Seeds Of Wellness: Return Of A Supergrain

November 15, 2007

Saturday Evening Post – In the annals of nutrition history, the last half-century may well be considered the age of the supergrains. Starting in the 1960s, Dr. Norman Borlaug developed disease-resistant dwarf wheat and sparked the "Green Revolution" in Asia; Purdue University researchers discovered opaque-2 maize, with the mutation that doubles the protein value of corn; and Canadian researchers developed triticale, the long-sought cross between barley and wheat. But what may be the most functional of all the supergrains still remains virtually unknown. It is the tiny seed of the Salvia hispanica L. plant, better known as chia, the same plant family used to grow furry foliage on those popular chia pets.

In chia's previous, more glorious existence, it served as the power food of the ancient Aztec civilization. According to Spanish manuscripts, the Aztecs ate the seeds of this semitropical plant to improve their endurance. They called chia their "running food" because messengers reportedly could run all day on just a handful. The Aztecs prized chia more highly than gold. They even used it as medicine. When the Aztec civilization ended, the much-vaunted grain fell into relative obscurity. Now, after half a millennium, chia is poised for a comeback in something other than a pottery animal.

Scientists investigating chia since the 1990s have found the grain surprisingly nutritious. Superior in protein quality to wheat, corn, rice, oats, barley, amaranth and soy, chia also offers a disease-fighting arsenal of antioxidants, including chlorogenic acid, caffeic acid, myricetin, quercetin and flavonols. Of keenest interest at present, however, is chia's abundance of omega-3 fatty acids, which studies have shown promote a wide range of cardiovascular and mental health benefits. Chia turns out to be the highest known wholefood source of omega-3s.

Dr. Vladimir Vuksan, a pioneer of the functional foods movement in Europe and one of the developers of the revolutionary glycemic index at the University of Toronto, recently conducted the first long-term study of chia's health effects. He and his colleagues used a commercial variety of chia called Salba, developed especially to produce white, rather than the original black, seed and a more reliable omega-3 content of about 60 percent.

In their six-month study of type 2 diabetes patients, the researchers found impressive health effects from eating Salba daily. In patients who already were on diets or medication to control their disease, Salba lowered systolic blood pressure by 10 and diastolic by five mm mercury. It also reduced c-reactive protein (CRP) levels by 32 percent and lowered fibrinolytic (blood thickening) factors, which can trigger cardiovascular disease.

"These were huge discoveries rarely seen in medical literature, even with the most powerful and combined pharmacological therapies," Dr. Vuksan explains. "Ten over five is a major blood pressure reduction; there aren't many studies showing this effect."

“We asked ourselves, why is this happening?.” Dr. Vuksan says. “Then we remembered one of the things from history, that Aztecs used chia seeds as a ‘running food.’ So we thought that maybe something [about chia] was helping the body to function better. We measured the body inflammation, the so-called c-reactive protein, which has been discovered as a major risk factor for heart disease, even more important than cholesterol, according to studies from Harvard. This was one of the rarest studies in the world, showing that CRP dropped about 32 percent in type 2 diabetics who were heavily medicated and well controlled,” he continues. “The only other major studies showing a reduction in CRP have been done with statin drugs.”

The researchers also looked at fibrinolytic factors. “The thickness of blood can determine heart problems,” Dr. Vuksan says. “We actually found some of the major fibrinolytic factors, like factor VIII (linked to von Willebrand’s disease) and fibrinogen, were significantly reduced after Salba. We also measured bleeding time because, as you know, if you are thinning blood, you want to see whether the patient will bleed more. We measured three factors, and there was no change with Salba whatsoever. We concluded that basically Salba is a functional food that has a health effect in diabetic individuals.”

In the beginning, Dr. Vuksan says, he only looked at the main nutrients in Salba. He knew that the seed’s protein quality was higher than soy and that it had the highest fiber content of any food, higher than wheat bran. But to explain some of the effects he and his team had seen in their study, they had to look more closely at the seeds’ makeup. And there they found a nutritional goldmine. They calculate that 3 1/2 ounces of Salba contain the same amount of omega-3 as 28 ounces of Atlantic salmon, as much calcium as 3 cups of milk, as much fiber as 1 1/4 cups of All-Bran cereal, as much iron as 5 cups of raw spinach, as much vegetable protein as 1 1/2 cups of kidney beans, as much potassium as 1 1/2 bananas, and as much vitamin C as seven oranges!

“When we started analyzing, we just couldn’t believe it,” Dr. Vuksan says. “For us in nutrition, this is like a dream food. This is an ideal composition.” At first reluctant to study the seeds at all, Dr. Vuksan is now an advocate. “My family sprinkles ground Salba on our cereal every morning,” he says.

Dr. Vuksan hopes to do further studies of the nutritious seeds. “I think Salba has great potential in regulating human health,” he says. “We would like to do more studies in different categories--in people with hypertension, arthritis, and for weight loss.” The diabetic patients in the study had no problem eating Salba, except that it made them feel full, he says. In fact, following the study, a number have continued asking for supplies of the seed.

The researchers may also look into a phenomenon reported by some study participants who had been lactose intolerant, but who on Salba found they could again drink milk without side effects.

In a summary of their findings, the scientists noted that Salba “could be considered the world’s most nutritious food crop and thus can be used as a global remedy for world hunger.”

“There’s no other food that can say that,” says Larry Brown, a nutritional foods entrepreneur and president of Salba Research and Development Inc. in Toronto. “But it’s going to take a while,” he adds. Brown is working to introduce the product in North America. This year, in collaboration with Neutraceutical, a Utah-based manufacturer of nutritional supplements, the first product with chia has been made available in North America, a tortilla chip that contains over 400 mg of omega-3 per serving and has no trans fats. The chips, called Taste Waves, may also be the only food product in North America made with organically grown high-lysine corn, a modified version of the opaque-2 maize supergrain discovered by Dr. Edwin Mertz and his Purdue colleagues in 1964.

Brown’s company is planning to offer more Salba products soon, including a salsa, a nutrition bar, and possibly a Salba drink. “Many companies have contacted us,” he says. “We’re talking to bakeries now to do bread and other baked goods with Salba. We’ve also been contacted by cereal companies. In fact, a company in Germany is doing a cereal with Salba now. So Salba is going to be around the world.”

Still, Brown says, it’s an uphill battle to convince people of the food value nestled in the tiny Salba seeds. “When we first started Salba,” he says, “we hired a consultant [from one of the world’s largest food makers] to advise us for a month and tell us what the biggest hurdle was going to be. He said, ‘Fellows, your biggest hurdle is, NO ONE IS GOING TO BELIEVE YOU.’ We laughed,” Brown says. “But you know what? He was right. If we didn’t have the University of Toronto researchers backing us up, saying that yes, what they’re saying is true, nobody would believe us.”