



# Sorghum Flour in the El Salvador Baking Industry



**INTSORMIL**

**Sorghum flour is a locally grown salvadoreña product with good flavor, low price and high in nutritional value providing dietary essentials such as protein, Ca, K and Mg**



**Because of the price and quality of sorghum flour it is accepted by small bakeries as a partial substitute for wheat flour**



The El Salvador baking industry is dependent on imported wheat which results in a loss of valuable foreign exchange. In response, CENTA (Centro Nacional de Tecnología Agropecuaria y Forestal) scientists with support from INTSORMIL have produced sorghum varieties which have the physical and chemical qualities making them suitable for flour which can be used as a partial substitute for wheat flour in the baking industry, thus decreasing the cost of baked goods. CENTA food technician, Fidelia Herrera pioneered the use of sorghum flour in El Salvador and began helping village bakers utilize sorghum flour back in the 70's.

To test the market demand for sorghum flour, the CENTA is collaborating with Agroindustrial GUMARSAL, a large flour (wheat, rice, maize and sorghum) milling company, in a study entitled "Acceptance and Utilization of Sorghum Flour as a Substitute for Wheat in the Baking Industry." The information obtained in this



René Clará Valencia, CENTA sorghum breeder examining a grinding wheel specially made for milling sorghum flour. The RCV variety of sorghum, bred by René and named in his honor by the ex-president of El Salvador, Lic. Alfredo Cristiani, is ideal for producing sorghum flour.



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René Clará Valencia, CENTA sorghum breeder (L) in left photo discussing the sorghum flour project with Lic. Wilfredo Guerra, General Manager, GUMARSAL Mills (R). GUMARSAL employee bagging flour in right photo.

Clemencia Barrerera, village baker (above) uses sorghum flour as a partial substitute for wheat in baking. Small scale sorghum farmer at an agricultural fair in the city park, Turín, Ahuachapán (R).

study will be used to develop a strategy to promote the use of sorghum flour by bakers.

GUMARSAL milled the sorghum flour from grain of CENTA developed sorghum varieties and prepared small packets (see photo below) for testing by bakeries and consumers in the Santa Tecla area. CENTA economist Gilberto Sandoval and food technologists Vilma Calderon and Margarita Alvarado interviewed the bakers to determine their acceptance and utilization of sorghum flour in their bakery as a partial substitute for wheat. The study indicated that:

- Most (83%) bakeries found the sorghum flour to be suitable as a partial substitute for wheat and that sorghum flour had acceptable color and texture.
- The range of sorghum flour used in the wheat/sorghum mixture ranged from 20-100% depending on the product.
- Bakers are willing to pay US\$ 0.12 to 0.20 per lb of sorghum flour and are now paying US\$ 0.16 for sorghum flour and US\$ 0.21 per lb for wheat.
- Sorghum flour can be used for most of the same baked products for which wheat is currently used.

What factors keep sorghum from being used by a greater extent by bakers? Primarily the strong competition from wheat because wheat imports are subsidized by the government thus decreasing the price, bakeries are historically accustomed to baking with wheat and the wheat oligopoly does not promote use of sorghum flour in baking.

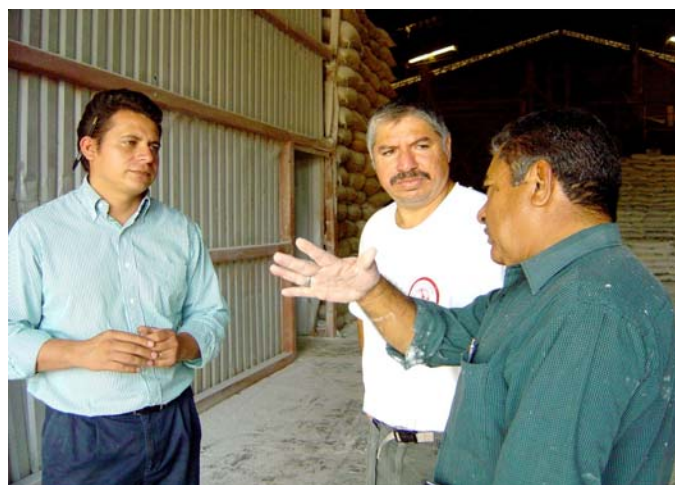
What can be done to decrease the costs of sorghum flour and thus encourage its use?

- Increase sorghum production efficiency through the development of higher yielding and higher food quality sorghum varieties and by decreasing production costs
- Eliminate the middle man between millers and bakers
- Increase milling efficiency by milling larger quantities

Increasing the market for sorghum grain through the promotion of sorghum flour in the baking industry will help the El Salvador economy by saving foreign exchange and increasing the income of small-scale sorghum farmers. These are farmers who are still recuperating from the devastating effects of hurricane Mitch and the two earthquakes in 2001.



Bag of sorghum flour milled by Agroindustrias GUMARSAL for testing by El Salvador bakeries. Label information indicates that for more information on the use of sorghum flour in baking refer to the attached bulletin or call CENTA.



René Clará Valencia, CENTA sorghum breeder (R), Gilberto Sandoval CENTA economist (C) and Agroindustrias GUMARSAL employee (L) discussing the study on the acceptance and utilization of sorghum flour as a partial substitute for wheat flour in the El Salvador baking industry.

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