

Ultrasound treatment can keep peanuts fresh longer, researcher says

July 20 2010, by Tom Nordlie

Every peanut lover knows the disappointment of finding rancid goobers in a seemingly fresh package, and a University of Florida researcher is fighting the problem by using familiar technology in a new way.

Food scientist Wade Yang employs [ultrasound](#), the high frequency audio waves used in sonograms, to discourage the chemical reaction that causes peanuts to turn rancid after exposure to oxygen.

It could reduce spoilage in packaged roasted peanuts by 90 percent compared with untreated varieties, according to a recent study by Yang, an assistant professor with UF's Institute of Food and [Agricultural Sciences](#).

The findings appear in the current issue of Food and Bioprocess Technology. Yang began the study while a faculty member at Alabama A&M University and concluded it at UF after he joined the faculty last summer.

The U.S. [peanut](#) crop for 2009 was about 3.7 billion pounds and valued at \$835 million, according to the U.S. Department of Agriculture. Florida accounted for slightly less than 10 percent of the national crop. Georgia grows roughly half the nation's peanuts.

“Peanuts have one notorious problem: rancidity,” he said. “The [shelf life](#) is not long if you don't do something to preserve them.”

Yang says rancidity is a major issue for companies selling peanut products, though they tend to guard information on their exact losses.

Roasted peanuts typically have a shelf life of three months when stored under ambient conditions, he said. Currently, manufacturers take several approaches to keep peanuts fresh, including use of chemical preservatives and packaging peanuts with special gases that discourage spoilage.

Yang said he became intrigued by ultrasound treatment because it looked like an inexpensive, safe way to extend shelf life. He knew scientists had developed other food-processing applications for ultrasound, such as tenderizing beef and extracting soybean oil.

His process uses sound waves in the range of 20,000 to 100,000 cycles per second, above the human hearing range. Peanuts are roasted, blanched and immersed in a chemical that absorbs peanut oil, then bombarded with ultrasound for a few minutes to remove oil from the nuts' outer surface and a thin layer just below it.

Afterward, the peanuts are soaked in a plant-derived edible coating that contains antioxidants, to block out [oxygen](#). The process doesn't affect the peanuts' appearance or taste, he says.

“The quantity is so small, the peanuts don't take on much flavor,” Yang said.

In the study, Yang and co-author Peter Wambura, an Alabama A&M doctoral student, tested three coatings — corn protein, whey protein and a compound called carboxymethyl cellulose, or CMC.

After the peanuts were treated they were stored for 12 weeks, then checked for the presence of hexanal, a chemical produced when peanuts

go rancid.

In a control group of peanuts that were simply roasted and stored, the hexanal content increased eightfold during those 12 weeks. Peanuts treated with ultrasound and coated with CMC produced one-fifth the amount of hexanal as the control; those treated with ultrasound and coated with whey protein had one-tenth the hexanal of the control group.

Ultrasound could also protect tree nuts and some fried foods such as potato chips, he said.

The UF study is a good demonstration of principle, but the challenge with any new process is making it affordable, said John Coupland, a food science associate professor with The Pennsylvania State University who has researched ultrasound.

Yang said peanut industry personnel are interested in the method, though it may be several years before it is commercially viable, he said.

“From invention to application, there’s always a gap,” he said. “I believe in the future this will have good potential.”

Provided by University of Florida

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