Food Science and Technology Notes

Extension Division Department of Food Science and Technology Virginia Polytechnic Institute Blacksburg, Virginia

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THE NATIONAL ICE CREAM RETAILERS ASSOCIATION, INC., PRODUCTION TIPS (July 1968)

"Bench Marks of a Quality Control Program for Ice Cream"

Dr. V. H. Nielsen
Department of Dairy and Food Industry
Iowa State University
Ames, Iowa

The concept of high quality ice cream varies significantly among ice cream manufacturers and consumers and ice cream itself is a product of great variety. The industry has sought to establish in the minds of consumers the image of ice cream as a highly palatable, nutritious food made from the finest ingredients. The substance behind this image is, of course, a manufacturing operation guided by definite standards and by an effective quality assurance program.

Here are the bench marks of such a program:

A. General goals and procedures

1. Establish standards for finished products and ingredients.

2. Examine ingredients regularly to assure that quality standards are met.

3. Examine finished products regularly and systematically. This may not include samples of every lot or run but should comprise enough samples to be representative of the total production.

4. Provide adequate laboratory facilities or services for bacteriological, chemical and physical analysis of products and ingredients.

5. Organize a competent taste panel to judge the finished products during periods reserved for this purpose.

6. Correct deficient quality when observed.

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B. Suggested standards and criteria

1. Composition		Ice Cream	Ice Milk	Sherbet
Fat	%	10.2-10.5	2.5-3.0	1.5-1.75
Total Solids	%	38-40	30-32	30-32
Food Solids	lbs/gal	1.6	1.3	--
Density	lbs/gal	4.6-5.2	4.5-5.0	6.0-6.2
pH (before addition of fruits, etc.)		6.4-6.6	6.4-6.6	

Control of fat content serves (a) to augment palatability, (b) to comply with legal standards and (c) to adjust composition in the interest of economy.

A minimum total solids content is essential to maintaining good body and texture.

Density is a measure of the overrun and influences body and texture. A satisfactory weight standard should be adopted and accurate scales should be used for weighing samples of the packaged product.

The pH value indicates whether or not acidity has developed in the mix or in some ingredients. A desirable level is pH 6.4-6.6.

2. Sanitation

Phosphatase test	-Negative
Standard plate count	-Less than 20,000/g
Psychrophilic count	-Less than 50/g
Coliform count	-Less than 10/g

High standard plate count and high coliform count indicate contamination from the following possible sources:

a. Milk ingredients

b. Flavors, fruits, nuts, candies, etc.

c. Equipment

d. Personnel

They may also result from improper pasteurization, a point which can be checked out by the phosphatase test. They may result from improper cleaning and sanitizing of equipment.

A high coliform count in ice cream generally indicates contamination after pasteurization. Often the foam encountered in vat pasteurization is the source of of these bacteria. Another potential source of coliform bacteria are the fruits, nuts, berries, candies, etc. with which ice cream is flavored.

High count of psychrophilic bacteria may result from extended storage of mix at temperatures much above 40°F.

3. Suggested standards for ingredients

Cream and Milk. Standard plate count should be less than 50,000 per ml.

Condensed Milk. Standard plate count should be less than 10,000/g.

Nonfat Dry Milk. Should meet standards for U. S. Extra Grade.

Sweetness. Standard plate count should not exceed 200/g and should preferably be less than 50/g. Liquid sugars should be protected against contamination with yeasts and molds. Condensation inside storage tanks may cause formation of films of dilute sugar which will support growth of yeasts and molds. Frequent cleaning of tanks is desirable. Ultra violet lights may also be used to subdue contamination.

Stabilizers. Standard plate count should be less than 10,000/g. Yeast and mold count should be less than 100/g.

Egg Products. Standard plate count should be less than 10,000/g. They should be free of staphylococci and salmonella.

Colors. Colors made up from powders should be heated to 160°F and should be stored in containers in which they were heated.

Fruits, Nuts, Candies, etc. As far as possible, these ingredients should be purchased in sterilized packages or in preparations treated to reduce bacteria counts.

4. Palatability

Flavor	-Characteristic of the flavor claimed on the label and free from high acid, rancid, oxidized, stale and other off flavors.
Body and texture	-Smooth and free of coarse, ice, sandy and gummy characteristics.
Melt-down	-Should melt completely to smooth mix, free from lumps, curd, whey and foam.
Color	-Natural and pleasing.

5. Special Precautions with Sweeteners.

a. Select corn syrups which are white to slightly amber in color.

b. Avoid overheating in storing and handling.

c. Adjust the amount of flavor added to the product to compensate for the masking effect of the corn syrup.

d. Cane and beet sugar should have a low invert sugar content and less than 3 p.p.m. of copper and iron.