SOY-BASED CHICKEN INVENTED BY MU SCIENTISTS TO ROLL OUT NATIONWIDE

BOCK SOY

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CREATING A FOOD ALTERNATIVE

that many consumers view as inferior to something already on the market might not sound like the best business plan, especially when the existing product costs less and is considered a paragon of food culture. But that hasn't deterred two MU scientists from spending decades in the pursuit.

Now, commercial success for their creation might be imminent.

Fu-hung Hsieh, a biological engineering and food science professor who holds four patents at Quaker Oats Co., is the research leader of a soy protein alternative to chicken. Savage River Inc., based in Cumberland, Md., is rolling out Chicken-free Strips nationwide under the brand Beyond Meat. A Columbia factory to produce the food opened in the fall, thereby translating MU research into a commercial product that brings jobs to mid-Missouri.

"A lot of researchers dream of having their work in the laboratory become commercial," Hsieh says. "This is all very exciting."

Supporters say the new product is about more than phony chicken. Soy protein is healthful. No animals are killed in the process. And the methane emitted by farm animals that experts contend contributes to global warming is reduced.

Hsieh admits he couldn't have done it alone. The reserved scientist found his unlikely partner in a charismatic engineer named Harold Huff, who heads the Food Engineering Lab in the Agricultural Engineering building. Hsieh and Huff share the patent on the soy chicken. In 2009, they met Ethan Brown, an East Coast entrepreneur who saw the commercial potential of the University of Missouri research.

A scientist, an engineer and a visionary are the key players in a yearslong trajectory that led from idea to innovation to Beyond Meat.

'MOUTHFEEL IS EVERYTHING'

Alternative meat purchases are slowly ticking upward. Mintel, a market research firm that tracks the food industry, reports nearly a 5 percent yearly increase in the American market. One of the biggest successes is Tofurky, a veggie turkey product by Turtle Island Foods in Oregon.

Given that poultry accounts for more than one-third of meat purchases in America, chicken alternatives would seem to be a market waiting to be plucked. But no company has had resounding crossover success. That might be because replicating fowl is not easy. The challenge is not so much the taste, which is rather nondescript, but the texture that feels right to the palate. "It's never about taste," Huff says. "It's always about fibrous structure. Mouthfeel is everything."

Soy chicken that chews right because it breaks apart in strips like a boneless chicken breast is the culinary gold — or better, fool's gold — standard.

Perfecting mouthfeel has been Hsieh's consuming passion as a food scientist. He started his career as an aspiring chemical engineer. But he got his doctorate in food science at the University of Minnesota. "I thought as an engineer that I could contribute to the food industry more than the chemical industry," he says. His field combines chemistry and engineering principles to create and improve food products.

From 1980 to 1987, Hsieh was a senior research engineer at Quaker's John Stuart Research Laboratories in Barrington, Ill. He developed a concentrated oat bran cereal containing beta-glucan, which can lower cholesterol and reduce the risk of vascular diseases. He also developed a method to keep raisins soft in Quaker's dry granola mix.

After leaving Quaker for MU, Hsieh revisited his earlier research interest in vegetable protein products. Because of his love of soy foods, he explored ways to make a soy meat analogue that chewed right. Hsieh and Huff went to work.

They are an unlikely team. Born in Taiwan, Hsieh is of slight frame, modest and careful with his words. Huff, the Mr. Scott of the food lab who keeps the gadgets and engines running, is a large-bodied, straight-talking native Missourian. "I will go for a pork chop or a rib-eye steak," he says, then adds, as if realizing his omission, "but I also put soy chicken on my salad."

The biggest engine in the lab belongs to a custom extruder that formerly churned out breakfast cereals. As big as a midsized tractor, the extruder turns soy mix and ingredients into veggie chicken tender strips in less than one minute. "It takes the mix and ingredients and blends them, kneads them, cooks them, cools them and forms them in one continuous motion," Huff says. The process is a marriage of science and engineering, with Hsieh providing the former and Huff the latter. "My part is to put into application ideas that Dr. Hsieh presents," Huff says.

"We complement each other," Hsieh says. "What I cannot do, Harold can do. And I can do things Harold doesn't do."

By the late 2000s, Hsieh and Huff's product looked and chewed like real chicken. But taking it from a cement-floored lab to a bustling market seemed a world away. Then the scientist and engineer met Brown. Things began to move quickly.

On Oct. 22, 2010, MU entered into a royalty-based licensing agreement with Savage River Inc. Among those slated to receive a portion of potential profits are Mizzou, the inventors, the departments of biological engineering and food science, and the University of Missouri System. MU also received a small ownership stake in the company.

"We would not be where we are today if he didn't believe in this program," Huff says of Brown.

CONVINCING AMERICA

Brown is a mover and shaker with a social conscience. He's worked in clean technology and favors electric vehicles. His firsthand encounters of what he characterized as the unhappy plight of pigs and poultry on his parents' Grantsville, Md., farm led to his swearing off meat and criticizing animal agriculture. Since 2006, he's been a partner in a vegan restaurant chain in Washington, D.C.

In 2009, Brown founded Savage River to introduce and develop plant-based protein products. His exploration of university research on chicken alternatives revealed promising projects, but they were still off the mark, he says. The MU project was a bull's-eye.

"It was the bite and mouth-feel," Brown says. "I felt so much potential."

American food culture is meat-based. But that's not the only reason veggie and bean burgers and ersatz chicken and turkey remain culinary minorities. Besides the scientific challenge of replicating taste and texture, fake meat costs more than the real thing. It also has an image problem. Consumers perceive it as lower quality, a cheaper cut.

Brown contends that if a plant-based product tastes like and has the texture of meat, and consumers understand that it is more healthful, they will alternate their meat eating with the product. He doesn't expect to create vegans, who make up only 3 percent of the U.S. population. He's targeting "flexitarians," people such as Huff, who delight in meaty ribs and phony fowl on their salad.

Brown says the price point will be less than meat once production ramps up.

'It's never about taste,' Huff says. 'It's always about fibrous structure.'

FAKE BEEF, COMING SOON

Chicken-free Strips hit the marketplace June 11, 2012, in 36 Whole Foods Markets in Northern California. By summer 2013, the meat alternative is expected to be nationwide, Brown says.

Plans are to have the central Columbia factory, 1714 Commerce Court, Suite B, handle most of the production, Brown says. At 16,000 square feet, the local plant is four times larger than Savage River's Maryland factory, and its extruder is twice as big. The factory is expected to employ 20 mid-Missourians by year's end, and about 60 after five years.

No one interviewed would discuss the product's cash potential, but it could be significant. "We expect that once the product is on the market across the country, sales will increase and so will royalty income," says Harriet Francis, MU director of program development.

The inventors aren't done. Next up is vegan beef. And don't expect select grade.

"There is no second best," Huff says. "We do everything the right way here." **M**