

The use of bitter cassava in Northwestern Amazon

Darna L. Dufour

Native Amazonians have traditionally cultivated both bitter and sweet cassava varieties. Sweet varieties have enjoyed a wider geographical distribution, but in certain areas, such as the Northwest Amazon, there has been and continues to be a strong cultural preference for the more bitter varieties.

Research carried out at Yapú in the Colombian Vaupés indicates that the Tukanoan Indians of the Tatuyo group cultivate over 30 cassava varieties, of which the bitter far outnumber the sweet. Bitter cassava is the dietary staple, providing about 80% of the total food energy. The remainder of the energy in the diet is obtained from other crops including sweet cassava, and from wild plants and animal foods, game, fish, and several insects, which provide 6% of the protein consumed.

Processing of bitter cassava and cassava products among the Tukanoans

The Tukanoan technique for processing bitter cassava roots is elaborate and no doubt very old. The technique decreases the level of toxicity due to hydrocyanic acid and improves its storage characteristics, as well as providing the raw materials for a variety of foods (Figure 1).

Processing separates the roots into its components: liquids, starch, and fiber. This is accomplished by grating and straining. The process involves several steps (Figure 2). The freshly harvested roots are first peeled by scraping to remove the outermost layer of bark-like peel, but leaving much of the inner layer intact. After they are washed, they are grated on a wooden grating board set with small sharp quartz stones (Figure 3).

The resulting wet pulp is placed in a large basket strainer set on a tripod,

INSTITUTO SOCIOAMBIENTAL
data 15 / 01 / 99
cod. TKD 00038



Figure 1. To eliminate HCN from bitter cassava the Tukanoan Indians perform a tedious task every day. The photos for this article were taken at CIAT where Hortensia Gómez, a Tukanoan, was present.

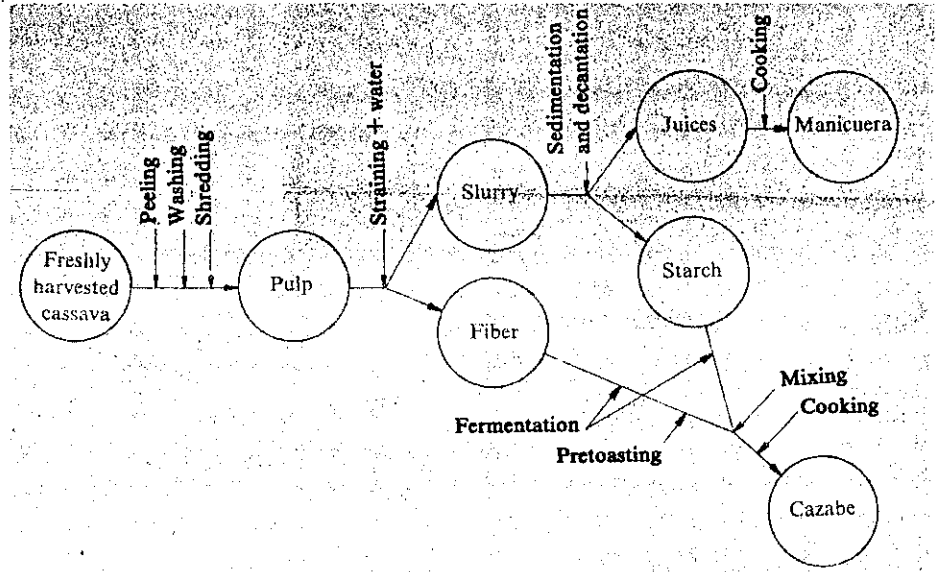


Figure 2. Process used by the Tukanoan Indians in Yapú, Vaupés (Colombia) for preparing bitter cassava and cazabe.



Figure 3. Shredding of the root is a basic step in the bitter cassava processing; women do it daily.



Figure 4. Straining of the pulp on a strong sieve that men weave from palm.



Figure 5. After one or several days of fermentation, the fiber is squeezed in a matafrío o tipiti; it is then milled, toasted, and mixed with starch to make the cazabe.



Figure 6. On a clay griddle (at CIAT a metallic one was used) the indians shape and bake the cazabe.

rinsed with water, squeezed, kneaded, and pressed against the strainer to squeeze out the liquids (Figure 4).

The extracted liquids, which carry the starch in suspension, are collected under the strainer in a large clay pot. The starch is allowed to settle and the liquids are later decanted off the top to make juice.

Once separated, the starch and fiber are relatively stable and can be left in pots or leaf-lined baskets for several days or more. Under these storage conditions they ferment slightly, and it is in this form, rather than fresh, that they are used. Surpluses of starch and fiber

which need to be stored for longer periods are usually buried in leaf-lined pits with the fiber covering the starch to prevent surface deterioration. The author observed products stored this way for more than a month.

The raw cassava juice is also used as food though it is a very unstable product and very toxic. Immediately after decantation it has to be boiled to evaporate the hydrocyanic acid.

Cassava-based staples

The most important foods of the Tukanoan are made from cassava starch, fiber, and juice. They are: bread

(cazabe), boiled juice (manicuera), and different starch-thickened drinks (mingao).

Cazabe. Most of the fermented starch and fiber produced in processing are used to prepare cassava bread. Cazabe can be prepared in a number of ways, but in the Vaupés one form is characteristic: a thick soft bread made by recombining the fermented fiber and starch for 2 or 3 days. To make this type of bread the fiber is first squeezed in a matafrío or tipiti to reduce its moisture content (Figure 5) and then lightly toasted. This pretoasted fiber is mixed with moist starch and baked on a clay griddle in the form of a large round bread (Figure 6).

Cazabe is made daily. Although it can be stored, it is not customary to do so.

Manicuera. Boiled cassava juice is a slightly sweet drink known as manicuera that is served late in the afternoon or early evening; when it is not consumed it is discarded the next day.

Mingao. This is another drink, which is usually served at meals when manicuera is not available. Mingao is prepared by dissolving some of the fermented starch in boiling water and cooking it until thickened. It is a bland tasting beverage which is often flavored with palm fruits, pineapple, bananas, or lemon.

Fariña. When a carbohydrate source with good storage characteristics is needed, fariña is used. Fariña, a dry cassava meal (about 10% moisture), is a light weight, concentrated source of calories which can be stored almost indefinitely.

It is prepared when needed from yellow varieties of bitter cassava which have been soaked in water for two or three days, then peeled and grated. The resulting mash is mixed with grated fresh roots, allowed to ferment for at least several days, and preferably several weeks, and then toasted.

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General observations

The processing and cooking techniques developed by Tukanoans are used to produce a variety of foods from bitter cassava. The efficacy of the processing techniques used in reducing the level of toxicity in bitter cassava is not known with any degree of certainty, but preliminary studies carried out suggest that they are very efficient.

The nutritional status of Tukanoans is generally good (Table 1) and there do not appear to be any problems, nutritional or otherwise, associated with their high reliance on bitter cassava.

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Table 1. Sources of food energy consumed in four Tukanoan households, according to a survey carried out in November 1978¹.

Source ²	Percentage of total energy per household				Mean
	I	II	III	IV	
Bitter cassava	86	72	92	83	83
Other crops ³	2	8	3	7	5
Wild plants	1	1	1	1	1
Fish	4	18	3	5	8
Game	0	0	1	3	1
Insects	7	1	0	0	2
TOTAL	100	100	100	100	100

1. Household food consumption was determined using a modified larder method.
2. Data were collected at the beginning of the principal dry season when both wild plants and insects are of limited importance.
3. Includes sweet cassava which, like other root crops, is used principally in the preparation of cassava beer (chicha). □