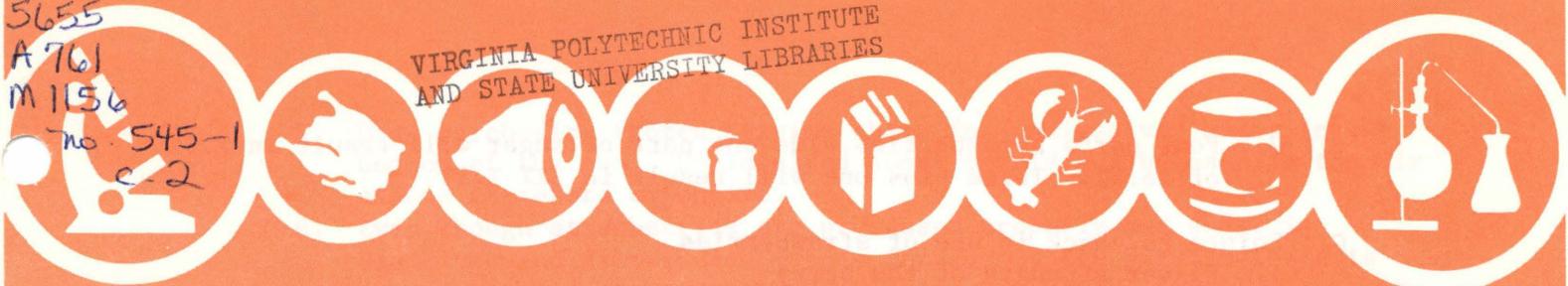


LD

5655

A 761

M 1156

no. 545-1  
c-2VIRGINIA POLYTECHNIC INSTITUTE  
AND STATE UNIVERSITY LIBRARIES

# Food Science and Technology Notes

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

MFST-545-1

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

## "Use of Fruits, Nuts and Flavorings in Ice Cream"

E. W. Custer  
Mississippi State University  
State College, Mississippi

In the use of fruits, nuts and confections for the flavoring of ice cream and frozen desserts, it is very difficult to establish a basic rule as to the source of supply and the manner in which the products should be prepared for use in ice cream.

Most of our ice cream plants today have the equipment, the ingredients, and the technical know how to produce a fine quality ice cream mix. Frequently, the vanilla ice cream stands high on quality rating and since over 50% of the ice cream sold is vanilla little or less attention is paid to the quality of the other flavors. Too many of us think "If the vanilla is good, all flavors produced by the plant will be good." Not true at all. Too frequently we are falling down on our small volume flavors which in turn not only decrease sales of that particular flavor but cost us in sales of our good vanilla since most customers think like we do; that is, "If the strawberry ice cream is of poor quality, then the vanilla will be the same." Let's make each flavor stand on its own two feet from a quality standpoint or get it out of our hardening rooms, off our trucks, out of our cabinets and stop taking up space some good flavored ice cream should be using.

I would like to discuss with you in a general way some of the pitfalls we must avoid and methods we can employ to improve our fruit, nut, and confection ice cream.

### I. Strawberries

- A. Forms utilized by ice cream industry
  - 1. Frozen Packed 80%; 2. Canned 18%; 3. Fresh 2%.
- B. Solids content of frozen berries
  - 1. U.S.D.A. states that total solids content of strawberries ranges from 4 to 13% with the average being approximately 8%.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture. W. E. Skelton, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia 24061.

2. Four parts strawberries plus one part of sugar will result in T.S. of 26.5%. Three plus one will result in 31% T.S.

C. Points to check in use of strawberries

1. Flavor strength of the berry
2. Body and texture of fruit
3. Tenderness
4. Size and color of the fruit and berry particle
5. Strawberry chunks must be the color (not the same shade) as the ice cream and should not have dull faded appearance.
6. They must match the texture of the ice cream and must thaw in the ice cream at serving temperature to a tender and smooth textured fruit that is not icy.
7. Freezing point of syrup in the particle must be below that of ice cream which means that it should contain at least 21-23% sugar.

a. To accomplish this the berry must be handled properly during processing.

- (1) Sugar must be given opportunity to penetrate berry before freezing takes place.
- (2) Sliced berries absorb sugar better than whole berries.
- (3) Berries that are too firm or overripe will not absorb sufficient sugar and do not have the ability to hold syrup when drained in ice cream plant.
- (4) Frozen cold packed berries that show layers of berries and layers of sugar are faulty.
- (5) Anemic and pale berry on thawing usually means poor sugar handling and inferior berries.
- (6) In a 3 plus 1 pack the sugar content of the berry after thawing should be 20-25% while juice will be 30-36%.
- (7) Proper processing of strawberries takes into account the moisture content of the berries and adjusts the sugar accordingly to prevent icy finished product.
- (8) Fast freezing of strawberries insures small ice crystals.

8. When purchasing frozen pack strawberries of specified sugar content, sugar content should be determined by determining the specific gravity of the drained juice. Research shows that the value obtained can be expected to run 1 to 2% higher than the theoretical sugar contents due to additional solids such as glucose from the berries, etc.

D. Handling of strawberries in ice cream plant

1. Keep berries frozen until ready for use. Do not allow shipments to sit outside hardening room for any length of time.
2. Thaw slowly in cooler at 40°F or below until all ice crystals have disappeared. NEVER thaw at room temperature or by use of hot water.
3. Thawing at 40°F retains the plumpness of fruit, assists in the retention of sugar syrup by the fruit, and prevents bacterial growth.
4. Draining:
  - a. Do not pile drained berries too deep as the pressure pushes out the syrup.
  - b. Excessive drainage or piling too deep leaves a flat, tasteless, fibrous berry.
  - c. Separated berries should be kept cold until used, should be used as soon as possible, and if held overnight should be held near freezing.

5. When purchasing frozen berries check for undissolved sugar in the bottom of the can. Undissolved sugar should not be used in the mix and is therefore expensive.
6. Even though strawberries are processed properly and sugar is dissolved and distributed evenly throughout the berries there is a tendency for the sugar to draw juice out of the fruit, the fruit to float to the top, and the heavy juice to drop to the bottom. When thawed properly this action of osmosis will reverse and the heavier syrup should force its way back into the fruit.

## II. Peaches

1. To obtain the desired flavor level fresh or frozen peaches should be used at the following level: 67% mix, 33% peaches.
2. For best results and to prevent the manufacturing of an ice cream that contains sublegal standards a special mix is desirable.
3. To provide a finished product of peach mix as follows: 10% B.F., 11% S.N.F., 16% sugar and .3% stabilizer, prepare a base mix to contain 14.94% B.F., 16.47% S.N.F., 14% sugar (using 4 + 1 packed peaches) and 0.44% stabilizer.
4. Quality of peach ice cream can be improved by bringing sugar content of peaches up to 2 + 1 when thawing to allow heavier syrup to penetrate the fruit. This reduces the icy tendency of the fruit in ice cream.
5. Peach flavor is a very delicate and elusive flavor. The flavor is improved and enhanced by the use of either nectarines or apricots along with the peaches. The use of nectarine puree has become very popular.
6. Attractive appearance and eye appeal can be obtained by using a nectarine-apricot or diced peach that has been processed with a nice pastel peach shade color added.
7. When fruit is purchased 3 + 1 or 4 + 1 and regular plain stock mix is used, it is necessary to add sugar to the thawing fruit at a ratio of 2 + 1 to provide proper total solids and prevent iciness in the finished product due to dilution.

## III. Pineapple

1. The use of raw pineapple in ice cream results in a product that is quite crumbly, has a snowy, icy type texture and is unpalatable at the time of consumption. Reason is that raw pineapple contains very active enzymes that are capable of splitting protein, fats and sugar.
2. To correct use pasteurized pineapple that has been mixes with sugar and stabilized.
3. Hawaiian crushed pineapple contains approximately 17% T.S., which means that the use of the product improperly prepared will lower the total solids of the ice cream resulting in an inferior product.
4. To correct add 3 lbs. sugar per No. 10 can of Hawaiian pineapple and allow to stand overnight in cold room (40°F). This raises the total solids to approximately 40% and will result in a smooth pineapple ice cream.

## IV. Cherries

1. Cherries do not present the problem that other fruits do.
2. It is advisable to check cherries purchased for total solids of specify solids of approximately 45%.

3. Bargain purees in Maraschino cherries usually means that they have been processed by fast syruping method which results in a tough cherry or one that will fall apart in the finished ice cream.

#### V. General Facts Concerning Fruits

1. In the case of peaches, bananas, and other fruit products, difficulty can be experienced if the fruit is oxidized. This can be eliminated if ascorbic acid or vitamin C is used when the fruit is prepared.
2. If the fruit is to be used within 24 hours 100 milligrams of ascorbic acid should be added per lb. of fruit. If fruit is frozen use 150-200 milligrams per lb. of fruit. In handling ascorbic acid use only stainless steel.
3. Fruits sugared at a ratio of 2 + 1 provide proper total solids and prevent iciness in finished product. Most frozen fruits are purchased 3 + 1 or 4 + 1 to keep down cost per lb. of fruit obtained.
4. When thawing unsweetened fruit add sugar 2 + 1 while fruit is frozen. After thawing stir sugar in and allow to stand 24 hours at 40°F.
5. Draw overrun on syrup but not of fruit pulp. Consider these only as displacement.
6. Use fresh or frozen pack fruit whenever available.
7. Use sufficient fruit to give the ice cream distinct flavor and eye appeal (10-20%). Avoid synthetic flavors and use of excessive colors.

#### VI. Nut Ice Cream

1. Quality in general is poor.
2. One reason - skimpy use of nut meats and the increased use of imitation nut flavors.
3. Nut meats should be properly processed before use to avoid:
  - a. Off flavors.
  - b. Sogginess.
  - c. Unpalatable nut meats.
4. Some nut meats have undesirable constituents such as enzymes that can cause serious defects in ice cream. An example of a nut of this type is black walnut. The use of raw black walnuts usually brings about several difficulties. Sandiness is one difficulty. This is due to the nuts absorbing the water in the mix. The nut meats have the ability to attract the lactose molecules causing them to be oriented on the surface of the nut meat. As a result the molecules are arranged as nuclei for crystal formation. Proper preparing of nut meats will preclude this difficulty.
5. Some nut meats in ice cream intensify in flavor, or are said to go wild, when ice cream is stored at 5-8°F in cabinets. This is usually due to enzyme development. Therefore, it is necessary to heat the nuts sufficiently to destroy the enzymes.
6. There are several ways that nut meats can be treated to prevent the above deleterious results.
  - a. Dry roasting.
  - b. Deep fat roasting.
  - c. Preparation in syrup.
7. A combination of dry roasting and deep fat roasting, especially if the fat is butterfat and carried out at a temperature above 300°F, accomplishes excellent results with most nuts. This is especially true of almonds and pecans.
8. Probably the number one "don't" in the manufacture of black walnut ice cream is don't use imitation extracts. Use black walnuts.

9. All nut meats that are not hermetically sealed should be stored in the hardening room, for most nut meats will become rancid rather quickly and will also absorb moisture, thereby becoming soggy and undesirable.

## VII. Candy Ice Cream

1. Feed through fruit feeder.
2. Use only dust-free, low hygroscopic candies to eliminate dust and clogging of fruit feeder due to dampness.
3. Shelf life of many candies is rather poor.
4. Candies containing large amounts of fats such as butterfat can become rancid unless properly handled.
5. Rule: Store candy flavoring material in hardening room if it is to be kept any length of time.
6. Judge candy from two standpoints.
  - a. The candy's flavor.
  - b. The bite, or feel of the candy in the mouth at the temperature at which ice cream is served.
  - c. Flavor: (1) Free of rancidity. (2) It should not have a neutralized flavor which is common to some candies if bicarbonate of soda is used to effervesce the candy and to create porosity for the purpose of establishing good bite.
  - d. Eating qualities: (1) The bite should not be the hard, glassy type. (2) It is essential that the bite be judged in ice cream so that the actual consumption, body and texture can be noted. (3) Frequently a candy, when eaten at room temperature, appears to have good eating qualities.
7. Avoid sogginess in candy flavored ice cream. Usually this is the result of the ice cream plant operator trying to feed candy into wet ice cream. Freeze ice cream stiff before the addition of candies. Otherwise the candy may dissolve completely.

There are a great many ice cream plants that make excellent ice cream mix, only to produce a poor finished ice cream by the fact that they have flavored the product poorly. We must take the knowledge available today and not just know it, but put it into practice. We have made great strides in the sale of ice cream but there is still room at the top for much more.

