

OSU center cooking up recipes for foods that dispense health benefits

BY CARRIE GHOSE | BUSINESS FIRST

When patients at the James Cancer Hospital sip tomato-soy juice or chew raspberry gel candies, they're not just snacking but helping research potential therapies devised at Ohio State University's agriculture school.

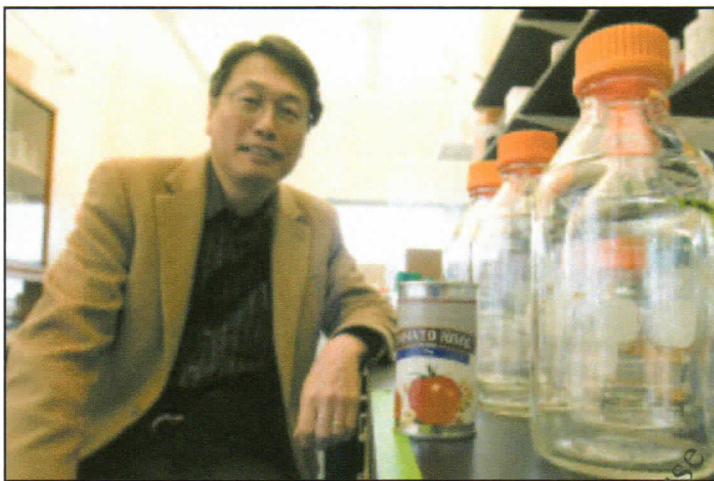
"Functional" foods that not only provide nutrients but prevent disease are one of the research programs getting punched up through the school's year-old Food Innovation Center. It is investing in existing research from many disciplines that make the global food supply more abundant, safe and healthful.

The goals are lofty: Enough food to feed a population estimated at 9 billion by 2050; no more devastating illness from contaminated eggs and peanut butter; finding a dietary link that might stave off Alzheimer's disease; and making it possible for mothers to tell their children, "Eat your chocolate, it's good for you."

Agriculture is the state's No. 1 industry, and food processing is the fourth-largest manufacturing sector, with some 50,000 jobs and \$25 billion worth of annual production. Together they're among nine focus areas for the Ohio Department of Development.

"It makes economic sense to make innovations in what you're already excellent at," said Ken Lee, a professor and director of food safety and security at Ohio State.

The university's effort, both from the consulting it can provide and companies it could spin off, can multiply the industry because similar businesses tend to cluster near each other, said Dave Beck, CEO of the Toledo-based Center for Innovative



Ken Lee, director of food safety and security at Ohio State University, is leading the effort to develop foods that have health benefits, including a tomato-soy juice. The juice is being tested on prostate cancer patients at OSU's James Cancer Hospital to see if it can inhibit tumor growth.

Food Technology. The state-supported consultant to food manufacturers draws on Ohio State research often, he said.

Structured as a collaborative among 13 Ohio State colleges, the Food Innovation Center will invest in research and encourage teams to be built across, for example, the schools of law, pharmacy and medicine. The center was created with a \$3.75 million grant in October 2009 to pay for administration and seed grants to university researchers - 11 worth \$25,000 apiece in the first year. It's expected to be self-sus-

taining in three years. Another center created at the same time is attacking poverty, and Lee sees their missions as linked.

It also falls within a larger university goal of getting more research patented and generating income.

"We have a very invention-rich campus," Lee said. "Maybe one out of 100 is making it out into the commercial marketplace."

MOVE OVER, LOW-CARB

One of the agriculture school's spinoffs that's closest to market has already spent

some time on Central Ohio store shelves.

Columbus-based Bavoy Inc. is on hiatus while working with a commercial bakery to scale up production and relaunch its soy sandwich bread after a successful market test in Anderson's and Kroger Co. stores, company President Cory Ballard said.

As a student, Ballard worked with food science professor Yael Vodovotz in the early 2000s on a soy bar she developed. He turned it into bread and made it more palatable. The bread is half soy by weight, with enough soy protein per serving to make a government-approved claim of heart health.

It wasn't just people with high cholesterol who sought it out, Ballard said. Parents would buy it for kids, who liked the cinnamon-raisin variety, older consumers were seeking more protein sources and other customers "were just looking for more from bread."

"Anything we plan to put in our bodies should offer us some added benefit," Ballard said.

Bavoy now is working with a larger bakery to scale up the recipe for commercial production but is having problems with the texture in larger batches. Ballard hopes to get it ready for shipment in the spring and bring in revenue sometime next year.

PUTTING FOOD TO WORK

Meanwhile, Vodovotz is experimenting with adding almond extract to the bread for a clinical trial at the James on how the soy and almond interact to see if they can help prevent cancer.

She's also working on healthier pretzels, high-fiber chocolate and other snacks. SEE PROGRAM, PAGE 24

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Yael Vodovotz, right, associate professor, and Jennifer Ahn-Jarvis test the moisture in a soy bread developed at Ohio State that helps control high cholesterol.

PROGRAM: *Eyes cancer prevention*

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with the thought that it's easier for consumers to replace something they already eat with a healthier option than make them take on some new bar or pill that's unpleasant.

"We have these products. We hope to get the industry interested enough to partner with us," Vodovotz said, and that type of outreach is where she hopes the new center can help.

The Chicago-based Institute of Food Technologists projects an \$83 billion annual market for functional foods, Lee said.

Functional food research takes two forms, said Dr. Steven Clinton, a researcher at the James and one of the principal investigators with Lee in the Food Inno-

vation Center. One is to concentrate the chemical components found naturally in food, such as compounds in black raspberries thought to prevent oral cancer, and develop them like drugs.

The other is to simply combine nutrient-rich foods that interact in complex ways, such as with the soy-almond bread or tomato-soy juice being studied.

"The program is often referred to as the 'crops to the clinic' cancer prevention effort," Clinton said in an e-mail to *Columbus Business First*. "We begin with traditional horticultural science, define the varieties and growing conditions that optimize the content of anticancer agents, we then use the skills of food scientists to process fruits and vegetables in ways to insure stability of the active components, as well as to develop new foods that will be acceptable in the clinical trials or even market."

As Lee puts it: "You don't need a biotech tomato to do this."

CAESAR SALAD WITHOUT FEAR

Massive egg recalls twice so far this year add to frequent food scares – peanut butter, bagged spinach, fresh tomatoes – that have huge economic consequences.

Consumers don't just stop buying the food from the affected supplier, they tend to cut out the food altogether for a time, hurting entire industries, Beck of the state safety consultancy said.

"One incident, that can mean the end of a company," he said.

The connections between colleges and researchers cemented under the Food Innovation Center helped food safety researchers win a recent \$5 million U.S. Department of Agriculture grant, said Lee, who also directs the agriculture school's Food Safety and Security Center.

Ohio State researchers are working on several ways to pasteurize foods such as high pressure or pulsed electric fields without using heat, which damages flavor and nutrients.

The university has formed a spinoff with egg producers, Eggtech Ltd., on using ozone under pressure to kill salmonella in eggs, but researchers did not want to comment because the development is at a "sensitive phase."

The university before had touted a juice company in Oregon that was able to start selling its uncooked fruit juices again in 2005 using pulsed electric fields, but the company has since been acquired and production switched to the parent company's existing high-pressure pasteurization.

Researchers also are looking at ways that diet can be used to prevent obesity or even Alzheimer's disease.

Combined with functional foods, such research could help reduce the nation's medical spending, Lee said.

The center is working with the business school's international programs on a project in Brazil and sees opportunity in the university's new office that works with alumni and businesses in China, Lee said.

"OSU has global reach," he said. "We want the Food Innovation Center to be part of that."

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