



ICE CREAM APPLICATION

February 2021

TABLE OF CONTENTS

- 3** GLOBAL ICE CREAM MARKET
- 4** NOTABLE KEY TRENDS
- 5** COMMON INGREDIENTS
- 8** RICOVIS 82
- 9** HARD PACK ICE CREAM (Recipe and Process)
- 20** EVALUATION: MELTING QUALITY
- 21** MELTING RATE
- 22** SOFT SERVE ICE CREAM (Recipe and Process)
- 28** ADVANTAGES OF RICOVIS 82

GLOBAL ICE CREAM MARKET

- The rise in income, along with an increase in demand for sweet dishes, drives the growth of this market.
- New innovative flavors that brands have come up with, act as a major driver for the market. Also, the cheaper price of the private label ice-creams is increasing the demand.
- The sales of low-quality ice cream has been declining, due to the increased preference for premium ice cream. Few of those premium ice creams have gained popularity among health-conscious consumers due to the presence of low calorie/no sugar claims compared to regular ice creams.



NOTABLE KEY TRENDS

- ICE CREAM AS LUXURY PRODUCT – The ingredients added, texture, color, flavor, packaging, the technology used, the circumstances of the purchase and consumption, all these contribute to a premium product.
- CHILD FOCUSED FLAVOURS – Children are the major consumers of ice cream, thus companies are producing products as per the interest of children
- NEW FLAVOR INNOVATIONS – Introduction of limited flavors such as: Vanilla Galaxy Twist, Peanut Butter 'S'mores Smash, Chocolate Caramel Pretzel Crunch, and White Chocolate Raspberry Lava Cake.



COMMON INGREDIENTS



FATS

- ✓ Gives body to ice cream
- ✓ Imparts smooth and creamy texture
- ✓ Increases richness of the flavor

NON-FAT MILK SOLIDS

- ✓ Controls the total protein content
- ✓ Affects the emulsification of fat and improves texture
- ✓ Affects water retention
- ✓ Provides a higher overrun without the snowy or flaky texture

EMULSIFIER

- ✓ Combines substances which tend to separate from each
- ✓ Affects overrun, meltdown, texture, mouthfeel, and ease of extrusion

COMMON INGREDIENTS



STABILIZER

- ✓ Inhibits formation of large ice crystals
- ✓ Provides resistance to melting
- ✓ Contributes to overall smoothness and texture

SWEETENERS

- ✓ Adds sweetness and improves texture and body
- ✓ Lowers freezing point
- ✓ Acts as pre-blend with other solid ingredients to make dispersion easier

FLAVORING

- ✓ Creates specialty taste
- ✓ Enhances acceptability
- ✓ Comes in both natural and artificial varieties

COMMON INGREDIENTS



AIR

- ✓ Combines substances which tend to separate from each
- ✓ Affects overrun, meltdown, texture, mouthfeel, and ease of extrusion

OVERRUN: The incorporation of air into the ice cream during processing results to an increase in the volume of the final product greater than the volume of the mix. If properly controlled, added air would eliminate the production of a soggy, heavy product.

RICOVIS 82

- ✓ As TEXTURIZER – provides smooth and homogenous meltdown.
- ✓ As VISCOSITY BUILDER – aids in increasing the viscosity of the ice cream mix.
- ✓ As PROTEIN STABILIZER – inhibits the precipitation of casein by binding with the casein globules.



HARD PACK ICE CREAM



RECIPE	
INGREDIENTS	PERCENTAGE (%)
Milk	11.0%
Sugar	14.0%
Butter	8.0%
Glucose	4.0%
Ricovis 82	0.5% – 0.7%
Water	62.5%

PROCESS

HARD-PACK ICE CREAM

1

WEIGHING OF INGREDIENTS



BUTTER



STABILIZER



SUGAR



MILK



GLUCOSE

PROCESS

HARD-PACK ICE CREAM

2

PREMIX SUGAR, STABILIZER, AND MILK



STABILIZER

+



SUGAR

+



MILK



PREMIX 1

PROCESS

HARD-PACK ICE CREAM

3

DISSOLVE GLUCOSE AND BUTTER IN LUKEWARM WATER



BUTTER



GLUCOSE



PREMIX 2

PROCESS

HARD-PACK ICE CREAM

4

DISPERSE PREMIX 1 IN PREMIX 2
WITH RAPID AGITATION



PROCESS

HARD-PACK ICE CREAM

5

PASTEURIZE IN A HOT WATER BATH AT 70°C FOR 30 MINS WITH OCCASIONAL STIRRING



PASTEURIZATION:

- ✓ Destroys pathogenic bacteria in the mix by heat treatment.
- ✓ Dissolves and liquefies the components of the mix completely.

Batch Pasteurization: where the mix is heated and held at a temperature of 70°C for 30 minutes.

High Temperature Short Time (HTST): involves heating the mix to 83°C to 85°C within 15 seconds by passing it through a plate exchanger.

Ultra High Temperature (UHT): flash heats the mix to a temperature of 105°C to 150°C for 5 seconds and then cools down to 5°C.

PROCESS

HARD-PACK ICE CREAM

6

HOMOGENIZE



HOMOGENIZATION:

- ✓ Reduces fat droplet size and creates a stable emulsion.
- ✓ Changes the physical and chemical function of the milk fat globule membrane by increasing the available surface area.

FIRST STEP: The mix is preheated to a temperature of 71.6°C to 75°C.

SECOND STEP: The mix is subjected to a pressure of 140 to 210 kg/cm² to reduce fat globule diameter to less than 2 μm.

THIRD STEP: The mix is subjected to a pressure of 30 to 50 kg/cm² to prevent fat globules from re-coalescing.

PROCESS

HARD-PACK ICE CREAM

7

COOL IN A WATER BATH UNTIL THE SOLUTION REACHES 15.5°C



8

MEASURE ICE CREAM VISCOSITY (BEFORE AGING) AT 15.5°C USING THE APPROPRIATE SPINDLE



PROCESS

HARD-PACK ICE CREAM

9

AGE SOLUTION OVERNIGHT AT 4°C.



AGING:

Develops important properties:

- ✓ Crystallization and stabilization of the fat that affects the overrun
- ✓ Hydration of the stabilizers to obtain acceptable consistency
- ✓ Structural modification of milk proteins

10

**MEASURES ICE CREAM VISCOSITY (AFTER AGING)
AT 4°C USING THE APPROPRIATE SPINDLE**



PROCESS

HARD-PACK ICE CREAM

11

FEED THE ICE CREAM MIXTURE IN THE ICE CREAM MAKER UNTIL IT FORMS INTO A THICK AND CREAMY TEXTURE



- ✓ Determines the final quality of the ice cream.
- ✓ Solidification of a certain percentage of the total water in the mix.
- ✓ Controlled incorporation of air in the aqueous phase by the whipping action .
- ✓ Mixing of flavor and color.

NOTE: Freezing should be done rapidly in order to produce extremely small ice crystals, which is important for a good texture. At the freezing temperature of -6°C to -3°C , 50% of the water content of the mix is frozen to ice.

PROCESS

HARD-PACK ICE CREAM

12

COLLECT ICE CREAM INTO A CLEAN CONTAINER AND STORE IN FREEZER



Proper storage of the ice cream prevents heat shock that leads to “freeze-thaw” conditions that result in ice crystal growth and much coarser texture for the product.

EVALUATION: MELTING QUALITY

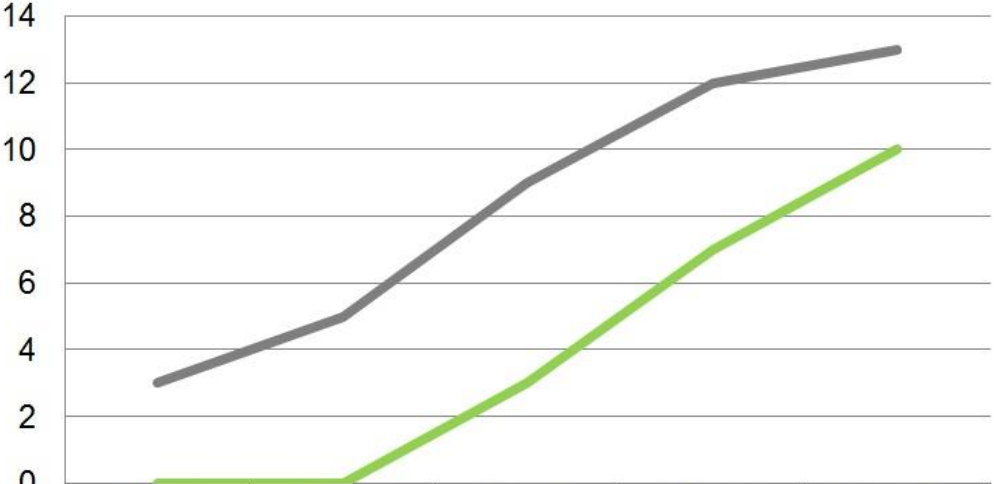
PARAMETERS	COMPETITOR'S SAMPLE	RICOVIS 82
Ice Cream Viscosity	220 cps	228 cps
Melting Rate	Faster	Slower
First Drop of Melted Ice Cream (IC)	After 4 minutes	After 12 minutes
Characteristics of Melted IC	Homogeneous, non-curdy	Homogeneous, non-curdy

These are the common score guide used in the industry as established by The American Dairy Science Association (ADSA) Committee on Evaluation of Dairy Products.



MELTING RATE

Amount of Melted Ice Cream (in ml)



	5 min	10 min	15 min	20 min	25 min
Competitor's Sample	3	5	9	12	13
RICOVIS 82	0	0	3	7	10

Melting rate has the greatest significance to the consumer when eating ice cream. If the product melts too fast, a messy situation often ensues. However, a slow melting rate can also be indicative of defective ice cream.



SOFT SERVICE ICE CREAM



RECIPE	
INGREDIENTS	PERCENTAGE (%)
Non Dairy Creamer	8.0%
Skimmed Milk	5.0%
Butter Milk	3.0%
Refined Sugar	11.0%
Ricovis 82	0.3% – 0.6%
Dextrose	5.0%
Food Color	q.s.
Food Flavor	q.s.
Hot Water	68.0%

PROCESS

SOFT-SERVE ICE CREAM

1

WEIGHING OF INGREDIENTS



REFINED SUGAR



DEXTROSE



SKIMMED MILK



NON DAIRY CREAMER

PROCESS

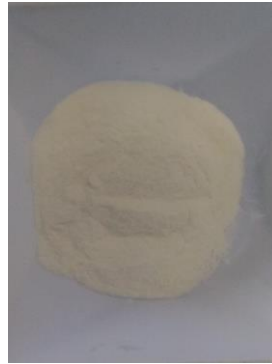
SOFT-SERVE ICE CREAM

1

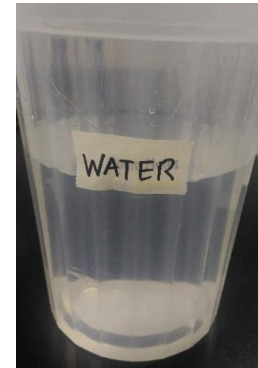
WEIGHING OF INGREDIENTS



BUTTERMILK



RICOVIS 82 (STABILIZER)



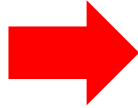
WATER

PROCESS

SOFT-SERVE ICE CREAM

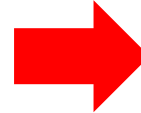
2

MIXING OF DRY INGREDIENTS



3

ADDING OF WATER



4

MIXING OF INGREDIENTS



PROCESS

SOFT-SERVE ICE CREAM

5

POURING OF MIX INTO THE MACHINE



6

FREEZING/CHURNING IN THE MACHINE



PROCESS

SOFT-SERVE ICE CREAM

7

DISPENSING OF PRODUCT



8

FINISHED PRODUCT



ADVANTAGES OF RICOVIS 82



- ✓ Reduces ice crystal formation and improves melting resistance
- ✓ Imparts non-curdy, clean meltdown, and prevents whey separation
- ✓ Imparts desirable consistency and mouthfeel
- ✓ Economical
- ✓ Plant-based (derived from Red Seaweeds)



THANK YOU!

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