

# Convergence of plant-rich and plant-only diets<sup>1-3</sup>

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**ABSTRACT** Discussants at the Third International Congress on Vegetarian Nutrition considered the nutritional adequacy, benefits, and health outcomes of plant-only (eg, vegan and fruitarian), plant-based (eg, macrobiotic, lactovegetarian, semi-vegetarian, and meatless), and omnivorous dietary patterns. The increased availability of a variety of plant foods, the advent of nutrient-fortified plant foods, the use of vitamin and mineral supplements, and the widespread dissemination of sound information on dietary patterns mean that convergence between the essential nutrient profiles of plant-only and plant-rich, plant-based diets is possible. Special attention should be paid to nutrition among vulnerable groups by age or physiologic status if they consume diets based solely on plants. Research has shown that both plant-only and plant-based eating patterns have health benefits, most notably in reducing the risk of chronic, degenerative diseases. The panel concluded that evidence for a convergence of scientific opinion on the safety and healthfulness of plant-only diets that are appropriately planned to meet all nutrient requirements compared with plant-based diets is considerable. *Am J Clin Nutr* 1999;70(suppl):620S–2S.

**KEY WORDS** Vegetarian diet, plant-rich diet, plant-only diet, vegan diet, macrobiotic diet, omnivorous diet, dietary guidelines

## INTRODUCTION

This is a summary of a panel discussion at the Third International Congress on Vegetarian Nutrition on the safety, efficacy, advantages, and disadvantages of plant-based and plant-only dietary patterns and whether scientific opinion on these 2 patterns was converging. Panel members included Susan Havala, Timothy Key, Lawrence Kushi, David Nieman, Walter Willett, and chair Johanna Dwyer.

## PERSPECTIVES ON VARIOUS EATING PATTERNS

### Plant-only diets: vegan perspectives

Susan Havala presented case studies showing that well-planned vegan diets can fulfill nutrient needs and be healthful if sources of nutrients not present in plants are provided by other means. Because the larger culture makes it more difficult to adhere to vegan than to other dietary patterns, vegans must endeavor to make wise food choices. The Vegetarian Dietary Practice Group of the American Dietetic Association is a source

of professional information on these issues. The Vegetarian Resource Group—a large, nonprofit vegetarian organization—provides useful information to laypersons.

Timothy Key asserted that habit, tradition, food availability, and the influences of advertising determine the food choices of most people, but that food choices should instead be based on scientific, environmental, ecologic, and nutritional considerations. He advocated more strenuous efforts to disseminate nutrition recommendations widely via the mass media, which could lead to changes in national attitudes and personal food choices that are based more on nutritional considerations. Key saw the most likely movement at the national level to be toward plant-based rather than plant-only diets. He pointed out that the literature on the long-term health of vegans was meager and that more research was needed because existing studies were based on small numbers of individuals. Key called for more research on vegan diets, especially those given to children. He also recommended more research on vegetarian and semivegetarian diets in highly industrialized countries. Much more is known about semivegetarian diets and their association with health in developing countries.

### Macrobiotic perspectives

Lawrence Kushi said that the general principle behind the macrobiotic diet is that foods biologically far away from humans are better for humans, so those foods, rather than red meat, should form the basis of the diet. Kushi opined that there was a bias in the scientific literature against macrobiotics. When findings were negative, the word *macrobiotic* appeared in the title, whereas when findings were positive, the word *vegetarian* was used. Kushi noted that some health problems such as rickets, borderline vitamin B-12 deficiency, and risks of other deficiencies had existed in the past when young children were fed some macrobiotic diets. He believes that this is no longer true and that macrobiotic parents have altered their infant feeding practices. With respect to health benefits, macrobiotic lifestyles appear to be associated with decreased blood cholesterol and blood pressure, and possibly beneficial changes in some serum estrogen subfractions that may be associated with lower cancer risk.

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### Lactoovovegetarian perspectives

David Nieman cited results of the Adventist Health Study and of many other studies showing that long-term lactoovovegetarians who had adhered to their diets for decades weighed less, had lower total serum cholesterol and blood glucose concentrations, and had lower blood pressure than did nonvegetarians. He summarized evidence showing that increased consumption of fruit, vegetables, and dietary fiber appeared to be associated with lower rates of coronary artery disease and stroke even in those who consumed some animal foods, especially if they included fish and very lean meat. On balance, Nieman added that there was solid evidence that lactoovovegetarians have lower prevalence rates of ischemic heart disease, type 2 diabetes, obesity, hypertension, dyslipidemia, and possibly some forms of cancer (eg, breast and colon) than do omnivores, and that diet was at least partly responsible for these findings. However, the vegetarian diet is “only one spoke in the wheel that turns toward wellness.” Vegetarians are often more physically active than are omnivores; thus, they also benefit from the many positive effects of active lifestyles.

Sujatha Rajaram spoke about the need for those following vegan diets to guard against dietary inadequacies through careful dietary planning. She emphasized the importance of eating plant-based diets that are high in whole grains rather than highly processed or refined foods. Such whole-grain foods have the advantage of being high in fiber, rich in antioxidant nutrients and phytochemicals, and low in fat. These dietary constituents reduce the risk of certain diet-related, chronic, degenerative diseases, such as coronary artery disease. Unsupplemented whole-food diets based solely on plants are not appropriate because they are devoid of vitamin B-12. Low concentrations of vitamin B-12 are apparent in the sera of individuals who consume such diets, especially after they have consumed such diets for many years. Vitamin B-12 deficiency is a special problem for pregnant vegans unless they are supplemented. Another nutrient that tends to be low in plant-only diets is calcium; plant foods must be chosen carefully to obtain enough calcium from them. Consumption of tofu and calcium-fortified orange juice helps. Vitamin D is a concern for vegans chiefly in wintertime and in northern latitudes where there is little sunlight. Vitamin D–fortified milk or vitamin D supplements are recommended for vegans. Consuming enough iron is sometimes a problem for vegans, but wise food choices or iron supplements can remedy the situation. Rajaram recommends a lactovegetarian diet, especially one that stresses whole foods and low-fat milk products.

### Omnivorous perspective

Walter Willett spoke about plant-based omnivorous diets, of which there are many in the world. Both Greek and Japanese eating patterns appear to offer advantages in these respects over certain other patterns. The challenge is to find out what components are responsible for beneficial effects in both vegetarian and omnivorous dietary patterns. Inappropriate choices within vegetarian or nonvegetarian diets can lead to health problems. Willett discussed unresolved questions about diet and breast cancer. He concluded that even though, on average, vegetarian diets are quite healthy, there may be ways to improve them even further. Research is needed on these issues.

### Audience perspectives

Among the concerns of the audience was whether genetic alterations taking place in the plant-food supply would affect the

health of vegetarians or vegans. The panelists recalled that selective breeding has been practiced for thousands of years, but stressed that caution was indicated so that biotechnology would be used appropriately. An audience member urged more emphasis on ecologic and environmental concerns relating to food and eating patterns; to “take the global viewpoint on resource use.” Another audience member asked whether it was better to add phytochemicals to milk or to add vitamin B-12 to soyfoods. The issue was left unresolved by the panel. The next question concerned how much meat semivegetarians should eat for optimal health, and whether 1–2 servings/wk would be optimal. A panelist suggested that the National Academy of Sciences recommends a larger amount. Other questions concerned whether vegetarians should become even more physically active (the panelists agreed that this was helpful) and a plea to be more specific about how vegetarian diets reduce disease risks in discussions of diet and health.

### IS THERE A CONVERGENCE OF SCIENTIFIC OPINION ON PLANT-BASED AND PLANT-ONLY DIETS?

Nutritional scientists agree that at all ages and stages of life, well-planned plant-based and plant-only diets that incorporate the principles of adequacy, balance, and moderation can be nutritious and healthful. Dietary guidance systems, including the most recent version of the *Dietary Guidelines for Americans* (1) and the US Department of Agriculture’s food guide pyramid (2) are recent examples of recommendations that incorporate these various eating options. Research must continue to further refine recommendations and determine the healthfulness of the eating patterns people are actually following (3).

From the education and communications standpoint, there is convergence in that the information disseminated on nutritious diets is sounder, more sophisticated, and more plentiful than ever before. The negativism and ridicule that vegetarians were once subjected to in the popular press has also largely disappeared. The media are increasingly tolerant and accepting of vegetarian and a variety of omnivorous patterns.

### ARE WE IN THE MIDST OF A “PARADIGM SHIFT?”

Is there a growing convergence of fact and opinion that plant-only diets are as or more healthful than plant-based diets that include animal foods? Thomas Kuhn, in his book, *The Structure of Scientific Revolutions* (4), called seminal changes in scientific thinking such as this would entail “paradigm shifts.”

Until the 1950s, adequacy and prevention of deficiency diseases was the main criterion and the standard for judging the healthfulness of dietary patterns. It is now well established that plant diets can be made adequate in the nutrients they lack by complementation, fortification, and supplementation, so these are hardly breakthroughs in thinking that would constitute a paradigm shift. It is also evident that variety does not need to be limited on vegetarian diets, and that balance and moderation can be achieved as easily, or even more easily, with vegetarian than in omnivorous dietary patterns.

Today, our criteria for salubrious dietary patterns are broader than nutritional adequacy and avoidance of deficiency disease. They include balance, moderation, and a focus on reducing the risks of chronic degenerative diseases. Improvements in analytic equipment and techniques have permitted an expansion of




research on how chemical differences between various types of dietary patterns are related to health benefits (Dwyer JT, Redican S, unpublished observations, 1997). If a paradigm shift has occurred in scientists' views of dietary patterns, it is in 2 areas. First is the recognition that essential nutrients can be added to plant foods. From a technical standpoint, a greater variety of plant foods; more plant foods fortified with vitamins B-12 and D, iron, and calcium; and more nutrient supplements are available today than ever before. These developments mean that convergence between the essential nutrient profiles of plant-only and plant-based eating patterns is possible if vegetarians use these expanded options in dietary planning (5). Second is the recognition that diet affects chronic degenerative disease risk and that many chemicals other than nutrients in foods are important to health. It is important to continue research on how dietary patterns vary in their composition of nonnutrient substances in foods that affect health.

### Remaining divergence in values about eating

Both scientific issues and values are involved in scientists' nutritional recommendations. Values are not amenable to verification by empirical methods (5, 6). For most eaters, choices between the various types of patterns are matters of taste, not of health or morality. Not everyone in society agrees that there are moral imperatives for following a particular eating pattern. In any event, ethical, religious, and moral considerations remain personal and beyond the scope of science to dictate. For others, such as some vegans, moral judgements and principles, nutrition, and health all play a part in eating decisions (6). Individual eaters make different choices and rationalize them differently. There is little evidence that societal or individual philosophies, ideologies, and tastes are converging to favor a single eating pattern to guide food choices among the multiple patterns discussed. Moreover, attempts to force such a convergence may do more harm than good. The prescription of a single pattern that everyone should follow is not only beyond the scientific evidence; from a practical standpoint, it will surely fail.

### The progress of science and the passage to dietetic perfection

Does nutrition science progress and evolve over time toward dietetic perfection? Certainly, nutrition has advanced from primitive to more complex and elaborate elucidations of the health effects of what we eat. Science works best within a dominant paradigm that endures until it is replaced by a single new paradigm. Nutritional guidance is different. It needs to be based on science, but there is plenty of room for diversity. Scientific progress should not be interpreted to imply that each successive breakthrough in nutrition knowledge brings us closer to a single platonic eating ideal or to "dietetic truth." Scientists must continue to respect dietary freedom and diversity when making recommendations. They must continue to resist "nutritional imperialism" that insists on a single recommended eating pattern, be it vegetarian or omnivorous. Dietary diversity is one of our culture's strengths and sources of pleasure. There are many healthy ways to eat to be healthy, happy, and wise. 

### REFERENCES

1. US Department of Health and Human Services, US Department of Agriculture. Nutrition and your health. Dietary guidelines for Americans. 5th ed. Washington, DC: US Government Printing Office, 1995.
2. US Department of Agriculture. The food guide pyramid. Hyattsville, MD: Human Nutrition Information Service, 1992. (Publication HG252.)
3. Dwyer J. Health aspects of vegetarian diets. *Am J Clin Nutr* 1988;48(suppl):712-38.
4. Kuhn TS. The structure of scientific revolutions. *International encyclopedia of unified science*, vol 2, no. 2. 2nd ed. Chicago: University of Chicago Press, 1970.
5. Dwyer JT. Vegetarian eating patterns, science, values and food choices—where do we go from here? *Am J Clin Nutr* 1994; 59(suppl): 1255S-62S.
6. Kunkel H. Values and interests in recommendations and nutritional guidelines for Americans. *J Nutr* 1996;126(suppl 9):2390S-7S.

