

ICE-CREAM & FROZEN DESSERTS



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Module 4. Technological aspects of ice cream manufacture

Lesson 11

PREPARATION OF ICE CREAM MIX –PASTEURIZATION, COOLING, AGEING AND FLAVOUR ADDITION

11.1 Introduction

Once the formulation of ice cream mix is decided and all the necessary ingredients weighed, the subsequent operations involves blending the ingredients, pasteurizing the ice cream mix followed by cooling and ageing. Thereafter just prior to taking it to the freezer appropriate flavor and colour is incorporated.

11.2 Pasteurization of Mix

Pasteurization is done to destroy all the pathogenic bacteria in the mix so as to render the final product safe for human consumption

Advantages of pasteurization are:-

- It renders the mix completely free of pathogenic bacteria.
- It dissolves and helps to blend the ingredients of the mix.
- It improves flavour.
- It improves keeping quality.
- It produces a more uniform product

Rapid heating and holding of the mix at definite temperature and rapid cooling below 5°C ensures proper pasteurization.

The temperature time combination for pasteurization of the mix as per BIS is as follows

- For Batch method – 68.5°C for not less than 30 min
- HTST method - 80°C for not less than 25seconds

- Vaccination - 90°C for not less than 1-3 seconds
- UHT pasteurization – 98.8 to 128.3°C for not less than 0-40 seconds

High temperature pasteurization is preferred as there is a greater bacterial kill resulting in low bacterial count in ice cream

- Better body and texture
- Better flavour
- Protection against oxidation
- Saving of stabilizer
- Saving of time, labour and space
- Increased capacity

11.3 Cooling of Mix

After pasteurization, the mix should be rapidly cooled to a temperature below 4°C using a plate heat exchanger. Unless the mix is cooled to a temperature of 4°C or lower, it will become very viscous and the ice cream will not melt down smoothly. Also, temperatures below 5°C retard the growth of bacteria.

11.4 Ageing of Mix

The cooled mix is left to age preferably for a period of 24 h at 4°C.

The changes that occurs during ageing are

- Hydration of milk proteins
- Crystallization of fats
- Absorption of water by any added hydrocolloids
- Viscosity is increased largely due to the previously mentioned changes.
- Ageing is substantially completed within 24 h and longer period should be avoided to control spoilage by psychrotrophs.

11.5 Flavour Addition

Frozen desserts are valued mainly for pleasing flavour and refreshing effects. Among the flavouring substances that play an important part in frozen desserts are vanilla, chocolate, strawberry, pineapple, lemon, banana, mango, orange etc. Type and intensity of flavours

are important characteristics in ice cream where delicate flavours are preferred to harsh flavours.

Some points to be remembered

Flavours are added by experience to obtain pleasing flavour and colours should correspond to the flavour.

Fresh or canned fruits should be used as pulp or cut into pieces and added to partially frozen ice cream or as top dressing

Nuts after cut into pieces, roasted / unroasted, should be added to partially frozen ice cream while it is in the freezer.

Examples:-

- Vanilla
- Chocolate and Cocoa
- Fruits – fruit concentrates and essences
- Candied and glazed fruits
- Dried fruits
- Freeze dried fruits & Nuts
- Spices & salt

Last modified: Wednesday, 19 December 2012, 03:31 PM

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