Does Flavor Affect the Melting Process of Ice Cream?

Material science

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Signature of Sponsoring Teacher

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Acknowledgments

I would like to thank my sister and mom for helping us observe the ice cream and for making this experiment that much better. I would also like to thank my mom for buying the materials and allowing us to dirty her kitchen. Finally I would like to thank my other sister for helping me develop the pictures and my baby brother for not destroying the actual experiment or eating the ice cream.

Purpose

The purpose of this project was to find out what flavored ice cream melts the fastest. Those hot summer days just ruin the perfect foamy ice cream into a messy liquid lump. If one flavored ice cream would end up melting slower than the rest, it would help keep the heat from anybody's favorite dessert.

Hypothesis

I think that the chocolate ice cream will end up melting the fastest. Dark colors tend to absorb heat. That dark chocolate color might affect how the chocolate ice cream will react to the change of temperature. It's also very sweet which might add to how fast it will melt.

Review of Literature

So what happens to ice cream? Why does that foamy, richness to it disappear so quickly? This may happen very often to all those ice cream lovers, especially during the course of the hot summer days. There are various numbers of reasons why this happens. A lot of the times fat structure does have a lot to do with this. The amount of fat structure can help the ice cream in the following ways; it gives the ice cream a smoother feel overall, it gives better richness and palatability, makes the ice cream have better air stability, and increases the resistance of ice cream from melting. The amount of fat structure and how it's built in affects how overall the ice cream will turn out.

The ice cream's melting rate also depends on its movement through temperature. If the ice cream is transferred from a place that is very cold to a place where it has become very hot it has more probability of changing its state faster than an ice cream that has been in the same type of condition all the way through. The warmer an object is the more energy it has. So when ice cream is eaten in a warm place, it begins to quickly collect a lot of energy. When the ice cream gets a higher amount of energy than it's supposed to it starts changing its state.

Emulsifiers, a group of compounds in ice cream that help in developing the right amount of fat structure and air distribution needed for a smoother ice cream and good melt down qualities are also very important elements. Emulsifiers also stabilize

the dispersion of air bubbles and prevent coalescence, which means all of the molecules growing into one. Controlling the protein concentration and type determines the amount and size of an air bubble. The airier an ice cream is the longer it tends to keep its same shape. The ice cream used was Breyers all natural ice cream and follows the procedures as set forth by the International Ice Cream Association.

Materials

8 oz cup of Breyers chocolate ice cream
8 oz cup of Breyers vanilla ice cream
8 oz cup of Breyers strawberry ice cream
A timer or clock
Room temperature, 75 degrees
A pair of observative eyes
An ice cream scooper or a spoon

Procedure

1. Gather all materials needed.
2. Make sure all your ice cream is the same brand, Breyers and plainly chocolate, strawberry, and vanilla.
3. Get all your ice cream out at the exact same time, frozen all the same.
4. Be sure to set your timer once the ice cream is out. Scoop out just enough to fill your eight ounce cup and make sure all your ice cream is filled up the same way.
5. Set them all facing the same type of condition and temperature. Make sure you are doing this at room temperature.

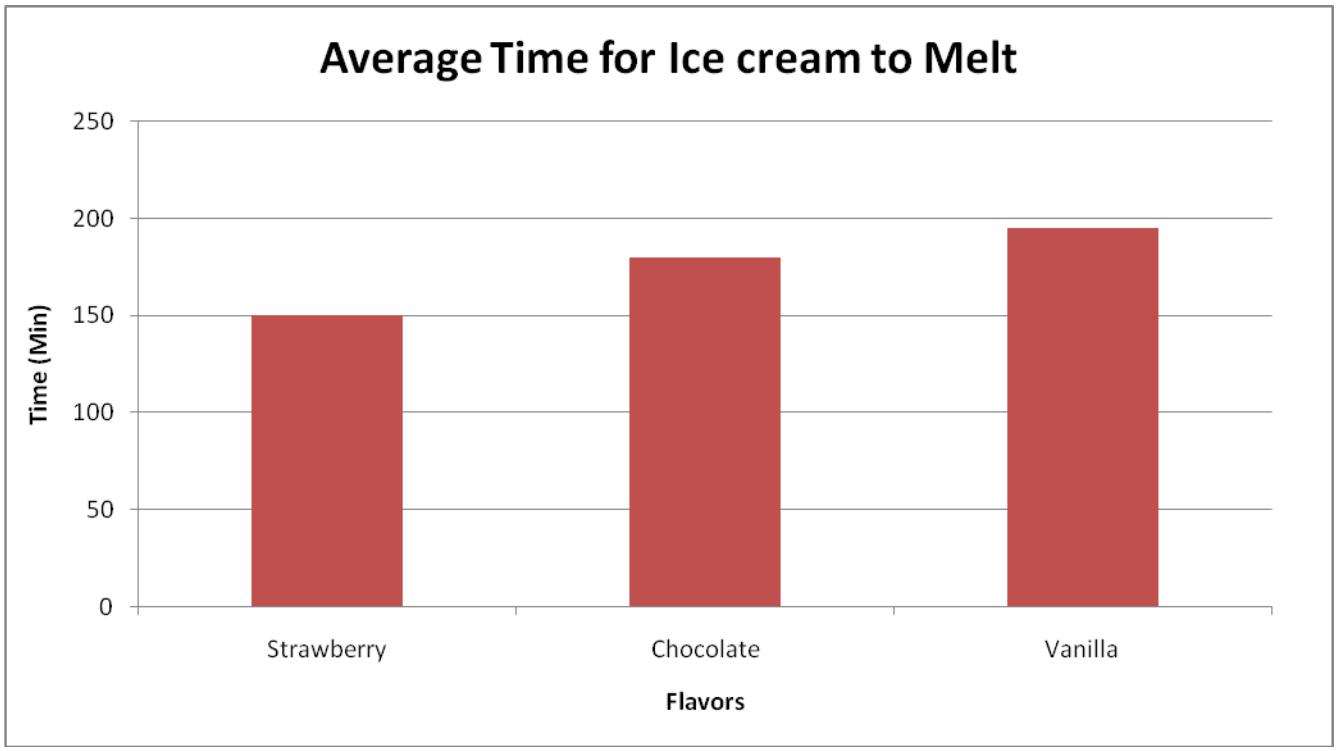
6. Observe let them sit alone, no shaking, stirring, or any type of movement that could affect how fast or slow the ice cream might melt.
7. Keep your eye on the ice cream, and be sure to keep observing how fast each flavor is melting. When thought to be melted through pick with a tooth pick and observe the texture of the three. Make sure to do this only when sure of the melting of the three.
8. Wait until all the flavors have melted all the way through and have become into a liquid state. Record your findings.

Results

	strawberry	chocolate	vanilla
Trial one	The ice cream has melted more from the bottom than from the top. It has melted faster than the other two. The cause maybe the strawberries?	The ice cream has a lot of air bubbles. It has a lot of water droplets forming outside the cup. Seems sticky. Melted the second fastest	Melted pretty slow, water droplets formed too. Seemed to have little chunks formed around some parts. It melted the slowest.
Trial two	Strawberries were seen. Seems to be melting bottom to top. All ice cream's have air bubbles forming in them. Still melted first.	It has the most air bubbles. Has all different kinds of shades of chocolate, maybe in the result of no movement. Was the second to melt.	Stayed in the liquid state longer than the other two. Seemed to go down but not as noticeable as the others.
Trial three	Went down pretty quick. Seemed to change in size. Was the first to melt again.	Looked like hot chocolate! Pretty gross, not the best thing to eat as was. Was standing as the second fastest to melt	Was not so fast to melt. Seemed to stay in its same state for a while. When it did start to melt, it melted evenly through.

It turns out that the Breyer's strawberry ice cream melts the fastest, while the Breyer's vanilla ice cream takes a while to melt all the way through. The chocolate ice cream melted through pretty quick as well but turns out to have a lot of fat! The air bubbles kept bursting away, and it started looking like cold hot

chocolate, not very tasty. Guess you better stay away from the strawberry and chocolate ice cream on those very hot days!!



Conclusion

After doing this experiment three times it has been determined that the strawberry ice cream melts the fastest. My hypothesis was wrong although not very far off. The strawberry ice cream might have melted through quicker because of its strawberries. Whatever it was it became apparent that ice cream isn't all that healthy. After being out in the room temperature the air bubbles started bursting and the ice cream didn't look all that great. Strawberry melted the fastest, chocolate followed, and vanilla trailed behind. So if you're out in the blazing hot sun I recommend you eating your ice cream quick or dumping it out before it gets too gross. I'd stick to vanilla, which doesn't melt as fast as the other two and doesn't result with a lot of air bubbles afterwards. If you're just an absolute strawberry and chocolate ice cream lover you're better off in the shade.

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