

Researchers develop ice cube that doesn't melt or grow mold

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UC Davis researchers have developed a new cooling cube to cut down on cross-contamination. It won't melt, is compostable and plastic-free. Credit: Gregory Urquiaga/UC Davis

Researchers at the University of California, Davis, have developed a new type of cooling cube that could revolutionize how food is kept cold and shipped fresh without relying on ice or traditional cooling packs.

These plastic-free, "jelly ice cubes" do not melt, are compostable and anti-microbial, and prevent cross-contamination.

"When ice melts, it's not reusable," said Gang Sun, a professor in the Department of Biological and Agricultural Engineering. "We thought we could make a so-called solid ice to serve as a [cooling](#) medium and be reusable."

The cooling cubes contain more than 90 percent water and other components to retain and stabilize the structure. They are soft to the touch like a gelatin dessert and change color depending on temperature.

Reusable and flexible

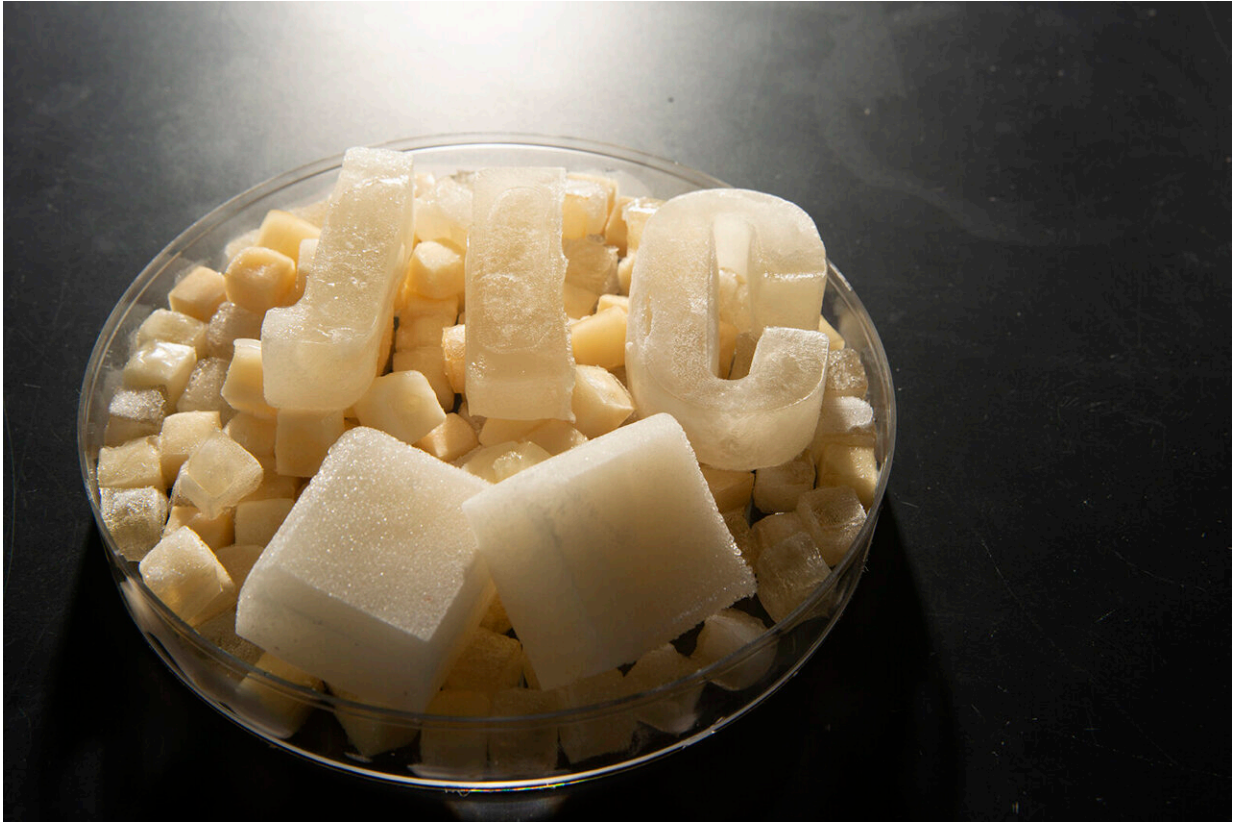
These reusable cubes can be designed or cut to any shape and size needed, said Jiahan Zou, a Ph.D. graduate student who has been working on the project the past two years.

"You can use it for 13 hours for cooling, collect it, rinse it with water and put it in the freezer to freeze again for the next use," Sun added.

A patent for the design and concept was filed in July.

The researchers hope to eventually use recycled agriculture waste or byproduct as the coolant material.

"We want to make sure this is sustainable," said Luxin Wang, an associate professor in the Department of Food Science and Technology.



New cooling cubes can be molded into any shape and could revolutionize cold storage. Credit: Gregory Urquiaga/UC Davis

Fish market wastewater, moldy ice blocks spurred idea

The researchers began working on the coolant cubes after Wang saw the amount of ice used at fish-processing plants and the cross-contamination that meltwater could spread among products or down the drain.

"The amount of ice used by these fish-processing sites is massive," Wang said. "We need to control the pathogens."

Sun also lamented mold found in the plastic ice packs used with school

lunches for kids and frequently found in shipping packages.

Early tests have shown the cubes can withstand up to 22 pounds without losing form. They can be reused a dozen times—just a quick wash with water or diluted bleach—and then disposed of in the trash or with yard waste.

Alternative to ice

The jelly ice cubes offer an alternative to traditional ice and could potentially reduce [water](#) consumption and environmental impact. They also offer stable temperatures to reduce [food](#) spoilage and could be ideal for meal prep companies, shipping businesses and food producers who need to keep items cold.

The application could potentially reduce [water consumption](#) in the food supply chain and food waste by controlling microbial contaminations. The research was published in the American Chemical Society's journal, *Sustainable Chemistry & Engineering*.

More information: Jiahan Zou et al, Sustainable and Reusable Gelatin-Based Hydrogel "Jelly Ice Cubes" as Food Coolant. II: Ideal Freeze–Thaw Conditions, *ACS Sustainable Chemistry & Engineering* (2021). [DOI: 10.1021/acssuschemeng.1c06309](https://doi.org/10.1021/acssuschemeng.1c06309)

Provided by UC Davis

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