# Qualitative Studies on Golden Harvest Agro & Ice-Cream (Bloop Ice- Cream) Industries Limited: Production, Quality Control & Quality Assurance of Frozen Food & Ice-Cream


**An Internship Report By**

**Abdul Rabbi Mredul**
**ID: 183-34-135**


**Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment of B.Sc. in Nutrition and Food Engineering**


*Supervisor*

**Professor Dr Md. Bellal Hossain**
**Dean (In-Charge) & Professor**
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences

*Submitted to*

**Dr. Nizam Uddin**
**Associate Professor & Head In-Charge**
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences



**Faculty of Allied Health Sciences**
**Daffodil International University**
**MARCH 2023**

# LETTER OF TRANSMITTAL

13th March, 2023

To
Dr. Nizam Uddin
Associate Professor and Head In-charge Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

Subject: **Submission of Internship Report**.

Dear Sir,
With respect, I'd like to notify you that my internship report on “Qualitative studies on Golden Harvest Agro and Ice-cream (Bloop Ice-cream) Industries limited: Production, Quality Control & Quality Assurance of Frozen Food & Ice-cream" has been done.
Under your important guidance, I have done my best to concentrate the report for conformity with the top standard.

I thank you for your thoughtful monitoring, and I hope you will graciously overlook all of my errors.

Sincerely yours,

……
Abdul Rabbi Mredul
ID: 183-34-135
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

# LETTER OF AUTHORIZATION

13th March, 2023

To
Dr. Nizam Uddin
Associate Professor and Head In-charge
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

Subject: **Declaration regarding validity of the Internship Report.**

Dear Sir,
I'd want to assure you that the Internship Report titled as "Qualitative studies on Golden Harvest Agro and Ice-cream (Bloop Ice-cream) Industries limited: Production, Quality Control & Quality Assurance of Frozen Food & Ice-cream" , I've written is not a clone of any prior thesis report written by other students.

I also provide my sincere assurance that the stated internship report has never been utilized to meet any other course requirement, and that it will not be submitted to any other body in the future.

Sincerely yours,

……
Abdul Rabbi Mredul
ID: 183-34-135
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

# CERTIFICATE OF APPROVAL

I am pleased to verify that **Abdul Rabbi Mredul's** internship report, " **Qualitative studies on Golden Harvest Agro and Ice-cream (Bloop Ice-cream) Industries limited: Production, Quality Control & Quality Assurance of Frozen Food & Ice-cream**" has been authorized for presentation and defense for the academic degree, under **ID: 183-34-135**, Department of Nutrition and Food Engineering.

**Abdul Rabbi Mredul** is a person with a strong moral character and a very pleasant identity. It has been a true pleasure to work with him. I wish him every success in life.

……..
**Dr. Nizam Uddin**
**Associate Professor and Head In-charge**
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

……
**Professor Dr Md. Bellal Hossain**
**Supervisor, Dean (In-charge) & Professor**
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

# ACKNOWLEDGEMENT

In composing this report, I would like to thank the numerous individuals who have supported and assisted me along my journey. I would want to thank the Almighty Allah for giving me the courage and opportunity to complete the report successfully at this time. I would like to take this time to thank everyone who has supported me throughout my life.

I am grateful to my parents because they are responsible for my survival. Without my parents' support, I would be unable to achieve my goals and objectives. **Professor Dr. Md. Bellal Hossain, Dean (In-Charge) & Professor**, Faculty of Allied Health Science, Daffodil International University continuous has given me continuous supervision during my organizational attachment time, and earned me a debt of appreciation.

I am grateful for the opportunity to convey my gratitude to all of those who have helped me throughout my life. **Dr. Nizam Uddin, Associate Professor and Head-in-Charge** of the Department of Nutrition and Food Engineering, has my highest regard and gratitude for your cooperation and acceptance of this degree.

I would like to thank **Mr. Rabbani, AGM**, and the **administration** of Golden Harvest Ltd. for allowing us to finish this internship at his company.

**Mr. Md. Aminul Islam**, who works as my **organizational supervisor**, also deserves my thanks. **Mr. Ashik Das**, **Officer-Quality Control & Microbiology** (Golden Harvest Ltd.), and **Mr. Asad, Senior Manager, Administration**, also deserve my appreciation. Without their aid, completing this report would have been extremely difficult.

I would like to express my deepest appreciation to the Department of Nutrition and Food Engineering teachers for their unending encouragement and support throughout my time as a student. Lastly, I would to extend my sincere gratitude to the managing director and express my admiration for him.

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# CHAPTER 01

## Introduction

## 1.1 ABOUT COMPANY

## 1.1 ABOUT COMPANY

With diverse holdings in food, dairy, commodities, information technology, logistics, real estate, aviation, infrastructure development, and insurance, Golden Harvest is one of Bangladesh's top commercial organizations.
The first firm in Bangladesh to create its own Cold Chain network in partnership with USAID is Golden Harvest, a pioneer in the frozen food industry.
Beginning as a commodity brokerage firm, Golden Harvest later grew and is now a driving force behind several industry sectors, employing over 5000 people. In addition, Golden Harvest is a joint venture partner with Nippon Express, the leading logistics provider in Asia with a global network spanning more than 480 sites.

## 1.2 COMPANY'S MISSION

Consistently deliver international standard innovative products & services for improved lifestyle.

## 1.3 COMPANY'S VISION

To be the most trusted and preferred brand to every household in Bangladesh.

## 1.4 FACTORY DEPARTMENT

- **Administration:** The Administration Department offers administrative and technical assistance in the fields of human resources (HR), budgeting, strategic planning, legal matters, calls for bids, facilities, and security.
- **Accounts:** The accounting division is in charge of keeping track of and recording cash payments made by clients for items supplied and services provided. Invoice creation and tracking are also its responsibilities.
- **VAT:** Maintain all VAT-related tasks and source-based VAT & TAX deductions. Send the VAT authorities your VAT returns and other necessary paperwork on time. Create a VAT Challan using approved pricing.
- **Production:** Food preparation is done by the food production department, sometimes known as the kitchen department, while delivery is handled by the F&B department. The main kitchen is part of the food manufacturing division (hot & cold).
- **Quality Control:** The food production department, also referred to as the kitchen department, is responsible for food preparation, while the F&B department is in charge of delivery. The department of food manufacturing includes the main kitchen (hot & cold).
- **Maintenance:** All properties in the area must be maintained and repaired by maintenance. Particularly, Maintenance is in charge of running and maintaining the central steam and chilled water facilities, as well as the distribution systems that go with them.
- **Store:** The stores division performs a variety of tasks, such as inspecting and accepting incoming goods. Identification and short-term holding. transporting items when necessary.
- **Distribution:** Distribution departments are tasked with receiving things that are purchased from vendors and distributing those items to the appropriate division or department within a corporation.

## 1.5 WORK OF QC

- Checking RM.
- Checking PM.
- Checking FG.

**3 types of tests for QA:**

- Physical. [RM, PM, FG]
- Chemical. [RM-Mandatory, PM]
- Microbiological. [RM, FG]

## 1.6 FACTORY UNIT

1. Agro Unit
2. Ice cream Unit


# CHAPTER 02

## Agro Section

## 2.1 GOLDEN HARVEST AGRO INDUSTRIES LTD

One of the first companies in Bangladesh to manufacture frozen foods was Golden Harvest Agro Industries Ltd., a publicly traded corporation. In 2006, it began producing frozen food in Bangladesh. For its extensive selection of frozen ready-to-cook items, the brand is well-known both domestically and internationally. The food processing facility & supply chain of Golden Harvest Agro Industries Ltd. are proudly displayed. The organization has many certifications, including ISO 22000:2005, 9001:2008, and HACCP, for its facilities related to production and the supply chain. 95 percent of the company's raw materials are supplied through a network of over 100,000 agricultural partners in Bangladesh. The food processing facility, which is located in Gazipur and has state-of-the-art equipment, is managed by a team of the greatest experts in the field. The distribution of frozen goods over a vast network of temperature-controlled transportation systems begins when manufacture is finished and quality is guaranteed. Through its network of cold storage facilities, the corporation maintains a temperature of -18ºC while exporting goods to the United States, Canada, Australia, the Middle East, and Europe. From farm to fork, all of them promise premium goods!

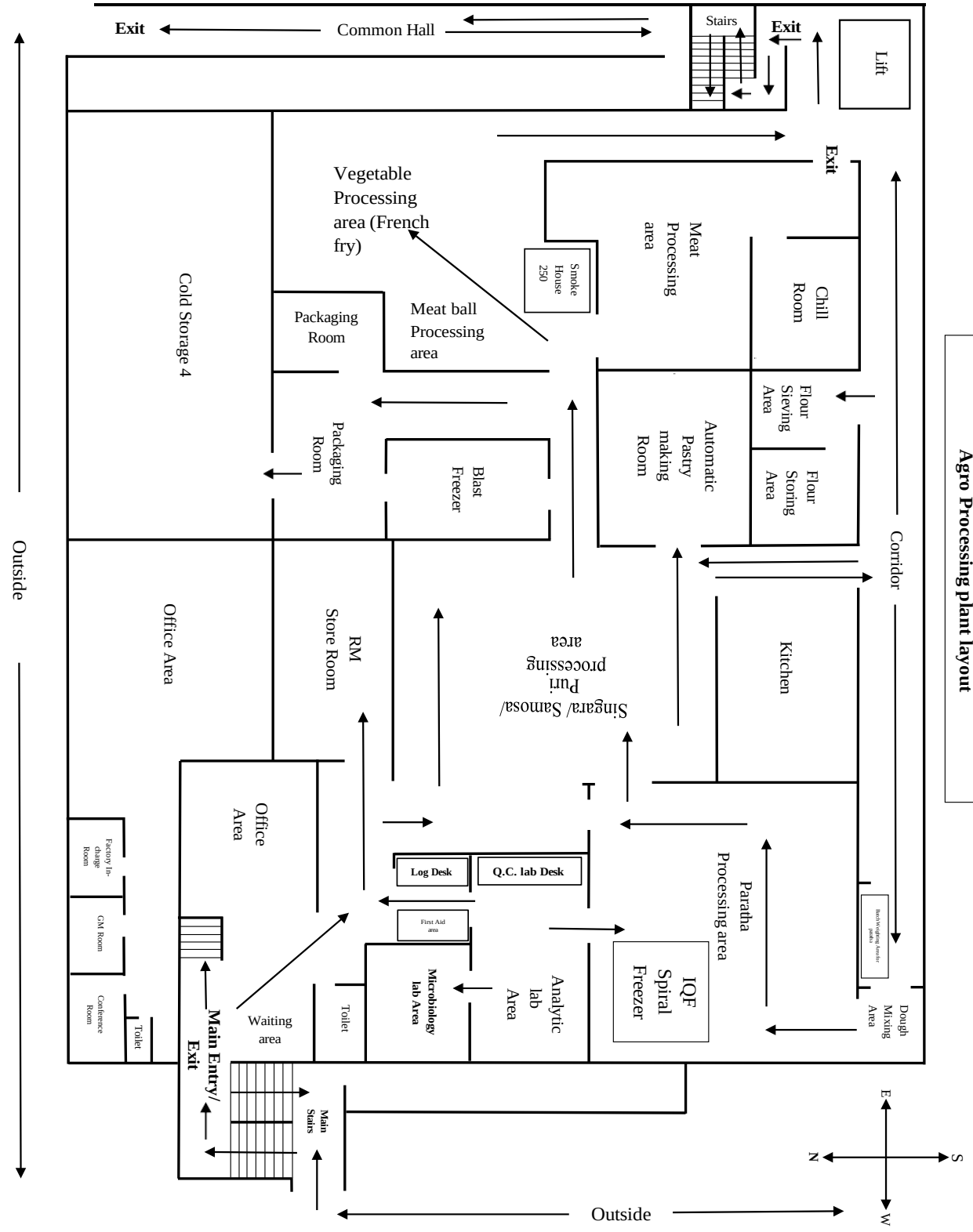
## 2.2 AGRO UNIT

1. Meat Processing Unit
2. Vegetable Processing Unit
3. Pastry making Unit
4. Paratha making Unit
5. Shingara/ Samosa/ Puri making Unit
6. Dough mixing room
7. Kitchen
8. Flour Sieving room
9. Batch weighting area
10. RM Store room
11. Packaging Unit
12. Q.C. LAB
13. Ready to eat food processing Kitchen.

## 2.3 SOME OF THE POPULAR AGRO PRODUCTS

- Premium Desi paratha/ Mega paratha/ Premium Paratha
- Nuggets
- French fires
- Samosa
- Rolls

## 2.4 AGRO PROCESSING PLANT LAYOUT

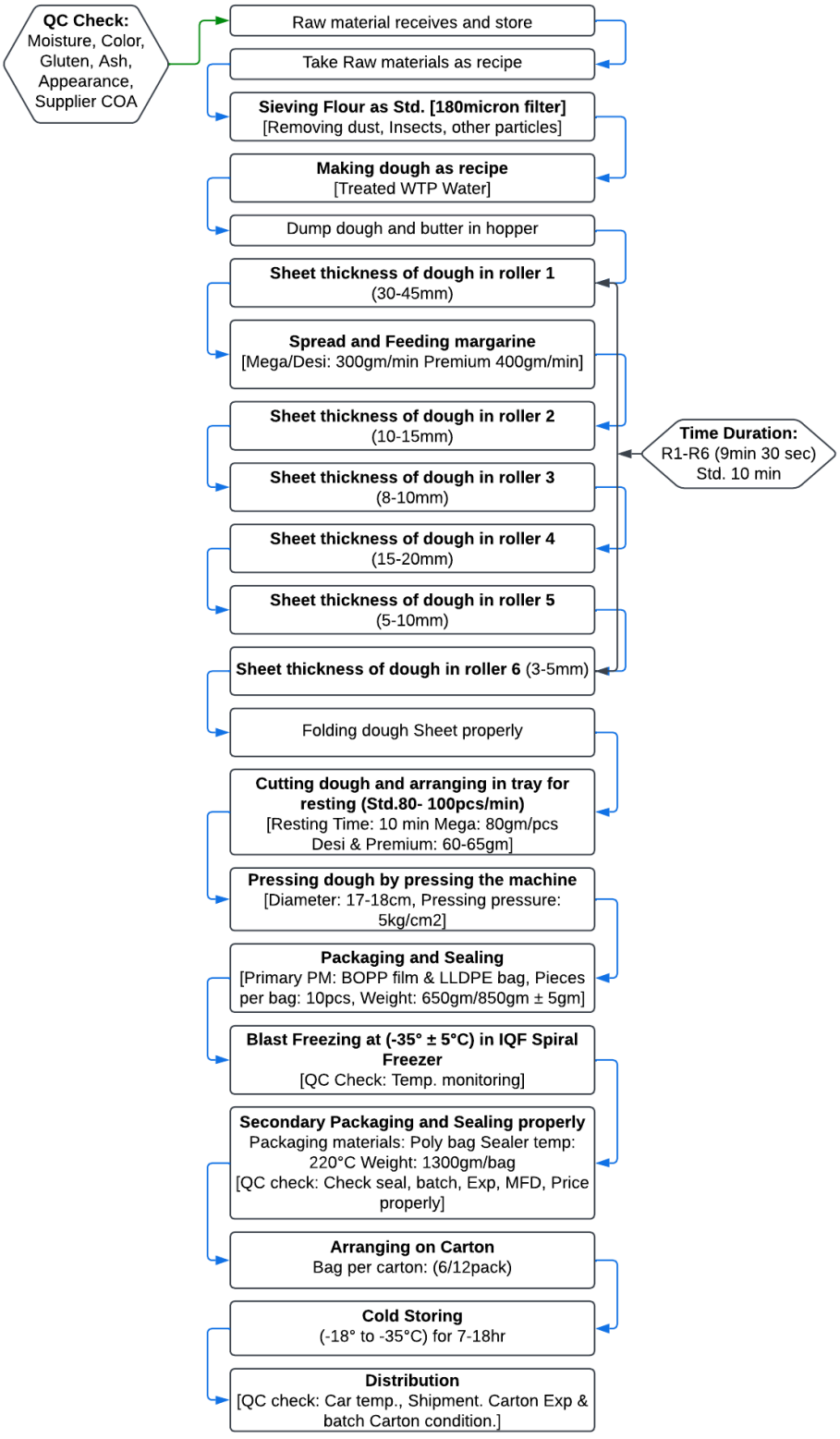


## 2.5 PRODUCTION FLOWCHART

### 2.5.1 SKU: Premium Desi paratha/ Mega paratha/ Premium Paratha

**Ingredient:** Flour, Salt, Sugar, Chilled water (With Ice), Baking powder, Margarine.

**Product Flowchart:**



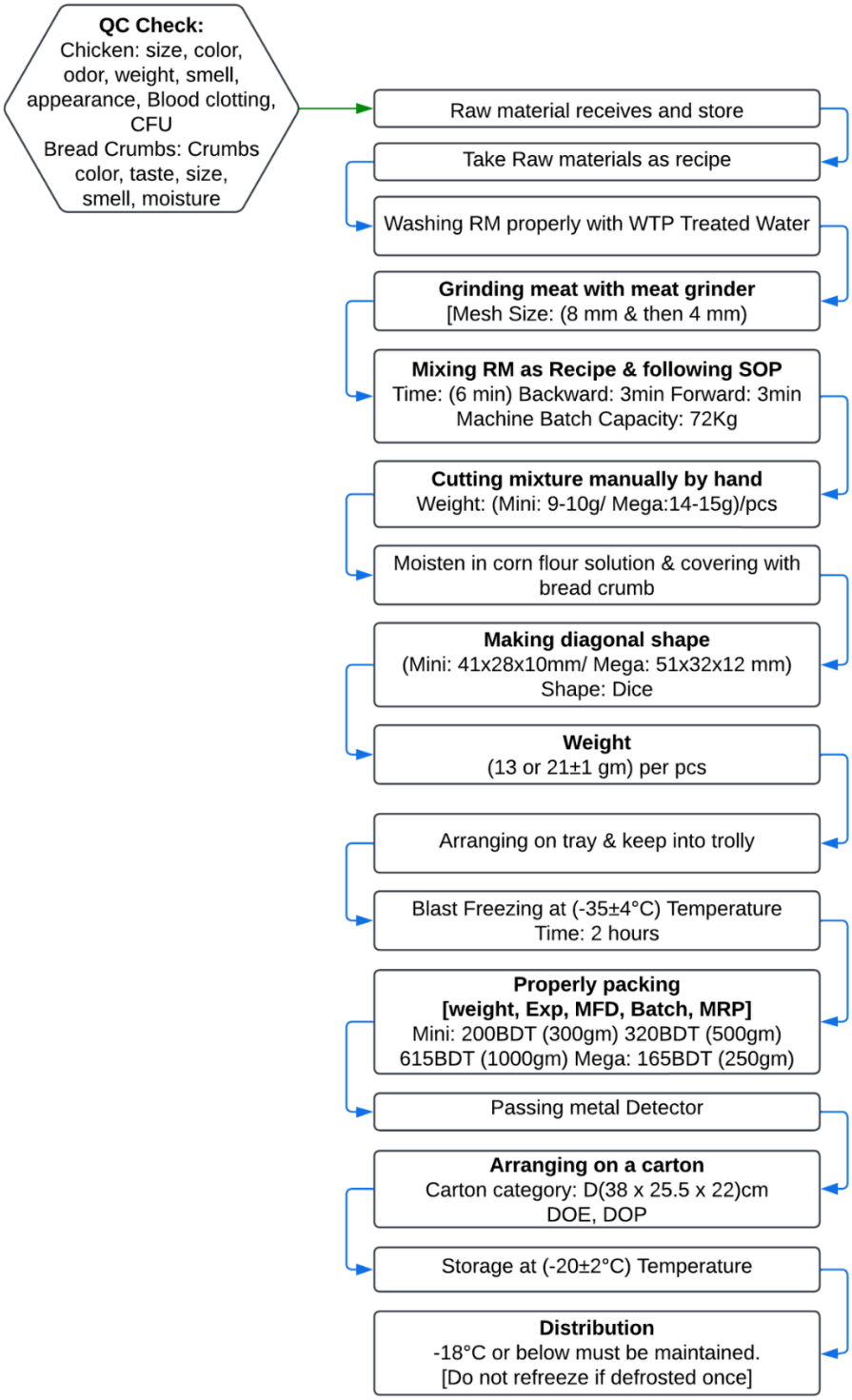
## Product Description:

| Name | Description | |
|---|---|---|
| Primary Packaging | BOPP | Thickness: 20 microns |
| | LDPPE | Thickness: 40 microns |
| Secondary packaging | Poly bag | Thickness: 90 microns |
| Product Weight/pcs | 65gm/80gm | |
| Product diameter | 17-18cm | |
| Product type | Frozen food | |
| Layer | 28 layers | |
| Role cutting machine speed | 88pcs/min [Std. 80-100pcs] | |
| Pressing machine speed | 36pcs/min | |
| Pressing time | 0.9 to 1.8 sec | |
| Pressing pressure | 5-6kg/cm² | |

## 2.5.2 SKU: Mini Chicken Nuggets(300/500/1000gm)/Mega Chicken Nuggets (250)

**Ingredients**: Chicken Breast, Chicken Skin, salt, Seasoning, Jelly powder, Soy protein, Chilled water, Bread crumbs(orange)

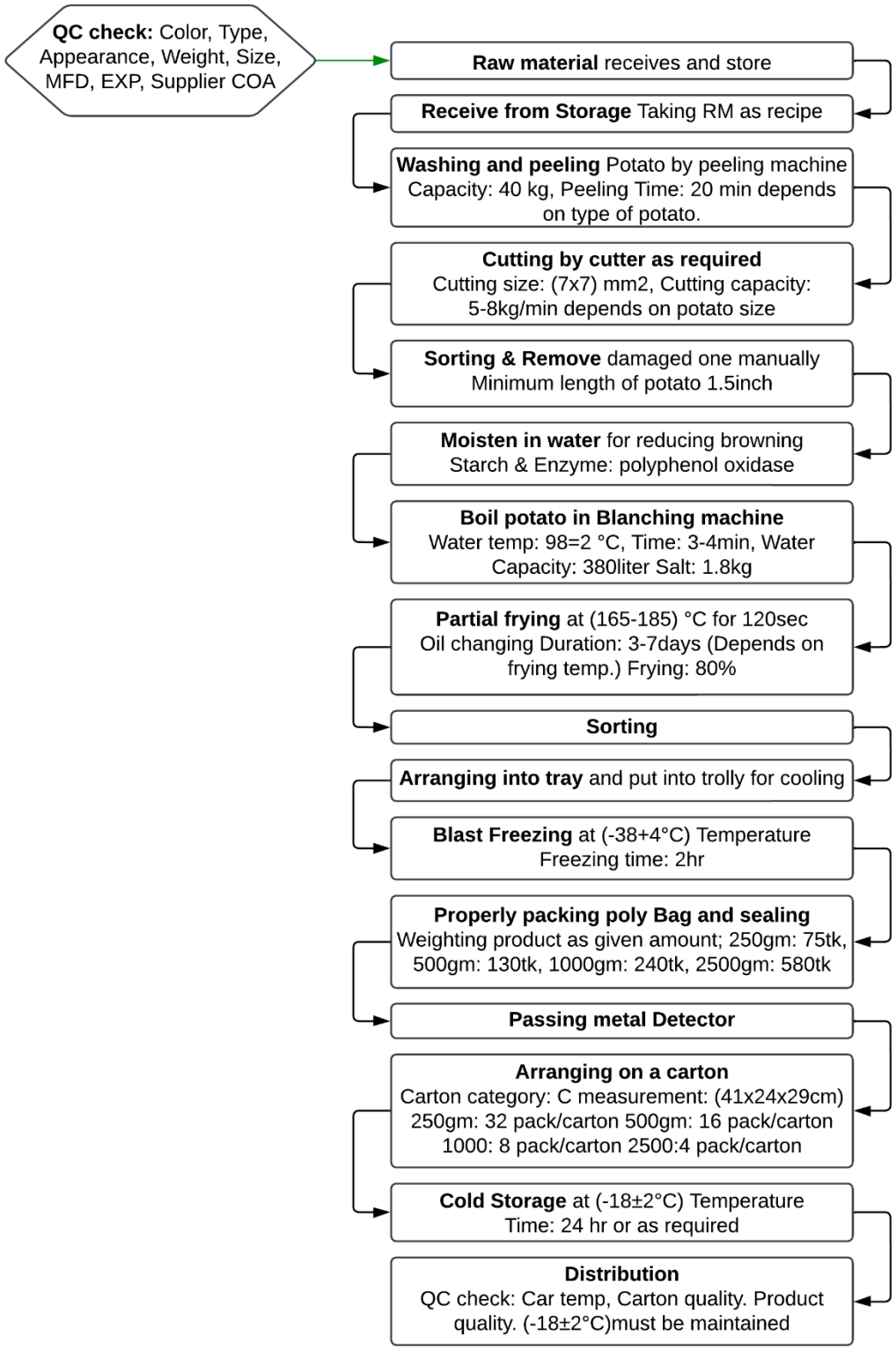
**Product flowchart:**



## 2.5.3 SKU: French fries Straight cut (250/500/1000/2500gm)

**Ingredient:** Potato, Salt, Water, Soybean oil

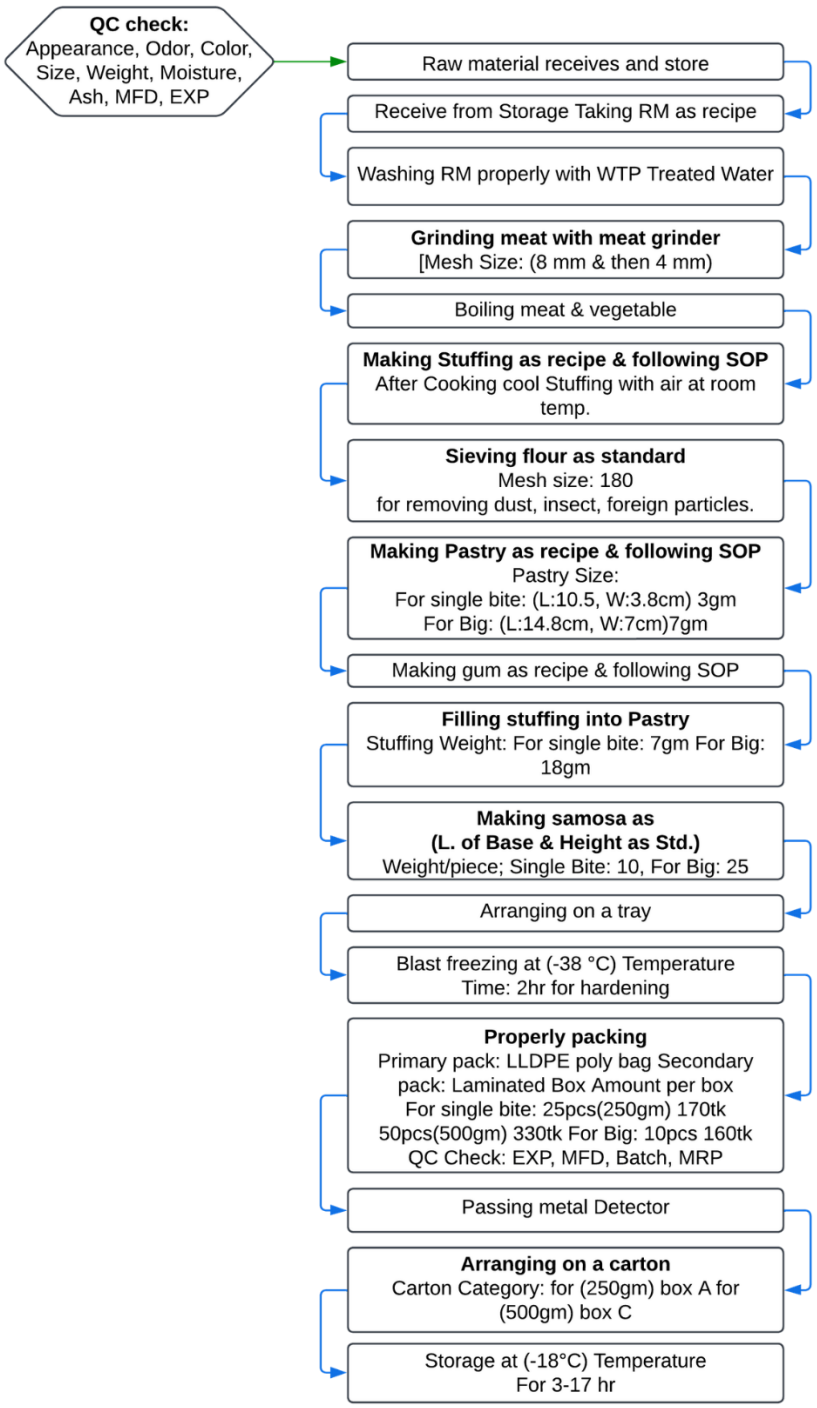
**Product Flowchart:**



## 2.5.4 SKU: Single bite Chicken(250/500gm)/Single bite Beef samosa(250/500gm)/Chicken Samosa-Big 10pcs(250gm)

**Ingredients:**
**For Chicken samosa:** Chicken thigh, onion, carrot, papaya, Soyabean oil, Ginger, Garlic, Green chilli, mixed spices, salt, testing salt, bay leaf.
**For Beef samosa:** Beef, onion, papaya, Soyabean oil, Ginger, Garlic, Green chilli, mixed spices, salt, Testing salt, bay leaf.

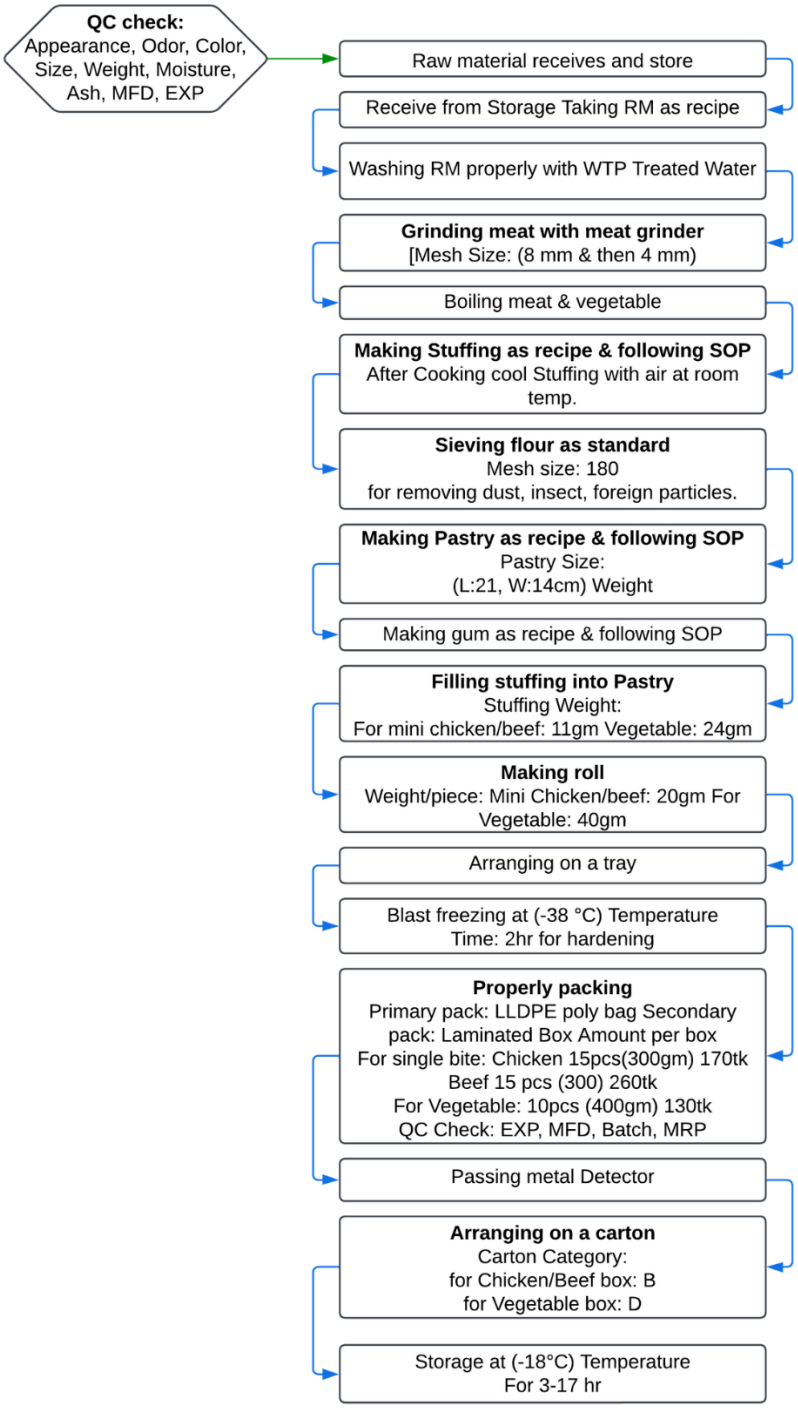
## Product Flowchart:



## 2.5.5 SKU: Mini Chicken/Beef roll (300gm)/ Vegetable Spring roll(400gm)

**Ingredients**:
**For Chicken**: Chicken, Flour, Soyabean oil, Salt, Sugar, Ginger, Garlic, Onion, Mixed Spices, Coriander leaf, Bay leaf, MSG, Chilli, Cinnamon powder, Water
**For beef**: Beef, Flour, Soyabean oil, Salt, Sugar, Ginger, Garlic, Onion, Mixed Spices, Coriander leaf, Bay leaf, MSG, Chilli, Cinnamon powder, Water
**For Vegetable:** Carrot, papaya, Soyabean oil, Salt, Sugar, Ginger, Garlic, Onion, Mixed

**Product Flowchart:**




# CHAPTER 03

## Ice-Cream Section

## 3.1 GOLDEN HARVEST ICE-CREAM LTD


With the brand BLOOP, Golden Harvest Ice-Cream Ltd. has just entered the Bangladeshi ice-cream market. In the fiscal year 2014–15, the Bangladeshi ice cream market was estimated to be worth BDT 10 billion, and it has been steadily growing at a pace of roughly 12 percent yearly. Golden Harvest has constructed a brand-new facility with help from Tetra Pack Sweden, which is being managed by a highly qualified Danish manufacturing manager. The firm offers over 40 various variations, including sticks, cups,
cones, calippo, sorbets, tubs, cakes, and more.

## 3.2 ICE-CREAM UNIT

1. Raw materials Storage
2. Mixing room:
    - Mixing hopper
    - Mixing tank
    - Homogenizer
    - Pasteurizer
    - Heat exchanger

3. Production Line:
    - Aging Tank
    - Continuous Freezer
    - Rollo 23 machine. [For Choco-bar/ Kulfi]
    - SL [Straight line] Ice-cream machine (Extruder Included)
    - Comet C2 machine. [for big cone]
    - Calippo Machine [for small cone & Cup]
    - Micron machine [for Cup]
    - IQF freezer [For SL Machine]
    - IQF freezer [For Cone/Cake Ice-cream]
    - Blast freezer.
    - Packaging area.
    - Cold Storage. (1,2,3)

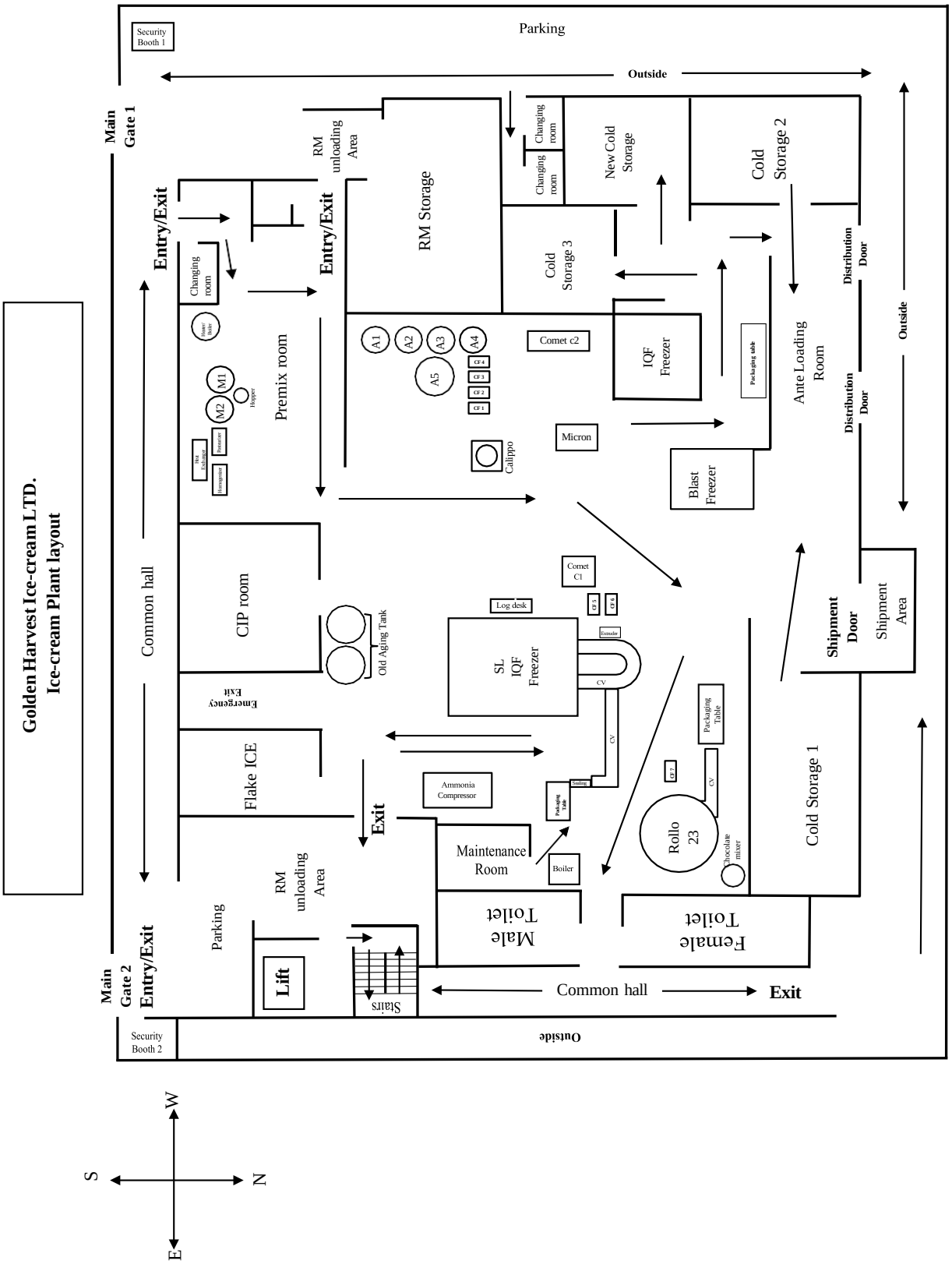
4. Machine maintenance Room
5. CIP room
6. Flake Ice

7. Packaging & raw materials storage
8. WTP [Water Treatment Plant]
9. Cone Biscuit making Unit.
10. Ante Room
11. Ice-cream Flavor room
12. Cone Biscuit Dehumidification room.

## 3.3 Some of the Popular Ice-cream Product

- Megastar/Chocostar
- Vanilla/Strawberry/Chocolate
- Full Toss
- Single Sundae
- Exotic Vanilla/Chocolate
- Double Sundae
- Premium Shor malai

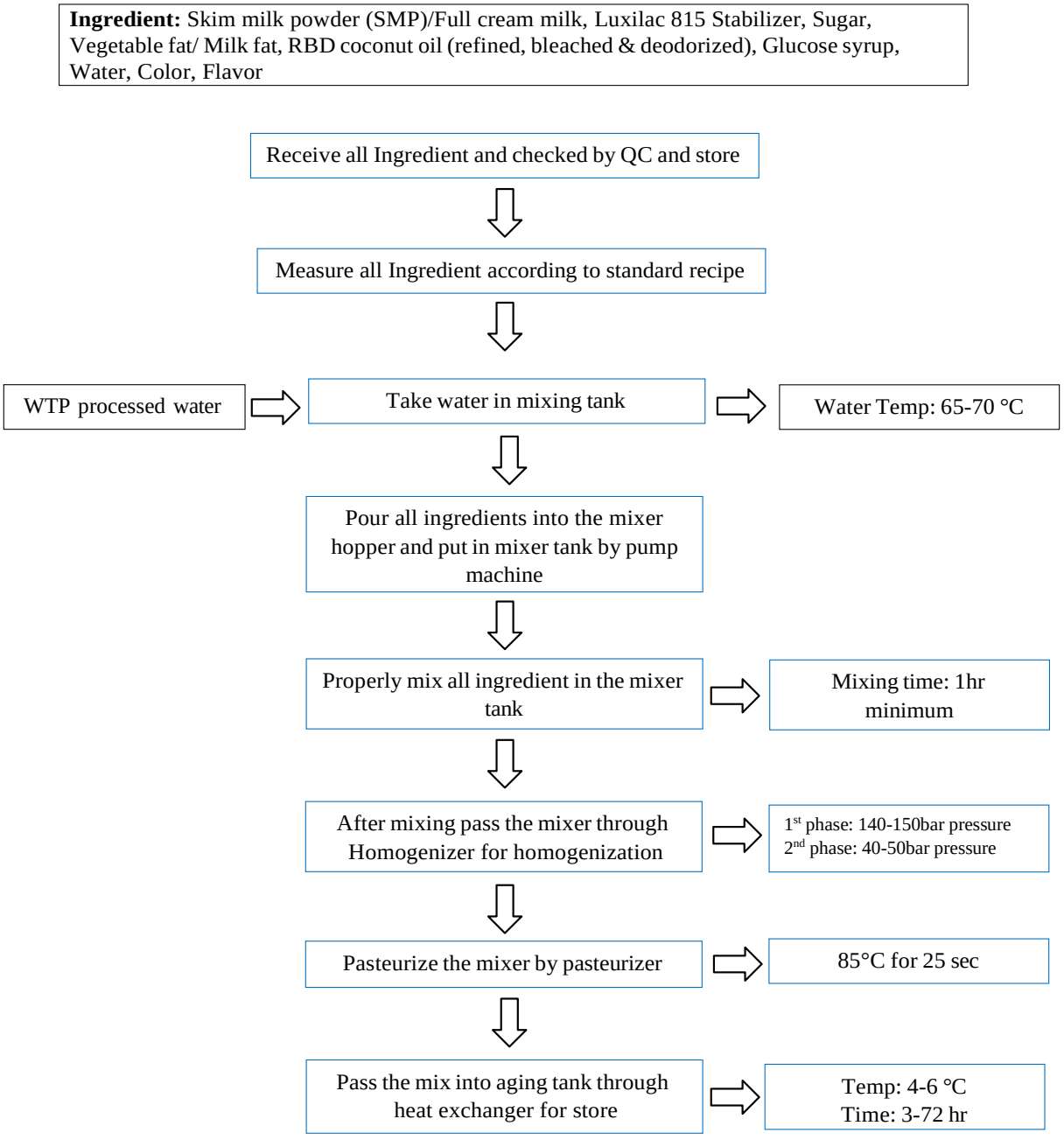
## 3.4 BLOOP ICE-CREAM FACTORY MAP



## 3.5 PRODUCTION FLOWCHART

### 3.5.1 Raw Ice Cream Mix

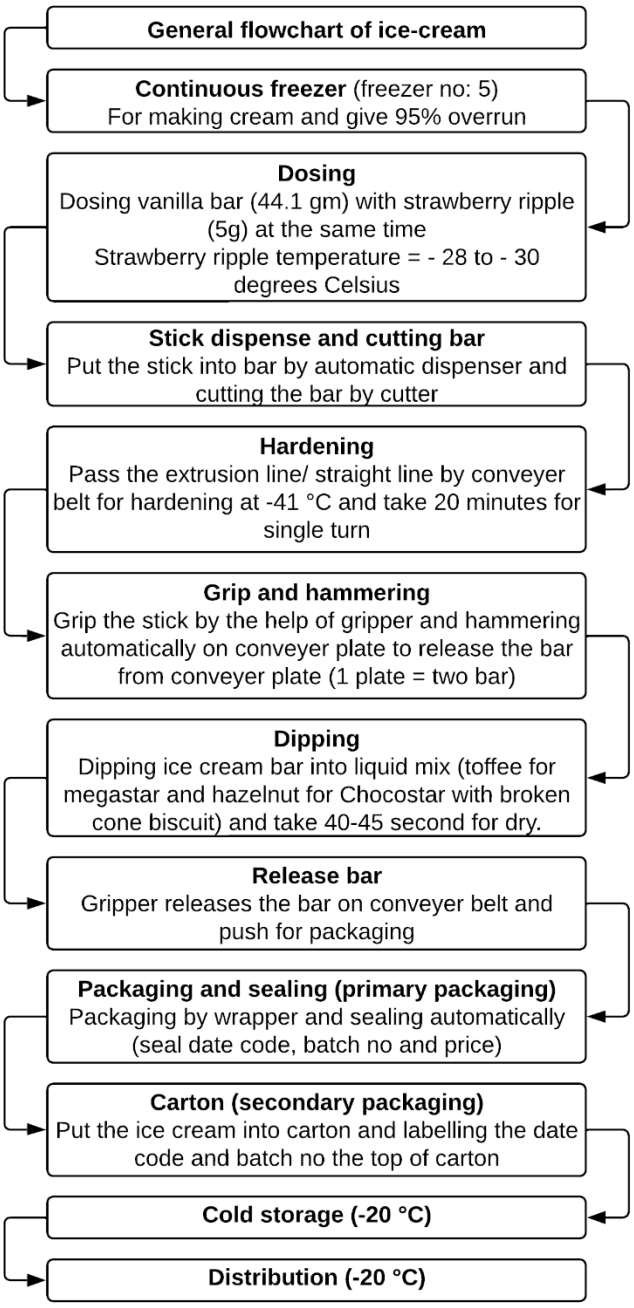
**General Flowchart of Raw Ice-Cream Mix**



## 3.5.2 SKU: Megastar / Choco star (82 ml)

**Ingredients:** Skim milk powder (SMP), Full cream milk (2%), Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Flavor, Stabilizer, Emulsifier, Liquid Chocolate Coating

**Product Flowchart:**




**Product Details**

| Megastar |
|---|
| Stick weight = 1.6 gm |
| Coating weight = 17 gm |
| Wrapper weight = 1.7 gm |
| Bar weight = 44.1 gm |
| Liquid coating temperature = 32 ℃ |
| Packed cutting temperature = 140 ℃ |
| Center point temperature = 150 ℃ |
| Gross weight = 61.4 gm |
| Final product core temperature = -22 ℃ |
| Price = 40 taka |
| Carton size = 18 Pcs |

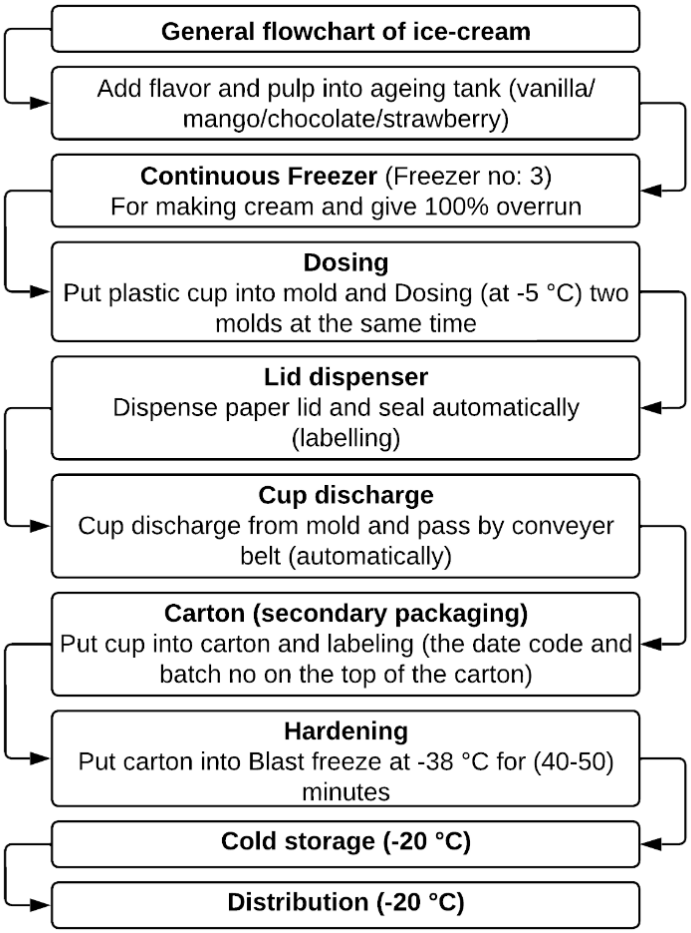
| Chocostar |
|---|
| Stick weight = 1.6 gm |
| Coating weight = 17 gm |
| Wrapper weight = 1.7 gm |
| Bar weight = 44.1 gm |
| Liquid coating temperature = 32 ℃ |
| Packed cutting temperature = 140 ℃ |
| Center point temperature = 150 ℃ |
| Gross weight = 61.4 gm |
| Final product core temperature = -22 ℃ |
| Price = 40 taka |
| Carton size = 18 Pcs |

*Table: Megastar / Choco star details*

### 3.5.3 SKU: Vanilla /Strawberry/ Chocolate/Mango plastic cup (50/100) ml

**Ingredients:** Skim milk powder (SMP), Full cream milk (2%), Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Flavor, Stabilizer, Emulsifier, Mango for mango cup, Strawberry for strawberry cup, Chocolate for chocolate cup

**Product Flowchart:**




**Product Description**

| 50ml cup |
|---|
| Machine = Micron |
| Cream = 29 gm |
| Cup weight with lid = 4.10 gm |
| Gross weight = 33.10 gm |
| Price = 15 taka |
| Speed = 40rpm |
| Production = 4800/ hour |
| Total mold = 32 |
| Carton size = 24 Pcs |

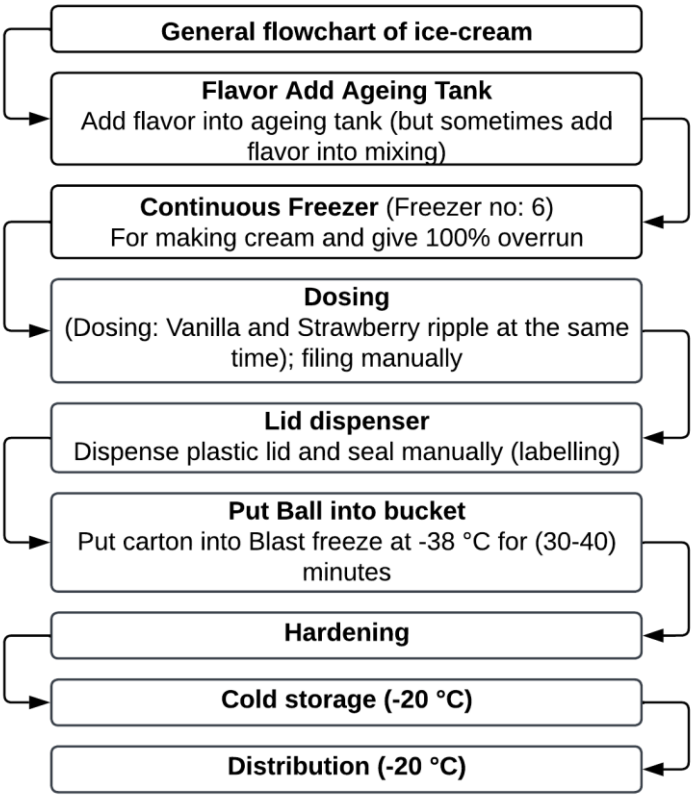
| 100ml cup |
|---|
| Machine = Micron |
| Cream = 54.2 gm |
| Cup weight with lid = 4.90 gm |
| Gross weight = 59.1 gm |
| Price = 25 taka |
| Speed = 40rpm |
| Production = 4800/ hour |
| Total mold = 32 |
| Carton size = 18 Pcs |

*Table: Vanilla /Strawberry/ Chocolate/Mango plastic cup details*

### 3.5.4 SKU: Full toss (100ml)

**Ingredients:** Skim milk powder (SMP), Full cream milk (2%), Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Flavor, Stabilizer, Emulsifier, Strawberry Ripple.

**Product Flowchart**




**Product Description**

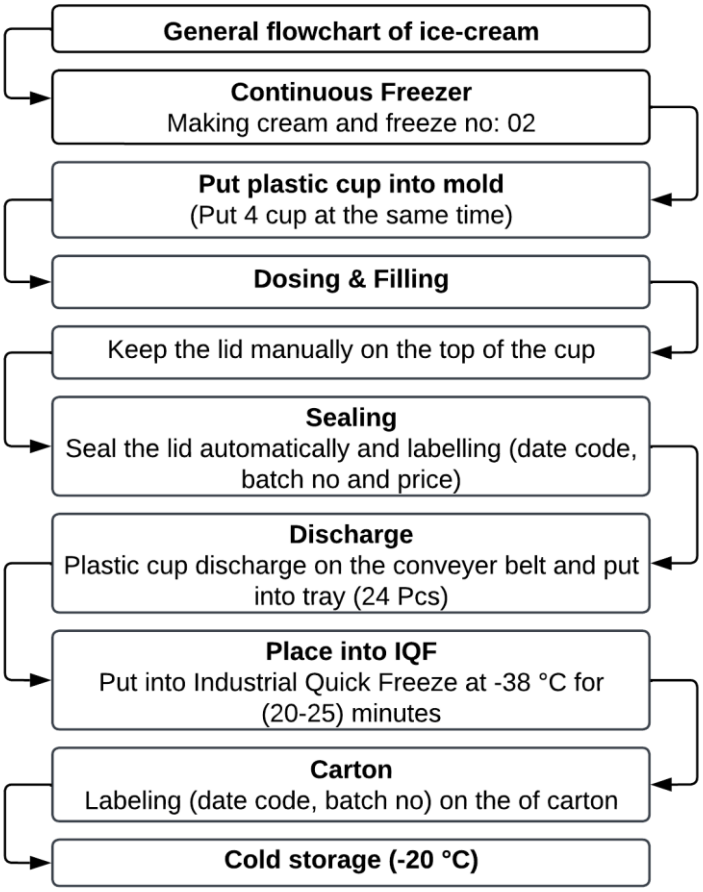
| Full Toss 100ml |
|---|
| Cream weight = 54 gm |
| Ripple weight = 5gm |
| Lid weight = 2.5 gm |
| Ball weight = 12.5 gm |
| Net weight = 59 gm |
| Gross weight = 74 gm |
| Machine = comet c1 |
| Bag size = 12 Pcs |
| Price = 25 taka |

*Table: Full toss details*

## 3.5.5 SKU: Single Sundae (100ml) flow chart

**Ingredients:** Skim milk powder (SMP), Full cream milk (2%), Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Flavor, Stabilizer, Emulsifier, Chocolate Ripple.

**Product Flowchart**




**Product Details**

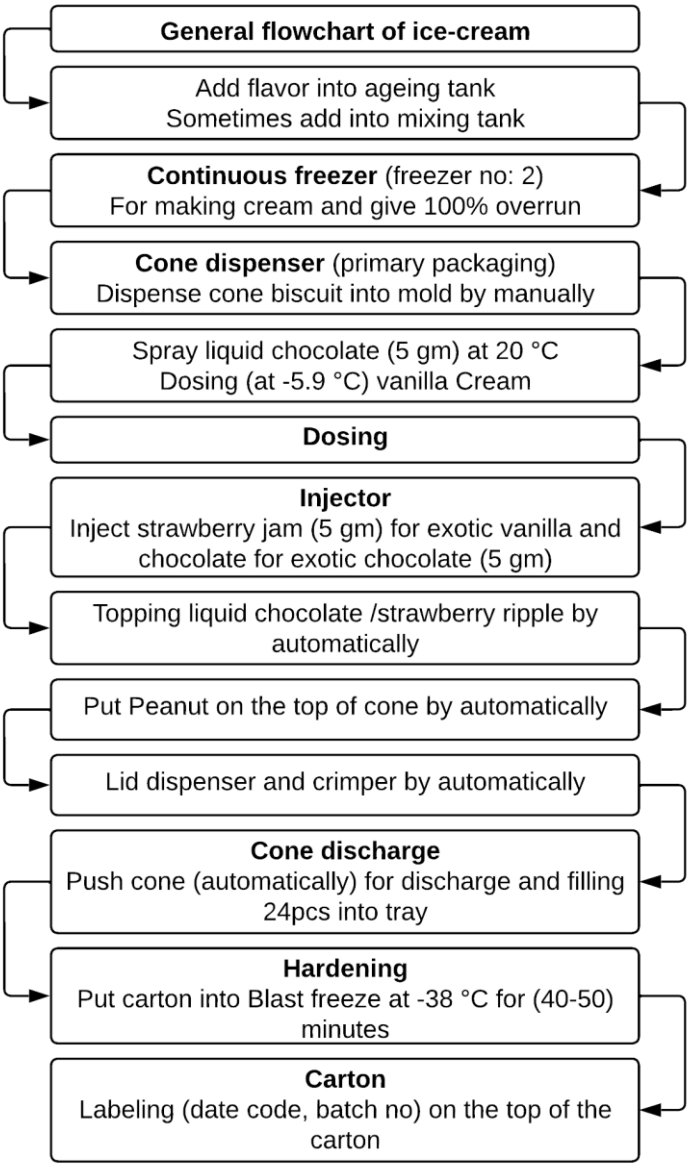
| Single Sundae |
|---|
| Chocolate ripple weight = 5 gm |
| Chocolate ripple temperature = 32 °C *standard (28-32) °C* |
| Vanilla = 54 gm |
| Dosing temperature = -5 °C |
| Overrun = 100 % |
| Total mold = 216 |
| Carton size = 12 Pcs |
| Price = 35 taka |
| Net weight = 57 |
| Gross weight = 76.4 gm |
| Lid and cup weight = 17.4 gm |
| Production = 4800/hour |
| Speed = 22 bar |

*Table: Single Sundae details*

### 3.5.6 SKU: Exotic vanilla/chocolate (110 ml)

**Ingredients:** Skim milk powder (SMP), Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Color, Flavor, Liquid cholate, Strawberry ripple, Peanut,

**Product Flowchart**




**Product Details**

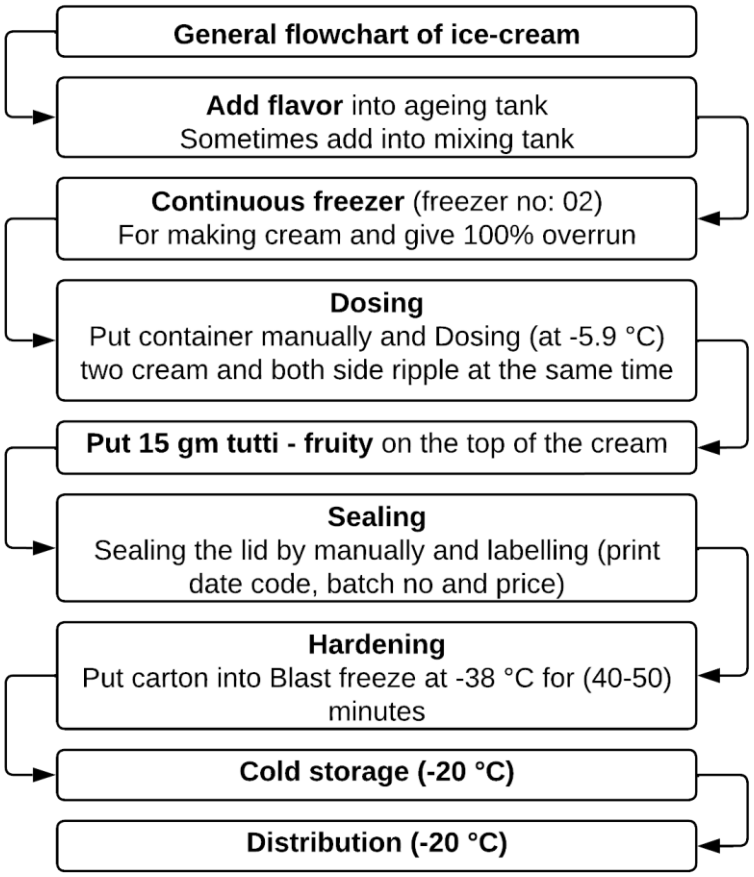
| Exotic vanilla/chocolate |
|---|
| Production = 4800 liter/hour |
| Overrun = 100 % |
| Carton size = 14 Pcs |
| Chocolate / strawberry ripple spray = 5 gm |
| Topping = 5gm |
| Peanut = 1.3 gm |
| Cone biscuit weight = 13 gm |
| Alu sleeve weight = 2 gm |
| Cream = 56gm |
| Gross weight= 82.3 gm |
| Machine = comet c2 |
| Price = 60 taka |

*Table: Exotic vanilla/chocolate details*

### 3.5.7 SKU Double Sundae [(Caramel & vanilla/ mango & vanilla/ Chocolate & Vanilla/ Strawberry & Vanilla) (1000ml)]

**Ingredients:** Skim milk powder (SMP)/Full cream milk, Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Color, Flavor, Stabilizer, Emulsifier, Strawberry pulp for strawberry, Mango pulp for mango, Strawberry ripple for strawberry and vanilla, Mango ripple mango and vanilla, Chocolate ripple chocolate and vanilla, Vanilla, Chocolate

**Product Flowchart**




**Product Description**

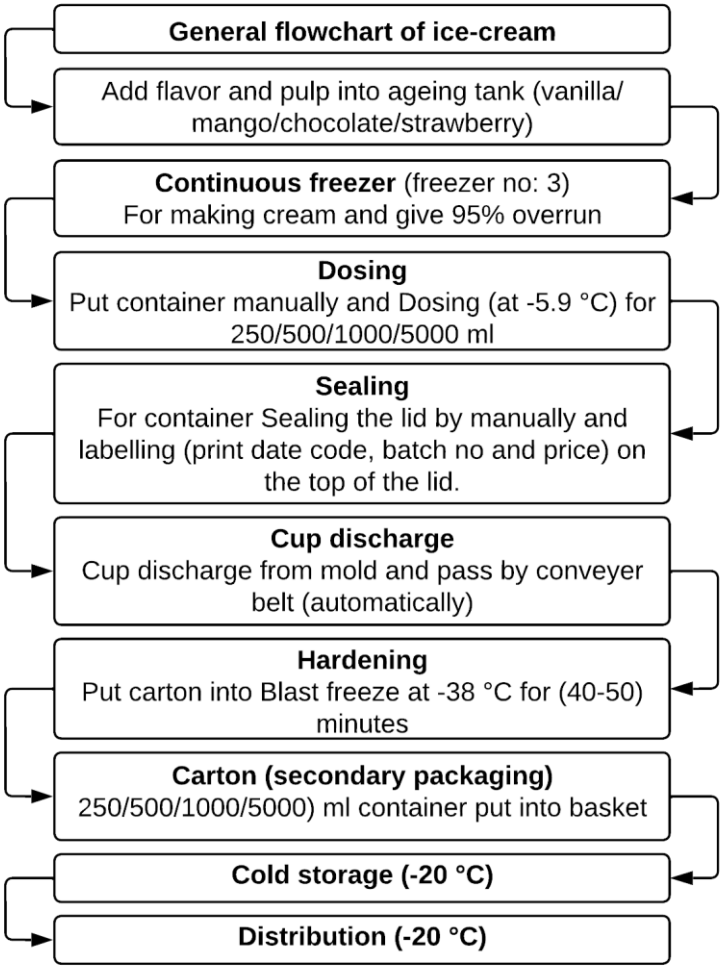
| Double sundae | | | |
|---|---|---|---|
| **Caramel and Vanilla** | **Strawberry and Vanilla** | **Mango and Vanilla** | **Chocolate and Vanilla** |
| Vanilla cream =260 gm | Vanilla cream = 260 gm | Vanilla cream = 260 gm | Vanilla cream = 260 gm |
| Caramel cream = 260 gm | Strawberry cream = 260 gm | Mango cream = 260 gm | Chocolate cream = 260 gm |
| Ripple = 40 gm (20+20) gm | Strawberry ripple = (20 +20) gm | Mango ripple = (20+20) gm | Chocolate ripple = (20+20) gm |
| Container and lid weight = 60 gm | Container and lid weight = 60 gm | Container and lid weight = 60 gm | Container and lid weight = 60 gm |
| Gross weight = 635 gm | Gross weight = 635 gm | Gross weight = 635 gm | Gross weight = 635 gm |
| Price = 270 taka | Price = 270 taka | Price = 270 taka | Price = 270 taka |
| Tutti – fruity = 15 gm | Tutti – fruity = 15 gm | Tutti – fruity = 15 gm | Tutti – fruity = 15 gm |

*Table: Double Sundae details*

### 3.5.8 SKU: Premium Shor malai (1000 ml)

**Ingredients:** Skim milk powder (SMP)/Full cream milk, Luxilac 815 / Sweet whey powder (SMP replacer), Sugar, Vegetable fat (Milk fat replacer), Milk fat, Milk protein, Chana powder, Concentrated date juice, RBD coconut oil (RBD = refined, bleached and deodorized), Glucose syrup, Water, Color, Flavor, Stabilizer, Emulsifier

**Product Flowchart**




**Product Details**

| Premium Shor malai |
|---|
| Cream = 570 gm |
| Overrun = 95 % |
| Container + lid weight = 60 gm |
| Other = 15 gm |
| Gross weight = 645 gm |
| Price = 300 taka |

*Table: Premium Shor malai details*

# CHAPTER 04

## QC parameter Test

## 4.1 LAB EQUIPMENT NAME

1. pH meter Brix meter
2. Micro oven
3. Laminar air flow
4. Digital autoclave
5. Colony counter
6. Micro-scope
7. Filter paper
8. Thermometer
9. BOD tester
10. Water bath
11. Digital meter
12. Magnetic stirrer
13. Moisture meter
14. COD Analyzer
15. Viscometer
16. Distilled water plant
17. Shaker
18. Refrigerator

## 4.2 ICE CREAM- CARTON

**QC parameter:**

1. **Physical appearance:** Carton's color, brand information, logo, "Do not drop" logo, "Recycle sign", BSTI logo, BSTI code (1083), HACCP certified, Product information, manufacturing details, exp details, storing details etc.
2. **Soaking time:** 25 minutes.
3. **Carton weight:** Minimum 140 gram
4. **Carton size**:
    a. Length: 225mm,
    b. Width: 150mm,
    c. Height: 145mm
5. **Ply**: Three
6. **Hole:** 6, **Diameter of hole:** (27-28) mm
7. **GSM** (Grams per square meter) check: (Carton has three layers)
    a. Duplex = 250
    b. Media = 150
    c. Linear = 150

**Procedure:**

- Cut (2*2) cm= $(length \times weidth)$ from carton
- Separate 3layers carefully from the carton.
- Take weight from each layer by analytical weight balance.
- Calculation

**Formula of GSM:**

Duplex/ Media/Linear = (Taken weight from D/M/L $\times$ 10000) $\div$ $(Lenght \times weight)$

8. **Corrugation:** Minimum 135%

**Procedure**

- Cut 10cm (Length) from carton and collect the media layer from the carton.
- Wet with water by dropper
- Now check the increase level that how much increased (Length)
- The increasing length will be corrugation.

**Note: Less corrugation effect on carton, can be broken**

9. **Glue flap: (20-25) mm**
10. **Lock length: 15 mm**
11. **Thickness of carton: 2 mm**
12. **Thickness of lamination: 20 microns. (15 microns acceptable)**

## 4.3 PLASTIC CUP- 100ML

**QC check:**

1) **Printing quality**: As per company standard.
2) **Actual volume**: 100 ml

**Procedure:**

a) Take 100 ml water into plastic cup by measuring cylinder(250ml).
b) Check the amount of water, if need extra water then add as needed(carefully).
c) The extra water is 5ml, so the actual volume is 105ml

3) Weight of cup: (4±0.2) gm
4) Top diameter: 75 mm
5) Bottom diameter: 57 mm
6) Neck height: 13±1 mm
7) Neck diameter: 68.5 mm
8) Total height of cup: 50 mm
9) Wall thickness: 0.4 mm
10) Sheet thickness: 0.7 mm
11) Printing layout: check (size, weight, information)
12) Lid check:
    a) Top lid: 68.5 (According to container neck diameter)
    b) Lid sticker (Glue check) [Here GSM check is not important factor.]
    c) Date (MFD, EXP), Batch no, Quantity, MRP.

## 4.4 CLASSIC CHOCO BAR ICE-CREAM (52ML)

**QC Check:**

1. **Wrapper check:**
    a. Type of wrap: BOPP pearled
    b. Length of wrap: 200 mm
    c. Width of wrap: 165 mm
    d. Thickness of wrap: 0.4 microns
    e. Weight of wrap: 1.2 gm
    f. Reel length: (1200-1400) meter
2. **Sticker check:**
    a. Sticker thickness: 0.03 micron (by makeup solution)
    b. Core diameter of Bobbin: 76 mm

3. **Layout of wrapper:** Ingredients, Batch no, Date (MFD, EXP), MRP, Environment logo, BSTI logo etc.

## 4.5 SINGLE SUNDAE CUP- 100ML

**QC Check:**

1) Check the fitting of lid with container.
2) Top diameter: 66 mm
3) Lid diameter: 69 mm

## 4.6 ICE-CREAM BOX (500ML/1000ML/5000ML)

**QC Check:**

1) Should be open and close lid from the container easily/ smoothly.
2) Should be equal top and bottom side of box.
3) Dropping test.
4) Check if have extra materials in the box.
5) Check out the transparent of the box. (If easily transparent into the box, then measure the thickness of box.)

## 4.7 ICE-CREAM

**Checking parameter: (Requirements for ice-cream)**

| Characters | Requirements for plain ice-cream | Requirements for composite ice-cream |
|---|---|---|
| Cream amount (Per litter) | 525(min.) | 540(min.) |
| Total solid (% by mass) | 36(min.) | 36(min.) |
| Total milk solid (% by mass) | 10(min.) | 8(min.) |
| SNF (solid not fat) | 10-11 | 10-11 |
| Vegetable fat/ milk fat (% by mass) | 10(min.)<br>10% (Regular) | 8(min.)<br>12% (Premium) |
| Acidity (% by mass) | 0.22 (max.) | 0.22 (max.) |
| Sugar (% by mass) | 16(min.) | 16(min.) |
| Stabilizer/ Emulsifier | 0.5 (max.) | 0.5 (max.) |
| Total colony count (per gram) | 100,000 (not more than) | 100,000 (not more than) |
| Total coliform count (per gram) | 10 (not more than) | 10 (not more than) |
| Phosphatase test of mix | Negative | Negative |
| Moisture (max.) | 60% | 60% |

*Table: Parameters for Ice-cream*

# 4.8 LABORATORY QC TEST

## Determination of fat

**Apparatus:**

- Butyrometer (Using for measuring fat content)
- Aluminum stopper
- Centrifuge machine (1100 RPM)

**Reagents:**

- 96% sulfuric acid
- Amyl alcohol
- Distill water

**Procedure:**

1. Take 0.5 gm fat sample, add 10.75 ml sulfuric acid and also add 1ml amyl alcohol in a butyrometer.
2. Shake it well with aluminum stopper by hand for 2 minutes
3. Take it into centrifuge machine and carefully and also balance at 1100 RPM for 5min.
4. Determined the fat content.

## Vegetable fat/ vegetable oil test

| No. | Name of parameter | Standard specification |
|---|---|---|
| 1. | Appearance | Light yellow with smooth texture |
| 2. | Odor | Bland, neutral odor |
| 3. | Melting points | (32-34) % |
| 4. | Moisture | Max. 0.1% by mass |
| 5. | Free fatty acid (FFA) | Max. 0.1% by mass |
| 6. | Peroxide value | Max. 1 |
| 7. | Iodine value | Min. 32 |
| 8. | MFD | COA |
| 9. | EXP | COA |
| 10 | Batch no. | Available |
| 11. | Packaging condition | Intake |
| 12. | Supplier COA | Mandatory |
| 13. | Quantity | Should be mentioned |

*Table: Vegetable Fat/ Oil test*

## Determination of per-oxide value

**Reagents:**

- Per oxide value (Prepare solution: Chloroform 20ml, Acetic acid 10ml, total solution 30ml)
- Starch solution (Prepare solution: 0.5gm starch in 100gm boil distil water)
- Potassium iodide (Prepare solution: 8gm potassium iodide in 6gm distil water)
- Sodium thiosulfate (Na2S203) – 0.01N solution prepare

**Procedure:**

1. Take 5gm oil. (Room temperature)
2. Add per-oxide value solution into the sample.
3. Then add potassium iodide 0.5ml solution
4. Rest in dark room for 1 minute
5. Add 30 ml distil water and 5 drops starch solution. The solution turns into light blue color.
6. Titrate the solution with sodium thiosulfate until the color will less.
7. Note the burette reading
8. Calculation.

**Formula:**

**Per-oxide value=** *(B.R* Normality of sodium thiosulfate* mass* 1000) ÷ sample weight*

## Determination of iodine value

**Reagents:**

- 0.1N silver nitrate (AgNO3)
- 5% potassium chromate indicator (K2CrO4)

**Procedure:**

1. Take 5gm sample, add 45ml distil water (10% solution)
2. Dissolved it well
3. Then add 1ml K2CrO4 indicator. The color turns into pale yellow
4. Titration with silver nitrate (0.1N solution)
5. Take the burette reading
6. Calculation

**Formula:**

**Iodine value**= *(B.R* normality of AgNO3* 0.00584* 100) ÷ (sample weight* 0.1)*

## Determination of Free Fatty Acid

**Reagents:**

- Ethanol
- 0.1N NaOH

- Fat sample
- Phenolphthalein indicator

**Procedure:**

1. Take 5gm sample in a conical flask (250ml)
2. In another conical flask, take ethanol solution for neutralization and take (5-6) drops phenolphthalein indicator and added with 5gm sample
3. If change the color of solution, mix it well by heating.
4. Again, add phenolphthalein indicator and titrate it with NaOH solution.
5. Observe the color for 1minute.
6. Calculation

**Formula:**

**FFA**= *(B.R*Normality of NaOH* Mass* 100) ÷ (Sample weight* 1000)*

## Determination of Acidity

**Apparatus:**

- Beaker
- Dropper
- Burette with stand.
- Measuring Cylinder — 25 ml.
- Stirring Rods — glass.

**Reagents:**

- 0.1N NaOH
- Distill water
- Phenolphthalein indicator

**Procedure:**

1. Take 2ml sample with 8ml distill water into a beaker by measuring cylinder
2. Then add (4-5) drops phenolphthalein indicator.
3. Shake it well.
4. Titrate it with 0.1N NaOH by burette with stand.
5. Titration the solution until the color turns into faint pink color.
6. Calculation.

**Formula:**

**Acidity%** = *(Burette reading× normality of NaOH×Mass×100) ÷ (sample weight× 1000)*

## Skimmed milk/ low fat milk powder Test

| Name of parameter | Standard specifications | Method |
|---|---|---|
| Appearance | White and free from lumps | Visual |
| Odor | No objectional odor | Organoleptic |
| Moisture | Max. 4% by mass | Moisture analyzer |

| | | |
|---|---|---|
| Milk fat | Min. 0.5% by mass | Garber |
| SNF (Solid not fat) | Min. 34% by mass | Analyzer |
| Titratable acidity | Max. 18ml/0.15% of 0.1N NaOH | Analytical |
| Total Ash (Dry basis) | Max. 8.2% | Analyzer |
| Packaging condition | Intake | Visual |
| Supplier COA | Mandatory | Physical |
| Quantity | Mentioned | Physical |

*Table: skim milk testing parameters*

## Brine test

**Brine solution** (60% water, 33% calcium chloride, 7% caustic)

1. **pH test:** (Standard: 6.4-7.4)
   **Procedure:**
   - Take brine sample in a beaker
   - Now dipping the pH strip into the sample
   - Match the color with pH box and record the result

2. **Baume test: (Standard 31.5)**
   - The brine solution takes into 20° temperature by heating
   - Then solution placed into a measuring cylinder (250ml) and fill it with top of the cylinder.
   - Now slowly the Baume meter dip into the solution
   - Take the result.

**NOTE**: If the result less than 31.5 then add 25kg calcium chloride for every 0.5 of Baume scale.

3. **Density:** Standard (1.280-1.286)
   - Take a pycnometer (25ml) and make it zero by weight balance.
   - Fill it with brine solution and take weight
   - Calculation

**Formula:**

**Density=** Sample weight ÷ Weight of Pycnometer

## 4.9 WTP (WATER TREATMENT PLANT)

| Name of parameter | Standard specification |
|---|---|
| Taste | No off taste |
| Odor | No off odor |
| Appearance | No visible color |
| Presence of dust | No visible dust |
| pH | 6.4-7.4 |
| Phosphate | < 4 ppm |
| Total Hardness | <300 ppm |
| Iron | <0.3 ppm |
| Total Dissolved Solid (TDS) | <500 PPM |

*Table: Water testing parameters*

1. **Total hardness test:**

**Reagents:**

- Hardness buffer = 5 drops
- Water = 5ml
- Calmagate solution = 1 drop
- EDTA = 1ml

**Procedure:**

- Take 5ml water in a beaker
- Then add 5 drops of hardness buffer and 1drop of Calmagate solution into water
- Titrate it with 1ml EDTA solution.
- Observe the color until it turns into dark violate color.
- Calculation

**Formula:**

**Total hardness** = (Final reading – Initial reading) × 300

2. **Iron test:**

**Reagents:**

- Water = 5ml
- FE1 = 15 drops
- FE2 = 30 drops
- FE3 = 1spoon

**Procedure:**

- Take 5ml water in a beaker
- Add 15 drops FE1, 30 drops FE2 and 1 spoon of FE3 into water.
- Shake it well
- Rest for 5minutes
- After 5minutes, observe the color and note down the result.

## 4.10 AGRO (QC CHECK)

**Name of Raw Materials:** Wheat flour

| Name of parameter | Standard specification |
|---|---|
| Appearance & color | Creamy white |
| Moisture | Max. 13% |
| Gluten % (wet basis) | Min. 36% for high gluten & min. 24% for low gluten. |
| Gluten % (dry basis) | Min. 12% for high gluten and min. 8% for low gluten. |
| Gluten index | 80-100% |
| Titration acidity in 90% alcohol | Max. 0.1 % for both |
| Falling number | Min. 200 |
| Protein (dry basis) | Min. 12/8% |
| Total ash content | 0.40- 0.55% |
| Total insoluble ash content | 0.040 -0.055% |
| Granularity over of 180 microns | Min. 95% |
| Damage starch | Max. 7% |
| Sedimentation value | 35-40 ml |
| Mycotoxin | Nil |
| Foreign particles (Hazard) | Foreign particle free |
| Insect | Free |
| Packaging condition | Intake |
| MFD, EXP | As per COA |
| Supplier COA | Mandatory |

*Table: Wheat testing parameters*

**Name of Raw Materials:** Potato

| Name of parameter | Standard specifications |
|---|---|
| Color | Khaki |
| Preferred brand | Diamond |
| Pcs/kg | 4-5 |
| Moisture | 76-80% |
| Damage | Damage free |
| Insect cutting | Insect cutting free |
| Foreign particle | Free |
| Dust | Free |
| Shape | Taller |
| MFD/ EXP | As per COA |
| Supplier COA | Mandatory |

*Table: Potato testing parameters*

**Name of Raw Materials:** Chicken meat (Breast/ thigh/ skin)

| Name of parameter | Standard specifications |
|---|---|
| Appearance and color | Characteristics and cleaned |
| Cleanliness | Properly clean |
| Disease free | Bird flu free |
| Water | No added water |
| Preservative | No preservative |
| Hemorrhage blood | Free |
| Feather | free |
| Smell | Bad smell free or natural smell of meat |
| Size and shape | As per standard |
| Weight / piece | Breast (160-165) gm<br>Thigh (130-135) gm<br>Wings (38-40) gm<br>Durmlets (40-45) gm |
| Bones | Characteristics |
| Foreign particles | Free |
| MFD | As per COA |
| EXP | As per COA |
| Supplier COA | Mandatory |

*Table: Chicken meat testing parameters*

## 4.11 OIL TEST OF FRENCH FRY

| No. | Name of parameter | Standard specification |
|---|---|---|
| 1. | Appearance and color | As per standard |
| 2. | Flavor | No bad odor/ flavor |
| 3. | % Of FFA | Max. 1% |
| 4. | % Of acid value | Max. 2% |
| 5. | Peroxide value | Max. 10 |

*Table: Oil test parameters*

# CHAPTER 05

## CONCLUSION

## CONCLUSION

In Bangladesh, one of the pioneering enterprises is Golden Harvest Agro & Ice Cream Ltd. I'm delighted and thrilled to have had the chance to educate myself in this field. They offered me ample time to go through my theories thoroughly concerning the various divisions of the production and quality control department. All of the staff members are quite polite, and the trainers for my internship session are very serious. I now know how various ice creams are produced and how to ensure their quality. My future endeavors will benefit greatly from this experience.