

Cooking with traditional crops improves nutrition and boosts women's incomes

May 9 2013



Pearl millet (*Pennisetum glaucum*). Credit: aaronforest/Flickr

It's no secret that traditional crops such as millets and pulses are highly nutritious. Now researchers, working with women in Ethiopia and India are making it easier for them to use these local crops when cooking healthy meals at home and creating new business ventures.

The opportunity: Nutritional traditional crops

Poverty and malnutrition are serious food security challenges in both countries, particularly among women and children living in rural communities. Millets in India and pulses in Ethiopia were dietary [staples](#) before crops like corn, rice, and wheat became more popular. Two projects, supported by the Canadian International Food Security Research Fund (CIFSRF) are generating renewed interest in these highly nutritious crops. As a result, they are adding protein, fibre, and vital [micronutrients](#) to rural diets—and creating a new source of income for women entrepreneurs.

India: Less work and healthier meals

A survey of 310 families in India's Karnataka state determined that the majority of surveyed families were aware of the nutrition and health benefits of eating millets. Yet, not everyone consumed them on a regular basis, mainly because processing millets is difficult and buying them can be expensive. For some communities it's cultural—millets tend to be eaten only on special occasions.

"People may know millets are healthy, but too many are not eating them as part of their staple diet," says lead researcher Nirmala Yenagi, a [food scientist](#) at India's University of Agricultural Sciences, Dharwad, who is collaborating with researchers at the M.S. Swaminathan Research Foundation in India and McGill University in Canada.

A labour-saving machine and education

Education and low-tech solutions are helping to overcome these challenges.

Women first needed a reliable supply of cleaned millets and flour. Researchers from Canada and India designed and delivered an easy-to-use and affordable grain mill that automates the process of separating the hull from the millet seed, and installed flour mills in three villages (Timmapur, Jekinkatti, and Manthrodi). Production lines were then established with women's self-help groups for preparing millet snacks, drinks, and other products for sale and eating at home.

Second, researchers used the data from the survey to develop nutrition education programs. When they tested the programs with 870 school children, 426 women and 67 men, they found that nutritional knowledge had increased between 3 and 14% among children and 7 and 8% among women. Most importantly, consumption had increased nearly 16%.

Recipes that taste good also helped. Of the 15 recipes developed by local women and tested with women farm labourers and adolescent girls, the majority scored above 90% for acceptability, with four ranked between 80 and 90%.

Next, 157 women from 14 villages learned how to incorporate these recipes into traditional family meals, and how to package, label, price, and market millet products.

Initially, each woman produced just over 40 kilograms of papadums (a crisp Indian flatbread) and other value-added millet products in one month. By March 2012, per-person production increased to about 100 kilograms, generating a net monthly profit of about 1055 rupees (CA\$19) for each woman.

The project ensured the nutritional benefits of these new products extended to the women's families as well. Each woman was required to set aside 100 grams of every ragi malt batch (which scored 100% on the acceptability scale with adolescent girls) and other millet products for

home consumption. It worked: the amount of millet in the children's diets increased 10%.

Coming soon to the school menu

Given the health benefits and high acceptance of these new recipes, researchers are working with local stakeholders in the village of Timmapur to include some products in school feeding programs. "We are proposing that locally grown millets be used, and that women's self-help groups prepare and sell the food. We would like to see it become a staple in the school diet," says Yenagi.

To date, nutritional education programs have been developed and delivered to 870 schoolchildren in 15 villages. The goal is to scale up these successes in other regions of India and South Asia.

Promising pulses in Ethiopia

A similar healthy-eating effort is underway in Ethiopia, where about 52% of the country's rural population fails to meet minimum consumption requirements for calories.

Researchers at the University of Saskatchewan and Hawassa University are studying how education can increase consumption of pulses, including chickpeas, broad beans, and lentils. They are focusing particularly on the consumption patterns of the most vulnerable: children under five, adolescent girls, and adult females. Studies found a lack of awareness among women of the nutritional value of pulses, and the need to incorporate this high-protein, high-iron crop in everyday meals.

"The main staple of the Ethiopian diet is teff (a local cereal grain). People would rather eat that alone than add a little protein, like lentils.

Part of our project is showing them the nutritional value of protein combinations. We are also trying to overcome the perception of pulse as 'poor man's food'," says investigator Carol Henry, with the University of Saskatchewan's College of Pharmacy and Nutrition.

Nutritious and tasty

A big win for the research team was developing recipes and food preparation methods that maximized nutritional benefits—without sacrificing taste.

In one experiment, food scientists tested four versions of porridge, one with no broad beans and three made with between 10 and 30% of the pulse. Preschool children and mothers in one South Ethiopian community said they liked porridge enriched with broad beans more, or as much, as porridge without them. A program is being developed to make this porridge available in more communities.

"If we teach children the benefits of complementary feeding, they would have a better practice going forward," says Henry. "It's difficult to change adult behaviours, but children growing up will view pulses as a natural part of their diet."

Data collected on socio-economic status, gender responsibilities, and diet diversity provided the foundation for a university graduate course in community nutrition (taken by 30 health professionals so far). In "train the trainer" workshops, more than 50 male and female farmers, along with health extension workers and district agents, learned about pulse crop production, nutrition, food combinations, and commonly consumed dishes.

Data collected from the various studies will be used over the coming year to develop nutritional educational packages for women in their

communities.

Provided by International Development Research Centre (IDRC)

Citation: Cooking with traditional crops improves nutrition and boosts women's incomes (2013, May 9) retrieved 27 April 2024 from <https://medicalxpress.com/news/2013-05-cooking-traditional-crops-nutrition-boosts.html>

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