

ICE CREAM MANUFACTURE

- ✓ Ice cream may be defined as a frozen dairy product made by suitable blending and processing of cream and other dairy products together with sugar and flavour, with or without stabilizers or colour, and with the **incorporation of air during** the freezing process.

- ✓ It may contain permitted stabilizers and emulsifiers not exceeding 0.5 per cent by weight.
- ✓ The mixture must be suitably heated before freezing.
- ✓ The product should contain not less than 10% milk fat, 3.5% protein, and 36% total solids.

Classification

Plain: Ice cream in which the colour and flavouring ingredients together amounts to less than **5 per cent of the volume** of the unfrozen ice cream. Example: vanilla and coffee ice creams.

Fruit: Ice cream containing fruits with or without additional fruit flavouring or colour. **Fruits such as strawberry, apricot, pineapple, mango, banana, etc., may be fresh, frozen, frozen packed, canned or preserved.**

Nut: Ice-cream containing nuts, such as **almonds, pistachio, walnuts, cashew nut,** etc., with or without additional flavoring or color.

Composition

Characteristics	Requirements
weight (g./litre/min.)	525
Total solids(% wt .min)	36.0
Milk fat (% wt. Min.)	10.0 (Tentative)
Acidity (% lactic acid max.)	0.25
Sucrose (%wt. Max.)	15.0
stabilizers/emulsifiers(%wt. Max)	0.5
Standard plate counts (per g.)	Not more than 2,50,000
Coliform count (per g.)	Not more than 90
phosphatase test.	Negative.

Food and nutritive value

- Ice cream contains two to three times as much fat and slightly more protein than does milk.
- Ice cream is a rich source of **calcium, phosphorus and other minerals** of vital importance in building good bones and teeth.
- Ice cream is an excellent source of food energy.
- Ice cream, is a rich source of essential vitamins, without which normal health and growth cannot be maintained.

Icecream



Blend the Ice Cream Mixture

- ✓ The milk fat source, nonfat solids, stabilizers and emulsifiers are blended to ensure complete mixing of liquid and dry ingredients.
- ✓ Premeasured amounts of eggs, sugar, and additives are blended with the milk for **six to eight minutes**

Pasteurizing to kill bacteria

- ✓ Ice cream mix is pasteurized at 155°F (68.3°C) for 30 minutes or 175°F (79.4C) for 25 sec.
- ✓ The conditions used to pasteurize ice cream mix are greater than those used for fluid milk because of increased viscosity from the higher fat, solids, and sweetener content, and the addition of egg yolks in custard products

Homogenization

- Ice cream mix is homogenized (2500 to 3000 psi) to decrease the milk fat globule size to form a better emulsion and contribute to a smoother, creamier ice cream.
- Homogenization also ensures that the emulsifiers and stabilizers are well blended and evenly distributed in the ice cream mix before it is frozen.

Ageing the Mix

- ✓ Ice cream mix is aged at 40°F (5°C) for at least 4 hours or overnight.
- ✓ Aging the mix cools it down before freezing, allows the milk fat to partially crystallize.
- ✓ This improves the whipping properties of the mix

Add Liquid Flavors and Colors

- Liquid flavors and colors may be added to the mix before freezing.
- Only ingredients that are liquid can be added before the freezing, to make sure the mix flows properly through the freezing equipment.

Freezing

- ✓ The process involves freezing the mix and incorporating air.
- ✓ Ice cream mix can be frozen in batch or continuous freezers.
- ✓ Batch freezers consist of a rotating barrel that is usually filled one-third to one-half full with ice cream mix.
- ✓ As the barrel turns, the air in the barrel is incorporated into the ice cream mix.

Freezing

- ✓ The addition of air is called **overrun and contributes** to the lightness or denseness of ice cream.
- ✓ Up to 50% of the volume of the finished ice cream (100% overrun) can be air that is incorporated during freezing.
- ✓ At the point of discharge from the freezer (draw temperature), only about **50% of the water in ice cream is frozen.**

Addition of Fruits, Nuts and Bulky Flavorings (candy pieces, etc.)

- ✓ Fruits, swirls, and any bulky type of flavorings (nuts, candy pieces, etc.) are added at this point.
- ✓ These ingredients can not be added before freezing or they would interfere with the smooth flow of the mix through the freezer.

Packaging

Hardening

- ✓ The ice cream is cooled as quickly as possible down to a holding temperature of less than $-13^{\circ}\text{F}(-25^{\circ}\text{C})$.
- ✓ Storage at $-13^{\circ}\text{F}(-25^{\circ}\text{C})$ will help to stabilize the ice crystals and maintain product quality. At this temperature there is still a small portion of liquid water.
- ✓ If all the water present in the ice cream were frozen, the ice cream would be as hard as an ice cube.

Thank you