

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.

NURTURING INFANTS AND MOTHERS

THE ISSUE

Nutritionists agree that breast milk is best for a baby. Infant formula is simply not as nourishing as the real thing. Babies fed breast milk develop fewer infections than those on formula and have different gut bacteria. While mother's milk is the best option, some mothers are unable to breastfeed for one reason or another. This raises the question -- how can society develop healthy alternatives to breast milk?

Scientists in the College of Agricultural and Environmental Sciences at UC Davis are finding solutions to problems of infant and maternal nutrition.

WHAT WE'RE DOING

UC Davis professor Bo Lönnerdal has researched how to create infant formula more similar to breast milk and its proteins that prohibit intestinal and respiratory disease. He has genetically modified rice plants to carry a human gene for a milk protein called lactoferrin -- a potentially revolutionary advance in formula milk.

Transforming Formula Feeding

"Babies need lactoferrin to use iron efficiently and fight infection," Lönnerdal said. "The goal is to use the modified rice as the basis for a new infant formula that are closer to mother's milk."

While additional testing is required before the rice-based formula is available, Lönnerdal believes that this type of genetic modification may be more acceptable to consumers because it directly benefits human health by improving the health of children and, indirectly, the lives



of their parents. The "humanized" milk formula also may enhance premature babies' nutrient absorption and help newborns fight HIV. The World Health Organization advises HIV-positive mothers against breastfeeding. An alternative approach would bring better nutrition to countless infants in the developing world.

Before this infant formula can be made available to the public, the researchers must conduct extensive testing on animals and humans and observe regulatory procedures.

RESEARCH IMPACTS

Beyond breastfeeding, UC Davis is delivering expertise to Californians on a number of infant and maternal nutrition issues:

- Highlighting the critical role of a woman's diet during pregnancy and lactation. UC Davis research indicates

that a proper diet may reduce pregnancy complications and birth defects.

- Developing better growth charts. Kathryn Dewey, a UC Davis nutrition professor, is working with a global research team to revise current growth charts for children. These charts don't accurately reflect the growth patterns of breast-fed children.

- Reducing iron deficiency and expanding nutrition education. A UC Davis study of young children in the Women and Infant Children federal program revealed a startling fact: 13 percent had anemia and 22 percent had iron deficiency despite efforts to provide the right foods and advice. Nutrition specialist Sheri Zidenberg-Cherr is expanding educational efforts in this area.

- Understanding zinc deficiency in children. UC Davis research indicates that 40 percent of children in low-income countries have stunted growth related to zinc deficiency. Nutrition professor Kenneth Brown's research shows that infants, young children and pregnant or nursing women are especially at high risk for zinc deficiency because they have increased needs for this essential nutrient. Brown is collaborating with the United Nations to address this problem on a global scale.

- Developing lactation centers. Visitors obtain information about strategies for successful breastfeeding at community centers developed in part by UC Davis faculty and staff.

- Contributing research findings to the public. Important UC Davis research on infant and maternal nutrition is regularly shared with physicians, universities, hospitals, and companies that make infant formulas.

- Promoting breastfeeding. Researcher Jane Heinig has conducted research on how to best promote breastfeed-

ing and has explored nutritional factors related to infant growth and development, the relationship between maternal perception of milk supply and milk intake by their infants, benefits of breastfeeding for infants and their mothers, and risk factors for poor weight gain among breastfed infants.

- Creating nutrition education materials for public use. Lucia Kaiser, community nutrition specialist, has developed materials for use through the Expanded Food and Nutrition Education Program (EFNEP) and other community programs; published a bi-monthly newsletter, maternal and infant nutrition briefs; and presented nutrition topics at conferences throughout the state. She has helped pilot an in-home breastfeeding support program for low-income women.

"What we're doing is relevant and compelling," Kaiser said, "I know that I am competing for people's time, so my educational programs have to answer a real need to be successful."

A SHARED VISION

The UC Davis nutrition department provides critical nutrition and health information to families in low socioeconomic conditions. Its EFNEP and Food Stamp Nutrition Education Program annually provide information on a one-to-one basis to over 300,000 Californians. These programs help families make wise choices about their diets and have resulted in greater health among participants. Much of the information is translated into Spanish and other languages common in California.

That's impact – science and communities at work together.

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