

San Francisco Chronicle

SFGATE.COM | Sunday, May 20, 2012 | PRINTED ON RECYCLED PAPER

\$3.00 ★★★★★

HEALTH

Raising the bar on nutritious snacks

By Erin Allday

Bruce Ames' first attempt at developing a nutrition bar was not entirely successful: The dense, fruit-based product was chock-full of vitamins and minerals and other healthy supplements, but it tasted awful.

"The first bar produced a gag response," said Mark Shigenaga, a scientist who helped Ames come up with the recipe. "Even Kenny couldn't eat it. And Kenny will eat anything."

Kenny is a colleague of Ames and Shigenaga's at Children's Hospital Oakland Research Institute, and he was one of the first unfortunate taste-testers of the snack, which has been dubbed the "Chori-bar."

But the Children's Hospital researchers kept at it, working with the U.S. Department of Agriculture to repeatedly redesign the nutrition bar

Nutrition continues on A17

FROM THE COVER

Raising the bar on nutritious snack

recipe. Seven years later, they have created perhaps the most nutrient-packed bar around — and it's so palatable that people are "knocking down doors" to try it, researchers say.

The Chori-bar hasn't yet joined the dozens, if not hundreds, of nutrition bars being sold on the market, although the scientists have submitted a patent. What sets their product apart, Ames and his colleagues say, is that it is designed specifically for people with poor eating habits who are lacking essential nutrients in their diet, and potentially putting themselves at increased risk for long-term health problems.

"Shortages of vitamins and minerals are causing DNA damage," said Ames, chairman of the research institute's Center for Nutrition and Metabolism. "We needed a vehicle to get people these nutrients. A lot of nutritional thought went into this."

May be a tough sell

Now might be an especially difficult time to design such a product for the public. Aside from the fact that the market is already flooded with nutrition bars, there's also been a recent backlash against multivitamins and supplements, after a study published last year claimed they're not necessary for most people.

Plus, nutrition experts are increasingly pushing "real food" diets that encourage people to get nutrients from natural sources, like fresh fruits and vegetables.

"I always tell people to get their vitamins through food first," said Jo Ann Hattner, a San Francisco registered dietitian who teaches nutrition courses at Stanford. "I like the synergy of the natural foods and the nutrients that are combined in there. It's not the same in a supplement. Nature does it better."



Bruce Ames led a team, including researcher Joyce McCann, to create a nutrient-dense bar at Children's Hospital Oakland.

Ames and his colleagues say that even the healthiest eaters — people who focus on eating lots of whole, fresh foods — almost certainly aren't getting all the nutrients they need. And people with very poor diets are facing immediate and long-term health risks such as heart disease or diabetes that make supplementing their diets a critical task, the researchers say.

"We're not advocating a diet of these bars and Coca-Cola," Ames said.

The bar they developed comes in assorted flavors, is low in calories and is filled with nutrients and minerals.

Early studies have shown that regular consumption of Chori-bars can alter certain biological indicators — or biomarkers — that are associated with chronic, sometimes deadly diseases. Even people who already have a healthy, well-rounded diet showed improvements.

Health improvements

The first study, the results of which were published earlier this month, looked at 25 volunteers of various ages, sizes and genders. Overall, the subjects saw increases in so-called good cholesterol and decreases in

plasma homocysteine — both shifts that are associated with a lower risk of heart disease. The changes came after just two weeks of eating two bars a day, the scientists reported.

That the Chori-bar may offer positive results after such a short time period is promising, researchers say, but larger, longer studies will be needed to show whether these improvements are sustainable



The Chori-bars are specifically designed for people with poor eating habits who are at risk for age-related diseases.

and, more important, whether they actually lead to lower rates of heart disease and other chronic conditions.

"Maybe longer term we'll try to see if it helps with weight loss and improved eating," Shigenaga said.

Ames first came up with the idea for developing a nutrition bar after a long career studying metabolic processes and micronutrients, the 40 or so vitamins, minerals, fatty acids and amino acids the body needs to survive.

Even mild deficiencies in these micronutrients can cause metabolic imbalances that, over time, can lead to diseases and conditions associated with aging, Ames said. When the body isn't getting quite enough of a certain nutrient, he said, it diverts that nutrient to the most essential purpose, leaving other needs derived from that nutrient lacking.

For example, the body uses vitamin K for blood clotting — a process essential for survival. But the same vitamin is also used, in conjunction with calcium, to build bone. So if a person is getting some vitamin K in his diet, but not enough, the body will divert the vitamin toward clotting, Ames said. In the long term, that could lead to bone weakness, or osteoporosis.

The challenge

The purpose of the Chori-bar is to increase micronutrient consumption toward opti-

mal levels. Unfortunately, building such a product is challenging, especially when the recipe needs to include pretty much every vitamin and mineral known to help humans — not all of which are delicious.

Ames knew right away that he would need to develop a bar, and not a multivitamin. A single pill can't hold all of the micronutrients, for starters, plus a nutrition bar can include vitamins and minerals in a form that's easier for the body to absorb.

The current bar has 36 ingredients and is 107 calories — it's purposely low-calorie, since it's being geared primarily toward people who are overweight. The bars are dense and very chewy, and the flavors — white chocolate blueberry or fruit cinnamon — are subtle, and not too sweet.

"Finding ways to put all of these healthy ingredients into one compact bar with limited calories that tastes good — that's a constant balancing act," said Tara McHugh, research leader of the processed food research unit with the USDA branch in Albany, who's been working with the scientists on the bar recipe.

Often, she said, the Children's Hospital scientists would come to her with a new request: can she get more fiber into the bar? Can she better mask the taste of the B vitamins? And what about that awful fish-oil flavor? McHugh and the scientists say they've developed a trick to disguise the fish-oil taste — but it's a secret the chefs are keeping to themselves.

"If we can get all of these things into one bar, and it actually tastes good?" Shigenaga said. "We've hit a home run."



Staff research assistant Alicia Zhou works in the lab at Children's Hospital Oakland, where the team figured out how to mask bad-tasting nutrients in the snack bars, which aren't for sale yet.

Erin Allday is a San Francisco Chronicle staff writer. eallday@sfchronicle.com