Unintended Consequences of Simplistic Dietary Recommendations: Good Advice Gone Awry?

How often do we hear nutrition advice oversimplified? Omit trans fats ... exercise more ... eat more fruits and vegetables ... avoid high-fructose corn syrup ... take your vitamins. Everywhere we turn, we hear simple dietary messages intended to improve health and well-being. Neighbors, friends, relatives and co-workers are adept at becoming "experts" on a topic and readily share their perspectives and advice. Advertising and the media publish messages, often sensationalized and based on singular studies, advocating consumption (or avoidance) of certain dietary components to cure our ails. Physicians, in their haste, often prescribe overly simplistic dietary recommendations without looking at the bigger picture. Even public-health recommendations, for sake of simplicity, often focus on one "nutritional nugget" at a time.

Often, consumers are confused, left with a convoluted view of what constitutes sound nutrition and a healthy diet. Trying to balance the plethora of singular nutrition messages offered through multiple communication venues, they lose focus on overall healthy eating. ***As nutrition professionals, we need to examine the outcomes of implementing simplified advice and assess the long-term, often unintended, effects these could have on health. Rather than simplistic messages, we need to provide individualized, comprehensive, yet feasible advice that promotes lifelong health and well-being.***

Background

Unintended consequences can be defined as "any intervention in a complex system that may or may not have the intended result, but will inevitably create unanticipated and often undesirable outcomes." While many people feel that simple nutrition recommendations can do no harm, often this type of advice can be shortsighted and lead to unintended and unhealthful consequences if the end result is an unbalanced diet. Anecdotal evidence of this phenomenon abounds; the most strongly substantiated examples include:

- **The low-fat messages** directed at consumers during the 1980s and '90s, intended to help them lose or manage weight and reduce their risk of heart disease, actually had the opposite effect as consumers misunderstood "low fat" to mean "low calorie," which resulted in over-consumption. Between 1971 and 2000, the percent of calories from fat ingested by Americans decreased, but total fat intake increased and overall caloric consumption increased by 22 percent in women (corresponding to an extra 335 calories per day) and 7 percent in men (168 calories per day).[1] In addition, the simple dietary recommendation to consume only low-fat or non-fat foods may influence an individual to restrict his or her intake of nuts, fish, avocado or oils that contain generous amounts of essential fatty acids, important to the inflammatory response[2] and brain development.[3] Focus-group research has found that consumers lack a definitive understanding of dietary fats, with many overwhelmed and confused about the various types of fats.[4]
- **Avoiding or limiting whole food groups**—in an attempt to reduce fat intake, lose weight, avoid animal products or out of concerns for intolerance symptoms—may similarly result in short-term nutrient deficiencies and long-term health consequences. Deficiencies in calcium, often the result of suboptimal dairy consumption, can result in fractures in children[5] and osteoporosis and osteomalacia in adults.[6] In fact, intakes of calcium, magnesium, potassium, zinc, sodium, folate, thiamin, riboflavin and vitamins B-6, B-12, A, D and E have been shown to be higher as more dairy is consumed.[7] Low-carbohydrate diets, popular for their purported weight loss and glucose-regulatory effects, have been linked to suboptimal intakes of vegetables, fruit, vitamin C and fiber, and to a higher consumption of meat, cholesterol and total fat intakes.[8] Research shows that eating a diet rich in

whole grains is associated with reduced risk of heart disease, certain types of cancer and type 2 diabetes, and may also help in weight management.[9]

- **Weight-loss diets** are beginning to be seen as a risk for weight gain. An analysis of 31 studies on dieting found that dieting is a consistent predictor of weight gain, with up to two-thirds of dieters regaining *more* weight than they lost.[10] A prospective study in 17,000 children ages 9 – 14 years old found that dieting predicted binge-eating behavior and concluded that, "... in the long term, dieting to control weight is not only ineffective, it may actually promote weight gain."[11] Another study in teens found that dieters had twice the risk of becoming overweight compared to non-dieting teens.[12]

Well-intentioned initiatives can result in unintended consequences

Often, nutrition and health professionals do not realize the impact a public-health initiative may have on consumer perceptions. For example, banning certain foods on school campuses in an attempt to improve the diets of children and adolescents may convey the message that these foods are "bad" or "unhealthy." For example, pizza might be perceived as unhealthy for its fat content and flavored milk for its high-fructose corn syrup—when, in fact, these nutrient-dense foods can be incorporated into a healthful eating plan. Such well-intended mandates send the message that foods containing no "negative components" are healthy—possibly resulting in consumer perceptions, for example, that diet soda is healthier than chocolate milk and trans fat-free crackers are healthier than nuts. Research on consumer perceptions resulting from such mandates—and implications on food choices—needs to be conducted to better formulate initiatives and policy with the desired effects.

Consumers show readiness for more comprehensive advice

It is important for health professionals to understand what issues are most important to consumers in order to create effective nutrition and food-safety communications that motivate consumers to implement behavioral change. The American Dietetic Association's (ADA) most recent survey on attitudes, knowledge, beliefs and behaviors around food and dietary habits sheds some light on how consumers feel about food and dietary advice:[13]

- Approximately 67 percent of those surveyed said diet, nutrition and physical activity are "very important" to them personally.
- Consumers are information-savvy, with 40 percent of them strongly agreeing that they actively seek information about nutrition and healthy eating.
- However, 38 percent strongly agree that they are always hearing information about what not to eat, rather than what they *should* eat.

Consumers also have the mindset that food holds a key role in promoting health. According to research conducted by the International Food Information Council:[14]

- 60 percent or more of Americans somewhat or strongly believe that certain foods and beverages can provide multiple health benefits.
- More than 80 percent say that they are currently consuming, or would be interested in consuming, foods and/or beverages for such benefits.

Unfortunately, the "good foods, bad foods" myth is still being propagated, with 54 percent of respondents saying that based on information they've heard, they strongly believe there are some foods that should never be eaten.[13] This has increased since 2002, when 43 percent agreed with the statement. This dichotomous belief about foods is fueled directly by the increasingly common, simplistic nutrition messages on *exclusion*—versus *inclusion* and *diversity*—of food choices. Often, the more forbidden a food is, the more desirable it becomes to some consumers.

While the most popular sources of food and nutrition information were television, magazines and the Internet—media that lend themselves to sound-bite, simplified messages—the most credible sources were dietitians, nutritionists, doctors and nurses.[13]

Thus, the average consumer is extremely interested in health and nutrition information and in improving his or her health and that of his or her family. ***This consumer receptivity to food and nutrition information, along with the credibility the health professional has built with the public, provides a unique opportunity for the nutrition community to make positive changes in our nation's eating practices.***

Food-grouping system as the cornerstone to nutrition advice

For more than 100 years, USDA has provided consumers with dietary guidance using a food-grouping system.[15] These systems are meant to distill complex dietary information into a simplified structure that can be easily remembered and implemented. The average consumer—young and old—is capable of remembering the serving requirements for five food groups, yet would have a great deal of difficulty remembering the recommendation for each key nutrient listed in the Dietary Reference Intakes.[16] The most recent food-grouping system—USDA's MyPyramid,[17] released in 2005—is complex in that it consolidates a large volume of science-based information applicable to meet a wide range of needs, yet is simple enough to be feasible and actionable.

Because the food groups are based on "key nutrients"—the **milk group** provides calcium, potassium, vitamins A, B12 and D; the **fruit group** provides vitamins A, C and fiber; the **vegetable group** provides vitamin C, phytonutrients and fiber; the **meats, beans and nuts group** provides protein, iron and zinc; and the **breads and cereals** group provides fiber, B-vitamins, carbohydrates and iron—it is unwise to omit a whole food group from one's diet.

Unfortunately, many popular diets are based on limiting or omitting whole food groups in overly simplistic attempts to reduce one's calorie intake. These limitations may result in a deficiency of key nutrients in one's diet, eventually leading to fractures, chronic disease or a myriad of other issues. ***It remains critically important to consume a variety of foods and adequate amounts from each of the five food groups.*** Each of the groups offers abundant variety to meet individual taste preferences as well as cultural, lifestyle and economic needs.

Nutrition education is key to balanced diets

Education is an integral component of translating simple or complex dietary messages into action to ensure that consumers make commensurate modifications to balance their diets and maintain adequate nutrient intakes. In today's environment, the time and opportunity for nutrition education is limited, yet creative ways can be found to extend advice that is actionable, balanced and avoids unintended and unhealthy consequences. Communicating messages through materials and interactive pieces on institutional websites, in group classes and via LISTSERVs or blogs can be effective. Materials developed and distributed through health care providers and worksite wellness centers can also reach a large number of clients and patients. Regardless of the venue, ***the focus is to promote a balanced, individualized diet that includes adequate amounts and varieties of foods from all food groups and that sustains health over the long term.***

The health professional can also contribute to creating healthier environments by working with retailers, restaurants and policy makers to improve access and affordability of foods deemed underconsumed—such as fruits, vegetables, whole grains and low-fat dairy foods. Advocating for healthier—yet not overly restrictive—environments, paired with nutrition education, is key to helping consumers make healthier choices.

Nutritional individualization needs to be factored into any diet plan

Research on the importance of nutritional individualization is accumulating at a rapid pace. With this knowledge comes confusion, however, as consumers may be asking:

- How do I synthesize all this information, including nutrigenomics, lifestyle and disease risk, to optimize my health?
- If my neighbor is successful with a certain diet plan, will it work for me?
- Does everyone need to be on a low-sodium diet, or just those who are "salt sensitive"?
- If I am active, at a healthy weight and not at risk for heart disease, do I really need to worry about saturated and trans fats?
- What specific types of fruits and vegetables are better for those at risk of cancer?

Today, criteria that consumers use to make food choices are broadening. Factors traditionally driving food-choice decisions, such as taste, convenience, price and nutritional value, continue to be paramount in the minds of most consumers.[18] However, the mindset is shifting among some consumers to include sustainability issues[19] such as the environment (organic, locally

grown), production (antibiotic-free, hormone-free, GMO-free) and animal-welfare issues (wild, free range and line caught). The health professional needs to consider these environmental and social factors when helping clients prioritize their health goals and formulate food plans.

Foods reign over supplements

While it seems an easy solution to pop a pill for a little extra nutrition "insurance," some consumers may rely too heavily on supplements to meet their nutritional needs, or have the misperception that their diets do not matter as long as they take their supplements.[20] On the contrary, it is far superior to get the nutrients one needs from foods[21] for a variety of reasons:

- Supplements, a concentrated source of nutrients that are often not chewed or consumed with other foodstuffs, pose a greater risk of toxicity than food sources of nutrients.[22]
- The ratio of nutrients required to maintain physiological functions is generally appropriate in foods but often imbalanced in supplements, resulting in competition for intestinal absorptive sites, over- or under-absorption of nutrients and, in extreme cases, physiological imbalances. Zinc, iron and calcium, for example, may compete for intestinal absorptive sites such that an inhibitory effect is seen if one nutrient is consumed in higher amounts than the others.[23]
- Components such as phytonutrients, fiber, bioactive peptides and other non-nutritive factors in our foods are critical to optimal health and prevention of chronic disease, yet most of these components have not been packaged in supplement form. Other important non-nutrients that are present in foods have yet to be identified.
- Absent the pleasures and social aspects of eating, the individual may lose the importance of foods and eating in a healthful lifestyle.

Supplements can play an important role in a well-thought-out diet plan when, for example, an individual is not able to meet his or her requirement due to food allergy, intolerance, aversion or inability to ingest the needed amount. However, the basis for a healthful diet should remain whole foods in as close to their natural form as possible.

Call to Action

In today's world of sound bites, magic bullets, immediate gratification and quick fixes, it is more important than ever that health professionals be the voice of reason and sound science. Consumers need to understand that heeding overly simplistic, singular nuggets of nutrition advice that eliminate or trivialize entire food groups can do them harm. They need to look beyond the obvious, short-term benefits to the potential long-term health consequences that may arise from neglecting to consider *all* factors in their dietary choices.

Use behavior-based materials that reflect sound science

As nutrition professionals, we must continue to provide sound nutritional advice based on the most current consolidation of research and the most recent versions of the Dietary Reference Intakes, Dietary Guidelines and MyPyramid. Helping clients plan out specific diets to meet their individual requirements and incorporating this broader approach will give them the confidence and perspective needed to ward off the conflicting, questionable advice they will undoubtedly hear from other sources.

At the same time, we need to ensure that the materials we develop and/or utilize are based in successful behavior-change approaches. Utilizing client-centered counseling techniques, considering the client's readiness to change and framing specific small steps for nutrition advice in a "total diet" context are critical to the long-term success of dietary advice.

Behavior-based tools to help health professionals and consumers consider food choices from a broader perspective include self-monitoring tools, which are shown to be highly effective.[24] Examples include:

- The MyPyramid Menu Planner[25] helps consumers plan balanced menus by searching for foods and beverages they plan to eat.
- The Personal Nutrition Planner[26] individualizes MyPyramid recommendations for the user according to various factors such as physical activity, ethnicity, disease risk and medical conditions.
- The daily Meal Planner[27] helps consumers balance healthy food choices over the course of each week by planning and organizing their daily meals and importing this into a grocery shopping list to discourage impulse buys.

Use nutrient rating systems in a balanced fashion
Consumers need practical tools that consider food choices from this broader perspective ... translating the "what" into the actionable "how." Nutrient-profiling systems are being developed to simplify healthy food choices for the consumer by labeling foods as being more or less healthful. There are a number of different systems introduced by manufacturers, retailers and nonprofit groups, most of them weighing the positive (e.g., calcium, protein, vitamins) against the negative (fat, saturated fat, sodium) attributes of a food and resulting in a final average score for each product. For this reason, these systems can promote a mentality of "good food, bad food" rather than "all foods fit in moderation"—and encourage consumers to assess individual foods rather than intake over a whole day or several days. In addition, since there is no commonly accepted scoring algorithm for these systems, it is unfeasible to determine which one(s) most effectively measures the healthfulness of a food. Thus, while these systems can provide useful information to the consumer, they are not the sole solution to healthy eating. Consumers need education on how to utilize these tools as but one factor in their food-choice decisions.

Practice Points for the Health Professional

- Encourage the consumer/client to look at the total health aspect of the nutrition advice he or she is receiving, rather than focusing on the nutrient of interest. If dietary changes are made in one food group, how will it impact other selections? Are there commensurate dietary adjustments that need to take place to compensate?

- Discourage clients from omitting a food or whole food group from their diets. Such omissions may result in nutrition deficiencies. Consuming a variety of foods from each food group ensures adequate and sufficient intake of all nutrients.

- Encourage clients to obtain their nutrients from foods rather than supplements. Foods contain a number of other as-yet-undefined factors that act synergistically with each other to enhance absorption and utilization, as well as non-dietary factors like fiber and phytonutrients that play a poorly understood but critical role in our health. Supplements are appropriate in certain cases when it is not feasible to obtain adequate amounts of specific nutrient(s) from food sources.

- Factor clients' readiness to change into any recommendations, assessing their motivators and barriers to dietary changes. Use client-centered counseling techniques such as open-ended questions, affirmation, reflection, enhancing self-efficacy, problem solving, summarizing, goal setting and focusing on what is important to them. These techniques will optimize their accountability and ownership of the solutions and, ultimately, long-term success.

- Motivate clients to take an individualized approach to their health by helping them understand that a specific nutrient, supplement or food that allegedly assists with weight loss, reduces cholesterol levels or increases energy in their neighbor will not necessarily have the same effect on them.

- Take into account individual goals, needs and personal preferences, including ethnic and cultural diversity, to develop a dietary plan appropriate to their needs.

- Consider alternative methods of reaching consumers with balanced dietary messages, such as health care newsletters, developing or posting materials online on LISTSERVs and blogs and holding group sessions if individual consultation is not financially possible for clients.

- Make a conscious effort to provide sound nutrition advice on social-networking forums such as Facebook, Twitter, blogs and LinkedIn. Consider that the majority of blogs have no sourcing, and empower yourself to challenge inaccurate, misleading or imbalanced information posted by others, adding your "voice of reason" to the dialogue.

Resources

American Dietetic Association: .....http://www.eatright.org
Live Well Tool Kit: .....http://www.nutrientrichfoods.org/documents/toolkit.pdf
Living Nutrient-Rich:.....http://www.nutrientrichfoods.org/living_nutrient_rich/index.html
Meals Matter's Meal-Planning Tool: .....http://www.mealsmatter.org/MealPlanning/MealPlanner/index.aspx
Meals Matter's Personal Nutrition Planner:.....http://www.mealsmatter.org/EatingForHealth/Tools/pnp.aspx
USDA's MyPyramid: .....http://www.MyPyramid.gov
USDA's MyPyramid Menu Planner:.....http://www.mypyramidtracker.gov/planner/launchPage.aspx
USDA's Food and Nutrition Information Center:.....http://fnic.nal.usda.gov
WebMD:.....http://www.webmd.com

References

[1]Trends in Intake of Energy and Macronutrients—United States, 1971–2000, http://www.cdc.gov/nchs/PRESSROOM/04news/calorie.htm.
[2]Breslow JL. n-3 fatty acids and cardiovascular disease. Am J Clin Nutr. 2006 Jun;83(6 Suppl):1477S-1482S.
[3]Uauy R, Dangour AD. Nutrition in brain development and aging: role of essential fatty acids. Nutr Rev. 2006 May;64(5 Pt 2):S24-33.
[4]Fitting Dietary Fats into a Healthful Diet—A Consumer Point of View. IFIC Foundation 2004. http://www.ific.org/research/fatsres.cfm Accessed 1/14/2009.
[5]Clark EM et al. Association between bone density and fractures in children: a systematic review and meta-analysis. Pediatrics 2006;117;291-297.
[6]Bone health and osteoporosis: A report of the Surgeon General, U.S. Dept of Health and Human Services, Rockville, MD, 2004.
[7]Ranganathan R et al. The Nutritional Impact of Dairy Product Consumption on Dietary Intakes of Adults (1995–1996): The Bogalusa Heart Study. J Amer Diet Assoc. 2005;105:1391-1400.
[8]Greene-Finestone LS et al. Adolescents' Low-Carbohydrate-density diets are related to poorer dietary intakes. J Amer Diet Assoc 2005(105);11:1783.
[9]Whole Grains on the Rise. Food Insight March/April 2005. http://www.ific.org/foodinsight/2005/ma/wholegrainfi205.cfm Accessed 11/25/2008.
[10]Mann, T. Medicare's search for effective obesity treatments: Diets are not the answer. Am. Psychologist, 2007; 62(3): 220-233.
[11]Field AE et al. Relation Between Dieting and Weight Change Among Preadolescents and Adolescents. Pediatrics, 2003 112:900-906.
[12]Neumark-Sztainer D. et al. Obesity, disordered eating,and eating disorders in a longitudinal study of adolescents: how do dieters fare five years later?J Am Diet Assoc. 2006;106(4):559-568.
[13]Nutrition and You: Trends 2008. http://www.eatright.org/Media/content.aspx?id=7639&terms=trends Accessed 9/15/2010.
[14]IFIC Foundation 2008 Food and Health Survey http://www.foodinsight.org/Content/6/IFICFdn2008FoodandHealthSurvey.pdf Accessed 9/16/2010.
[15]www.MyPyramid.gov website, News & Media; Backgrounder section. Accessed 9/16/2008.
[16]Caine R N, and Caine G (1991). Making connections: Teaching and the human brain. Alexandria, VA: Association for Supervision and Curriculum Development.
[17]USDA MyPyramid www.mypyramid.gov Accessed 1/15/2009.
[18]An Overview of Nutrition. In: Understanding Normal and Clinical Nutrition, 7th Ed. Rolfes, Pinna, .Whitney, eds. Thompson Wadsworth, pp. 3-5.
[19]International Food Information Council: 2008 Food Biotechnology: A Study of U.S. Consumer Trends. http://www.ific.org/research/upload/Executive-Summary-Biotech-Report_Website-version.pdf Accessed 1/20/2009.
[20]Vitamin and Mineral Supplements. In: Understanding Normal and Clinical Nutrition, 7th Ed. Rolfes, Pinna, Whitney, eds. Thompson Wadsworth, pp. 359-365.
[21]Position of the American Dietetic Association: Food fortification and Dietary Supplements. J Amer Diet Assoc 101(2001):115-125.
[22]Position of the American Dietetic Association: Fortification and Nutritional Supplements. J Amer Diet Assoc 2005:105(8):1300-1311.
[23]Perales S et al. Fortification of milk with calcium: effect on calcium bioavailability and interactions with iron and zinc. J Agric Food Chem. 2006 Jun 28;54(13):4901-6.
[24]http://www.adaevidencelibrary.com/topic.cfm?cat=3483 Accessed 9/20/2010.
[25]http://www.mypyramidtracker.gov/planner/ Accessed 12/1/2008.
[26]http://www.mealsmatter.org/EatingForHealth/Tools/pnp.aspx Accessed 12/1/2008.
[27]http://www.mealsmatter.org/MealPlanning/MealPlanner/index.aspx Accessed 12/1/2008.