

# Diet factors could ease disease, build healthier California

Health professionals have long recognized that what we eat can foster wellness or disease. This idea is the focus of the new *2010 Dietary Guidelines for Americans*, the federal guidelines to promote health, reduce chronic disease and diminish overweight and obesity through better nutrition and physical activity.

Today, more than one-third of children and more than two-thirds of adults in the United States are overweight or obese. Investigating the causes and consequences of this health crisis and finding effective responses are key priorities for land-grant universities. As the articles in this special issue demonstrate, UC scientists are pioneering this vital public work, integrating research, education and public service to improve health outcomes.

The 2010 guidelines emphasize the need to balance caloric intake with physical activity. The guidelines encourage Americans to consume more vegetables, fruits, whole grains, fat-free and low-fat dairy products, and seafood, and they recommend an overall diet low in sodium, saturated and trans fats, added sugars and refined grains. Secretary of Agriculture Tom Vilsack stated: "These new and improved dietary recommendations give individuals the information to make thoughtful choices of healthier foods in the right portions and to complement those choices with physical activity. The bottom line is that most Americans need to trim our waistlines to reduce the risk of developing diet-related chronic disease. Improving our eating habits is not only good for every individual and family, but also for our country."

## Adopting healthier diets

Few question the guidelines, but many encounter obstacles to their implementation. Healthier foods are often unavailable to those who most need them due to high prices, limited access, confusing food labels or insufficient understanding of food preparation options. Trends toward decreased physical activity are reinforced by the nature of many jobs, the physical design of communities and the ubiquity of electronic gadgets.



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Research is elucidating how antioxidants in many foods can improve human health and prevent chronic disease.

Building on historic expertise in nutrition education, UC is poised not only to recommend healthy food options but also to devise consumer-friendly messages identifying what these foods are and how they can be incorporated into a typical

diet. Increasingly, UC Cooperative Extension (UCCE) faculty and staff find themselves leading or supporting coalitions to address these issues at the community scale through public policy and planning.

Over the past century, our expectations of food have moved beyond reducing well-recognized nutritional-deficiency diseases (such as scurvy, rickets and pellagra). The research advances of the past decade have enabled us to relate nutrition to chronic disease and aspects of the aging process. Evidence indicates that chronic diseases such as osteoporosis, dementia and cardiovascular disease are also "deficiency diseases" that develop over a long period of time — years or decades. The progression of these deficiency diseases may be modulated by newly recognized dietary factors distinct from the previously characterized essential nutrients. The identification and characterization of such health-promoting dietary factors hold promise for preventing or treating a range of debilitating afflictions.

## Research and outreach strategies

We also need to change our focus from an ever-shifting list of "bad diets" and "bad foods," to identifying dietary components that confer health benefits. For example, basic research on several UC campuses is investigating the role of specific nutrients and phytochemicals in human metabolism and disease prevention. The Center for Health and Nutrition Research (CHNR) at UC Davis has investigated the roles of fruits, vegetables and nuts in providing vitamins and other phytochemicals that can lower the risk of chronic diseases such as cancer and heart disease. Examples of research that has been facilitated by the Center include the impact of diets that are rich in plant-based flavonoids during pregnancy, and the effects of fish and almond consumption on cardiovascular disease prevention.

Research supported by CHNR is highlighted in this special issue. UC scientists review the role of nutrition in optimizing health outcomes in female athletes (page 124), report recent research on the role of omega-3 fatty acids in moderating disease progression (pages 106 and 112), review the role of soy in the prevention of cardiovascular disease (page 118) and describe the characteristics of mitochondria, suggesting



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mechanisms by which biofactors may enhance mitochondrial function and reduce disease signs or symptoms (pages 136 and 141). Other research explores the use of tangerines to prevent vitamin A deficiency (page 130).

But simply knowing what foods are healthy is not

enough. We need to increase access to healthy food and physical activity for all segments of society. The UC Berkeley Robert C. and Veronica Atkins Center for Weight and Health, a national leader in obesity prevention, has long worked with community partners to develop and evaluate obesity prevention strategies. Campus-based scientists at UC Berkeley and UC Davis have joined with county-based UCCE advisors to investigate and evaluate obesity issues in a variety of environments including childcare, school, after-school, community, work site and health care settings.

Research suggests that the solution to this health care crisis is a combination of educational and environmental interventions to promote healthy eating and active lifestyles.

## Healthy Families and Communities Initiative

UCCE, the statewide extension arm of UC Agriculture and Natural Resources (UC ANR), has launched the Healthy Families and Communities Initiative. The initiative addresses critical challenges faced by children, teens and

young adults, including childhood obesity and science literacy. Childhood and adolescence are critical periods to develop healthy behaviors that can be sustained into adulthood (see box).

Known for their effective collaboration with diverse public and private partners, UCCE faculty and staff are in a favorable position to create and evaluate school and community interventions in counties across California.

These include school, nonformal educational settings and youth programs, such as 4-H. Interventions will serve as learning laboratories through which

UC research and education can strengthen efforts to reduce obesity and chronic disease, improving the health of all Californians.

### For more information

**UC Berkeley Robert C. and Veronica Atkins Center for Weight and Health**  
<http://cwh.berkeley.edu>

**UC Davis Center for Health and Nutrition Research**  
<http://chnr.ucdavis.edu>

**UC Healthy Families and Communities Strategic Initiative**  
<http://ucanr.org/sites/HFC>

**USDA dietary guidelines**  
<http://dietaryguidelines.gov>

## UC Cooperative Extension focuses on youth health and science literacy

**U**C Cooperative Extension is launching a new effort to promote the physical, intellectual and emotional health of California's young people.

Called Healthy Families and Communities (HFC), this initiative addresses three critical challenges faced by children, teens and young adults in our state: childhood obesity, lack of science literacy and the need for positive development.

"Rather than concentrating on risky behaviors, the focus is on nurturing youth to help them reach their potential and strengthen their connections with the community," says Dave Campbell, initiative leader.

Nearly a third of California's school-aged children are overweight or obese, and the state has the unfortunate distinction of leading the nation in obesity-related health care costs. "To effectively address obesity, we need to wed traditional nutrition education outreach with youth and community development," Campbell says. "It's not enough to just educate individuals, you also need to address the social and built environment to see who has and who needs opportunities."

California's science literacy ranking is also dismal, with only Mississippi scoring worse. "Addressing this is absolutely critical," Campbell notes. "We need new scientists to retain our economic competitiveness, and the ability to recognize good science and think through problems systematically is also part of being a good citizen who can participate in the political discourse."

Alarming statistics jumped out during the panel's research. High school dropout rates are high, and about one-sixth of 16 to 24 year olds are out of school and out of work. This has high social costs and is a missed opportunity to train a skilled workforce to replace people who are about to retire.

HFC has solicited proposals for studies on the initiative's three strands. Funded projects will be carried out through campus-county research and extension partnerships that assess the effectiveness of individual and community change strategies. These projects will build on existing UC research on school wellness policies, garden-based learning, farm-to-school programs, after school and nonformal education, and youth development. "We're connecting our work to key issues in California," Campbell says.

— Robin Meadows



Finding solutions to the epidemic of obesity is a key goal of land-grant universities.