

Cornell Food Scientists Discover Why Baked-Then-Cooled Mozzarella Cheese Turns Translucent

ITHACA, N.Y. — A Cornell University food science student has answered an age-old question that has puzzled collegians through the years: Dude, why is the cheese on this cold pizza translucent?

As those who save leftovers for next-day snacks know, low-fat mozzarella cheese turns almost clear after it has been baked on a pizza and then cooled. It gives leftover pizza an aged, unappetizing look. Lloyd E. Metzger, a Cornell doctoral candidate in food science, from Lester, Iowa, has discovered that it is the serum — the water content in the mozzarella cheese — that causes the translucency.

Pizza connoisseurs know that mozzarella should be white. Low-moisture, part-skim mozzarella has a fat content high enough to maintain a white color before baking, during baking and after the pizza cools down. But the lower fat mozzarella cheese has a white color when baked but doesn't retain the opaque whiteness during cooling.

"What's causing the moz-

zarella to become translucent? Well, by understanding how it works, we can control it," says Metzger. "In this study we wanted to find out what was happening to the structure of the cheese during heating and cooling."

Once made exclusively from the milk of water buffalo, mozzarella is composed of water, protein and fat. Mozzarella in the United States is made from cow's milk and then processed through a stretcher, in which a water solution is added. The fat and water are bound together in mozzarella by a protein called casein. Other proteins form the watery serum that is dissolved within the cheese.

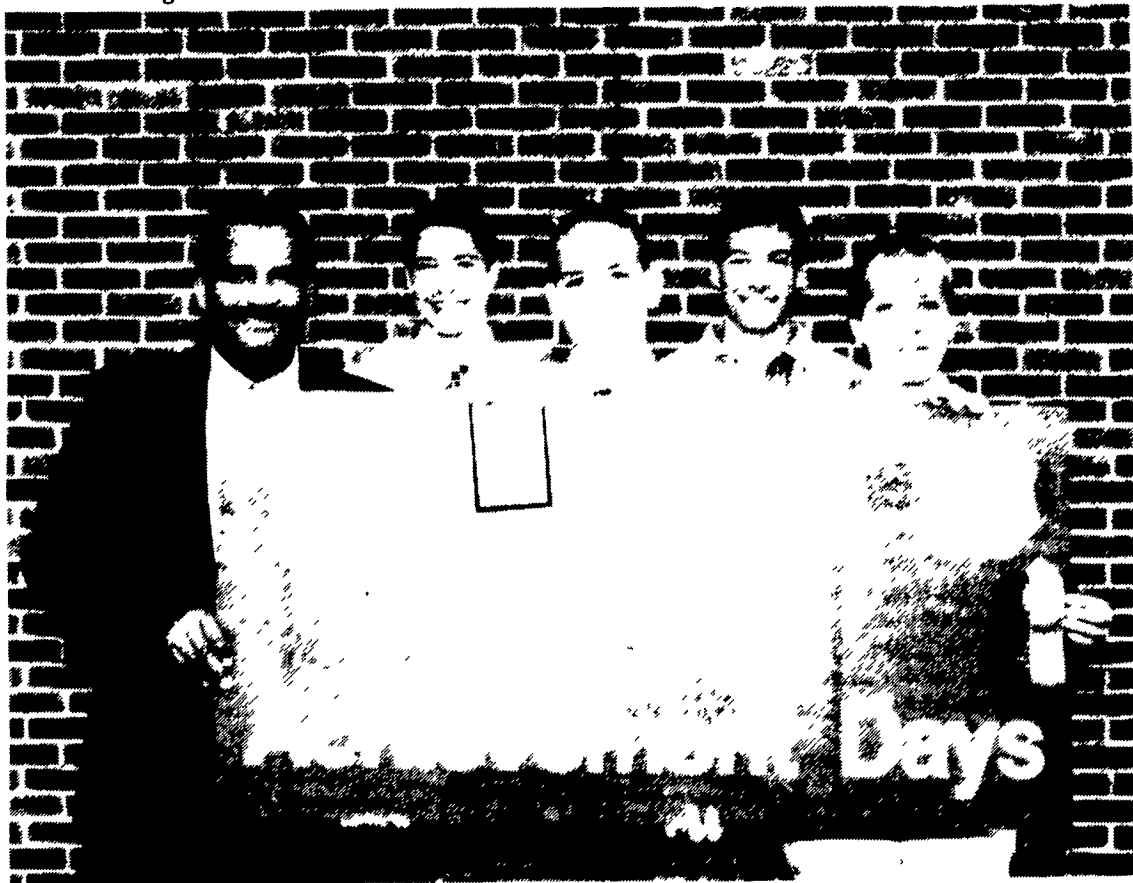
When pizza is topped with mozzarella and popped into an oven, the water-soluble proteins interact with each other during the heating process. The serum in the cheese forms a white gel during heating that causes the cheese to become white. As it cools, the gel reverts back to a clear liquid, and the cheese then becomes translucent. As a result, the serum — the protein dissolved in the cheese's water —

is responsible for the whiteness changes during heating and cooling of low-fat Mozzarella.

"When we make a fat-free cheese, we're trying to get the cheese to behave like a fattier cheese from a sensory point of view," says David M. Barbano, Cornell professor of food science.

"We know there's something in the low-fat cheese that makes the white color reversible during heating and cooling. One we completely understand cheese's properties, we can apply that information to control whiteness of other low-fat dairy foods."

Metzger won the American Dairy Science Association competition for graduate students this summer in Denver for his presentation on "Whiteness Change During Heating and Cooling of Mozzarella Cheese." He performed this research with Barbano; Michael A. Rudan, Cornell postdoctoral fellow in food science; and Ming R. Guo of the University of Vermont. It was funded by the Northeast Dairy Food Research Center and Dairy Management Inc.



York County's first-place team. From left, Dr. Blannie Bowen, Mike Burrell, Joe Emerheiser, Travis Reid, and Jennifer Flinchbaugh.

York County Has First-Place Team

YORK (York Co.) — York County Livestock Judging team placed second at the Eastern National Livestock Judging contest in September at Timonium, Md and first at the Keystone International Livestock Expo judging contest recently. The team will compete in the Main event contest in Ohio and then

in the contest in Virginia at the end of October. In November they will travel to Louisville Kentucky to compete in the national livestock judging contest. The team members are Jennifer Flinchbaugh, Travis Reid, Joe Emenheiser, and Mike Burrell. In the picture Dr. Blannie Bowen, head of the agri-

cultural and extension education, presents the award to the first-place team at the 4-H State Achievement Days contest. The team is currently fund-raising for their trip to Louisville. Contact Kathy at the York county extension office (717) 840-7408 if you have questions.

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