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Edible Antifreeze Saves Ice Cream
Food Chemists Use 'Edible Antifreeze' To Make Smoother Ice Cream

July 1, 2008 — Chemists adding a tasteless edible protein called gelatin hydrolysate to ice cream find that it keeps ice crystals small, resulting in a smoother, more pleasing product. The protein inhibits the growth of ice crystals, keeping them small and preserving the creamy texture of ice cream.

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People in the U.S. eat more ice cream than any other country in the world. The average American consumes about 24 quarts of ice cream a year. But, if you buy a lot of ice cream, you know that freezer burn or ice crystals can ruin the flavor and creaminess of your favorite treat.

Whichever flavor you like best, ice cream is a favorite for kids of all ages. But when it comes to ice cream, ice isn't such a good thing, especially when it forms on the inside of the container.

"Ice crystals when they grow they change the texture of ice cream, it

gives you some gritty sensation in your mouth, and that is not very desirable," Srinivasan Damodaran, Ph.D., food scientist at the University of Wisconsin, Madison, told Ivanhoe.

Now Dr. Damodaran and his colleagues think they've found a solution. It's an odorless, tasteless natural protein called gelatin hydrolysate.

Added to ice cream, food chemists say it works like edible antifreeze. Here you see the ice crystals that normally form in ice cream ... but when the protein is added, it prevents those large crystals from forming. Chemistry that could make ice cream taste better and last longer.

"You can take ice cream and store it in your freezer. You can store it for four months, don't have to worry about ice crystal growth, don't have to worry about throwing them out after a couple of weeks," Dr. Damodaran said.

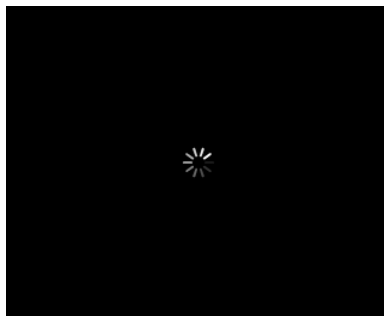
Dr. Damodaran says manufacturers are already taking an interest. "This is a very safe product, and it doesn't require even the FDA's approval to implement the technology," Dr. Damodaran said.

And that means it could be coming soon to a cone near you.

THE SCIENCE OF ICE: Ice is the frozen form of liquid water. The same substance will behave differently at various temperatures and pressures. Water (H₂O) is the most familiar example. It can be a solid (ice), a liquid (water), or a gas (steam), but it is still made up of molecules of H₂O, so its chemical composition remains unchanged. At sea level, water freezes at 32 degrees Fahrenheit (0 degrees Celsius) and boils at 212 degrees Fahrenheit (100 degrees Celsius), but this behavior changes at different altitudes because the atmospheric pressure changes. In fact, get the pressure low enough and water will boil at room temperature. The critical temperature/pressure point at which H₂O changes from one form to another is called a phase transition.

WHAT IS GELATIN? Gelatin is a processed protein called collagen, derived from the bones, hooves and connective tissues of cows or pigs. Those parts are ground up and mixed with acid or other chemicals to break down the cellular structure, thereby releasing the collagen. Boiling it causes a layer of gelatin to form on the top, which can be skimmed off for further processing. Eventually it ends up in your local grocery store aisle in powder form, or in this case, in ice cream.

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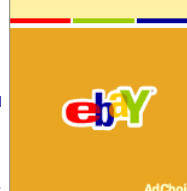
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