

Ice Cream Food Lab

Ontario is Canada's leading ice cream producers, with 60% of Canada's total production.

The main ingredients of ice cream are milk, sugar, eggs, and flavorings. A variety of milk products can be used; for example, cream, whole milk, condensed milk and instant skim milk powder. Milks with a higher fat content are smoother, richer, and a more flavorful product. Sugar is commonly used as a sweetener. It increases the palatability and improves the body and texture. Stabilizers such as gelatin may be used to absorb some of the free water in the ice cream mix and help prevent the formation of large ice crystals. Gelatin also helps gives substance and a less watery taste.

Eggs help to combine the fat and water and also improve the whipping ability, which results in greater resistance to melting. Although vanilla is the most popular flavour, others can be added to suit your taste.

Why use salt? The concept of melting ice with salt is not new to anyone living in Canada. During the winter months we use salt on our roads, driveways, and sidewalks. As salt is applied to ice, a concentrated brine solution forms on the ice. The freezing point of a 20 percent solution of salt is -16.6 C. As a result, more ice melts to dilute this solution, until the freezing point of the solution matches the outside temperature (equilibrium is established).

Ice Cream Recipe

250 ml (1 cup) homogenized milk
 125 ml (1/2 cup) sugar
 Egg substitute (the equivalent of one egg)
 2 ml (1/2 teaspoon) of vanilla
 250 ml (1 cup) of whipping cream
 75 ml (1/3 cup) course salt
 Crushed ice
 Medium Sized Ziploc Bag
 Large Sized Ziploc Bag

- 1) Place the milk, sugar, egg substitute, vanilla and cream into the medium sized freezer bag. Zip the bag.
- 2) Place the medium sized freezer bag into the larger bag and pack with crushed ice between them. Pour some of the salt evenly over the ice. Continue with the ice and salt until the smaller bag is completely covered. Zip up the large bag.
- 3) Shake the mixture until it firms up and becomes ice cream. This may take 10 to 15 minutes. You may want to wear gloves because your hands will get very cold.
- 4) Remove the smaller bag from the larger one and wash the small bag under cold water until all traces of salt are removed. Open carefully and enjoy.

Observations

1) Complete the following chart comparing homemade and commercially prepared ice cream.

	Homemade	Commercially Prepared
Colour		
Texture		
Flavour		
Melting (speed)		

2) Compare the ingredients in homemade ice cream to commercially prepared ice cream. How are they similar? How are they different?

3) Identify three food additives used in commercially prepared ice cream. What is the purpose of each additive? (Hint: There is a VERY helpful link on my website).

4) Based on your observations, what conclusions can you draw about the use of additives in commercial ice cream? How can additives affect the quality of food consumers buy?