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Lowfat cheese research leads to pizza innovation

By Johanna Nelson

MADISON, Wis. — When it comes to lowfat pizza cheeses, manufacturers may face many obstacles with regard to functionality and taste; however, current research projects have made considerable progress in addressing these concerns.

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Management Inc. (DMI)-sponsored National Dairy Foods Research Center Program, researchers at the University of Wisconsin-Madison's Wisconsin Center for Dairy Research (CDR) have developed novel methods to turn a functional base cheese into a lowfat, Mozzarella-type cheese that has proven to work well on pizza, researchers say.

According to John Lucey, a professor at UW-Madison, the main focus of research efforts has been to create a natural or processed cheese that works effectively in pizza and baking applications.

"It's always been a challenge to get a lowfat cheese to perform the way a normal-fat cheese does under baking applications such as pizza," says Lucey, who notes some of the difficulties lie in the fact that cheeses must contain 6 percent fat or less to qualify as lowfat.

Specific challenges that Lucey and his team of researchers have addressed in their DMI-funded research include lack of melt, toughness, burning, lack of color, stickiness and lack of shreddability.

Lucey notes flavor is not as big of an obstacle for cheeses such as Mozzarella since they do not have as strong of a flavor profile, and additional flavoring can be added to address this concern.

"We focused primarily on textural and functional properties," he says. "We wanted to address these challenges and find a solution that can be used in both natural and processed cheese type situations."

Through its research efforts, CDR has developed technology that can be applied to both processed and natural cheese. For processed cheese, researchers started by creating a base cheese comprised of natural cheese and specific acids instead of cultures.

"We found that we could make a cheese that could be used for processing that did not need emulsifying salts," Lucey says. "The advantage of that is we don't have to add sodium-based emulsifying salts."

Instead, true emulsifiers such as mono- or diglycerides were added to produce a reduced-sodium, healthier cheese with desirable properties for use in applications such as pizza.

In particular, the processed cheese became whiter and more sliceable, with a consistency similar to Provolone. Lucey also notes the cheese was not sticky, making it ideal for shredding and slicing.

And since creating a processed cheese involves heating the base cheese in a cooker, researchers say it does not require as high of a baking temperature compared to regular cheeses used for pizzas.

"Because it's been through a cooker already, and we have removed a lot of calcium by the use of acids, it's more meltable and doesn't require as high baking temperatures," Lucey says. "It already is melted well before what we normally would expect."

Researchers also used a related type of approach to make what could be considered a natural Mozzarella. Lucey notes that when making a lowfat version of a full-fat standard of identity cheese (like Mozzarella), the U.S. governmental labeling regulations allow manufacturers to add ingredients not listed in the standard identity of full-fat cheese.

"The U.S. government knows it is tough to make good quality, lowfat products," Lucey says. "There is some leeway — if you need to add certain ingredients to produce a good texture, you are allowed to add it."

Currently, CDR is in the process of applying for a patent and already is working with a company interested in using the technology. Lucey also sees market opportunities in the foodservice and school lunch sectors.

"The lowfat process cheese could be used as a substitute for American pasteurized processed cheese in school lunch programs," says Lucey, who notes it would provide a lowfat, reduced-sodium alternative to full-fat processed cheeses. "Pizza is a popular item with kids, and with tightening regulations about nutritional guidelines, we see this sector as an attractive opportunity for our technology for the production of lowfat Mozzarella."

Lucey also says the technology holds a great deal of potential in the general market for pizza since it produces a lowfat end product that meets key functionality requirements such as shredability, sliceability and color. He also notes it bakes well without oiling off, browning or blackening, which makes it a desirable ingredient for pizza as well as baked foods such as lasagna.

With regard to future research, CDR plans to focus on natural cheese to an even greater extent. In particular, Lucey says researchers will examine ways to improve the final natural cheese product as well as explore ways to make the cheesemaking process work more efficiently. **CMN**