

**KEYNOTE ADDRESS**

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**View From the U.S. Agency for International Development**

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There are more than 800 million chronically undernourished individuals whose lack of good quality foods prevents them from realizing their physical and cognitive potential and from contributing to their countries' development.

An estimated 167 million children were underweight and 15 million children were overweight in developing countries a decade ago. Poor nutrition increases the frequency, severity, and duration of childhood illness such as diarrhea, pneumonia and measles and increases susceptibility to infectious diseases such as malaria, TB and HIV/AIDS. Under-nutrition appears to increase the virulence of infection and the likelihood of adult onset chronic disease such as hypertension, coronary heart disease and diabetes.

Historically, USAID's efforts and resources have been targeted toward addressing these problems. USAID's particular mandate and niche remains the assurance that people in the developing world have access to nourishing and adequate foods in the face of poverty, food shortages and illness.

A reduction in malnutrition requires not only economic growth alone, but investment in an integrated approach to reducing under-nutrition which may include:

- Growth promotion and monitoring of infants
- Complementary Feeding Practices
- Infant feeding
- Disease Management
- Improved and more accessible health services
- Improved sanitation and water
- De-worming
- Targeted Food Supplementation
- Community based programs linked with health care outlets
- Women's Education
- Women's status relative to men's
- Per capita food availability

Combining these components is more effective for reducing malnutrition than any measure taken alone.

Research remains a major part of our efforts. In this regard, National Nutrition Surveillance Surveys are needed to clearly outline the nutritional deficiencies, dietary excess and dietary patterns of the national population.

And agriculture research is needed to increase productivity and lower prices of micronutrient rich crops as well as to improve the bioavailability of micronutrients in staple crops. More than 10 years ago, USAID's nutritionists began working with DANIDA (Danish AID, IFPRI and other CGIAR centers to identify new genetic variability for nutritional enhancement.

From these early efforts grew the CGIAR's Harvest Plus Challenge Program, a comprehensive "biofortification initiative to Harness Agricultural Technology to Improve the Health of the Poor." USAID is proud to have joined with the World Bank, the Gates Foundation and other supporters to promote this research aimed at producing a nutritional safety-net for hundreds of millions of people vulnerable to micronutrient deficiency.

Bio-fortified crops are varieties bred for increased mineral and vitamin content, and both conventional and bioengineering breeding techniques are used. The following Nutrient Enriched Staple Crops are currently being developed:

- Iron-rich Rice
- High Beta-carotene Cassava
- High Iron and Zinc Beans
- Micronutrient Enhanced Maize (Vitamin A, Iron and Zinc), and
- Golden Rice (for Beta-carotene enhancement)

There is good scope for combining gains in micronutrients with improved protein or other nutrient content, such as Quality Protein Maize.

USAID has supported all of this work, but especially the efforts to increase iron in rice, and beta-carotene content in both maize and rice. I would like to tell you a bit more about those:

Our work on iron-rich rice goes back years, when we supported researchers at the International Rice Research Institute (IRRI) in their efforts to screen the enormous diversity present in IRRI's genebank. They found the high-iron trait in a variety from the foothills of the Himalayas, and using molecular markers, moved it quickly into an improved agronomic background. So crop germplasm field collectors, genebank curators, plant breeders, and molecular geneticists (or gene jockeys, as they are sometimes referred to in this part of the country) all played a part.

But that's just the first part. Then IRRI teamed up with nutritional scientists and devised "bioavailability" studies – the first group they studied were Roman Catholic nuns. It's not

easy to find test groups where all food intake can be monitored – and the nuns were only too happy to oblige for a good cause. And the news was good – by eating high iron rice, the nuns achieved gains in their serum iron status. Thus the effort to help protect hundreds of millions of women and children across Asia from the ravages of iron-deficiency anemia gained an important new tool – and one that could be effective in the remotest of areas. IRRI is working with national regional partners to utilize the new trait widely.

The other great scourges of micronutrient malnutrition are iodine and vitamin-A. Iodized salt has helped a great deal, and USAID has been actively involved in supplementation and fortification efforts to combat the terrible effects of Vitamin-A deficiency.

But unlike the case with iron, there is no genetic variability for putting pro-Vitamin-A, or beta-carotene, in rice. But fortunately, some forward looking minds in the Rockefeller Foundation, Switzerland and Germany set out to do just that. I'm sure you've heard about "Golden Rice" and its potential for helping our fight against blindness, infant mortality and other symptoms of severe Vitamin-A deficiency.

Well, like most good things, this takes hard work. But I'm glad to say that, with the help of funding from USAID and other supporters - most recently the Gates Foundation, a global public-private research partnership has created golden rice strains with more than 10 times as much beta-carotene as the first types.

The trick? The new Golden Rice uses maize genes, and it has a brilliant golden-orange color. This will make it a challenging thing to get people to eat, but we know that nutrition experts and social marketing can work wonders. We know, for example, that people in many parts of Africa are shifting from white to high beta-carotene, orange-fleshed sweet potatoes because they know they're good for them and their children. USAID-sponsored research in school feeding trials in South Africa that Vitamin-A levels improved when school lunches featured orange sweet potatoes.

I hope you can see why we at USAID are enthusiastic about biofortification. It's not a silver bullet, but it's sustainable over time – unlike other approaches, the nutrient comes in the harvest, year after year, and doesn't have to be added. It can also help us to reach some of the most vulnerable communities in remote areas, where health care is unavailable and there may not be supplements or fortified foods available.

And yes, it's a safety net – we want people to eat their vegetables and have greater access to meat and milk- we're putting science to work on that too. But the cold reality is that for millions of people, those foods will remain luxuries for some time to come.

As you have heard, my message has focused on the problem of under-nutrition. Increasingly, we face the terrible irony of countries where large numbers of people do not have access to adequate food, while others much higher up the income ladder suffer from the chronic diseases familiar to those of us accustomed to abundance.

WHO and the World Bank are examining the growing public health problem of nutrition-related non-communicable/chronic diseases such as diabetes, hypertension, cardiovascular disease and obesity. As we seek ways to mitigate both problems, we need to ensure that the most vulnerable group – the poor and hungry – are not inadvertently harmed by a focus on over-nutrition.

I am certain that many of those gathered here have already considered this dilemma. While we focus on those consuming too much fat or sugar, we must be mindful of their compatriots who are getting far from enough of those foods. Reconciling these two ends of the nutritional problem spectrum will be an important task, and I hope a major accomplishment during the coming decade.