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

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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 the total diet or overall pattern of food eaten is the most important focus of a healthful eating style. All foods can fit within this pattern, if consumed in moderation with appropriate portion size and combined with regular physical activity. The American Dietetic Association strives to communicate healthful eating messages to the public that emphasize a balance of foods, rather than any one food or meal.

Public policies that support the total diet approach include the *Dietary Guidelines for Americans*, MyPyramid, the DASH Diet (Dietary Approaches to Stop Hypertension), Dietary Reference Intakes, and nutrition labeling. 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. Alternative approaches may be necessary in some health conditions. Eating practices are dynamic and influenced by many factors, including taste and food preferences, weight concerns, physiology, lifestyle, time challenges, economics, environment, attitudes and beliefs, social/cultural influences, media, food technology, and food product safety. To increase the effectiveness of nutrition education in promoting sensible food choices, food and nutrition professionals should utilize appropriate behavioral theory and evidence-based strategies. A focus on moderation and proportionality in the context of a healthful lifestyle, rather than specific nutrients or foods, can help reduce consumer confusion. Proactive, empowering, and practical

messages that emphasize the total diet approach promote positive lifestyle changes.

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POSITION STATEMENT

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

Over the past 4 decades, Americans have become more conscious of diet and nutrition (1). Although nearly all consumers believe that body weight, diet, and physical activity influence health, diet surveys suggest that their food habits are not always commensurate with knowledge and beliefs (2). Only half describe their diet as healthful, and 14% eat five or more servings of fruits and vegetables per day. One third classify themselves as sedentary and do not engage in physical activity. Even though more than half of consumers say they are making dietary changes to improve their health, approximately two thirds are overweight or obese. It is clear that practical guidance by food and nutrition professionals is needed to promote positive lifestyle changes that are sustainable.

According to the Shopping for Health 2004 study, nearly six in 10 consumers are trying hard to eat healthfully so they can avoid health problems later in life (3). More than

half of food shoppers strongly agree that eating healthfully is a better way to manage illness than medication. Unfortunately, this trend toward increasing awareness has been accompanied by widespread confusion with complaints that nutrition education is focused on what NOT to eat, instead of what TO eat (1). These conflicting messages make it difficult to know what to do.

Eating is an important source of pleasure. As food and nutrition professionals strive to improve the quality of Americans' dietary and lifestyle choices, challenges are exacerbated by the widespread perception that individuals must choose between good taste and nutritional quality. In fact, no single food or type of food ensures good health, just as no single food or type of food is necessarily detrimental to health. Rather, the consistent excess of food, or absence of a type of food over time, may diminish the likelihood of a healthful diet. For example, habitual, excessive consumption of energy-dense foods may promote weight gain and mask possible underconsumption of essential nutrients. Yet small quantities of energy-dense foods on special occasions have no discernible influence on health.

In most situations, nutrition messages are more effective when focused on positive ways to make healthful food choices over time, rather than individual foods to be avoided (4,5). Unfortunately, the current mix of reliable and unreliable information on diet and nutrition from a variety of sources is confusing to the public and elicits negative feelings such as guilt, worry, helplessness, anger, fear, and inaction.

The total diet approach is based on overall eating patterns that have important benefits and health consequences and that provide adequate

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nutrients within calorie needs. This includes the concept that foods are not inherently “good” or “bad.” Over the years, the American Dietetic Association has consistently recommended a balanced variety of nutrient-dense foods eaten in moderation as the foundation of a health-promoting diet (5,6).

FEDERAL NUTRITION GUIDANCE SUPPORTS THE TOTAL DIET APPROACH

The *Dietary Guidelines for Americans* (7), which are the centerpiece of federal food, nutrition education, and information programs, are based on a total diet approach to food guidance. The DASH (Dietary Approaches to Stop Hypertension) Eating Plan from the US Department of Health and Human Services is one of many resources that are available to assist consumers in implementing these recommendations (8-11).

The MyPyramid Food Guidance System is another example of a dietary pattern that uses a total diet approach to ensure nutritional adequacy and healthful food choices. MyPyramid was released in 2005 as an updated graphic to replace the Food Guide Pyramid. The developers of the *Dietary Guidelines for Americans* and MyPyramid found that consumers and educators preferred dietary guidance that enables consumers to eat in a way that suits their individual tastes and lifestyles (8,12,13). The concept of monitoring discretionary calories (solid fats, added sugars, alcohol) was introduced to allow consumers to choose small amounts of less-nutrient-dense foods while meeting nutrient needs within caloric limits (14). For example, consumers can balance a small amount of low-nutrient or high-energy-density food or beverage (eg, fried food, butter/margarine, jelly, alcohol) with nutrient-dense foods (vegetables, whole grains, nonfat milk) to achieve an overall healthful dietary pattern (13). However, the discretionary calorie values can be quite low (150 kcal/day), such that if an individual ate a fried chicken entree, it would be impossible to stay within the recommended limits with the addition of other high-energy foods. Thus, large servings of foods or beverages high in solid fats, added sugars, or alcohol are not compatible with the *Dietary Guidelines*

for Americans, but limited quantities would be acceptable, provided that nutrient-dense foods comprise the bulk of the day’s choices. This message of the total diet approach must be communicated to consumers by food and nutrition professionals.

Nutrition Labels

Nutrition labels are a third tool that consumers can use to choose and compare foods. The Nutrition Facts label was developed by the Food and Drug Administration and its collaborating agency partners as a consumer information system. Food and nutrition professionals have found the label to be an effective educational tool that helps consumers plan their diets. For example, 48% of survey respondents reported that they had changed their minds about buying or using a food product after reading the nutrition label in 1995, as compared with 30% in 1990 (15).

Nutrient Intake Recommendations

The Dietary Reference Intakes (DRIs) are reference values that are used to plan and assess diets for healthy populations. The DRIs replaced the Recommended Dietary Allowances, which had been revised periodically since 1941. The new dietary standards emphasize the prevention of chronic diseases and promotion of optimal health (16). A positive emphasis was implemented, rather than “focusing solely on the prevention of nutritional deficiencies.” In addition to the Recommended Daily Allowances (RDAs), DRI categories include Estimated Average Requirements (EARs), Adequate Intakes (AIs), and Tolerable Upper Intake Levels (ULs). Each type of DRI refers to average daily intake over time—at least 1 week for most nutrients. For macronutrients, recommendations are stated as Acceptable Macronutrient Distribution Ranges (AMDRs). The AMDRs show that there is not just one acceptable value, but rather a broad range within which an individual can make diet choices based on their own preferences, genetic backgrounds, and health status. This concept of adequacy of nutrient intakes over time supports the need to help consumers understand the importance of the total diet approach.

SUCCESSFUL COMMUNICATION CAMPAIGNS AND PROGRAMS

Teaching consumers to make wise food choices in the context of the total diet is not a simple process. Depending on the audience and the situation, a variety of nutrition information, communication, promotion, and education strategies may be needed for an appropriate and effective nutrition intervention. It may be necessary to suggest a change to a more healthful lifestyle in terms of small steps that are achievable in increments, so that these can build to broader successes in improving fitness or dietary quality (17). In addition, successful campaigns often include the coordinated efforts of a number of agencies and organizations with similar health promotion goals (4,17-19).

A growing body of evidence supports the recommendation to design behavior-oriented food and nutrition programs that are targeted to help learners adopt a total diet approach that is sustainable and fits individual preferences. Nutrition education research supports the identification of components that are effective across various types of interventions (17,20).

PSYCHOSOCIAL CONSEQUENCES OF GOOD AND BAD FOOD MESSAGES

Categorizing foods as good or bad promotes dichotomous thinking. Dichotomous thinkers make judgments in terms of either/or, 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 or binary (either/or) categories is common in childhood. Almost all elementary-age and half of middle school children believe that there are good and/or bad foods (21). Although the ability to think in more abstract and complex modes is prevalent among adolescents and adults, consumers of all ages tend to rely on dichotomous thinking in certain situations (22).

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, a cookie), loss of control may occur, depending on the individual's emotional state, interpersonal conflict, and social pressure (23).

In this scenario, a cookie would be regarded as a forbidden food and a dieter who yields to a desire for a cookie would tend to say, "I ate the cookie. I have blown my diet. I might as well finish the rest of the box." 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 (24). A skilled nutrition counselor 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" or "I can occasionally enjoy a small portion"). The option of providing simple, one-size-fits-all decision rules may be an expedient approach to education and counseling, but it often misleads consumers into thinking that a given type of food is always a positive or negative addition to the diet. 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 (17).

All-Good or All-Bad Foods? Problems occur when a food or food component is oversimplified as all good or all bad. The increased risks for cardiovascular disease associated with ingestion of *trans* fat produced during processing of foods might lead to the classification of all *trans* fat as bad. However, a type of *trans* fat that occurs naturally from ruminant animal sources (dairy and meat), conjugated linoleic acid, has far different effects on metabolic function, genetic regulation, and physiological outcomes (25). In contrast to the atherogenic nature of most synthetic forms of *trans* fat, conjugated linoleic acid has been shown to have beneficial effects on cardiovascular disease, diabetes, immune response, energy distribution,

and growth. To avoid this confusion, the Food and Drug Administration has excluded the naturally occurring *trans* fat that is in a conjugated system from its definition of *trans* fat for nutritional labeling (26).

Conversely, even foods associated with a healthful diet such as egg whites and soybeans should not be oversimplified as being perfect. Egg whites are low in cholesterol and high in protein, yet they are also so low in zinc that they can induce a zinc-deficiency when used as a primary or sole source of protein in the diet (27). Similarly, soybeans have n-3 fatty acids, flavonoids, and phytoestrogens with health-promoting properties, but soy also contains phytates that diminish absorption of zinc and iron (28,29) and the health benefits of adding soy to the diet have not been consistently supported by research (30). For example, animal studies in which soy intake was higher than that found in Asian diets found an *increase* in tumor growth (31). Thus, foods such as egg white and soy cannot be classified as completely good or bad, but rather their value is determined within the context of the total diet. Furthermore, lists of good and bad foods were considered one of the "Ten Red Flags of Junk Science" by the Food and Nutrition Science Alliance, a collaboration of seven scientific professional organizations (5).

With over 45,000 food items in the average supermarket (32) and an infinite array of recipe combinations, the futility of attempting to sort all food items into dichotomous categories becomes evident, leading to confusion and frustration. Thus, the total diet approach, with its emphasis on long-term eating habits and a contextual approach to food judgments such as discretionary calories, provides more useful information to guide long-term food choices.

CONTROVERSIES WITH THE TOTAL DIET APPROACH

One concern with the total diet approach is that it may be viewed as permitting unlimited inclusion of low-nutrient-density foods and beverages or encouraging overconsumption of foods with marginal nutritional value. In a study using a Dietary Guidelines index as a measure of healthful diet quality, heavy con-

sumption of savory, high-fat snacks was associated with poor diet quality (33). In addition, three national surveys of the US population have documented that portion sizes and energy intakes have increased substantially over time both inside and outside the household (34). Nutrition education is critical because individuals tend to eat more calories when served large portions of foods, especially energy-dense foods (35). Yet foods low in nutrient density can fit as part of the total diet, if these foods are consumed as discretionary calories in combination with appropriate quantities of other recommended foods (36).

Another controversy with the total diet approach is the emphasis on variety. Choosing a variety of foods has been a cornerstone principle in the *Dietary Guidelines for Americans*, but that emphasis has changed from overall variety to varying choices within the food groups. Choosing a variety of nutrient-dense foods helps to ensure adequate intakes of more than 50 nutrients that are needed for growth, repair, and maintenance of good health. However, an increase in food availability and variety in food choices may be a cause of overeating, especially when applied to energy-dense foods (37). For example, the multitude of choices at a buffet and the temptation to taste each food can result in a greater intake of calories than from a plated or family-style meal. When McCrory and colleagues (38) 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 limited variety of vegetables. Krebs-Smith and colleagues (39) observed that a variety of foods was associated with nutrient adequacy to a point, beyond which there was no improvement. When nutrient needs are satisfied, eating additional foods provides excess calories without added health benefits.

WHY WE EAT WHAT WE DO

Convenience, Cost, and Confusion

Although 87% of consumers reported being very or somewhat concerned about nutrition, widespread improvements in dietary changes have not occurred (2). Shoppers say healthful

foods are not readily accessible at fast-food restaurants or take-out places and the cost is too high. Also, confusion exists over conflicting information about the healthfulness of the wide range of foods that are available (40). Americans have made a number of positive dietary changes in the past 20 years (41), such as increased consumption of fruits, vegetables, and grains. However, many still fail to include adequate servings of fruits, dark green vegetables, orange vegetables, mature beans and other legumes, and low-fat dairy products. At the same time, added sugars and fats contribute substantial calories to the American diet.

Taste and Food Preferences

Taste is generally the most important factor influencing food choice. The six basic taste sensations—sweet, sour, bitter, salty, umami (L-amino acid), and fatty acids—are affected initially by genetics, but these can be modified by physiological and metabolic variables such as feelings of contentment and satiety (42). Taste preferences are further developed by experiences related to one's sex, age, weight, and eating behaviors (43). For example, taste preference for sweetness is in-born. This preference for sweetness, in conjunction with familiarity, is the most significant determinant of food choices in young children (44). Because young children (45) and even rats (46) 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. Consequently, small portions of these foods on special occasions are permissible within the context of the total diet approach.

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, or cost. A high level of nutrition knowledge is positively associated with overall diet quality (47) and a greater weight loss in dieting women (48).

Food choices are significantly influenced by misdirected concerns over weight control (49). One common consequence of many popular weight-

control diets is a preoccupation with food and eating (50). In the context of self-improvement, the dieter may restrict foods or macronutrients considered to be "fattening." Rather than focus on total restriction of particular foods, which can lead to feelings of deprivation (and subsequent recidivism), individuals are encouraged to avoid excessive weight gain by undertaking lifestyle changes that represent a balanced and healthful diet and an exercise pattern that can be maintained throughout life (7,51).

Abundance of Foods with Healthful Properties

The demand for nutritious foods has stimulated the food and agriculture industries to develop a variety of products, including functional foods that provide potential health benefits beyond basic nutrition and new agricultural and biotechnology techniques. Many new biotechnologies have enhanced the quality, safety, nutritional value, and variety of foods available to the consumer (52). 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 (53), such as reduced-fat cookies. As consumer choices continue to expand, food and nutrition professionals need to stay current through continuing education to meet the needs of an ever-changing society.

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 (54) and chemotherapy for cancer (55), also change food habits. For example, patients with renal failure tend to dislike sweet foods, vegetables, and red meats, whereas protein foods (eggs, cheese, meat) often become unpleasant for patients undergoing treatment for cancer. More recently, the profound significance of one's genes on obesity and feeding behaviors is being investigated (56). Because of

the great influence of pathophysiologies on food choices and nutrient needs, it is important to stress that the total diet approach is designed for the general, healthy population, rather than individuals with chronic diseases.

Lifestyle Influences

Time. One of the most significant influences affecting food choices is the lack of time in our rapidly changing lifestyle. In the 2000 American Dietetic Association Trends Survey, 38% indicated that, "It takes too much time to keep track of my diet" (57). This is even higher than the 1995 American Dietetic Association Trends Survey, in which 21% cited time restraints as an obstacle to change (58).

With 60% of American women trying to juggle work with families and a desire to spend less than 15 minutes to prepare a meal (59), there has been a virtual explosion of convenience foods, take-out, value-added (precut, prewashed), and ready-made foods. The traditional role of mothers preparing healthful foods from scratch is being replaced by parents purchasing take-out foods from a variety of vendors.

Culture. Cultural food practices not only affect taste preferences, but also shopping habits, manners, communication, and personal interactions. In 2005, the minority population totaled 98 million, or 33%, of a total of 296 million (60). 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 (43). Sensitivity to what might be considered good or bad by persons from varying cultures is critical for food and nutrition professionals, who have the complex job of tailoring advice to each individual within a cultural context. For example, to improve the diet of Latinos who are prone to diabetes and may overemphasize some traditional foods, a food and nutrition professional could provide guidance on alternate choices such as brown rice and whole-wheat tortillas and encourage portion control (61).

Economics. Food prices vary in their effects on food choice behaviors. In 1993, 53% of Americans thought that

economic factors were the most important issue facing this country; by 1999, only 12% held this belief (59). In individuals with lower incomes, convenience is rated as a more important influence on food choices as compared with those with higher incomes (62), reflecting limitations in transportation, cooking facilities, food preparation skills, grocery store locations, and availability of healthful food choices (63,64). However, financial issues were associated with limited compliance with dietary guidelines in a recent study of low-income women (65).

Environmental Factors

Attitudes and Beliefs. Attitudes and beliefs about foods tend to reflect cultural values, but they change more quickly with time (66). For example, perceptions, attitudes, and beliefs about fat have shifted in the last half of this century, much of it because of social trends and marketing campaigns. Also, the typical “meat and potatoes” plates have been replaced by varying cuisines and preparation techniques (67). An illustration is a 1950s restaurant meal of beef steak, fried onion rings, lettuce wedge with Thousand Island dressing, and baked potatoes with butter, cheese, and sour cream. Today, meals might be lower in fat and reflect changing tastes, such as pasta with chicken, sun-dried tomatoes, and roasted vegetables, accompanied by a salad of mixed field greens, dried cranberries, and balsamic dressing.

Social Influences. Social factors substantially influence eating behaviors. For example, the presence of a friend (but not a stranger) while eating increases energy intake by 18%. This study suggested that social facilitation of eating is caused by an impaired ability to self-monitor (68). In a study of why cardiac patients do not follow nutritional advice, 86% reported that social and work situations presented challenges, in addition to financial barriers to change and difficulty with restraint when facing large amounts of food (69).

Media. The media is a powerful force influencing the food choices of Americans. In 2004 approximately \$11 billion was spent for food, beverage, and restaurant advertising in magazines, newspapers, television, and radio (70).

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 (71). Trade association programs have promoted generic advertising, such as the one for fluid milk (“Got Milk?”), which featured celebrities wearing milk mustaches. Remarkably, these campaigns slowed or stopped the declining trend of milk consumption and 47 lb of milk were purchased for each advertising dollar spent (72). Thus, consumers can change their perceptions of foods and food choices when given repeated and positive nutrition messages.

Product Safety. Concerns about product safety can affect food choices profoundly. For example, the 1988 scare of Alar (Chemtura Corporation, Middlebury, CT) in apples resulted in near hysteria among mothers who thought they had fed their children tainted foods. Apple sales plummeted as a result, even though the research behind the scare was controversial. When Alar (a plant growth regulator) was removed from use in some states and the perceived risk of cancer minimized, consumers returned to eating apples as in the past (73). Although it is essential to acknowledge that truly unsafe foods are never good food choices, in this case, positive messages about the benefits of diets with plenty of fruits and vegetables help restore balance in diet and health goals.

COMPLEXITIES OF CHANGING EATING BEHAVIORS

The impact of nutrition information on promoting healthful lifestyles depends on how effectively nutrition messages are communicated to consumers. Nutrition information must be presented with sufficient context to provide consumers with a broader understanding of the issues and to determine whether it applies to their unique needs (4). Communications and educational programs must 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 use appropriate theories and models of factors related to human behavior (18). Although providing information can be effective in

promoting healthful behaviors, communications designed to build skills or help learners master more complex concepts usually benefit from the inclusion of principles from health-behavior theories and models (Figure).

Adapting Behavior-Oriented Theories for Food and Nutrition Communication

Knowledge-Attitude-Beliefs. One of the simplest models for food and nutrition communication is the Knowledge-Attitude-Beliefs approach, which is based on the often-mistaken assumption that the person who is exposed to new information will attend to it, gain new knowledge, change attitude, and improve dietary patterns (20). This approach can be effective if the individual is already motivated and the new information is easy to follow. For example, a list of foods that are high in iron may be a successful trigger to dietary improvement for someone concerned over a recent diagnosis of anemia. However, without such a “teachable moment,” increased knowledge, such as a memorized list of high-iron foods, often fails to result in changed behavior. This is true especially if following the advice is not convenient or congruent with personal taste preferences.

Health-Belief Model. The Health-Belief Model is one of the most widely used theories in health education (74). An example is the promotion of foods high in folate to reduce the risk of certain birth defects. This model explains human behavior and readiness to act via four main constructs: perceived susceptibility (“How likely am I to get heart disease and how soon?”), severity (“How bad would it be to have heart disease?”), benefits (“Will I feel better if I change the fats that I eat?”), and barriers (“How hard will it be to make these changes in my fat intake?”). A recent addition to the Health-Belief Model is the concept of self-efficacy (“How confident am I that I can succeed in changing the fats that I eat?”). The Health-Belief Model is useful when the target audience perceives a problem behavior or condition in terms of health motivation. Yet many consumers “tune out” repeated messages of gloom and doom for habits that seem common and without immediate negative consequences.

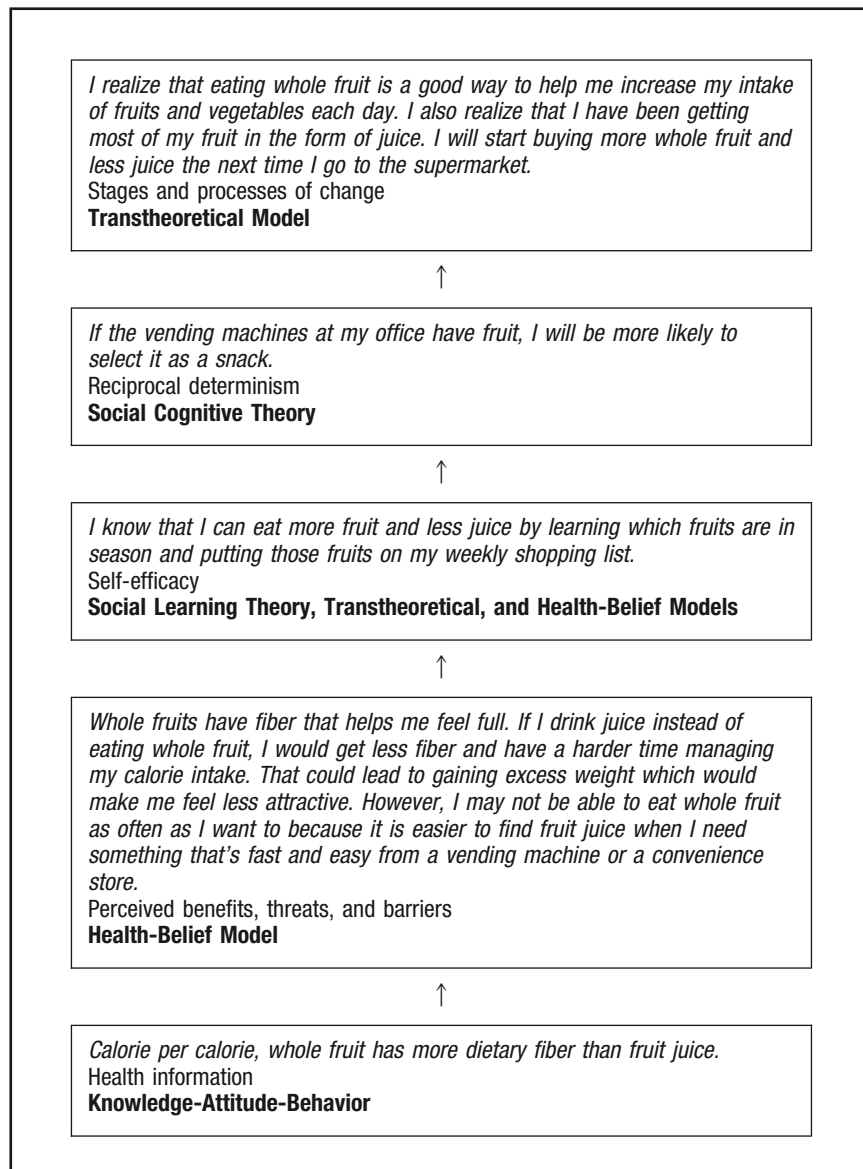


Figure. Example of how behavioral models can be used to provide positive nutrition messages for increasing consumption of fruit (eg, eating whole fruit more often than juice). Each level adds important concepts to factors addressed by models on the levels below it.

Social Cognitive Theory/Transtheoretical Theory. When problem behaviors are closely tied to social or economic motivations, more comprehensive theories and models may be effective tools for planning nutrition interventions (75). For instance, if an educator needs to promote milk-based foods as sources of dietary calcium, Social Cognitive (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).

The Transtheoretical Model/Stage of Change (76) describes learners in

terms of their progress through a series of behavioral stages (stages of change). It also includes related dimensions such as processes of change, self-efficacy, and decisional balance (pros/cons) and allows educators to tailor educational messages to learners' needs and readiness for behavioral change.

Social Marketing. Social marketing is a behaviorally focused process that adapts commercial marketing techniques to 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 use a range of theoretical concepts to design effective interventions, marketing campaigns also may be more effective when important determinants of behavior are identified and used in a media campaign (77).

The Fruits and Veggies: More Matters campaign and its predecessor, the 5-A-Day for Better Health campaign, are examples that adapt marketing theory to food and nutrition communication (78). Designers of these campaigns studied the preferences and habits of various audience segments; developed messages that would be perceived as relevant, comprehensible, and actionable; and then distributed these to consumers in settings such as supermarkets, restaurants, and the Internet (79). The effectiveness of these campaigns in increasing Americans' consumption of fruits and vegetables is well known.

Regardless of the theoretical basis of communications, messages must be consistent with an emphasis on a total dietary pattern that is balanced and moderate, and guard against inadvertent use of oversimplified messages such as good/bad foods. Otherwise, communicators may not be effective in achieving their educational goals (80).

The Socio-Ecological Dimension

In addition to programs that target behavioral practices and dietary knowledge/skills of individuals and families, it is often appropriate to promote behavioral changes and dietary

improvements at the broader organizational or societal levels. A socio-ecological model has been developed to guide programs that facilitate choices of targeted systems, environment, and public policy change within organizations at the community and state levels (81).

REDUCING NUTRITION CONFUSION

To reduce confusion from the high volume and apparent inconsistencies of nutrition advice, the following should be considered when designing nutrition education for the public:

- Promote *variety, proportionality, moderation, and gradual improvement*. Variety refers to an eating pattern that includes foods from all MyPyramid food groups and subgroups. Proportionality, or balance, means eating more of some foods (fruits, vegetables, whole grains, fat-free or low-fat milk products), and less of others (foods high in saturated or *trans* fats, added sugars, cholesterol, salt, and alcohol). Moderation may be accomplished through advice to consumers to limit overall portion size and to choose foods that will limit intake of saturated or *trans* fats, added sugars, cholesterol, salt, and alcohol. To make gradual improvement, individuals can take small steps to improve their diet and lifestyle each day (16).
- Emphasize *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. Understand that social and cultural aspects of food consumption are essential for planning educational programs to help correct nutritional problems of individuals and population groups (82).
- Acknowledge the importance of *obtaining nutrients from foods*, rather than relying on nutrients from supplements or fortified foods. Although nutrient modifications are recommended when food intake is inadequate to meet specific needs (eg, iron, folic acid, vitamins B-12 and D for some population groups),

it is important to stress that a diet based on a wide variety of foods remains the preferred overall source of nutrients (83). 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 (7).

- Stress that *physical activity* complements the total diet approach because it permits individuals to help manage weight and lowers the risk of premature diseases. The minimum amount recommended for health benefits by MyPyramid and the *Dietary Guidelines for Americans* is 30 minutes, preferably each day. To avoid weight gain, 60 minutes per day may be necessary, and this may increase up to 90 minutes to maintain weight loss.

ROLE OF FOOD AND NUTRITION PROFESSIONALS

Food and nutrition professionals have a responsibility to communicate unbiased food and nutrition information that is culturally sensitive, scientifically accurate, medically appropriate, and feasible for the target audience. Some health and nutrition experts and many "pseudo-experts" promote specific foods or types of food to choose or avoid in order to improve health. A more responsible and effective approach is to help consumers understand and apply the principles of healthful diet and lifestyle choices. Unless there are extenuating circumstances (eg, individuals with severe cognitive or physical limitations such as dementia or renal failure), the total diet approach is preferred because it is more consistent with research on effective communication and inclusive of cultural/personal differences. To achieve this goal, the Board of the American Dietetic Association approved the objective to focus nutrition messages on total diet, not individual foods (84).

Effective Communication Strategies

To be communicated effectively, educational messages and counseling interventions should:

- focus on high-priority personal and/or public health needs;
- provide a proactive, positive, and practical approach;
- promote an enjoyable pattern of diet and activity choices as part of a long-term overall healthful lifestyle;
- use successful educational strategies based on theories and models that promote behavioral change; and
- evaluate and share information on effectiveness of food and nutrition programs.

As leaders in nutrition communication, food and nutrition professionals need to continue strengthening skills, updating competencies, and documenting outcomes. Suggested techniques to achieve these goals are:

- build coalitions with industry, government, academia, and organizations;
- use a full range of available and appropriate communication technologies and take 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;
- act as role models of active participation in local and professional associations;
- maintain state-of-the-art knowledge through continuing education; and
- take a professional and unbiased approach to promoting healthful eating and physical activity patterns.

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