

# NEWS

## Enriching Children's Lives, One Meal at a Time\*

The workers at David Técotl Crisóstomo's tortilla mill in Mexico City begin grinding lime-steeped corn and rolling out dough (*masa*) at 6 a.m. They typically make tortillas in several short morning production runs and sporadically throughout the afternoon as demand rises and falls in the immediate neighborhood. Customers walk up to the mill's sales counter with their own colorful cloths (*servilletas*) to wrap small stacks of the freshly made tortillas, carrying them home for meals based on beans and rice. Similar scenes take place every day throughout Mexico, where more than half of tortilla production is centered in small neighborhood *masa* mills (*molinos de nixtamal*) like David's. But the products customers take home from that mill – and from another like it in Guadalajara, run by Lorenzo Vital Pineda – are something special. They are changing children's lives one meal at a time, in ways the kids don't notice, their mothers appreciate, and the mill owners and workers take real pride in. What makes them so special?

As popular and wholesome as the tortillas rolled out at these two mills were a year ago, they're even better for families today, fortified with essential vitamins and minerals that support childhood growth and development, protect against disease



and build stamina for work and learning. David was one of the first in the audience to approach Mike Dunn after the Brigham Young University food scientist (a SUSTAIN research partner) delivered the 2004 keynote speech to a corn products association in Mexico City. An active member and future president of the group, David had listened intently as Mike broached the idea of blending a premix of micronutrients into wet milled masa to create a value-added product.

"He was on board from the start," Mike recalls, "grasping the potential benefits for his own and neighborhood children of fortifying his product with micronutrients often lacking in the Mexican diet". As an engineer, David was also frankly curious about how it could be done. He agreed to host production trials in one of the mills he owns and visits daily in Mexico City. There was a hitch, though—equipment suitable for fortifying wet dough in a small mill environment had yet to be found or developed.

Mike had only recently learned of the tortilla fortification idea himself, recruited to the cause by SUSTAIN, a U.S. based non-profit that brings innovative food technology to bear on nutritional challenges in developing countries. Like David and Lorenzo, he would become a key player in SUSTAIN's initiative to deliver critical micronutrients to Mexicans in their most beloved and popular food. From his lab, where the fortification process was first developed and tested on a small scale, and on frequent trips to Mexico with SUSTAIN team members to scope out potential equipment suppliers and meet with millers and public health officials, he helped set the wheels in motion for two millers to make history – producing the country's first commercially available fortified tortillas directly from freshly ground masa.

There was no shortage of obstacles along the way. Most off-the-shelf



dosifiers were made for the fortification of flours produced in large continuous production processes—including the corn masa flour used to make the balance (estimated at 40-50%) of Mexico's commercially sold tortillas. Flour fortification is technically feasible but, for now, voluntary; even if all producers of corn masa flour were to fortify their product, the majority of tortillas sold commercially in Mexico would remain unfortified because the fresh masa millers, whose product comprises the bulk of tortillas consumed, have had no means of adding vitamins and minerals to their dough. Liz Turner, SUSTAIN's executive director explains, "We started this project working with corn masa flour producers, sponsoring research to help develop effective fortification systems. But after progress stalled, due principally to concerns about the potential for fortification to apply only to half the tortilla market, we shifted our focus to the development of fortification technology for the fresh masa sector." To help explore options, SUSTAIN partnered with *Instituto Nacional de Salud Pública* to organize a tortilla fortification working group of key expertise and industry stakeholders.

Fortifying more than a minor share of Mexico's most popular food seemed an unattainable goal to many. Skeptics in government, industry, the scientific community and international agencies endorsed the fortification concept for flour but doubted that technology could be developed for fortifying the dough that small entrepreneurs like David and Lorenzo make directly from milled corn. But with iron, zinc and other micronutrient deficiencies widespread among Mexico's children, Liz refused to give up on the initiative. "Fortunately," she adds, "our donors were very supportive and optimistic about our prospects for finding the right technology for the mills."



Mike vividly remembers the first equipment manufacturer he approached about developing a dosifier for the masa mill environment. "He told me tortillas didn't need vitamins and minerals, he considered them perfect as they were, almost sacred," Mike recalls. Other equipment he investigated turned out to be too expensive for the small scale family businesses selling fresh milled tortillas over the counter.

At a December 2005 meeting of the Tortilla Fortification Working Group, project partners learned of a promising dosifier distributed by a Mexican industrial firm. After Mike and others watched it in operation, SUSTAIN decided to purchase two units for plant trials. The equipment manufacturer, intrigued by the project, offered the unit at an affordable price—and agreed to help with needed adaptations as production was launched in real mill environments.

No one was more eager to test out the new technology than David Técotl Crisóstomo—except perhaps Lorenzo Vital Pineda. An enthusiastic and expressive man, Lorenzo sells a range of tortilla products to health conscious consumers. He was naturally intrigued by the tortilla fortification project when he learned of it through a friend at a micronutrient premix company. David and Lorenzo have much in common—keen business acumen and a desire to distinguish their products from competitors in a way that not only attracts, but benefits customers, particularly children. In part for the kids, both men willingly offered

their time and use of their facilities to pilot the technology as project partners. To ensure that the fortified tortilla passed muster, David joined a consumer test panel at Mexico's National Institute of Public Health, personally comparing unfortified tortillas to those fortified with different iron forms. A darker color imparted by some iron compounds had concerned him in previous mill trials, but subsequent work in Mike's BYU laboratory addressed and solved the problem. Panel members, including David, equally preferred unfortified tortillas and those fortified with a premix containing an iron form that did not discolor the product. No one reported seeing or tasting a difference between the two.

After successful pilot runs of the fortification process using this premix at David's mill, both millers agreed to host extended commercial trials—and began producing and selling fortified tortillas to their loyal customers on a daily basis. SUSTAIN partnered with the Monterrey Institute of Technology (ITESM) to design instructional materials on fortification processes for personnel at all skill levels: a detailed manual for mill owners and a more simplified poster for those mill operators with little formal education.

The pioneer mills have attracted the attention of leading researchers, Mexican government officials, U.S. embassy staff and other millers throughout Mexico, who have contacted SUSTAIN about getting the fortification process up and running at their own businesses.

\* Adapted version of "Micronutrient Fortification" [internet site] Washington, DC: SUSTAIN. [accessed on 2009 August]. Available at: [www.sustaintech.org/story.htm](http://www.sustaintech.org/story.htm).