

THE CIFSRF –HU/UOFS STORY

CAROL HENRY, ADDIS ABABA, 1 SEPTEMBER 2014

I'll begin by recognizing the members of the CIFSRF – Hawassa University – University of Saskatchewan team that are present here today. From HU, College of Agriculture, Project PI-Dr Sheleme Beyne, and the University of Saskatchewan, Dr Bob Tyler, Interim Executive Director, Global Institute of Food Security and the Department of Food and BioProducts, UofS.

In 1997, 2 soil scientist –HU & UFS came together to address soil micronutrient deficiencies in southern Ethiopia, today we have a strong partnership of a multidisciplinary team of scientists and graduate students –agriculture-soils, agronomists, food and bioproducts, nutritionists, social scientist, research organizations, government ministries working together from Canada & Ethiopia, led by Hawassa U and The UofS. Our story is one of change through the use of a pulse-centered strategy to improve the nutritional status and the livelihoods of small-holder farmers and their households in southern Ethiopia.

Micronutrient malnutrition is a major concern, particularly in developing countries such as Ethiopia, and much priority is given to addressing health concerns related to micronutrient deficiencies by the Government of Ethiopia and Ethiopian universities and research organizations. Child under-nutrition constitutes a daunting challenge in Ethiopia. Inadequate knowledge about appropriate foods and feeding practices is often a greater determinant of malnutrition than the lack of food.

Besides pulses crops or legumes, Ethiopia produces a variety of cereals (maize, tef, wheat, barley, sorghum, etc.) and root crops and tubers (cassava, potato, etc.). These, coupled with fruits and vegetables, make up a significant part of the Ethiopia diet. In southern Ethiopia, where this work was undertaken, the diet, especially in rural areas, is mainly starch-based. This results in a lack of diversity in the diet, which in turn is reflected in nutritional deficiencies of protein and micronutrients such as zinc and iron. Low zinc and iron in the diet is an issue, as it has been associated with several health concerns such as stunting (40%) in young children (Zn), growth retardation...

The collaborative initiative was a food-based, biofortification strategy which linked agriculture and nutrition by spanning the spectrum from improved pulse crop agronomy (with an emphasis on chickpea and bean and including Zn and Fe fertilization), isolation of superior Rhizobium strains (nitrogen-fixing bacterial), breeding of improved cultivars of chickpea and bean, seed production and distribution. **As well, improved seeds were used in the** development of familiar foods (injera, bread, infant foods, etc.) made from pulse-cereal complementary flours, and development of household-level processes (dehulling, soaking, germination, fermentation, etc.) to improve micronutrient (Zn and Fe) availability.

Incorporating existing pulses into cereal-based foods represented a substantial nutritional improvement. The use of household-level processes to improve Zn/Fe availability provided additional benefit, as did the use of pulses higher in Zn/Fe. So, the hierarchy was really incorporation of pulses into existing cereal-based foods, followed by design of household-level processing strategies to improve mineral availability, i.e. reduce phytate levels, followed by development, production and use of superior pulse varieties, i.e. pulses higher in Zn/Fe. Production of pulses higher in Zn/Fe also was achieved through agronomic practice, i.e. Foliar application of micronutrients. To make this work required lowering of the barriers to pulse production and consumption, in large part through education and extension, but would be aided by improved economics of pulse production through improved yields, i.e. Improved varieties and agronomics. Thus both agricultural and nutritional strategies were required.

In addition significant emphasis was placed on extension, community education and capacity building with respect to pulse production, nutrition, recipe formulation and product development, measurement of anti-nutritional factors, and assessment of nutritional status using anthropometric measures, 24 hr dietary recall and other measures.

Through the use of a variety of household-level food processing methods and the incorporation of bean and chickpea flours in cereal-based foods, we were able to improve the micronutrient profile of foods and introduce them into the diets of young children. These new foods were as well liked as those made from traditional ingredients and via traditional processes, and were higher in available Zn and Fe.

Importantly, nutrition education to mothers through community-based demonstration of recipes and preparation of the newly developed food products and follow-up has led to significant reductions in child wasting and undernutrition.

New market opportunities for farmers, initially at the community level, were explored and encouraged in this project. Farmers who initially provided food for household use only have begun to sell for income (25%). One female farmer told me that she is still able to sell while feeding her household.

Building on the success of previously funded CIFSRF projects best practices for chickpea production within the region, was adopted and validated, looking particularly at strategies and systems for scaling-up

A broad multi-stakeholder platform has been established for the adoption of chickpeas in the southern highlands of Ethiopia;

Our story is also one of building capacity. An important component of the project was increasing the capacity for nutrition extension education through the professional development of extension personnel and the training of graduate students. The project has trained 90 graduate students in agriculture, food science and which benefitted both universities.

To sum up – a farm-to-fork (field-to-fingers) strategy has identified barriers to pulse crop production and consumption, improved bean and chickpea yields, identified improved agronomic practices, created improved bean and chickpea varieties, improved the nutritional status of children through the formulation and preparation of pulse-cereal foods with superior nutrient availability, and provided nutrition education to a large audience. Our aim is to connect our work to similar and complementary efforts of others in the public and private sectors, to spread the word by taking the new technologies and practices to a larger group of farmers and their households, to support the creation of new market opportunities for farmers through commercial production of pulse-cereal foods, and to disseminate the lessons learned to more districts in Ethiopia and beyond.

1- Capacity building,

1- Project began in 1997 as soils-soils, to today university-university and community partnership.

- 1997- 2-soil scientist – focus- incl. curriculum dev MSc & later PhD
- 2004- College of Pharmacy and Nutrition- focus curriculum support MAHN program, research supervision-faculty-mentorship & graduate students

Training and Development –graduate students, junior researchers/mentorship, learning from the field

–extension workers

Partnership building- agriculture, nutritionists, social science, community organizations, extension workers, government and research organization, multi-stakeholder platform.

Focusing on gender (men, women & children) - emphasis on female farmers (10%), female graduate students, workshops, participatory seed selection, joint training in agriculture/nutrition