

Invention May Help Improve School Lunch

National School Lunch Week is being held this month, and Agricultural Research Service (ARS) researchers have provided another reason to celebrate—a new technology that holds promise to make students' mealtimes safer and more appealing.

It all started several years ago when school food-service personnel noticed that there were too many bone fragments in poultry used to make meals for the National School Lunch Program. The National School Lunch Program is a federally assisted meal program operating in public and nonprofit private schools and residential child-care institutions. About 31 million children participate in the program each weekday during the school year.

Complaints from school food-service providers led to researchers at the ARS Environmental Microbial and Food Safety Laboratory (EMFSL), in Beltsville, Maryland, being asked to come up with a method to help meat producers detect bone fragments. "The meat comes from processing plants and is made into little cubes for use in dishes such as chicken nuggets," says Alan Lefcourt, a biomedical engineer with the laboratory.

EMFSL physicist Moon Kim, agricultural engineer Yud-Ren Chen (retired), and Lefcourt invented and patented the method, which also detects fragments in fish products.

The novel technique uses fluorescence spectroscopic imaging to detect bone fragments on or near the surface of mechanically deboned meat during processing. It works by illuminating the surface of the processed meat with ultraviolet or visible light, which elicits detectable fluorescence responses from any animal bone or shell fragments present.

An objective in developing the invention was to provide a high-speed method capable of detecting the bone fragments without interfering with existing processing-line speeds or procedures. The patent could ultimately improve school lunches once the technology is licensed to, for example, meat processors for incorporation into their production lines.

"This will help ensure bone-fragment-free products," says Kim.

This research supports the USDA priorities of ensuring food safety and of improving children's nutrition and health.—By **Rosalie Marion Bliss**, ARS.

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More than 31 million children participate in the National School Lunch Program during the school year.

Celebrating 15 Years of a Healthy School Lunch Option

How about cheesy pepperoni, Hawaiian pineapple and ham, or vegetarian pizza, all piping hot and ready to enjoy? These pizzas are made with reduced-fat mozzarella cheese and are offered at the Crossroads Café—the food-service installation at Camas High School in Camas, Washington.

One technology for making tasty-but-healthy cheese was invented by Agricultural Research Service (ARS) scientists at the Dairy and Functional Foods Research Unit in Wyndmoor, Pennsylvania. It became available to schools in 1995 and is used to provide a low-fat alternative to high-fat cheese when making pizzas. The ARS team included chemists Michael Tunick, Edyth Malin, and James Shieh, physical science technician Brien Sullivan, and Peter Cooke (no longer with ARS). Other team members, Virginia Holsinger and Phil Smith, are deceased.

In 2009, more than 31 million children participated in the USDA National School Lunch Program in more than 101,000 schools and residential childcare institutions. With National School Lunch Week being observed each October, now is a good time to celebrate all healthy cheese options—produced using a variety of manufacturing methods—that are available in school lunches.

Starting in 1992, the team began exploring new ways to cut mozzarella's fat content without sacrificing its flavor or stretchy texture, especially as a pizza topping. They worked on modifying the network of the milk protein casein. The result was a mozzarella

with improved storage life and only 10 percent fat—about half the fat content of regular mozzarella.

Just as important, pizza-eating students give the cheese a thumbs-up, according to school food-service director Sarah Winans with the Crossroads Café.

Martha Henry, director of food service for all schools in Tennessee's Maryville City School District, agrees. "We find that pizza is one of school kids' favorite lunches," she says. "Reduced-fat mozzarella cheese allows the students to enjoy pizza while reducing their dietary fat intake."

The USDA Farm Service Agency's Kansas City Commodity Office in Missouri began buying lower fat mozzarella cheeses in the early 1990s. Since 2000, that office has been buying lower fat mozzarellas exclusively. More than 500 million pounds of lower fat mozzarella cheeses—worth more than \$800 million—have been purchased for school-related programs, according to program analysts David Leggett and Michael Buckley with the USDA Food and Nutrition Service in Alexandria, Virginia.

This research supports the USDA priority of improving children's nutrition and health.—By **Rosalie Marion Bliss**, ARS.

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