



Starch market adds value to cassava

Cassava-producing countries should convert more of this relatively low-cost raw material into high-value starch for domestic and international markets

Each year, an estimated 60 million tonnes of starch are extracted from a wide range of cereal, root and tuber crops for use in a staggering variety of products: as stabilizers in soups and frozen food, as coating on pills and paper, as adhesives on stamps and plywood, as a stiffening agent in textiles, as raw material for making ethanol, and even as binder in concrete. Around 10% of that starch comes from cassava roots, a crop better known as the staple food of millions of low-income rural people in Africa, Asia and Latin America.

With world cassava root production now standing at some 200 million tonnes a year, FAO says many developing countries could strengthen their rural economies - and boost cassava farmers' incomes - by converting more of that relatively low-cost raw material into high-value starches. "Cassava makes a really excellent starch," says Danilo Mejía, an agricultural engineer with FAO's Agricultural Support Systems Division. "Compared to starches derived from most other plants, it has greater clarity and viscosity, and it's very stable in acidic food products. It also has excellent properties for use in non-food products, such as pharmaceuticals and thermobioplastics."

Highly competitive. As a crop, cassava already has advantages in production, such as high yields per hectare, tolerance to drought and degraded soils, and great flexibility in planting and harvesting. As a source of starch, it is highly competitive: the root contains more starch, by dry weight, than almost any other food crop, and the starch is easy to extract using simple technologies. Export prices - currently around \$225 a tonne for superfine cassava starch from Thailand - are consistently lower than those of potato, maize and wheat starch produced in the European Union and the USA.

The Global Cassava Development Strategy - an initiative facilitated by IFAD and FAO - recognizes the importance of processing fresh roots to produce secondary products, such as starch, within a market-driven, commodity chain



approach. However, while global demand for cassava starch has increased over the past 25 years, only in Thailand has cassava made the transition from a staple food to products and raw materials for the processing industry.

Outside of Nigeria and South Africa, the starch extraction industry is virtually non-existent in Africa, which produces more than 100 million tonnes of roots a year. "In most countries of tropical Africa, cassava root is a basic staple, an important reserve in case of failure of other food crops, and increasingly a cash crop for the urban market," says NeBambi Lutaladio, a roots-and-tubers specialist with FAO's Crops and Grassland Service. "Government policies are not geared toward promoting cassava starch production, even though several countries import starches that could be produced locally from cassava.

"In addition, there is no established tradition of value-added public research and development, and the private sector is reluctant to invest in research to improve cassava starch technology because of the lack of patent protection." In countries where some starch extraction is carried out, inadequate transport, power shortages and the lack of trained personnel have made production inefficient and uncompetitive globally. Lutaladio says a viable starch extraction industry in Africa "cannot depend solely on

small-scale producers. It requires organized contract farming and large-scale plantations using high-yielding varieties, post-harvest technologies capable of processing large quantities of raw material and a solid knowledge of the commodity chain."

In Latin America and the Caribbean, the cassava starch business is expanding, with a marked trend towards production of modified and hydrolysed starches that command higher prices. However, starch extraction accounts for a very small part of total cassava production. From 60 to 70 percent of the region's total cassava root output, estimated at some 40 million tonnes a year, is destined for traditional foodstuffs, and the region contributes only about 4% to the global cassava starch supply (and produces far more maize starch).

Most cassava starch is processed in small and medium-sized, community-level factories using labour-intensive, traditional techniques, although some large-scale modern processing plants are now operating in Brazil, Colombia and Venezuela. While FAO sees "a range of opportunities that should be pursued in starch processing" in the region, it lists a number of important constraints on the industry, including highly irregular supply and the uneven quality of end products.

Thai example. The key to cassava's future in global and domestic starch markets, FAO says, will be improvements in efficiency and quality, and a reduction in production costs. For a model of successful cassava starch industry development, African and Latin American countries need look no further than Thailand, the world's No. 1 producer. The Thai industry began more than 50 years ago, and expanded rapidly during the 1990s, when trade restrictions sharply reduced the European market for Thai dried cassava chips, used as animal feed.

The centrepiece of a government programme to promote cassava starch was the introduction of higher-yielding cassava varieties, developed from crosses between local and Latin American germplasm. By 1996, the improved cassava had spread to about 380,000 ha, or nearly a third of the country's cassava area, and currently produces up to 20 tonnes of roots per hectare. Thailand now uses about 50 percent of its annual

cassava root production, of around 18 million tonnes, to extract some two million tonnes of starch. Half of it is destined for domestic food and non-food industries, the rest being exported, mainly to Japan and Taiwan, and increasingly in the form of higher-value modified starch for specialized applications. The country is also exploring a promising new market for its starch - as raw material for production of ethanol used as a biofuel. The leading Thai petroleum company has announced a feasibility study for a plant that would use cassava to produce one million litres of ethanol per day.

"Thailand has demonstrated what can be achieved by taking advantage of inexpensive labour, low transport costs and efficient marketing of products," says FAO's NeBambi Lutaladio. "If more countries regarded cassava as a strategic and staple product for industry, it would favour the development of their food, agricultural and industrial sectors, as well as contributing to rural and urban employment."

FAO recommends that fledgling cassava starch industries concentrate initially on meeting domestic demand - a study of global cassava markets found that tropical countries were importing annually maize starch and derivatives to a value of more than \$80 million. In many countries, the study found, almost all imports could be replaced with locally-made cassava starch or, for simple application, even by good-quality cassava flour.

In Africa, there are signs of growing interest in using locally-made cassava starch as an import substitute. Cassava starch start-ups have recently been established in Uganda, Tanzania, and Madagascar, while in Malawi industries have shown interest in buying local cassava starch for use in paper, cardboard, sweets and food processing. Meanwhile, the region's leading cassava producer, Nigeria, has recently announced an ambitious programme aimed at producing ethanol biofuel from cassava.

"Market opportunities for native cassava starch," says NeBambi Lutaladio, "exist to some extent in all tropical countries with a degree of industrialization. However, potential entrants to this market will only succeed if they have sufficient capital to back the venture, and can deliver reliable supplies of starch that meet the users' specifications at a competitive price."

Agriculture, Biosecurity, Nutrition and Consumer Protection Department,
Food and Agriculture Organization of the United Nations

Viale delle Terme di Caracalla, 00100 Rome, Italy · Web: www.fao.org/ag · email: ag21@fao.org
