

CHAPTER 34: FROZEN DESSERTS

In present times, frozen desserts have become so popular that they are now a major profit - making item on the menu in many commercial outlets such as fast foods and coffee shops. It also has an advantage that they can be prepared in advance and can be stored for long periods of time. Ice creams are purchased ready- made and require no preparation time, space or manpower.

- Frozen Yoghurts contains yoghurt in addition to the normal ingredients for ice cream
- Sherbets and Ices made from fruit juices, water and sugar. American sherbets usually contain cream or milk and sometimes egg whites. The egg whites increase smoothness and volume. Ices, which are also called water ices, contain only fruit juices, purees and sugar. They do not contain milk products and are often referred to as sorbets or granite. Ice creams and sorbets are churn frozen and are constantly mixed while they are freezing. If they are not churned, they would freeze into a solid block of ice. The churning keeps the ice crystals small and also incorporates air into the ice cream.
- Frozen souffle, bavarois and mousses are referred to as still-frozen desserts. There is no churning involved. Egg whites or fresh cream is incorporated to give lightness.
- Specialty ice creams are commonly found ways in which ice creams are served. These include :
 1. Bombes
 2. Parfaits
 3. Coupes/sundaes
 4. Meringues glace
 5. Baked alaska
 6. Frozen eclairs and profiteroles

What is Ice cream?

Technically, ice cream may be defined as the partly frozen foam with an air content of 40-50% air by volume. The continuous phase of the foam contains dissolved and colloidal solids such as sugars, proteins and stabilizers. The fatty phase is in the emulsified form. Some of the milk proteins are structurally related to the fat globules of the emulsion.

Imitation ice cream is known as **Mellorine** and is made now in many parts of the world.. Mellorine is cheaper than ice cream because in expensive vegetable fats and oils are substituted for the more expensive dairy fats. Other than this, mellorine has almost the same composition as ice cream. There is still no cheap substitute for milk protein, although some vegetable proteins, particularly from soy bean, with improved flavors are used to prepare **lactose free** ice creams.

Prevention of food adulteration Act (PFA) Rule A 11.02.08, defines ice cream and kulfi as under:

The frozen food obtained from cow or buffalo milk, or a combination thereof, or from cream and /or milk product with or without the addition of cane sugar (dextrose, liquid glucose and dried liquid glucose), eggs, fruit and fruit juices,

preserved fruits, nuts, chocolate, edible flavors and permitted food colors. It may contain permitted stabilizers and emulsifiers not exceeding 5% by weight. The mixture should be suitably heated before freezing. The product must contain not less than 10% milk fat, not less than 36% total solids, except when the aforesaid preparation contains fruits, nuts or both, the content of the milk fat shall not be less than 8% by weight. Starch may be added to a maximum extent of 5% under the declaration on the label. The standards of ice cream shall also be applied to soft-ice.

Ice cream is a complex system in which the stable mixed emulsion of four phase system of fat-water-ice-air, must be balanced and protected from breaking and separating.

The blend of milk fat and non fat solids with sugar must result in a product of pleasing taste and one which is smooth and creamy. Composition of the mix is important, but the most critical stage of ice cream manufacture is the mechanical blending, freezing and hardening of the ice cream.

COMPOSITION OF ICE CREAM

The ingredients used in ice cream manufacture are milk, skim milk powder, cream, butterfat, sugar, stabilizers, emulsifiers, food grade flavors and permitted colors. Chocolate, dried fruits and nuts, honey, fruit pulps and other such ingredients are also added to give variety.

Normal ice creams will have a milk fat content of 10-14% but richer ice cream will have a dairy fat content of up to 20-24%. Proteins are usually between 3.5-4%, sugar 14-15%, stabilizers .3-.5% and emulsifiers .1-.2%

MANUFACTURE OF ICE CREAM

The following are the steps involved in the processing of ice cream:

- Pasteurization
- Homogenization
- Cooling
- Ageing
- Freezing
- Hardening
- Storage
- Transportation and delivery

After weighing or metering by volume, the ingredients are heated together in a jacketed tank with strong agitation so as to form a coarse emulsion with large fat globules up to 15 gms in size. Pasteurization treatment may be carried out in the mixing tanks. During Homogenization, the mix is converted into a true emulsion with a fat globule size of less than 2 gms. For efficient homogenization, the fat phase should be completely liquid and hence a temperature near pasteurization temperature is preferred. Homogenization of the ice cream mix is normally carried out at a pressure of 140-210 kg/cm². At the end of this treatment, it is often found that individual small fat globules cohere in clumps, resulting in a viscous mix with poor processing properties in subsequent stages. A second homogenization at lower pressure of 35kg/cm² is used to break up the clumps.

The emulsion is now cooled immediately to 4°C sometimes using a supercool.

The next step is ageing. The cooled emulsion is usually stored in a thermostatically controlled vessel for 2-8 hours because ageing improves freezer performance and produces better ice cream structure. During ageing, the stabilizer hydrates fully and increases the viscosity of the mix. The importance of ageing will vary with different stabilizers. Significant improvement in texture is noted at this stage.

FREEZING

Ice cream is available in two forms:

1. As hard ice cream which has been frozen in a continuous freezer and is either extruded, shaped or packed in small individual portions or in the larger family packs. The final processing step now is hardening at a low temperature cold store at -30 to -40°C before it is distributed in refrigerated transport.

2. As soft ice cream which is frozen in a small batch freezer situated at the retail outlet. Ice cream mix for this type of operation is provided as a pasteurized mix which must be stored at 4°C after manufacture. This is often referred to as the *softie* ice cream.

STORAGE OF ICE CREAM

Ice cream can be stored at 0°F (-18°C) to prevent large ice crystal formation.

For service, temper frozen ice cream till it is soft enough to serve. If scooping, the ice cream scoop must be rolled over the surface so that the ice cream forms into a round ball.

FUNCTIONS OF SOME OF THE INGREDIENTS:

- Sugar: Sugar represents half the total amount of solids in the ice cream mix. It includes lactose, which is the natural milk sugar. Sugars act as a sweetening agent, depress the freezing point, influence the consistency and to some extent the size of the ice crystals and the lactose crystallization of the frozen ice cream.
- Stabilizers: Gelatin was the first stabilizer used in the manufacture of ice cream. Since then a number of poly saccharide stabilizers have become available. These include sodium carboxy methyl micro crystalline cellulose, sodium alginate, carrageenan, agar pectin, xanthin gums, carobbean and guar gum. Often a combination of these are used. Stabilizers perform several functions in the manufacture of ice cream. They increase the viscosity, thereby improving the body and creaminess of the ice cream. They also regulate the development of the ice crystals and thereby give a smooth texture to the ice cream. During inevitable temperature fluctuations, they minimise the development of large crystals and the undesirable coarse texture. They thicken the aqueous phase and modify the crystallization of ice

ICE CREAM QUALITY

Quality implies a clearly produced ice cream of acceptable flavor, taste, body and texture. The composition of the product and the ingredients used should be within the parameters and the limits set by the food laws. The desirable physical properties of ice cream should be defined mainly in terms of the texture as it is eaten. The consistency should be smooth

and creamy and the air content should be finely distributed. There should be a quick melting effect on the palette, without greasiness or gumminess and with no gritty icy sensation. As the ice cream warms up, it should have a tendency to retain its shape, and as it melts, a creamy and not a watery serum should be formed. Flavor acceptability is governed by the quality of the ingredients that are used as well. Fruits, nuts, chocolate as well as the added flavors should be of a good quality. However, the basic flavor must come from high quality of milk and cream.

ICE CREAM - THE CHILLING TRUTH

Ice cream, Sumptuous....., Luscious....., Creamy..... Ice cream!!!

Now that summer is almost here, it is time for scoops of it. But, have you ever considered what gives that delightful taste to a snowy vanilla ice cream? The real extract of orchids???? Forget it!!! The genuine vanilla that is obtained from the variety of orchids, almost never reaches the ice cream manufacturer. Instead, a synthetic substance called vanillin makes its way into the creamy stuff. **Vanillin** comes much much cheaper than vanilla. If a small amount of vanilla can flavor two cups of ice cream, then the same amount of vanillin can flavor 500 cups. So why should't the manufacturer use the cheaper stuff... the customer would never know!!!! The substitute tastes like the real thing, but it is far from harmless! This is largely because there is very little accountability for the manufacturers. Even in the US, the food and drug administration (FDA) has not forced icecream manufacturers to name all the ingredients on the labels of their products. All you get is the brand name, the Company's name and the flavour. The small print merely says, 'only permitted colours and flavours used. But what flavours and what colours? Icecream companies here and abroad are given carte blanche to use additives. Not surprisingly, neutralisers, stabilisers, emulsifiers, buffers, anti-oxidants, surfactants, bactericidals, synthetic colours and artificial flavours - all find their way into the gooey stuff. In 1942 the FDA had banned the use of many additives because their safety had not been verified. But oddly enough, again in 1960, it sanctioned the use of these chemicals - although there was still no proof of their safety. The fact is that surfactants, which reduce the surface tension and are wetting agents are chemicals similar to detergents. And most emulsifiers are polyoxyethylene based and have caused cancer in experimental animals. Most germicidals, anti-freeze agents and pain removers contain propylene glycol alginate - so does icecream. Why then are these products used? Animals given even minute quantities of propylene glycol alginate developed diarrhoea and some of them even died.

Artificial flavours are harmful too, besides vanillin another substitute for vanilla is piperonal, which is a lice killer. Chocolate icecream contains aldehyde C 18, amyphenyl acetate, n-butyl, phenyl, veratraldehyde, and other such tongue twisters... All, strong chemicals you wouldn't like to touch, leave alone eat. Rare are the manufacturers who use real fruit like strawberries. More usually, artificial flavours are employed. Pineapple icecream is often flavoured with ethylacetate, which is a cleaning agent for leather and textiles and whose vapours cause damage to the heart, liver and lungs. Banana icecream scarcely contains banana, but an artificial flavour - amy acetate - which is actually a solvent for oil paint. Now you wouldn't let your kids come anywhere near that.

In the west, there are thousands of synthetic colourings which are usually coal tar dyes proven to be carcinogenic. Worse, most Indian icecreams are violently coloured to suit our flashy tastes, which just means a whole lot of colour. It's time the government stopped being complacent about a food product that is downed by tons every day. On the positive front, Indian icecreams are believed to be more wholesome and natural and not so thoroughly soaked in synthetic additives as in the West. Even then icecream companies should be made to mention all ingredients by name on their labels, plus the date of manufacture and expected shelf life.

Accountability is the only solution when it concerns the health of millions.

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