%	
For each food pair, which food is higher in fat?		
Chicken with skin* vs chicken without skin	91	202
Brownie* vs angel food cake	74	202
Butter vs regular margarine	66	202
Hamburger* vs turkey	92	202
Potato chips* vs pretzels	82	202
For each food pair, which food is higher in fiber?		
Raw apple* vs apple juice	92	203
Boiled or refried beans* vs mashed potatoes	70	203
Bran flakes* vs cornflakes	85	202
Popcorn* vs potato chips	80	203
For each food pair, which food is higher in saturated fat?		
Butter* vs margarine	76	203
Hamburger* vs peanut butter	55	203
Lard or shortening* vs vegetable oil	87	202
Coconut oil* vs corn oil	70	202
Broiled steak* vs broiled fish	84	201

* signifies correct answer

TABLE 5. Diet change decisions based on better health

If it were good for your health, would you ...?		
	Yes	n
	%	
Eat more fruits/vegetables	94	205
Trim fat from meat	93	203
Use whole-grain breads	91	203
Take skin off poultry	88	202
Eat fewer desserts/pies	83	202
Use 1% skim milk	79	203
Use margarine instead of butter	77	204
Use egg whites instead of whole eggs in baking	53	202

agreed that eating plenty of vegetables, fruits, and grains could reduce the frequency of intestinal problems. Consumers were more apt to recognize the relationship between dietary fat and heart disease than dietary fiber and cancer.

Knowledge about diet guidelines

While the respondents' ability to recognize USDA dietary recommendations was good, our survey found that the majority did not know specifics about the recommended number of daily servings. Only 34% knew they should eat five or more servings of fruits and vegetables daily, only 6% were aware that dietary guidelines recommend six to 11 servings of breads, cereals, pastas and rice daily, and 21% were aware of specific fat restrictions. Although many food labels display the food pyramid (fig. 1), consumers appear not to understand recommendation details. More emphasis is needed on the recommended number of servings in each category.

Consumers were knowledgeable about relative fat content of several common foods. Most were able to correctly distinguish which foods had more fat, saturated fat, or fiber (table 4). More than 90% knew that chicken with skin had more fat than chicken without, and hamburger had more fat than turkey. About three-quarters recognized brownies were higher in fat than angel food cake, and potato chips higher than pretzels. In contrast, less than one-quarter recognized there is no difference in fat level between butter and margarine.

Knowledge of sources of saturated fat was also good (table 4). More than 70% of respondents knew butter, lard/shortening and coconut oil were higher in saturated fat than margarine, vegetable oil and corn oil, respectively. More than four-fifths identified broiled steak as higher in saturated fat than broiled fish. Over half knew hamburger contains more saturated fat than peanut butter.

Consumers were unaware of sources of dietary cholesterol. Two-

thirds knew cholesterol came from animal products such as meat and dairy; however, almost one-third incorrectly responded that all food containing fat or oil contains cholesterol.

Respondents' knowledge of relative fiber content was commendable (table 4). More than two-thirds (70%) knew boiled or refried beans are higher in fiber than mashed potatoes. The majority also identified popcorn and bran flakes as higher in fiber than potato chips and cornflakes, respectively. Ninety-two percent knew raw apple had more fiber than apple juice.

Changing dietary practices

Respondents indicated a willingness to adopt new strategies to reduce dietary fat and increase dietary fiber to improve health (table 5). Despite good



Jack Kelly Clark

Only 34% of the respondents knew USDA dietary guidelines recommend eating five or more servings of fruits and vegetables daily.

intentions, however, not all reported following these strategies. For example, 93% had indicated they would be willing to trim fat from their meat, 66% said they follow this practice (tables 5 and 6). About 90% said they would remove the skin from poultry, but only 59% reported doing so always or often. Correspondingly, 78% said they would use skim milk, but only 67% reported using this low-fat product.

Meat, fish, and poultry consumption. Many respondents reported using lower fat preparation methods (table 6). More than half said they "always or often" baked or broiled chicken and removed the chicken skin prior to consumption. Almost three-quarters said they usually or often eat fish or chicken instead of red meat and two-thirds trimmed all visible fat from red meat. The per-capita consumption reported in *Agricultural Outlook* confirms that U.S. consumption of red meat has dropped, with beef consumption dropping 12.9 pounds per person and poultry consumption increasing 16 pounds per person from 1985 to 1993.

Most people reported they had reduced, but not eliminated, meat/poultry consumption. Almost 40% said they had never eaten a vegetarian meal or used a meatless tomato sauce. Only about 31% reported having a vegetarian dinner.

Milk and cheese consumption.

Californians were reducing dairy fat consumption by selecting nonfat or low-fat milk, but were not switching to other lower-fat dairy products. Two-thirds said they often drank very low-fat (1%) or nonfat milk (table 6). Low-fat cheeses, however, were used less often. Similarly, respondents rarely substituted yogurt for sour cream when cooking. Only one-third said they often substitute lower-fat, frozen desserts for ice cream.

Fats and oils consumption. Less than half (42%) said they always or often add butter or margarine to vegetables, and only 20% always or often add sour cream, cheese or other sauces

TABLE 6. Californians' diet practices in the last month

In the last month, how often did you ...?	Always or often	Never	No. of responses
 %		
Meat, fish, poultry			
Eat fish or chicken instead of red meat	75	5	198
Trim all visible fat from red meat	66	16	199
Eat baked or broiled chicken	61	11	202
Eat chicken with skin removed	59	17	202
Eat small portions of red meat	55	25	204
Use meatless tomato sauce on spaghetti/noodles	35	38	200
Have a vegetarian dinner	31	39	198
Dairy			
Use very low-fat (1%) or nonfat milk	67	22	200
Eat ice milk, frozen yogurt or sherbet instead of ice cream	36	34	200
Eat special, low-fat, diet cheeses	29	44	200
Use yogurt instead of sour cream	28	58	201
Use of added fats			
Use low-calorie instead of regular salad dressing	44	30	202
Use diet, low-calorie mayonnaise instead of regular mayonnaise	43	43	201
Use Pam or other nonstick spray when cooking	42	34	204
Put butter or margarine on cooked vegetables	42	31	202
Eat breads, rolls, or muffins without butter or margarine	40	34	203
Eat green salad with low-calorie, diet dressing	39	31	199
Eat broiled or baked potatoes without butter	25	50	204
Eat only fruit for dessert	28	32	198
Put sour cream, cheese, or other sauces on vegetables and potatoes	21	45	202
Eat green salad without dressing	14	68	202
Fruits, vegetables, and high fiber foods			
Eat broiled or baked potatoes with the skin	69	12	201
Eat breads, rolls, or muffins made from whole grains (whole wheat, rye)	64	13	202
Eat cereal for breakfast	61	16	198
Eat raw fruits for snacks	53	11	199
Eat fruit for breakfast	46	25	199
Eat at least two vegetables (not green salad) at dinner	44	15	204
Eat beans, peas, or lentils as a vegetable or main course	35	29	201
Snack on raw vegetables instead of potato, corn, taco chips	34	31	203
Eat a vegetable (not green salad) at lunch	30	32	199
Eat raw vegetables for snacks	30	36	201



To improve their health and weight, the majority of people indicated they had changed their eating habits, including reducing the amount of fat in their diets. However, 54% said food likes and dislikes played an important role in what they ate.

(table 6). Forty percent always or often ate bread products without butter. About two-thirds (68%) said they rarely eat a green salad without dressing; however, almost half always or often use a low-calorie dressing, low-calorie mayonnaise, or nonstick spray when cooking.

Despite these statements, per-capita consumption reported in *Agricultural Outlook* showed no significant changes in total consumption of butter/margarine, shortening or salad/cooking oils.

Fruits, vegetables and salad consumption. Two-thirds of respondents said they were eating more fruits and vegetables than in the past (table 2), but less than half ate two vegetables at dinner (excluding a salad), and less than one-third ate vegetables at lunch (excluding lettuce). One-fourth said they rarely ate fruit with breakfast and one-third said they rarely ate raw vegetables as a snack. Raw fruits were more popular, eaten as snacks by about half of respondents.

While respondents reported consuming more fruits and vegetables, nationwide per-capita consumption data show an insignificant increase. Vegetable consumption has increased by less than one pound per year per person and fruit consumption also

dropped from 1989 to 1991. This suggests Californians may be responding with the “right” answer rather than the answer reflecting actual behavior.

Whole-grain bread products were eaten by almost two-thirds of respondents (table 6). Similarly, almost two-thirds said they often ate cereal for breakfast, and ate potatoes with the skins. Most said they rarely served beans, peas, and lentils as a main course.

Exercise and health

Routine exercise, along with a healthy diet, can reduce the risk of heart disease. More than three-fourth of respondents believe lack of exercise contributes to the development of heart disease, with more than half finding it a very important factor.

Consumer attitudes

Consumer responses do not always reflect scientific fact. For example, about one-third of those surveyed consider exercise important in preventing cancer; however, this relationship has not been supported by scientific studies. Additionally, 16% believe dietary fat is related to bone problems; again, there is no scientific support for this statement.

Survey responses also may reflect the views, but not necessarily the be-

havior, of a more health-conscious population. For example, California respondents report consuming 1% or nonfat milk at a higher rate than sales indicate, suggesting we had a disproportionate number of diet-conscious people among our respondents or they incorrectly estimated their dietary practices.

Our findings demonstrate that a segment of Californians:

- Recognize the important role of diet in health, especially as it relates to heart disease and certain cancers.
- Read labels more frequently.
- Trim fat from meats and skin from poultry.
- Believe they decreased fat and oil consumption.
- Believe they ate more fruits and vegetables.

Results clearly revealed areas for focused health education:

- Consumers recognized the four food groups, but could not identify the daily recommended number of servings. Dietary guidelines should encourage increased consumption of breads/grains and fruits and vegetables.
- People need to be encouraged to eat more produce, both at meals and as a healthy, between-meal snack.
- Consumers were misinformed about fat and cholesterol. Nutritional education should dispel misconceptions about butter and margarine fat levels and encourage consumption of less total fat.
- People should be reminded that lean meat can be part of a healthy diet.
- Californians still underestimate the health benefits of regular exercise. Along with dietary education, the importance of regular exercise must be emphasized.

C.M. Bruhn is Consumer Food Marketing Specialist, Center for Consumer Research, UC Davis; D. Wong is Sensory Technologist, The National Food Laboratory, Dublin; H.G. Schutz is Professor Emeritus, Department of Food Science and Technology, UC Davis.