

# IMPACT

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*IMPACT is a series of publications highlighting how UC Davis' College of Agricultural and Environmental Sciences makes a difference in the lives of Californians. Through research, teaching, and outreach programs, UC Davis research touches almost all aspects of Californian life. Today, millions of people eat safer foods, breathe cleaner air, and drink healthier water with the help of our researchers. We're making discovery work – for California and the world.*

## FIGHTING MALNUTRITION OVERSEAS

### THE ISSUE

Nearly one billion people around the world are undernourished, primarily in South Asia, Southeast Asia, and sub-Saharan Africa. Approximately one-third of children under the age of five in developing countries are malnourished.

Malnutrition increases the risk of disease and early death. The most damaging consequences occur during pregnancy and the first two years of life. Inadequate nutrition during this period can irreversibly stunt a child's physical and cognitive development. Malnutrition diminishes the intellectual ability of children and their work capacity in adulthood, undermining economic growth and perpetuating poverty.

### WHAT WE'RE DOING

Scientists in the College of Agricultural and Environmental Sciences at UC Davis are assisting developing countries with research on nutrition, livestock production, and plant breeding.

#### *Enriching local diets with nutritional supplements:*

An international team of researchers led by nutrition professor Kathryn Dewey is evaluating low-cost ways to prevent childhood malnutrition in developing countries. The research team includes African and European participants, as well as UC Davis collaborators Kenneth Brown, a pediatrician and professor of nutrition; Lindsay Allen, director



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of USDA's Western Human Nutrition Research Center; and Stephen Vosti, an adjunct professor of agricultural and resource economics. The work is funded by the Bill & Melinda Gates Foundation.

Investigators are evaluating the impact of enriching local diets with fortified lipid- or fat-based nutritional supplements on the health of pregnant and lactating women and young children in the African nations of Ghana, Burkina Faso, and Malawi. One of the lipid-based supplements that Dewey and others have developed is Nutributter, made of peanut butter, milk powder, vegetable oil, and a bit of sugar, fortified with vitamins and minerals. Nutributter contains essential fatty acids that are critical for neurological development and is made to be spooned into home-prepared foods. Unlike reconstituted powdered milk, it doesn't require clean drinking water and can be stored without refrigeration.

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One of the goals of the project in Africa is to evaluate the economics of producing and marketing affordable food supplements like Nutributter locally. In several developing countries, local production of lipid-based nutrient supplements has begun.

**Livestock production:** UC Davis is headquarters of the Global Livestock Collaborative Research Support Program (GL-CRSP), an international network of universities and organizations, funded in part by USAID, whose goal is to increase household income and improve nutrition for impoverished rural residents in developing countries. According to Montague Demment, a plant sciences professor and director of the GL-CRSP, the program at UC Davis has taken a leadership role in implementing livestock projects abroad for 30 years.

GL-CRSP studies in developing countries have shown that children who eat foods from animal sources have improved cognitive and academic performance, as well as higher activity levels. However, in areas of rural Africa where livestock are an important part of the diet, lack of income and education can limit access to animal source foods.

In Ghana, one GL-CRSP project taught women to understand how foods from animal sources could benefit the development of their children. They were also shown how to raise poultry and were given small loans to raise chickens. By building the capacity to raise livestock, GL-CRSP helped these women boost the family finances and provide nutritional benefits to their children.

**Bean genetics:** Beans are a vital source of protein for people, particularly in East Africa where they provide up to 40 percent of protein intake. UC Davis plant sciences professor and geneticist Paul Gepts is helping bean breeders in East Africa use DNA marker-assisted selection to increase bean production for sustenance and revenue.

Gepts is lead scientist for a project called the African Bean Consortium-Kirkhouse Trust. Financed by a British charity, the bean genetics project began in 2006 and includes more than 30 collaborators from Rwanda, Uganda, Kenya, and Tanzania.

The economies of many developing countries are dependent on agriculture. By using existing bean biodiversity and DNA marker technology to breed disease-tolerant plants, East Africans can increase the efficiency of bean production. Higher bean yields will have a tremendous impact on the health and nutrition of impoverished people in these areas.

## A SHARED VISION

Food security—the confidence that there will be enough to eat—is tenuous in many parts of the world, particularly in developing countries. UC Davis scientists are participating in research that enables people in developing countries to produce foods that improve nutrition, health, productivity, and quality of life. Our faculty are helping to lift people out of the poverty that underlies malnutrition.

That's impact—nutritional and agricultural research to promote healthy human development.

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## CONTACTS

**Kathryn Dewey**, *professor*  
Department of Nutrition  
(530) 752-0851  
kgdewey@ucdavis.edu

**Montague Demment**, *professor*  
Department of Plant Sciences  
(530) 752-7757  
mwdemment@ucdavis.edu

**Paul Gepts**, *professor*  
Department of Plant Sciences  
(530) 752-7743  
plgepts@ucdavis.edu

**Neal Van Alfen**, *dean*  
(530) 752-1605  
nkvanalfen@ucdavis.edu

**Robin DeRieux**, *senior writer*  
(530) 752-8244  
rderieux@ucdavis.edu



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