

NEWS/BUSINESS



Dairy researchers look at freezing, other technologies to extend shelf life of cheese

By Rena Archwamety

MADISON, Wis. — As more cheese is being exported and requiring longer shelf-life for shipping and storing times, the Wisconsin Center for Dairy Research (CDR) is starting to look at new research projects on how to best freeze cheese.

“We have gotten a number of inquiries from companies who have gotten inquiries from Asia on whether they can freeze cheese, what works and what doesn’t work, so as not to be detrimental to its performance,” says Dean Sommer, CDR senior management team and cheese and food technologist. “We have done a little work on this, but we expect to do more.”

These questions are particularly relevant to pizza cheese exports such as Mozzarella, which is relatively high-moisture and usually does not have a tremendously high shelf life. As cheese exports are growing, particularly exports to Asia, freezing would be advantageous, Sommer says. CDR is starting to look at how to optimize the process to extend the shelf life of frozen cheeses, and the possible creation of freezing and handling guidelines.

Sommer notes that a lot of work on freezing cheese was done in the 1970s, when there were larger swings in cheese production between spring and fall. Manufacturers were asked to freeze cheese in the spring flush time, when demand was low. Then they brought it out to use in the fall when cheese supplies were tight.

“A lot of work was done back then, but most of the work is old, 30-some years,” Sommer says. “Second, they didn’t go real deep, as they would need to today, into the difference in performance. There was no thought of shipping to Asia.”

Some people have asked about freezing cheese up to a year, though most studies available are for a much shorter time-frame, Sommer says. There is some historical information available and some smaller studies have been done, but CDR now is looking at more comprehensive research on this topic.

Freezing cheese can cause loss of flavor and texture, Sommer says. And while freezing greatly slows down the cheese aging and breakdown process, it doesn’t entirely stop it.

“Even at frozen temperatures, changes continue to happen at the chemical level, affecting flavors but also performance,” Sommer says. “It will affect melt and stretching over time. It could affect browning over time and getting a glistening surface. All the things you look at for Mozzarella performance — stretch, chewiness, mouthfeel — could be affected by long-term storage.

The questions on freezing and long-term storage are not just limited to Mozzarella, but also apply to other cheeses that are facing longer periods of transportation in today’s global trade.

“We’re looking at where cheese has

to last for longer periods of time in export channels than it does in domestic channels,” Sommer says. “It used to be loaded on a trailer and sent across the United States. Now we ship it over to China, and this presents new challenges and potential issues to think about. It’s different than dry milk or whey powder.”

Some large Mozzarella producers use instant quick freeze (IQF) to make their shredded product last longer. The moisture of Mozzarella and other cheeses also can be reduced to extend shelf life, though reducing moisture also reduces the profit margin, says Dr. Mali Reddy, president of American Dairy and Food Consulting Laboratories and

International Media and Cultures Inc. (IMAC). Other technologies increase acid levels or reduce calcium in the matrix.

For those who would prefer to keep the cheese fresh but also extend the shelf life, Reddy says microbial adjustments should be made in the cheese-making process.

“If you want to make cheese for a long hold, send it to Japan so it will be on a boat 20 or 25 days, a lot of people are asking for 90 days of shelf life,” Reddy says. “There are technologies available on the market for these things.”

Reddy says it takes fine-tuning and attention to detail, but there are enzy-

matic systems available on the market to accomplish these longer shelf lives, as well as recent technologies that prevent cheese from deteriorating as much with age.

“If you’re going for 90 days, and if someone wants to use it one week later, so it has to perform the same at one week as at 90 days, different technologies can be done. Yank some calcium off the matrix so it doesn’t break down any further. It prevents aging,” Reddy says.

“Some spores survive pasteurization. If you can legally block it through culture systems, you can control the shelf life,” he adds. “This is a very fine technology.” **CMN**