



Cooling Packs from Rice Flour in Wastewater from Rice Noodle Factory





Cooling Packs from Rice Flour in Wastewater from Rice Noodle Factory

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What is a cooling pack?



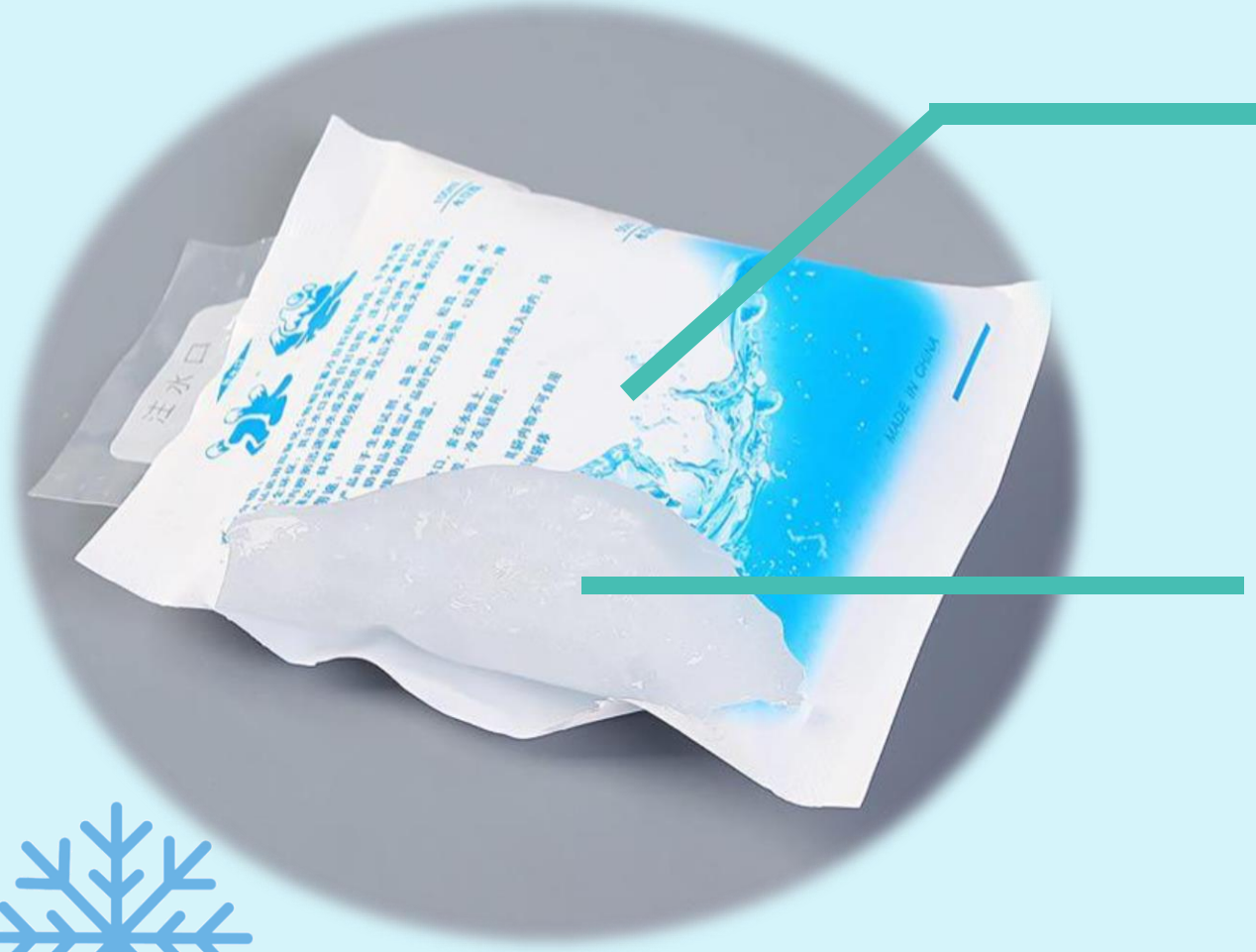
What is a cooling pack?



- Cooling pack is synthetic polymers, contained in a plastic bag.
- used for first aid such as strained muscle.
- used for chilling frozen food instead of using ice.



The main component of the cooling pack



The packaging makes from a Plastic bag

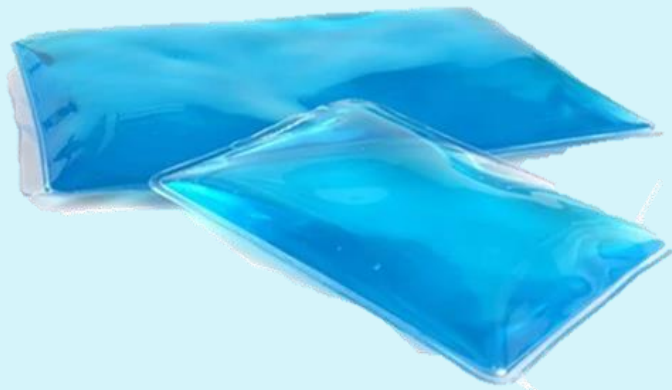


Gel texture

- synthetic polymers are sodium polyacrylate
- colored water



Effect on the Environment



The gel texture is nondegraded in nature

gel texture combined in nature

dangerous to nature



The rice noodles factory

The starch used to produce the rice noodles



wastewater and food waste after production



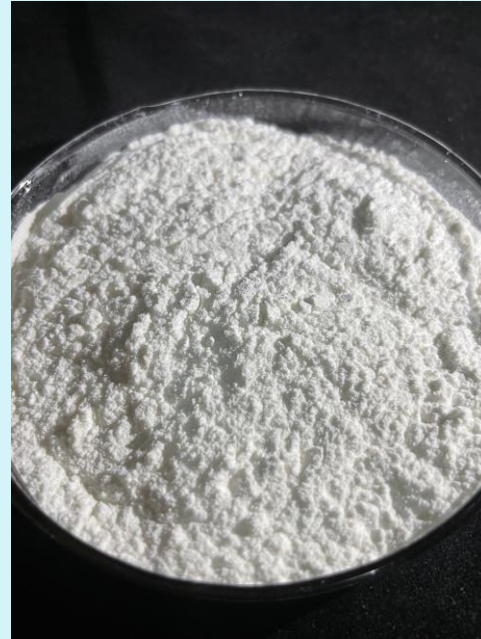
wastewater is not utilized



The rice noodles factory



starch is a component
of wastewater



sediment the starch
from wastewater



develop a cooling
pack from the starch





Objective

- Developed cooling packs from flour in a rice noodle factory.
- Study the ratio of flour and water to increase the efficiency of keeping temperatures cool.
- Compare the efficiency of the cooling pack between the cooling pack from steamed rice and the cooling pack from rice flour.





Hypothesis

The starch in the effluent from the Thai rice noodle factory could be used to prepare the cooling gel.

Related variables

- The Independent variable is the starch in the effluent from the Thai rice noodle factory
- The dependent variable is frozen starch gel
- The controlled variable is the experiment site, the weight of the starch gel zip lock bag size

Expected Benefits



- Developed a cooling gel formula that is easy to make and cheap.
- Prepare a cooling gel from natural substances. Harmless to the body and the environment
- The cooling gel can degrade naturally and not cause residue.



Equipment



Infrared thermometer



different types of flour



water



heating stove



Freezer or fridge



Method



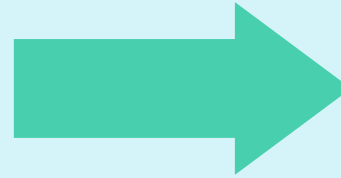
Prepare cooling gel



Mix the water with the flour



heat until viscous



Study of temperature changes



Remove from the freezer



Measure temperature every 20 minutes



Method



Collect flour from the wastewater of the Thai rice noodle factory.



Collect wastewater samples from the Thai rice noodle factory.



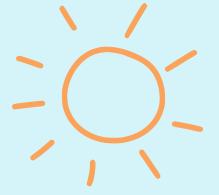
Got the starch from the effluent from the Thai rice noodle factory.



Use the flour to prepare the gel and Study of temperature changes.



Experimental results



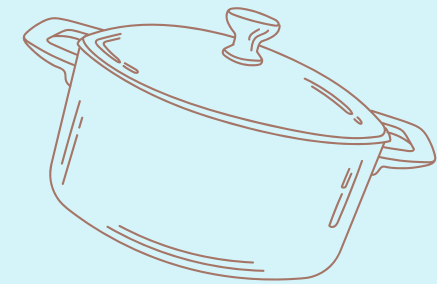
Flour collection from wastewater in Noodle Factory.

- Flour has a stink. Indicating that the flour fermented.
- The smell will fade when the flour is exposed to the sun for a long time.
- The resulting flour is powder and white.
- The flour from the rice noodles factory is similar to steamed rice.



Experimental results

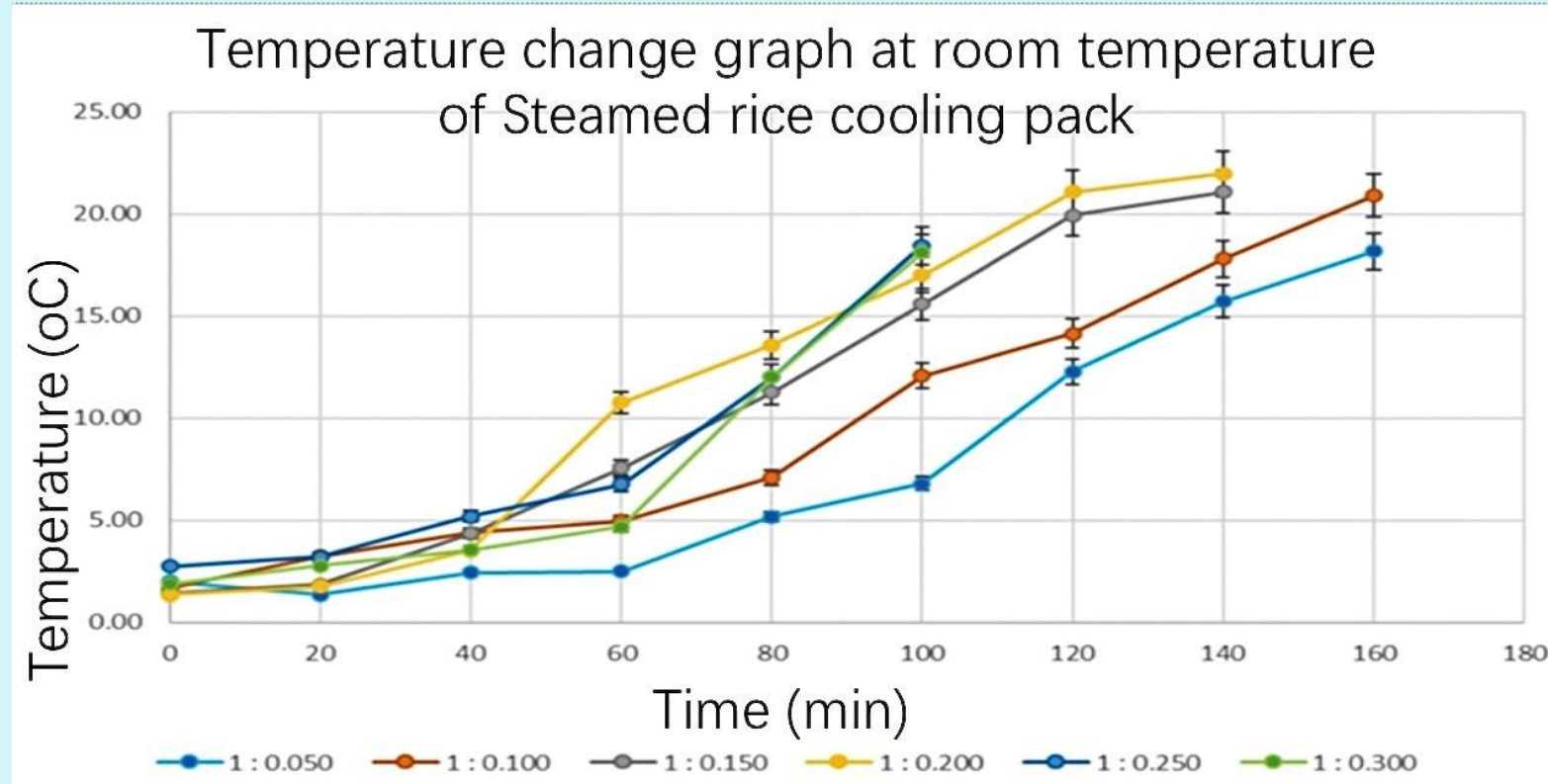
Characteristics of steamed rice when gelatinization.



Opaque white clumped together because of high amylose content.



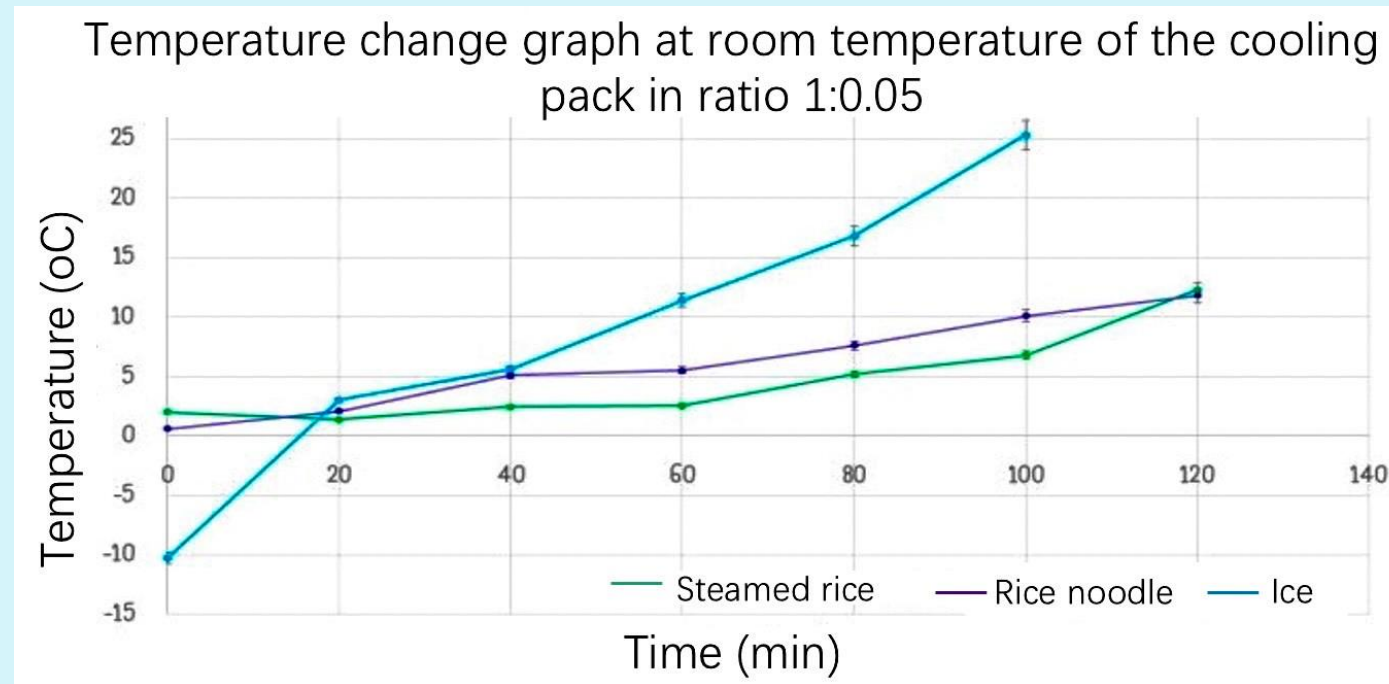
Experimental results



- The ratio of 1:0.05 by weight had a lower temperature change rate than other ratios.



Experimental results



- Cooling pack at room temperature it can keep temperature below 5 for 60 minutes and can be stored longer than ice in the same ratio.

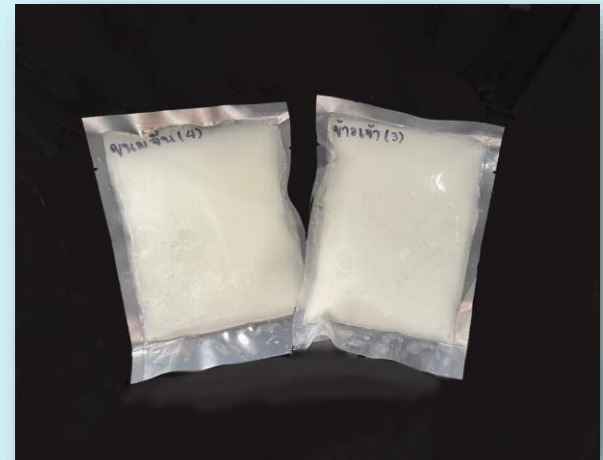




Experimental results

Steamed rice gel

- Steamed rice makes a binding force with water and absorbs less water.
- The structure of amylose is very organized. Therefore a lot of heat energy to disintegrate the binding force.



Conclusion



- Flour gel at the ratio of water to flour 1:0.05 by weight can keep the cold the best.
- The experimental results of steamed rice and flour from a noodles factory were similar.





Suggestion

- Developed cooling pack for better effective keeping cool by adding substances to decrease the temperatures change.
- Used materials are suitable for making packaging.





Thank you!

