Ice creamier: 'Edible antifreeze' puts the smooth in smoothie

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It's Friday night, and the movie's already spinning in the DVD player. You run to the kitchen to grab a gallon of ice cream and a spoon, but you find the tub nearly empty.

What's left is an icy mess that crunches unappetizingly when you poke your spoon into it. Time to make popcorn.

If this has happened to you, then Srinivasan Damodaran has good news.

The University of Wisconsin-Madison food science professor has discovered an edible antifreeze that can preserve ice cream's smooth, silky texture.

Colorless and tasteless — you'd never know you were eating it — the antifreeze employs a cocktail of small gelatin proteins to slow the growth of ice crystals, which over time form in ice cream and other frozen foods, ruining texture and overall quality.

Ice crystals form when frozen foods are exposed to temperature variations, which usually happens when freezers defrost or are repeatedly opened and closed. In the ice cream business, a $5 billion annual industry in the United States, that's hardly a selling point, and several companies have been working to develop substances that can prevent crystal formation.

The multinational food company Unilever, for example, sells ice cream in the United States, the Philippines and Mexico that includes an antifreeze protein derived from fish. The additive is pending approval in Europe, but strong consumer sentiment against genetic engineering may prevent it from being widely accepted.

Damodaran says he believes Europeans and other consumers may take more favorably to a gelatin-based antifreeze, which comes from animal collagen, the same protein source tapped for gelatin desserts such as Jell-O.

"A lot of people study antifreeze proteins because they have so much technological value," he says, adding that they can be used in a variety of frozen desserts, fruits and vegetables. "They are very appropriate for meat, too. So much texture is lost due to ice crystal damage in meat tissues."

To create the new antifreeze, Damodaran mixed gelatin with papain, a natural enzyme from fruit that cuts proteins into smaller pieces. When blended into ice cream, a group of truncated gelatin proteins worked to keep the frozen treat smooth even after researchers exposed the samples to repeated fluctuations in temperature, designed to mimic the variances of a typical home freezer.

"We used ice cream as the model to show that this antifreeze works," says Damodaran. "Now it's up to the companies, manufacturers and the consumers to decide if they want to have it in their products."

Source: University of Wisconsin