Position of the American Dietetic Association: Total diet approach to communicating food and nutrition information

ABSTRACT

It is the position of the American Dietetic Association that all foods can fit into a healthful eating style. The ADA strives to communicate healthful eating messages to the public that emphasize the total diet, or overall pattern of food eaten, rather than any one food or meal. If consumed in moderation with appropriate portion size and combined with regular physical activity, all foods can fit into a healthful diet. Public policies that support the total diet approach include Reference Dietary Intakes, Food Guide Pyramid, Dietary Guidelines for Americans, Nutrition Labeling and Healthy People 2010. The value of a food should be determined within the context of the total diet because classifying foods as "good" or "bad" may foster unhealthy eating behaviors. Eating practices are influenced by taste and food preferences, concerns about nutrition and weight control, physiology, lifestyle, environment, and food product safety. To increase the effectiveness of nutrition education in promoting sensible food choices, dietetics professionals plan communications and educational programs that utilize theories and models related to human behavior. Communication campaigns/programs should implement an active, behaviorally focused approach within the larger context of food choices. Nutrition confusion can be reduced by emphasizing moderation, appropriate portion size, balance and adequacy of the total diet over time, the importance of obtaining nutrients from foods, and physical activity.

At least four of every five Americans agree that there is a relationship between diet and health (1,2), and 57% have become more aware of the benefits of a healthy diet in the previous year (3). In addition, over half of shoppers report actively seeking diet and nutrition information in the last month (2), and 41% of Americans feel that they are doing all they can to eat healthfully (4).

Obstacles to healthful eating reported in the recent American Dietetics Association (ADA) Nutrition and You: Trends 2000 (4) were reluctance to give up favorite foods (44%), satisfaction with current diet (39%), lack of time to keep track of diet (38%) and lack of understanding of nutrition guidelines (29%). In addition, 77% of Americans believe that there are "good" and "bad" foods. Perhaps the myth of "good" and "bad" foods is linked to the perception that tasty foods do not fit into a healthful diet. This pessimistic attitude may impede dietary change if Americans are tired of messages from nutrition experts that everything that tastes good is bad for them. Eating is an important source of pleasure in life (5); consequently, attempts by health promoters to change undesirable dietary behavior may be difficult if consumers perceive that they must choose between good taste and nutritional quality.

Nutrition messages from dietetics professionals can be more effective if they focus on a positive image of healthy food choices over time, rather than individual foods to be avoided. This concept is not new. The American Dietetic Association strives to communicate that there are no good or bad foods, only good or bad diets or eating styles (6). No single food or type of food ensures good health, just as no single food or type of food is necessarily detrimental to health.

Research conducted for the Dietary Guidelines Alliance's "It's All about You" campaign suggests that the "good foods/bad foods" myth should not be perpetuated (7). The Alliance is a consortium of government and food industry organizations, including ADA, whose mission is to provide nutrition messages to help achieve healthy, active lifestyles. In order to boost effectiveness, it is recommended that food tips be kept positive, short, and simple and include examples of foods and activities that reflect the lifestyle, preferences, and culture of the audience. The recent Food for Thought III survey (8) reported that the news media are airing more positive messages about food and fewer negative messages. This positive approach empowers consumers to achieve the principles of a healthy diet as part of their overall lifestyle.

Positive messages help avoid the consumer confusion that results when messages from experts appear to be in disagreement, as well as the feelings of guilt that are associated with eating "less healthful foods" (9).

POSITION STATEMENT

It is the position of the American Dietetic Association that all foods can fit in a healthful eating style. The ADA strives to communicate healthful eating messages to the public that emphasize the total diet, or overall pattern of food eaten, rather than any one food or meal. If consumed in moderation with appropriate portion size and combined with regular physical activity, all foods can fit into a healthful diet.

FEDERAL NUTRITION GUIDANCE THAT SUPPORTS THE TOTAL DIET APPROACH

The Dietary Guidelines for Americans and the Food Guide Pyramid take a total diet approach to food guidance which form the basis of federal food, nutrition education, and information programs. From their inception in 1980, the Dietary Guidelines for Americans have recommended moderation for certain dietary components, such as fat and sugar, while continuing to emphasize nutrient adequacy. The Guidelines are reviewed every 5 years by a scientific advisory committee to ensure that they reflect the most current research that is available on diet and health (11). The science-based framework supporting the Food Guide Pyramid, originally developed in the early 1980s, incorporates dietary standards, including the Dietary Guidelines and data on food composition and food consumption practices of Americans. This research framework is updated continually by the USDA to ensure that Federal dietary guidance is based on the most accurate and current scientific data. (12a,12b)

The developers of the Dietary Guidelines for Americans and the Food Guide Pyramid found that consumers and educators tend to prefer dietary guidance that allows consumers to eat in a way that suits their individual tastes and lifestyles (12-14). An illustration would be to balance a high-fat dessert such as rich ice cream with lower fat selections in other food groups to

Table 1
Incorporating French fries and soda within the context of a total diet[a]

Meal	Food item	Unit
Breakfast	Cereal, raisin bran	1 c
	Milk, 1%	½ c
	Orange juice, fresh	¾ c
Snack	Apple	1 large
	Milk, chocolate, 1%	1 c
Lunch	Cheeseburger, fast food:	1 regular
	Lettuce	1 leaf
	Tomato	1 slice
	French fries	1 small
	Ketchup	1 Tbsp
	Soda	12 oz
Dinner	Pasta	1 c
	Meat sauce	½ c
	Meatballs	2
	Parmesan cheese, grated	1 Tbsp
	Broccoli, steamed	½ c
	Roll, whole wheat	1 each
	Salad: Lettuce, romaine	1 c
	Tomato	½ 3" diameter
	Cucumber	¼ c
	Carrot, shredded	¼ c
	Sunflower seeds	1 Tbsp
	Olive oil vinaigrette	2 Tbsp
Dessert	Frozen yogurt, coffee almond fudge	¾ c
	Strawberries, fresh, sliced	½ c
Daily totals		
Total calories (kcal)		2,167
% Energy from protein		15
% Energy from carbohydrate		57
% Energy from fat		28

[a]For a 25-50 year old female.

Table 2
Calculated nutrient profile for sample menu in Table 1 for selected nutrients[a,b]

Nutrient	Amount	%RDI/goal
Total calories (kcal)	2,167	98
Protein (g)	83	128
Carbohydrate (g)	321	109
Total fat (g)	71	98
Saturated (g)	20	100
Monounsaturated (g)	19.7	79
Polyunsaturated (g)	13.6	60
Cholesterol (mg)	144	48
Fiber (g)	32	158
Vitamin A (RE)	2,031	290
Thiamin (mg)	2.0	181
Riboflavin (mg)	2.3	209
Niacin (mg)	23	164
Folate (μg)	508	127
Vitamin B-6 (mg)	1.7	130
Vitamin B-12 (μg)	4.5	188
Vitamin C (mg)	258	431
Vitamin E (mg alpha-TE)	10.9	136
Sodium (mg)	2,778	116
Calcium (mg)	1,190	119
Phosphorus (mg)	1,261	180
Magnesium (mg)	343	107
Iron (mg)	19.4	107
Zinc (mg)	12.2	152

[a]Food Processor 7.3, ESHA, Salem, OR.
[b]For an adult woman, 19-50 yr.

achieve an overall healthful diet (13). Exorbitant amounts of high-fat desserts would not be possible in a healthful diet, but limited quantities could be incorporated if low-fat selections of other foods were consumed in moderation (15). Another example is including French fries, a common fast-food item, within the context of the total diet (Tables 1 and 2).

Caution must be taken, however, to avoid a common misimpression; ie, that the "no bad foods" message gives people license to consume snack foods and desserts in unwarranted quantities (16). This does not invalidate the message that there are no inherently "bad" foods, but rather challenges educators to emphasize that the "all foods can fit" message includes an important concept of overall dietary balance (13).

In developing the Nutrition Facts label, the Food and Drug Administration and its collaborating agency partners chose to implement a consumer information system that focuses on the total diet. The labels are tools that consumers can use to choose, compare and combine foods. Nutrition label education appears to be an effective way of helping consumers make food choices. In 1995, 48% of survey respondents reported that they had changed their minds about buying or using a food product after reading the nutrition label, compared with 30% in 1990 (17).

A greater understanding of the connection between diet and health has led to the new Dietary Reference Intakes (DRI) that focus on the prevention of chronic diseases and optimal health (10). This positive focus was taken rather than "focusing solely on the prevention of nutritional deficiencies." New categories of Estimated Average Requirement (EAR), Adequate Intake (AI) and Tolerable Upper Intake Level (UL) were established to provide estimates of adequate and excessive daily intakes averaged over time, at least one week for most nutrients. This concept of evaluating the adequacy of nutrient intakes over time supports the total diet approach.

In setting health objectives to drive national health policy, the US Department of Health and Human Services developed objectives based on dietary patterns rather than individual foods.

The Healthy People 2000 report recommends that healthy children follow eating patterns that are lower in fat and saturated fat as they begin to eat with the family. Specific emphasis is given on averaging nutrient intake over several days, rather than a single meal or a single food (18). This approach is continuing with the development of Healthy People 2010, which includes promotion of healthful behaviors, protection of health, assurance of access to quality health care, and strengthening of community prevention (19).

SUCCESSFUL COMMUNICATION CAMPAIGNS AND PROGRAMS

Teaching consumers to make wise food choices in the context of the total diet is not a simple process. A continuum of nutrition information, communication, promotion and intervention strategies must be integrated in order to design the most appropriate educational intervention. In addition, successful campaigns often include the coordinated efforts of a number of agencies and organizations with similar health-promotion goals (20,21).

A review of nutrition education literature was conducted for

the US Department of Agriculture in 1995 to identify successful elements across various types of interventions. The study reported that to be effective, programs should address specific behaviors and eating patterns and that educators should implement active, behaviorally focused approaches that include the larger context of food choices whenever possible (22).

Social Marketing

"Social marketing" is a behaviorally focused process that adapts commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the behavior of target audiences to improve their well-being. Social marketers work to create and maintain exchanges of target audience resources, such as money or time, for perceived benefits such as feeling better or having more independence. Just as educators may utilize a range of theoretical concepts to design effective interventions, marketing campaigns may also be more effective when important determinants of behavior are identified and utilized in a media campaign (23). Examples of such campaigns are "5-A-Day for Better Health" and "It's All About You."

The 5-A-Day for Better Health campaign was one of the first major health campaigns to follow the principles of social marketing theory. Using data from a variety of research interviews and surveys, designers of this campaign studied the preferences and habits of various audience segments and developed messages that would be perceived as relevant, comprehensible, and actionable by people in those subgroups. By adapting messages and distribution techniques to the needs of consumers in a variety of settings such as supermarkets, restaurants, and the Internet, this campaign has made progress toward the goal of increasing Americans' consumption of fruits and vegetables (24).

In the Dietary Guidelines Alliance's "It's All About You" campaign, educators were urged to customize information to the needs, likes and dislikes of the particular audience for maximum impact (7). The more focused and individualized the messages are, the more likely it is that consumers will act on them (25).

Social marketing is an important and powerful tool for communicating relatively simple messages such as "eat five servings of fruits and vegetables a day." However, unless the message is consistent with a total diet emphasis, the application of a strict marketing approach that focuses exclusively on specific behavioral outcomes may inadvertently lead to use of oversimplified messages such as good/bad food advice that may conflict with more comprehensive educational goals (26).

PSYCHOSOCIAL CONSEQUENCES OF "GOOD" AND "BAD"

Categorizing foods as "good" or "bad" promotes dichotomous thinking. Dichotomous thinkers make judgments in terms of black/white, all/none or good/bad and do not incorporate abstract or complex options into their decision strategies.

The Magic Bullet Approach

Thinking in terms of dichotomous (black-and-white) categories is common in childhood. Almost all elementary-age school children believe that there are "good" and/or "bad" foods (27,28). Although the ability to think in more abstract and complex modes is better developed in adolescents and adults, consumers of all ages tend to rely on dichotomous thinking in certain situations (29).

An example of dichotomous thinking is the "quick fix" or "magic bullet" approach to weight control. As long as one stays on the diet (target behavior) the person feels a sense of perceived control (self-efficacy). However, when an individual encounters a high risk situation such as a tempting food (eg, ice cream), loss of control may occur, depending on the emotional state, interpersonal conflict and social pressure (30).

In this approach to food choice, ice cream would be regarded as a forbidden food and a dieter who yields to a desire for a few spoonfuls of ice cream would tend to say, "I ate the ice cream. I have blown my diet. I am going to finish the carton." This type of thinking has been associated with addictive or compulsive behaviors. Once a mistake is made (such as breaking abstinence for alcoholics or eating a large bowl of ice cream for bingers), the tendency is to abandon oneself to one's weaknesses and indulge in the forbidden behavior. This pessimistic approach becomes self-fulfilling, as the subject believes that there is not much that can be done once a loss of control occurs (31). Not every relapse is believed to occur in this manner but intense negative feelings when the loss of control happens increase the likelihood of such an event reoccurring (32). A dietetics professional might reduce the probability of relapse by increasing awareness of nutrition (knowledge), teaching coping skills (alternative behaviors), incorporating personal favorites in individualized eating patterns, and promoting acceptance of personal responsibility and choice ("I can refuse to eat it.").

When dichotomous thinking is taken to the extreme, it can become an underlying force for disordered eating behaviors such as chronic restriction (anorexia), bingeing, or purging. When these eating behaviors are severe, the concept of moderation tends to be ignored. Part of the therapy for these conditions is to expand the range of acceptable food items (33), with the ultimate goal of learning that foods cannot be classified as good or bad.

This poses a challenge for educators. The option of providing simple, one-size-fits-all decision rules may mislead consumers into thinking that one type of food is always a positive addition to the diet, which reinforces the notion that all foods that taste good are bad for you. The alternative of offering more comprehensive and targeted education involves context-based judgment. This type of educational message is more difficult to address in language that is easy to understand and apply, but it is more likely to help the consumer to make well-reasoned food choices and adopt behavior patterns that are sustainable over time.

All-Good or All-Bad Foods?

Milk, egg whites, tomatoes and soybeans are foods associated with healthful diets that can be used to illustrate the problems in perceiving a food/food component as all good or all bad. Milk is considered to be an excellent food, as it contributes calcium, high quality protein, and B vitamins to the diet. However, when young children rely too heavily on milk as a source of calories to the exclusion of other nutritious foods, iron deficiency anemia may result. For example, infants consuming nonfortified formula or whole cow's milk have a 30-40% risk of iron deficiency by 9-12 months of age compared to 20% in infants who are exclusively breastfed (34). Thus, even low-fat milk cannot be classified as either "good" or "bad," but rather its value is determined within the context of the total diet.

Egg white is a high quality protein, yet low in zinc and, when used in research studies as a primary source of protein in the

diet, it can induce a zinc-deficiency (35). Tomatoes are a source of lycopene and other phytochemicals with antioxidant properties, but also an alkaloid that can be toxic to humans in high doses (36). Similarly, soybeans have n-3 fatty acids, flavonoids, and phytoestrogens with health-promoting properties, but they also contain trypsin and protease inhibitors that may interfere with digestion, as well as phytates that may interfere with absorption of zinc and iron. While these components are not a problem with cooked soybeans consumed in moderation, very large intakes of raw soybeans may be harmful (36).

Even when a well-accepted system such as nutrient density is the basis for good/bad categorization systems, the results can be arbitrary and misleading. Nutrient density gives a relatively simple indication of the amount of a nutrient or nutrients (vitamins, minerals, protein and/or fiber) provided by an individual food in relation to its concentration of energy (kilocalories). When this concept is stretched to a simpler system of classification wherein foods are determined to be good or bad, these distinctions tend to become ambiguous. For example, plain potatoes are good sources of vitamin C and potassium, and would usually be considered a "good" food because of their high nutrient density. However, French fries and potato chips are higher in fat and sodium, so these are more likely to be classified as "bad" (37). When an individual adds salt, butter, margarine, sour cream, and/or bacon bits to a baked potato, the nutrient profile more closely resembles that of French fries. It would be nearly impossible to specify a point at which the potato would have been changed from good to bad. With over 40,000 food items in the average supermarket (38) and an infinite array of recipe combinations, the futility of attempting to sort all food items into two categories becomes evident. Thus, the total diet approach, with its emphasis on long-term eating habits and a contextual approach to food judgments, provides more useful information to guide long-term eating patterns.

CONTROVERSIES WITH THE TOTAL DIET APPROACH

One concern with the total diet approach is that it may be viewed by dietetics professionals as permitting the food industry an unlimited license to add fast foods and soft drinks to school meal, hospital, and other food service programs. In addition, there may be concern that the lack of limits for individuals may encourage overconsumption of foods that may have marginal nutritional value. In a study utilizing the Diet Quality Index (DQI) as a measure of healthful diet quality, heavy consumption of savory, high-fat snacks was associated with higher DQI scores (poor diet quality) (39). Similarly, consumption of fats, sweets, and alcohol was inversely related to nutritional adequacy of diets in the Second National Health and Nutrition Examination Survey (40).

Consequently, dietetics professionals must emphasize the need to select appropriate portion sizes. Nutrition education is critical because few consumers intuitively know that 3 oz of beef is considered an appropriate portion size. Choosing sensible portion size is a basic tenet of the new 2000 Dietary Guidelines for Americans (41). If one thought that a restaurant portion of broiled beef rib steak (8 oz) was the most appropriate portion size the caloric content would be far higher (500 kcal) rather than the 188 kcal from the Food Guide Pyramid's recommended 3 oz portion. Therefore, it is imperative that the message of appropriate portion sizes be incorporated into the total diet approach.

Another controversy with the total diet approach is the emphasis on variety. Choosing a variety of foods was a cornerstone principle in the past editions of the Dietary Guidelines for Americans. It has been believed that a variety of foods is needed for optimal nutrition because there are more than 50 nutrients needed for growth, repair and maintenance of good health and there is no one food or even one food group that contains all these nutrients.

A problem with variety, however, may be that a diversity of foods tends to increase our desire to eat and may even lead to overeating. When McCrory and colleagues (42) analyzed 1999 food consumption data, increases in energy intakes and body fatness were associated with ingestion of a high variety of sweets, snacks, condiments, entrees and carbohydrate foods, coupled with a small variety of vegetables. Another review of food consumption data by Krebs-Smith and colleagues (43) observed that a variety of foods was associated with nutrient adequacy up to a certain point, beyond which there was no improvement. Coulston (44) has suggested that escalating energy intakes from dietary variety may be one of the factors contributing to the spread of obesity in this country (45). In contrast, Drewnowski and colleagues found that a low level of dietary diversity was associated with low energy intakes and lower dietary quality scores (46). Thus, confusion exists as to whether dietitians should promote a variety of foods.

To address these concerns, the 2000 (5th) edition of the Dietary Guidelines for Americans states that there are many healthful eating patterns that allow maximum flexibility in food choices. In addition, the wording of the major headings has been modified from previous editions to replace the broader "Eat a variety of foods" recommendation with more specific advice to "Let the Pyramid guide your food choices." The current Dietary Guidelines for Americans also places greater emphasis on appropriate serving sizes and specifies the need for variety in one's choices of fruits, vegetables and grains. These changes are meant to obviate the mistaken impression that large quantities of high-fat and high-calorie foods become more acceptable when one eats many different kinds of these foods (41,47).

WHY WE EAT WHAT WE DO

Americans have made a number of positive dietary changes in the past 20 years (48). For example, consumption of fruits, vegetables and grains has generally increased. However, many Americans still fail to include adequate servings of fruits, dark green leafy vegetables, deep yellow vegetables, dry beans and other legumes, and dairy products. At the same time, added sugars, fats and oils contribute more than their share of calories to the American diet.

Research studies on why Americans eat what they do suggest the need for a total diet approach. What we eat is influenced by the diversity of individual tastes and food preferences, concerns about nutrition and weight control, physiology, lifestyle influences on food selection, environment, and perceptions of food product safety. The reader is referred to an excellent text for more detailed information (49).

Taste and Food Preferences

Taste is generally the most important factor influencing food choice. Taste responses are affected initially by genetic, physiological and metabolic variables; taste preferences are modified by experiences related to one's gender, age, obesity, and eating behaviors (50). For example, taste preference for sweet-

ness is inborn. This preference for sweetness, in conjunction with familiarity, is the most significant determinant of food choices in young children (51). Preferences for fat are learned in infancy or early childhood, largely through experience that fat is associated with a greater reduction in hunger (52). Since young children (53) and even rats (54) can learn to prefer high-energy foods, the avoidance of these foods may be foiled by feelings of deprivation because of a well-established desire to eat sweet and high-calorie foods.

Nutrition and Weight Control

Nutrition is a major predictor of food choices even though it is less of a personal concern for most consumers than taste, convenience and cost. A high level of nutrition information is positively associated with overall diet quality, as indicated by the US Department of Agriculture's Healthy Eating Index (55).

Interest in nutrition is particularly germane for older individuals, women and African-Americans (56). Food choices are also significantly influenced by concerns over weight control. One common consequence of dieting to control weight is a preoccupation with food and eating (57). In the context of self-improvement, the dieter may restrict foods considered to be "bad." Those with a high level of inflexible cognitive restraint may restrict foods to the point of developing eating disorders such as bingeing as a compensation for the prior deprivation (58).

The demand for nutritious foods has stimulated the food industry to develop a variety of functional foods, those that provide potential health benefits beyond basic nutrition (59). It is predicted that consumer demand for these foods will influence food patterns and continue to grow as the population ages and develops more self-efficacy and autonomy in health care (60). Concern has been raised that increasing abundance of functional foods may contribute to increased energy intakes if individuals tend to think it is acceptable to eat larger quantities of foods that are "good" for them (61).

Physiological Influences

Digestive decline, poor dental health, swallowing difficulties, bone demineralization, dementia and/or diminished basal metabolism affect food choices of many individuals, especially older adults. Disease states and treatments, such as dialysis for chronic renal failure (62) and chemotherapy for cancer (63), also change food habits. For example, patients with renal failure tend to dislike sweet foods, vegetables, and red meats while protein foods (eggs, cheese, meat) often become unpleasant for patients undergoing treatment for cancer. More recently, the profound significance of gene mutations on obesity and feeding behaviors has been discovered (64). Due to the great influence of pathophysiologies on food choices and nutrient needs, it important to stress that the total diet approach is designed for the general, healthy population, rather than those individuals with chronic diseases.

Lifestyle Influences

Time One of the most significant influences affecting food choices is the lack of time in the rapidly changing lifestyle of people in the United States and other Western societies. In the 2000 American Dietetic Association Trends Survey, 38% indicated that "It takes too much time to keep track of my diet" as a major reason for doing the same or less than 2 years ago (4). This is even higher than the 1995 American Dietetic Association Trends Survey in which 21% cited time restraints as an obstacle to change (65).

In a 1997 study of 14,331 subjects in the European Union, lack of time (irregular working hours, busy lifestyle) was the most frequently cited barrier to healthy eating (66). Similarly, a 1998 report of data from over 2,000 American adults showed that time was the primary influence on diet (more than concerns for health, family influence, and personal likes/skills) for 17% of respondents (67).

With 60% of American women trying to juggle work with families and a desire to spend less than 15 minutes to prepare a meal (3), there has been a virtual explosion of convenience foods, take-out, value-added (precut, prewashed) and ready-made foods. Instead of "Mom in the kitchen preparing chicken with a broccoli/rice casserole and homemade bran muffins," either parent is now more likely to be transferring take-out fried or rotisserie chicken onto a platter to be served with delicatessen salads and bakery breads.

Culture Cultural food practices not only affect taste preferences, but also shopping habits, manners, communication, and personal interactions. Today one in four Americans has African, Asian, Hispanic or American-Indian ancestry (68). As people from varying backgrounds become acculturated into US society, their dietary habits tend to change from a pattern based on whole grains and vegetables to foods that are higher in fats and sugars (50). Sensitivity to what might be considered "good" or "bad" by persons from varying cultures is critical for dietetics professionals who have the complex job of tailoring advice to each individual within a cultural context. For example, advice by a dietitian to stop using lard may be perceived as unrealistic by many Mexican-Americans because of the prevalence of its use in traditional recipes (68).

Economics Food prices are of declining importance in their effect on food choice behaviors for many Americans. In 1993, 53% of Americans felt that economic factors were the most important issue facing this country; by 1999, only 12% held this belief (3). Along with cost factors, individuals with lower incomes rate convenience as more important factors affecting food choices than do those with higher incomes (56), reflecting limitations in such related factors as transportation, cooking facilities and food preparation skills.

Environmental Factors

Attitudes and beliefs Attitudes and beliefs about foods tend to reflect cultural values, but they do change over time (52). For example, perceptions, attitudes, and beliefs about fat have shifted in the last half of this century, much of it due to social trends and marketing campaigns by agencies and organizations such as the American Heart Association, American Cancer Society, and the National Cholesterol Education Program. The typical "meat and potatoes" plates have been replaced by a combination of cuisines and preparation techniques (69). An illustration is a 1950s restaurant meal of beef steak, fried onion rings, lettuce wedge with Thousand Island dressing and potatoes with butter, cheese and sour cream. Today, a restaurant meal might be a chicken breast with a chipotle sauce, Spanish rice, and broccoli with lemon-butter sauce.

Societal influences Societal influences on eating behavior can also be very important. For example, the presence of another person while eating as been reported to increase the quantity of a meal by 44%; the size of the meal further increases

as more people are present (70). In a study of why cardiac patients do not follow nutritional advice, eating in the company of others was the most commonly cited reason for noncompliance (71). The same study reported that the second most prevalent reason was the limited availability of appropriate food during work hours.

Media The media is a powerful force influencing the food choices of Americans. In 1997 approximately $11 billion was spent for food advertising in magazines, newspapers, television, and radio (72). When Kellogg's high fiber cereals first added health claims about cancer prevention and dietary fiber to their package label, sales escalated 47% within the first 6 months (73). Trade association programs have promoted generic advertising, such as the one for fluid milk ("Got Milk?"). In the fluid milk campaign, one of the promotions featured celebrities wearing milk mustaches. Analysis of sales data shows that these campaigns slowed or stopped the declining trend of milk consumption and that 47 pounds of milk were purchased for each advertising dollar spent on these campaigns (74). Thus consumers can change their perceptions of foods and food choices when given repeated and positive nutrition messages.

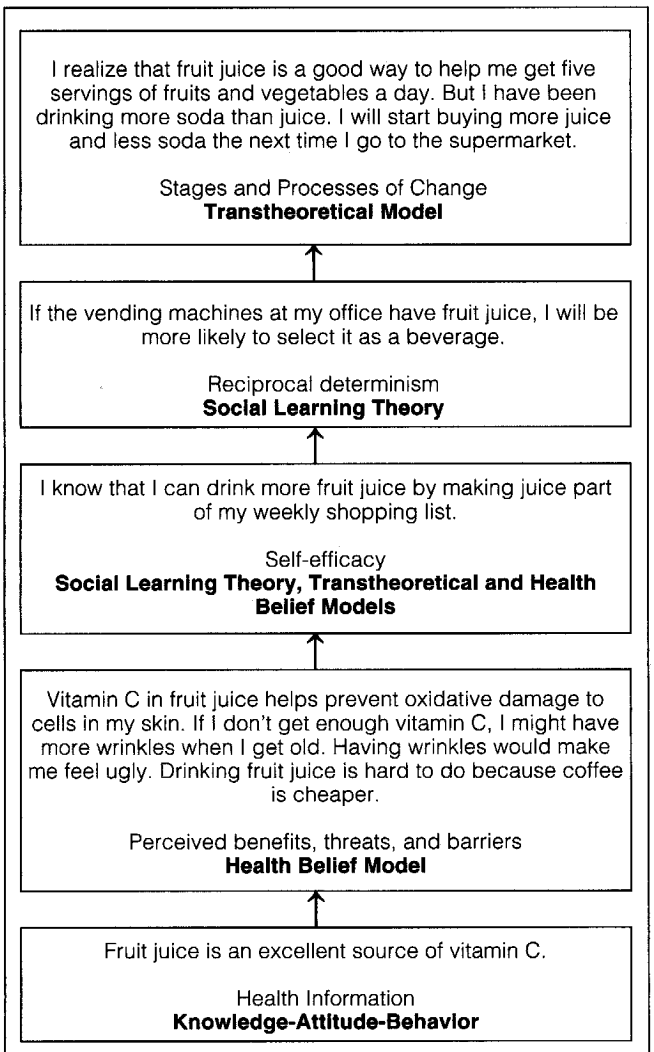

FIG: An example of how behavioral models can be used to provide positive nutrition messages for increasing consumption of fruit juice. Each level adds important concepts to factors addressed by models on the levels below it.

Product Safety

Concerns about product safety also affect food choices. It is important to acknowledge that unsafe foods are never "good" food choices. Emphasis should be placed on proactive, positive messages that consumers can implement. For example, the 1988 scare of alar in apples resulted in near hysteria among mothers who thought they had fed their children tainted foods. Apple sales plummeted as a result. However, when consumers realized that the risks were insignificant they returned to eating apples as in the past (75). Positive messages about the benefits of diets with plenty of fruits and vegetables help to counteract unjustified fear-inducing campaigns.

COMPLEXITIES OF CHANGING EATING BEHAVIORS

To avoid the pitfalls of classifying foods into good/desirable or bad/avoid categories, dietetics professionals plan communications and educational programs that emphasize the importance of considering a food or meal in terms of its contributions to the total diet. This type of communication can be more effective when educators utilize appropriate theories and models that explain interrelationships among knowledge and other factors related to human behavior (20). Good/bad food communications are often based on the knowledge-attitude-behavior model. Although this model can be effective in some situations, communications designed to build skills or help learners master more complex concepts may benefit from the inclusion of principles from more comprehensive health-behavior theories and models, as outlined in the Figure at left.

The knowledge-attitude-behavior approach is not so much a theory-based model, but a set of basic concepts that appear to be based on the often-mistaken assumption that the person who is exposed to new information will attend to it, gain new knowledge, experience a change in attitude, and improve his/her dietary patterns accordingly (76). This approach can be effective in some situations when knowledge is highly motivational and easy-to-follow. For example, a list of foods that are good sources of iron may be a successful trigger to dietary improvement for a person who is concerned over a recent diagnosis of anemia. However, without such a "teachable moment," numerous studies have shown that increased knowledge, such as a memorized list of high-iron foods, often fails to result in changed behavior. Thus, giving out more information about the oversimplified differences between simple/bad sugars and complex/good carbohydrates is not likely to be effective if the learner is not perceiving an immediate need for these "facts," especially if following this advice is not convenient or congruent with personal taste preferences.

Explaining the need to modify recipes to reduce or modify the type of fat to reduce heart disease risk and promoting foods high in folate to reduce the risk of certain birth defects are examples of educational interventions based on the Health Belief Model (HBM), one of the most widely used theories in health education (77,78). The HBM explains human behavior and readiness to act in terms of four main constructs: perceived susceptibility ("How likely am I to get heart disease and how soon?"); perceived severity ("How bad would it be to have

heart disease?"); perceived benefits ("Will I feel better if I change the fats that I eat?"); and perceived barriers ("How hard will it be to make these changes in my fat intake?"). A recent addition to the HBM is the concept of self-efficacy ("How confident am I that I can succeed in changing the fats that I eat?"). The HBM has been found to be useful in some interventions when the target audience perceives a problem behavior or condition in terms of health motivation, but many consumers may tend to "tune out" repeated messages of gloom and doom for habits that seem common and without immediate negative consequences.

When problem behaviors are closely tied to social or economic motivations, more comprehensive theories and models such as the Social Learning Theory and the Stage of Change/Transtheoretical Model may be effective tools for planning nutrition interventions (79). For instance, if an educator needs to promote milk-based foods as sources of dietary calcium, Social Learning theory would support an educational intervention addressing behavioral capability (knowledge and skills needed to select and prepare milk-based foods), reciprocal determinism (availability of milk-based foods in vending machines and restaurants), expectations (beliefs about osteoporosis as a consequence of avoiding milk-based foods), self-efficacy (confidence in one's ability to use more milk-based foods), observational learning or modeling (seeing peers and other role models drinking milk), and reinforcement (positive or negative feelings that occur when milk drinking is practiced).

Another behavioral model that has been effective in formulating successful educational interventions is the "transtheoretical model" (80). This model describes learners in terms of their progress through a series of behavioral stages (stages of change) along with other related dimensions such as processes of change, self-efficacy, and decisional balance (pros/cons), that can be taken into account in tailoring educational messages to learners' needs and readiness for various types of information. For example, learners in the precontemplation stage would lack awareness or intent to adopt a behavior such as reducing dietary fat. Educational programs for these learners would put more emphasis on the benefits of making a change, and the more practice-oriented "how-to" tips would be diverted to programs and materials targeting learners in more advanced stages such as action or maintenance (81).

REDUCING NUTRITION CONFUSION

Recognizing that many consumers are overwhelmed by the high volume and apparent inconsistencies of nutrition advice, the following principles are recommended as points to consider in designing nutrition education for the public:

- Promote moderation, appropriate portion size, balance and dietary adequacy as fundamental and interrelated principles that can be used as indicators of whether and how the typical food pattern of a person or group may be improved. Although the definition of "moderation" varies according to individual circumstances, it generally refers to eating a wide selection of foods within and among the major food groups, with a recognition that no one major food group is more or less important than any other food group (82). Moderation should also include appropriate portion size in order to minimize passive overeating (44). "Balance" and its corollary term, proportionality, refer to eating relatively more servings from the larger food groups at the bottom of the Food Guide Pyramid and fewer servings of foods from the smaller food groups at the top of the pyramid. Dietary adequacy can be achieved by including a variety of nutrient-dense foods, such as grains, fruits and vegetables, within the context of the total diet.
- Emphasize total diet over time or food patterns, rather than individual nutrients or individual foods, as key considerations in evaluating and planning one's food choices. Be aware of the social, cultural, economic and emotional meanings that may be attached to some foods and allow for flexibility whenever possible. Understanding these social and cultural aspects of food consumption is essential for planning educational programs to help correct nutritional problems of individuals and population groups (83,84).
- Stress the importance of obtaining nutrients from foods, rather than relying on supplements. Although supplements are recommended when food intake is inadequate to meet specific needs (eg, calcium, vitamin B12 and folic acid for some population groups), it is important to stress that a balanced diet remains the preferred overall source of nutrients. Numerous bioactive compounds in foods such as phytochemicals and ultra trace elements have been identified that have potential health benefits. Yet the precise role, dietary requirements, influence on other nutrients, and toxicity levels of these dietary components are still unclear. Furthermore, foods may contain additional nutritional substances that have not yet been discovered. Thus, appropriate food choices, rather than supplements, should be the foundation for achieving nutritional adequacy (85).
- Acknowledge the contribution of regular physical activity as an essential part of a healthy lifestyle. According to the US Centers for Disease Control and Prevention, more than 60% of American adults are not regularly active and 25% of the adult population are not active at all (86). Health experts now understand that physical activity complements a diet that is nutritionally adequate and consumed in moderation in reducing the risk of premature mortality, coronary heart disease, hypertension, colon cancer, and diabetes mellitus. Healthy People 2010 goals for the nation's health and the Dietary Guidelines for Americans recommend that Americans engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day (11,87).

ROLES OF DIETETICS PROFESSIONALS

Dietetics professionals have an important role in effectively communicating unbiased food and nutrition information to the public. They need to strengthen their status as being among the most valued source of nutrition information, as cited in the ADA Trends 2000 Survey (4).

There are two ways in which dietitians can promote nutrition, health and well-being. The first alternative is to tell the public what they should or should not eat. The second is to "help consumers understand the principles of a healthful diet and empower them to achieve it." Although some members of the ADA have commented on the disadvantages of the second approach, it was chosen because it is more inclusive of cultural differences and personal preferences. In order to achieve this goal, the Board of the ADA approved the objective to focus nutrition messages on total diet, not individual foods (88).

How Dietetics Professionals can Communicate Effectively

In order to communicate effectively, dietetics professionals must continue to:

- provide proactive, positive, and practical messages when-

ever possible;
- promote a wellness perspective and an enjoyable eating pattern as part of an overall healthful lifestyle;
- use successful educational intervention strategies based on models that promote behavioral change;
- tailor messages to meet individual needs; and
- evaluate effectiveness of nutrition programs.

Dietetics professionals need to strengthen skills, continuously update professional competencies, and document the outcomes of their work in order to retain leadership in nutrition communications. Suggested techniques to achieve these goals are: building coalitions with industry, government, academia and organizations; using the full range of new communication technologies, particularly the Internet; taking advantage of opportunities to communicate with professional colleagues and the public, such as giving presentations and writing publications to influence social norms and public policy; acting as role models of active participation in local and professional associations; maintaining state-of-the-art knowledge through continuing education; fostering goodwill by enthusiastic and positive interactions; and having a professional and unbiased approach to promoting healthy eating patterns.

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