

## Rice rivalry

From paddy fields in China to the dusty plains of the Sahel in Africa, rice is a staple food in high demand throughout the world. But for many small-scale farmers meeting quality standards remains a challenge. Despite the fact that rice forms a major part of the local diet in Ghana only 33 per cent of rice sold is produced locally. Sixty per cent of the country's rice is grown in the north but dry conditions result in brittle and broken rice grains. Dr John Manful, at the Food Research Institute (FRI) based in Accra, has been developing improved technology, with one clear goal in mind. "What we need to do for our local farmers is to help them improve the quality of the locally produced rice, so that they can compete effectively on the local market."

### Demand for rice

Rice processing is one of several major income earners for Ghanaian women. Rural women in the north typically process rice grains using a technique known as parboiling, which literally involves partially boiling the grain. The rice is usually parboiled in batches of 40 kilograms in a cooking pot over an open fire. But the process is rudimentary and involves hard, laborious work, often resulting in broken and weak rice grains. Brittle rice is broken when it is milled, and broken rice sells at a lower price than local whole, or it is sold for less per kilogram than uniform imported grains.

The traditional process of parboiling itself is beneficial, strengthening the grains before they go through other processes - like milling. During parboiling, starch in the rice produces gelatine, which seals cracks, mending and strengthening the grain. Usually, the bran containing vitamins and minerals is polished off during the milling process. But parboiling allows soluble vitamins and minerals from the bran to penetrate and remain in the grain thus enhancing the nutritional content. Another advantage is that parboiling gives the rice a more uniform colour, and improves its flavour.

### Vast improvements



Draining the water from the rice vessel, leaving some for the steaming process  
credit: John Manful



The women open the vessel to check whether the steaming process is complete.  
credit: John Manful

Improved parboiling techniques developed by FRI were sent to three locations in the north of Ghana, where they were compared to traditional methods. Improved vessels were introduced capable of parboiling up to 100 kilograms of rice grain, instead of 40 kilograms using traditional pots. The amount of fuel needed, and the time involved in processing were thus reduced by 50 per cent. According to the women involved in testing the improved methods, the quality of rice is considered better, and has a "shinier" finish after milling.

The improved aluminium vessels have an upper and lower chamber. One hundred kilograms of washed rice grain is placed in the upper chamber of the vessel and heated over an open wood fire. However, instead of being transferred to other pots as in the traditional process, the hot and soaked grain is left in the vessel to cool overnight. In the morning, the water is drained through a pipe with a tap at the bottom, retaining 12 litres of water, which is then turned to steam. The steam passes through a piece of wire mesh for 10 to 15 minutes. The rice grains are then scooped out and spread onto cement to dry before being packed into sacks and sent to the mill.

### **What the processors say**

According to the women who tested the vessels, rice is sold faster at the market. However, they have suggested improvements such as increasing the thickness of the vessel walls from 1.5 mm to 2 mm. The tap for draining water has also been strengthened, and the lid has been made from cheaper material. But there are still concerns over the cost of the technology. At US\$300 per vessel, it has to be questioned as to whether processors will earn enough money parboiling rice to meet the cost of this equipment. Research evaluation studies suggest that meeting this cost depends upon producing and selling a bag of rice per day - something which researchers themselves recognise as a big assumption, especially as processors have other priorities.

Ghana's Ministry of Food and Agriculture (MOFA) and the International Fund for Agricultural Development (IFAD) jointly fund a loan scheme which is aimed at funding small-scale farmers in the north of Ghana. The scheme known as the Land Conservation and Small-holder Rehabilitation Project - LACROSREP - offers loans at the rate of 30 per cent over a period of one to three years. Currently, 40 interested rice parboilers have registered under the loan scheme to enable them to purchase the vessel. Securing credit is certainly a major problem for many small-scale farmers, but Dr Manful remains optimistic. He insists that there is hope that the cost of this parboiling technology can be reduced in future. "In time," he says "the quality of local rice will be such that it will be able to compete more favourably with imported rice in Ghana.

For further information see [DFID CPHP website](#)