Testing the Demand for Sorghum Meal in Tanzania: a Case Study with Power Foods

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Sorghum is the second most important cereal in the Tanzanian economy. The country's farmers annually produce over 600,000 t, enough to supply 30 kg of grain to every consumer in the country. Yet virtually all of this is consumed on the farms where it is produced.

The importance of sorghum as a national food security crop contrasts sharply with the lack of commercial marketing and utilization. During a reconnaissance survey conducted in 1999 (Rohrbach and Kiriwaggulu 1999), we estimated that less than 40 t of sorghum is being commercially milled for sale as meal each year. This compares with an estimated annual commercial milling of over 300,000 t of maize meal.

Millers expressed skepticism about the levels of commercial demand for sorghum meal. They argued that urban consumers, in particular, prefer maize, rice or wheat based food products. However, this perception contrasts with the experiences of countries like Botswana where 60,000 t sorghum meal is sold each year (50 kg per capita), and in South Africa where at least 15,000 t sorghum meal are sold each year. In particular we would expect that people migrating to urban areas from sorghum growing regions of the country would maintain a taste preference for sorghum meal.

One clue to the lack of sorghum meal demand, obtained during the 1999 reconnaissance study, was the high relative price of sorghum meal. In mid-1999, sorghum meal was selling in the Dar es Salaam at three to four times the retail price of maize meal. In effect, sorghum meal only represented a specialty food product.

Yet the justification for this price premium was difficult to establish. While sorghum prices in Tanzania's wholesale markets fluctuate sharply from year to year, these are commonly similar to the price of maize grain. In Dodoma, a major sorghum producing region, sorghum prices tend to be less than those for maize.

The two millers found to be processing small quantities of sorghum complained about the difficulty of grain processing. In particular, sorghum grain found in the wholesale market tends to be contaminated with sand and stones that can only be cleaned through a laborious process of grain washing. In addition, sorghum needs to be dehulled before it is ground into flour. Finally, milling throughput is reduced by the variability of grain quality associated with mixtures of varieties, and poor grain storage conditions in the market.

However, none of these factors fully explain the limited commercial milling of sorghum, and limited sale of sorghum meal. Grain quality can be improved by communication about grain standards. Grain processing can be improved with the purchase of grain cleaners. While questions remain about the levels and determinants of consumer demand, it is reasonable to target sorghum meal sales at minimum rates of one to five percent of the level of maize meal sales. This would increase sorghum sales from about 40 t per year to at least 3,000 t per year.

Response

In view of this potential, a pilot project was established to test the demand for sorghum meal in the Dar es Salaam market. This pilot project tested the assumptions that if sorghum meal is priced more competitively with maize meal, and if the quality of the milled product is found to be acceptable, the market for sorghum meal will grow. Project components were designed to examine consumer preferences for sorghum meal, consumer preferences for alternative sorts of packaging, and the sensitivity of consumer demand to retail price discounts.

The evaluation of consumer preferences was conducted through sensory taste panels outside the market, as well as through surveys of consumers purchasing sorghum meal in the market. Assessment of market demand for sorghum meal was pursued through testing for consumer interest in alternative types and sizes of packaging, and by reducing the price of sorghum meal to a level closer to the retail costs of maize meal. The latter experiment included a review of the costs of sorghum meal production.

In order to assess the commercial viability of the market for sorghum meal, the pilot project was led by a small private miller in Dar es Salaam - Power Foods. This miller had previously experimented with sorghum meal production. However, when the pilot study was initiated, the company's sales of sorghum meal were negligible—less than 2 t per year. Backstop support was provided by the Sokoine University of Agriculture (SUA), the Tanzania Food and Nutrition Centre (TFNC), the Ministry of Agriculture and Cooperatives (MAC), and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

Results

Over the period of the pilot project more than 30 t of sorghum meal were sold by Power Foods. A major factor explaining this expansion of sales was the reduction of sorghum meal prices. The average wholesale price declined by 50%. The average retail price of sorghum meal sold by Power Foods similarly declined.

However, sorghum meal still costs 50 to 100% more than the price of maize meal. This is largely the result of higher grain processing costs - particularly for grain cleaning and dehulling. The mechanization of these operations with appropriate equipment should significantly improve the efficiency of grain processing. Sorghum meal may then be sold at prices equal to or lower than for maize meal.

Most of the consumers buying sorghum meal were purchasing this product for the first time. This implies a need for continuing promotion to introduce new buyers to the product.

The results of sensory taste tests suggest a strong preference for whiter sorghum meal. This can be assured by purchasing grain from the modern varieties (like Macia and Pato) now commonly grown in the Dodoma region. As a result of seed production programs, these varieties are also spreading across other parts of the country. The sensory profile suggests a continuing preference for maize meal compared to sorghum, though the strength of this preference is not strong. Further analysis may be needed to test the preferences of households that have historically consumed this crop.

The retail surveys indicated a preference for clear, plastic packaging, as opposed to opaque, paper packaging by the majority of consumers. Buyers want to see the color and quality of the grain meal. Plastic packages are also perceived to be more robust than paper. However, there is also a demand for more attractive and informative packaging. The latter could include nutritional information and a recipe.

In sum, the national market for sorghum meal is in the early stages of development. Demand is growing. But the market may take many years to establish. The volume of sales is still too low to attract larger investments in improved grain processing technologies. And the opportunity to pursue such investments is limited by credit constraints and high interest costs. In an effort to resolve these constraints, ICRISAT and Power Foods are exploring the opportunity to sell sorghum meal through school feeding programs.

Reference

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Breeding for Drought Tolerance in Sorghum in South Africa

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Drought stress is the major constraint in the production of sorghum. Of all grain crops, sorghum (*Sorghum bicolor*) and millets (*Pennisetum glaucum*) require the least amount of moisture for development. Drought tolerance is the degree to which a cultivar or crop can maintain production under increasing drought stress. The most drought tolerant cultivar or crop is therefore least responsive to improved moisture conditions. This means, that on average, sorghum will not have the same yield potential as that of maize. A drought tolerant cultivar increases yield stability by reducing crop failure during droughts and limiting overproduction during high rainfall seasons as experienced during the 1999/2000 season in South Africa.

Table 1. Drought tolerance of sorghum varieties and inbred lines, Potchefstroom, South Africa, 1999/2000.

Degree of drought tolerance		
High (up to 15% loss under stress)	Intermediate (16 to 44% loss)	Low (45 to 76% loss)
RSA* 498	RSA 1222	VSA 967
RSA 1110	RSA 1225	RSA 1486
A/BSA 1288	RSA 1488	RSA 2516
A/BSA 2465	A/BSA 2447	A/BSA 2845
A/BSA 2861	BSA 3101	A/BSA 2849
SA 3006	SA 3105	A/BSA 2894
VSA 3716	VSA 3699	A/BSA 2896
VSA 3728	VSA 3737	VSA 3744
RSA 4114	RSA 3984	SA 3802
VSA 4158	VSA 4159	VSA 4170
RSA 4206	VSA 4162	VSA 4173
A/BSA 4293	VSA 4166	VSA 4175
A/BSA 4305	RSA 4201	VSA 4179
	A/BSA 4301	VSA 4258
	A/BSA 4322	VSA 4368
		VSA 4396

* RSA = R-line; BSA - B-line; A/BSA = A/B-line; VSA = variety; SA = unknown fertility reaction.