



**An Internship Report  
On  
Studies on Production and Quality Control of Food & Beverage  
At  
Akij Food and Beverage Ltd.**

**Submitted To:**

**Prof. Dr. Md. Bellal Hossain  
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Faculty of Allied Health Science  
Daffodil International University**

**Submitted By:**

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**Date of Submission: 22 December, 2018**

## LETTER OF TRANSMITTAL

**Date: 22 December, 2018**

Prof. Dr. Md. Bellal Hossain  
Head  
Department of Nutrition and Food Engineering  
Faculty of Allied Health sciences  
Daffodil International University

**Subject: Submission of internship report.**

Dear Sir,

It is a great pleasure and honor for me to have the opportunity to submit Internship report as a Part of the Nutrition and Food Engineering (NFE) program curriculum.

I have prepared this report based on the acquired taste knowledge during my internship period In Akij Food and Beverage Ltd. It is great achievement to work under your active supervision. This Report is based on, **“Studies on the production and quality control of Food and Beverage”** at Akij Food And Beverage Ltd., Barobaria, Dhamrai, Dhaka. I have got the opportunity to work in Akij Food and Beverage Ltd. In “Quality Control and Production Department” for sixty days, under the supervision Md. Helal Uddin, General Manager (QMS).

Firstly of all I have gained knowledge about the organizational culture of a prominent product producing organization of the country. Secondly, the project gave me the opportunity to develop a network with the corporate environment.

I therefore, would like to place this report to your judgment and suggestion. Your kind advice will encourage me to perform better planning in future.

Sincerely Yours,

Md. Islam Uddin  
ID: 161-34-505  
*Department of Nutrition and Food Engineering*  
Faculty of Allied Health Science  
Daffodil International University

## LETTER OF AUTHORIZATION

**Date: 22 December, 2018**

Prof. Dr. Md. Bellal Hossain  
Head  
Department of Nutrition and Food Engineering  
Faculty of Allied Health Science  
Daffodil International University

**Subject: Declaration regarding the validity of the internship report.**

Dear Sir,

This internship report entitled Knowledge and extent the practice of “**Studies on Production and Quality Control of Food and Beverages**” at Akij Food and Beverages Ltd. was submitted to the Department of Nutrition and Food Engineering, Faculty of Allied Health Science, Daffodil International University, Dhaka, Bangladesh. This study was fully concerned with the department and faculty members.

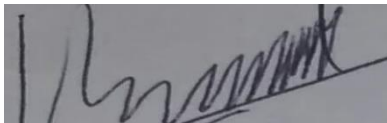
Sincerely yours,

Md. Islam Uddin  
ID: 161-34-505  
*Department of Nutrition and Food Engineering*  
Faculty of Allied Health Science  
Daffodil International University

## CERTIFICATION OF APPROVAL

I am pleased to certify that the internship report on Production and Quality Control of Food and Beverage, conducted by Md. Islam Uddin, bearing respectively ID No: 161-34-505 of the department of Nutrition and Food Engineering has been approved for presentation and Defense/viva-voice.

I am pleased to hereby certify that the data and finding presented in the report are the authentic work of Md. Islam Uddin. I strongly recommended the report presented by Md. Islam Uddin for further academic recommendations and defense/viva-voice. Md. Islam Uddin bears a strong moral character and a very pleasant personality. It has indeed a great pleasure working with him. I wish him all success in life.



**Prof. Dr. Md. Bellal Hossain**

**Head**

*Department of Nutrition and Food Engineering*  
Faculty of Allied Health Science  
Daffodil International University

## ACKNOWLEDGEMENT

In the preparation of this report, I would like to acknowledge the encouragement and assistance given to me by a number of people. At first, I would like to express my gratitude to almighty Allah for enabling me the strength and opportunity to complete the report in the scheduled times successfully. I am taking this privilege to deliver my gratefulness to each and every person who is involved with me in every phase of my life.

I am grateful to my parents without whom I cannot be here. Without the support of my parents, I could not be able to achieve my objectives and goals.

My deep gratitude and sincere thanks to the honorable Head, Nutrition and Food Engineering department **Professor Dr.Md. Bellal Hossain** for this kind cooperation and to accept this Degree. I am encouraged taking this privilege to deliver my gratefulness to each and every person who is involved with me in every phase of my life.

I am deeply indebted to my Supervisor **Professor Dr.Md. Bellal Hossain** honorable Head, Nutrition and Food Engineering department, Department of Nutrition & Food Engineering, Daffodil International University for his whole-hearted supervision during my organizational attachment period. I am very grateful to **Sheikh Shamim Uddin, Director** of Akij Food and Beverage Ltd. For giving us permission to carry out this internship in his organization. I am also grateful to **Md. Helal Uddin, (GM, QMS)** as my organizational supervisor to conduct. It would have been very difficult to prepare this report up to this mark without their guidance.

I would like to express my warmest thanks to **Nutrition and Food Engineering Faculty members** for their countless inspiration and encouragement during the student life.

Finally I wish to express immense gratitude & humbly convey my heart-felt respect to Managing Director.

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# Chapter ONE

## INTRODUCTION

At 09 semester out of 09 semesters in three year Bachelor of Science in Nutrition and Food Engineering I got an opportunity to work at Akij Food and Beverage Ltd. (AFBL), Bangladesh the part of my internship program. The duration of my internship was from 10<sup>th</sup> September 2018 to 10<sup>th</sup> November 2018. AFBL is the top & largest beverage company in the country. AFBL has many types of department. The departments are – HR & Admin, Quality Control, Research & Development, Production, Electrical, Mechanical, Store, Distribution, Accounts, Vat, Civil, Resource, Hygiene etc. My concern was **Quality Control Department & Production Department** which encompassed the following activities:

- Maintain all quality control parameter as per specification.
- Ensure quality of production.
- Knowledge on product costing.
- To prepare & to submit necessary reports required by the management.
- Have to submit report to authority every day for production consumption, costing, quality etc.
- To make necessary production plan as per the schedule provided by the production department.



## **AIM OF THE TRAINING**

### **Aim of the Training:**

Internships provide an opportunity for students to link theory with practice and further serve as a temporary labor pool for those agencies that have committed to participate in the internship program. The department fulfills its mission of preparing students for significant professional and managerial positions in all the sectors. Relevant professional development topics and workshops are discussed weekly.

### **The internship...**

- Provides a student with a practical real world experience in the public, private or nonprofit sector.
- Enables a student to develop important public administration skills which cannot be taught in the classroom. These experiences vary from working on special projects for the interning agency to learning about the human motivation process in a complex organization.
- Enables a student to compare theoretical ideas learned in the classroom within the world of work regarding public administration experiences.
- Provides a student with experience in an actual public, private or nonprofit agency before entering the job market. Such experience not only increases students' job prospects, but also teaches what is expected in terms of professional behavior.
- Permits a student to apply the technical skills learned in the classroom to real world public, private or nonprofit administrative problems.

### (DESCRIPTION OF THE ORGANIZATION)

#### **2.1: About Akij Group:**

Akij Group is one of the largest Bangladeshi industrial conglomerates. The industries under this conglomerate include textiles, tobacco, food & beverage, cement, ceramics, printing and packaging, pharmaceuticals, consumer products etc. In 2009, Akij Group paid 390 million euros in tax, making it the biggest local tax-payer, contributing two per cent to this nation's entire budget. Akij also provides services in healthcare, information and communication technology. Its turnover in 2009 was 89 billion Taka.

Akij Group was established in the 1940s by industrialist Sheikh Akij Uddin as a jute trading business, before moving into cigarettes and other areas of business. It has faced criticism for employing child workers.

The legacy of AKIJ GROUP is over half a century old and over the years Akij has established itself as the full of confidence and much revered industrial family of Bangladesh. Akij Group is one of the biggest conglomerates in Bangladesh. It consists of 24 big concerns with diverse activities & different products. Akij Group launched its venture as a small jute trader more than 50 years ago. Since then it has been progressing with tremendous pace in the industrial area of Bangladesh. A large number of people are employed by the group and cared for as members of the Akij family. The non-profit concerns are also involved in sustaining development of the country & for social welfare.

- Akij Cables limited.
- Abrar Tours and Travels
- Ad-Din Foundation
- Akij Automotive Industry
- Akij Biri Factory Ltd.
- Akij Cement Company Ltd.
- Akij Ceramics Company Ltd.
- Akij Computer Ltd.
- Akij Corporation Limited
- Akij Food & Beverage Ltd.
- Akij Foundation School & College
- Akij Gas Company Ltd.
- Akij Gas Station Ltd.
- Akij Institute of Technology
- Akij Jute Mills Ltd.
- Akij Match Factory Ltd.

- Akij Motors
- Akij Particle Board Mills Ltd.
- Akij Pharmaceuticals Ltd.
- Akij Printing & Packaging Ltd
- Akij Securities Ltd.
- Akij Textile Mills Ltd.
- Akij Zarda Factory Ltd.
- Dhaka Tobacco Industries
- Akij Rice Mill Industry
- Akij Flour Mill Industry
- Akij Ceramics Ltd.

## **2.2: About Akij Food and Beverage:**

Akij Food & Beverage Ltd. (AFBL) a unit of Akij Group started its operation in the year 2006. AFBL manufactures a wide range of Snacks and Beverage for both National & International market alike. AFBL is a project worth \$ 70 million& is funded by the parental company Akij Group. There are various types of drink. Mojo is the brand name of cola, Lemu is the brand name of Lemon and Speed is the brand name of energy drink. Immediately after the introduction of the brand it became very popular among its consumer because of the high quality and intensive distribution in every nook and corner of the country. Checky Monkey is the brand name of banana chips produced from this factory. It also is becoming popular chips in Bangladesh.

## **2.3: Vision of Akij Food & Beverage:**

- Having the quality of quality, becoming the most food & beverage company of Bangladesh

## **2.4: Mission of Akij Food & Beverage:**

- Produce high quality products.
- To supply high quality products.
- To distribute zero defect products.
- All time apply high technology to produce high quality products.
- Brings quality in life.
- Work for social welfare.

## **2.5: Values of Akij food & Beverage:**

- Innovation
- Teamwork
- Integrity
- Customer focus
- Trust and Respect

# Chapter THREE

## 3.0: Product of Milk Plant

1. Pasteurized milk
2. UHT Milk
3. Sweet Curd
4. Sour Curd
5. Low Fat Curd
6. GHEE
7. Butter
8. Mango Milk
9. Chocolate Milk
10. Green Mango Milk
11. Mango Shake
12. Mango juice (Frutika Tetra pack-UHT)

**3.1: Definition of Milk:** Milk is the lacteal and physiological secretions of mammary glands obtained from healthy cows or buffaloes (excluding fifteen days before and five days after parturition) and contains at least 3.5% fat and 8.5 solids-non fat.

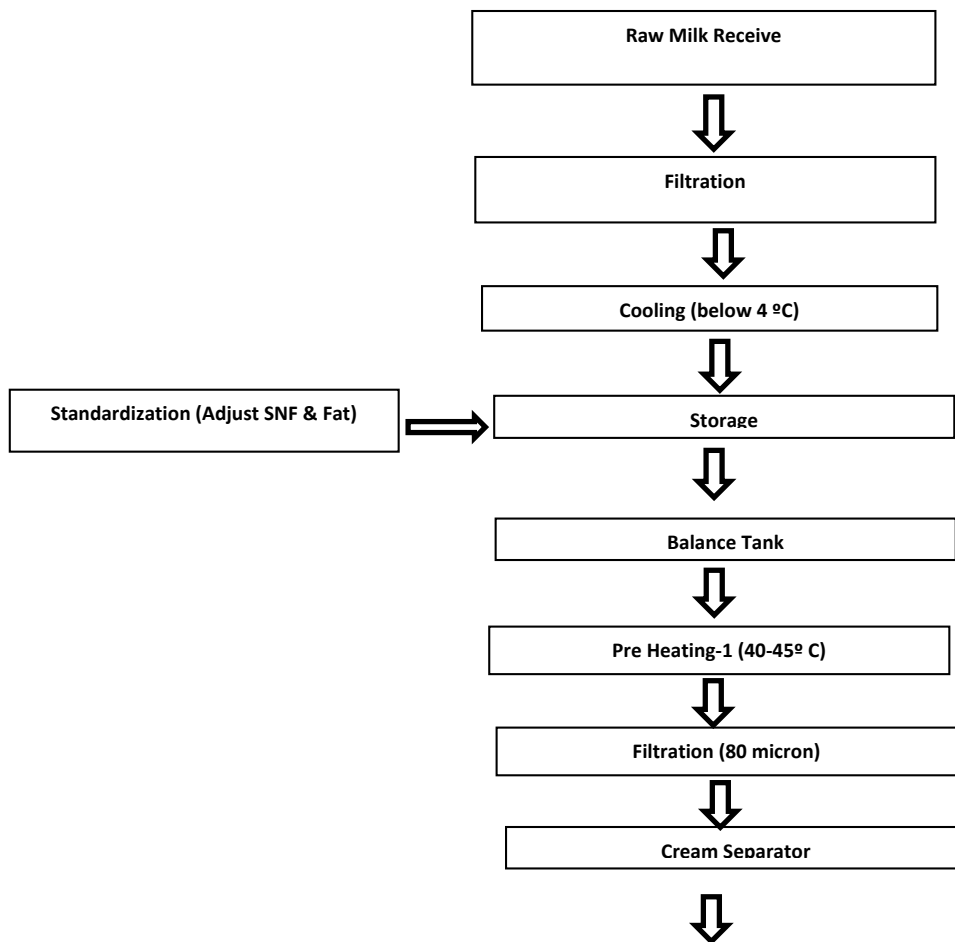
**3.2: Composition of Milk:** The basic composition of milk regardless of the source remains the same:

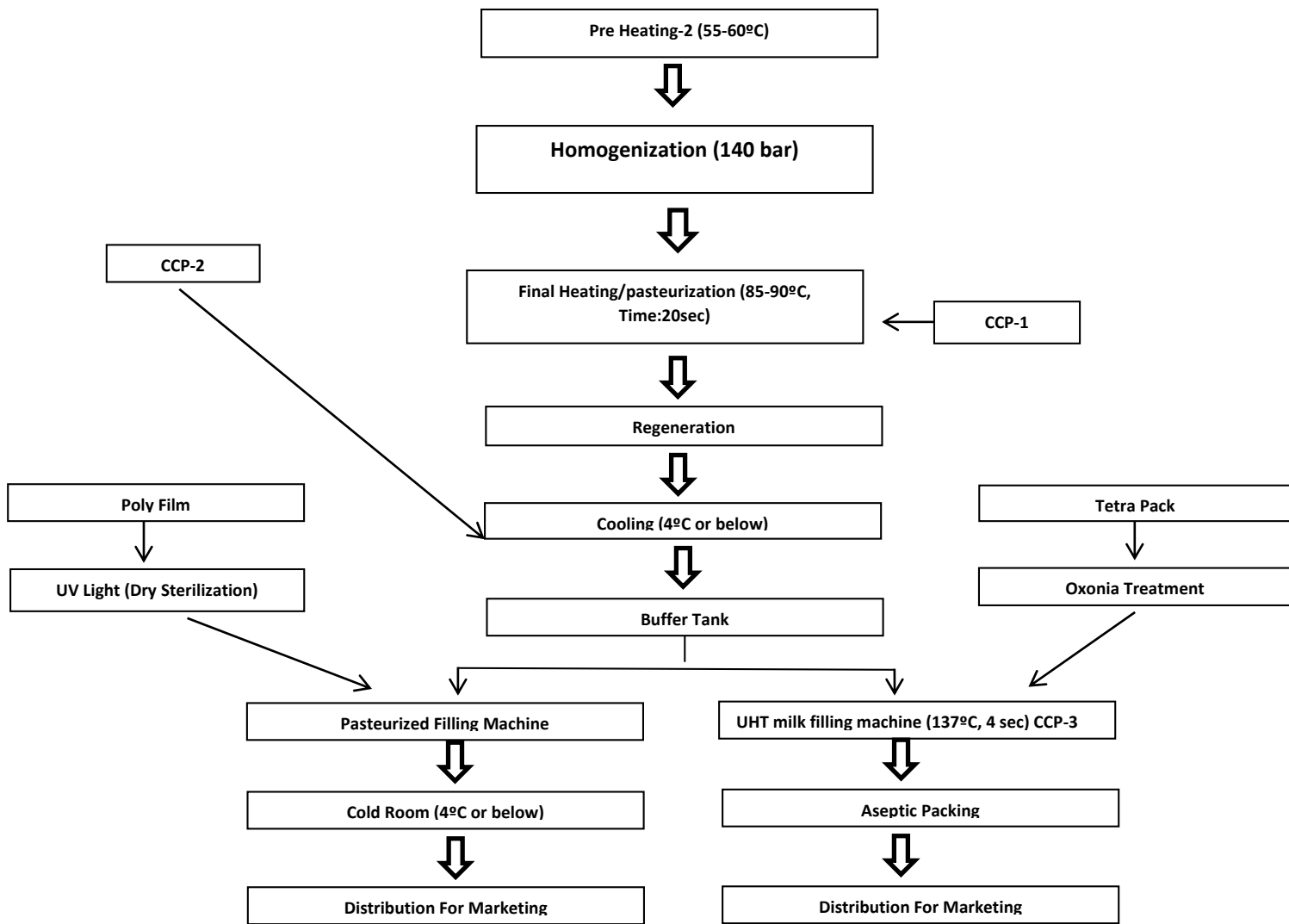
SL	Elements	Percentage
01	Water	87.1%
02	Carbohydrate	4.8%
03	Protein	3.8%
04	Fat	3.5%
05	Minerals	0.8%

### 3.3: Process of Milk:

1. At First Collection of Raw Milk of Chilling Center.
2. Collected Raw Milk is Passed through Platfrom Principle test and adultration test.
3. The passed milk is Chilled in a Storage Vat at 4°c or below.
4. Storage Milk is recombined with milk or full cream milk for maintaining fat percentage(3.5%) According to BSTI Standard.
5. Raw milk Have Higher fat Percentage then Standarization of milk (Adjusting SNF and Cream Separation )
6. Milk is Pasteurized at 80-88°c for 15 Sec.
7. Pasteurized milk is Homogenized by milk Homogenizer.
8. Final milk cooling is 4c and storage tank.
9. Then cooled milk is taken in the Packing machine for Storage Vat.

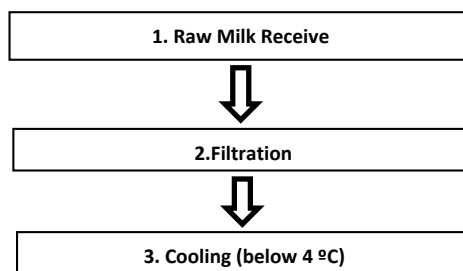
### 3.4: Milk Processing Flow chart:





**Figure 3.4 : Flow chart of Pasteurized milk & UHT milk**

### 3.5: Mango Milk/Chocolate Milk Process:



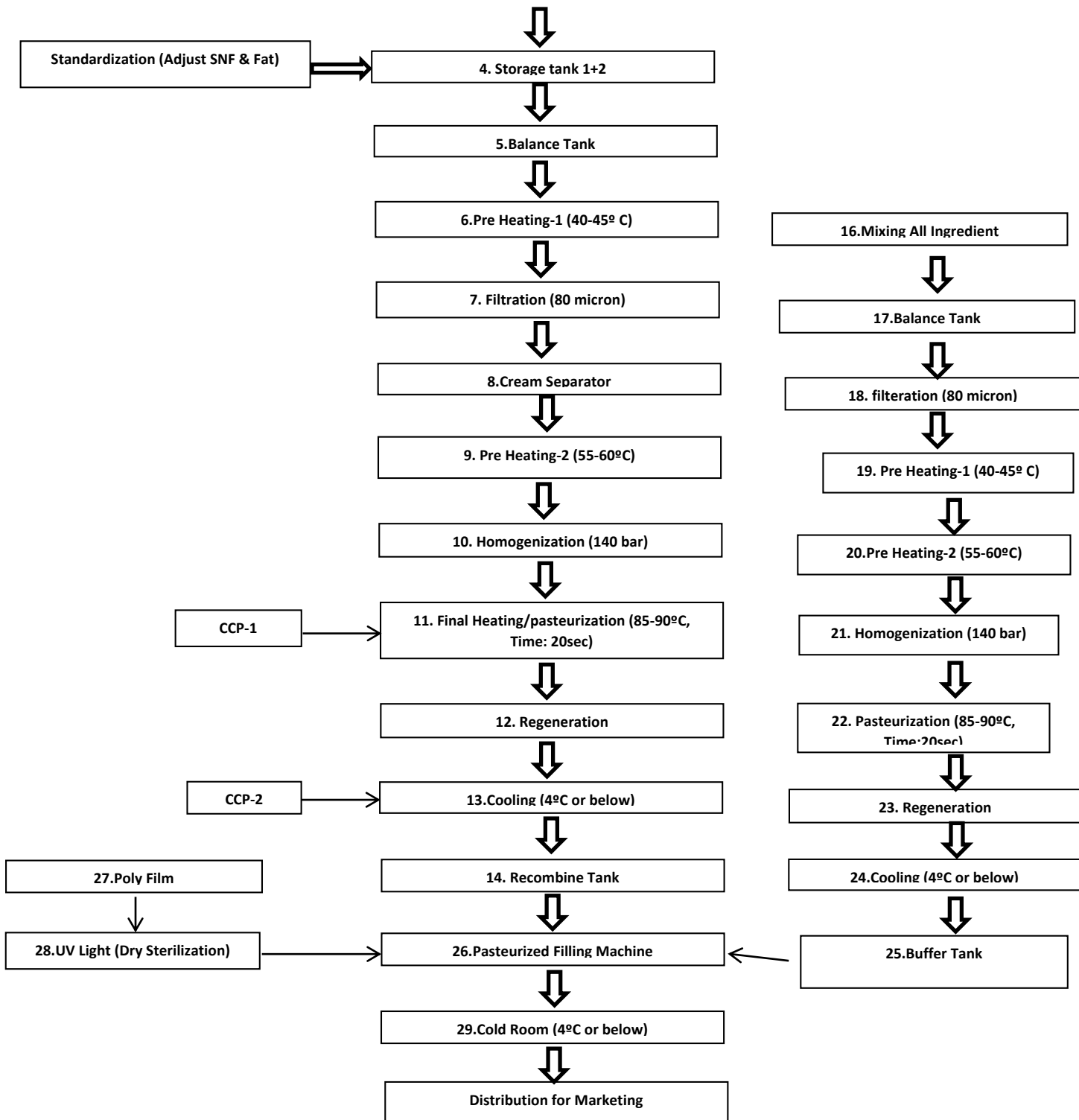


Figure 3.5: Flowchart of Mango Milk/Chocolate Milk

### 3.6: Butter Process:



**Figure 3.6: Flow chart of Butter**



### 3.7: Yoghurt Processing:

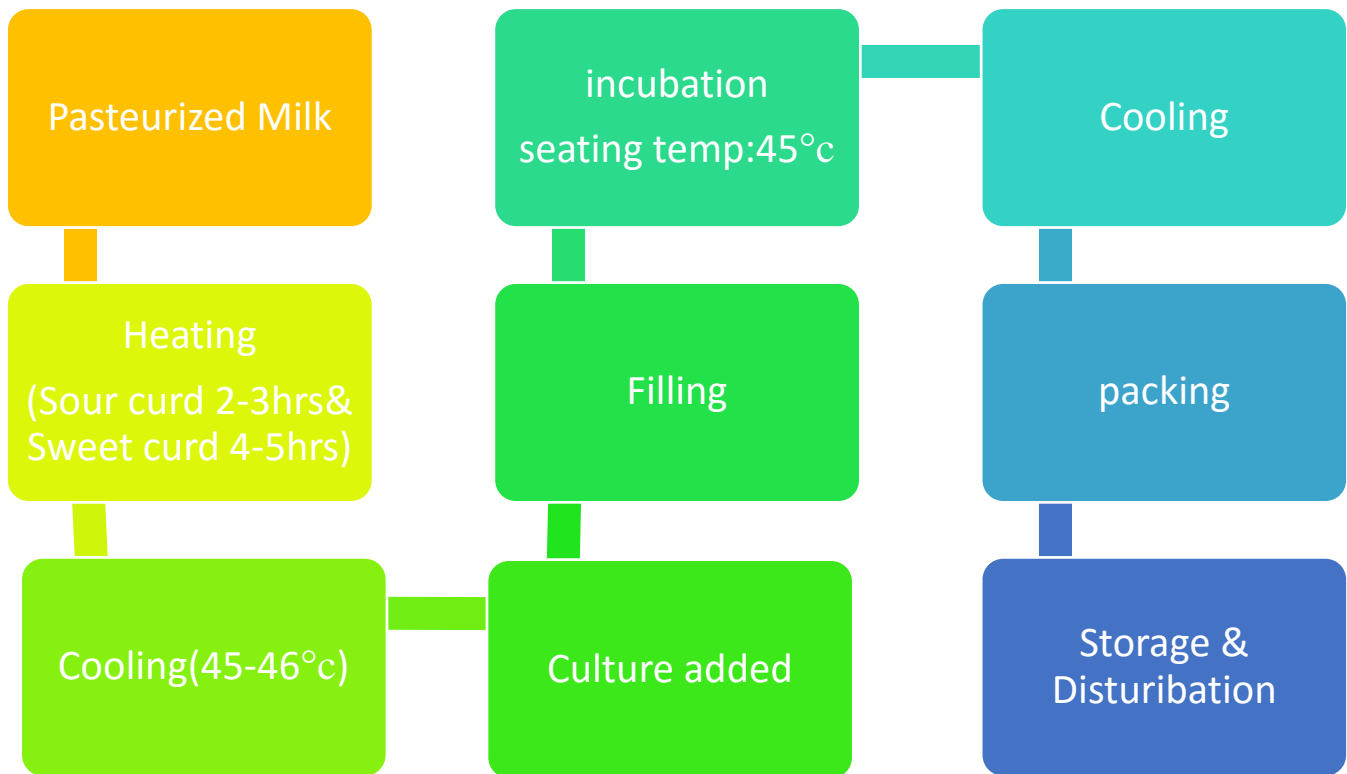
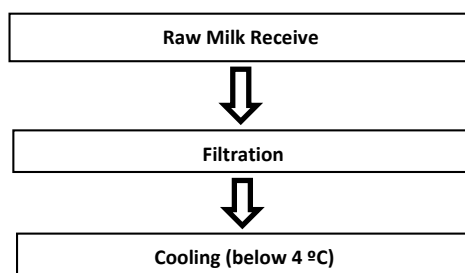
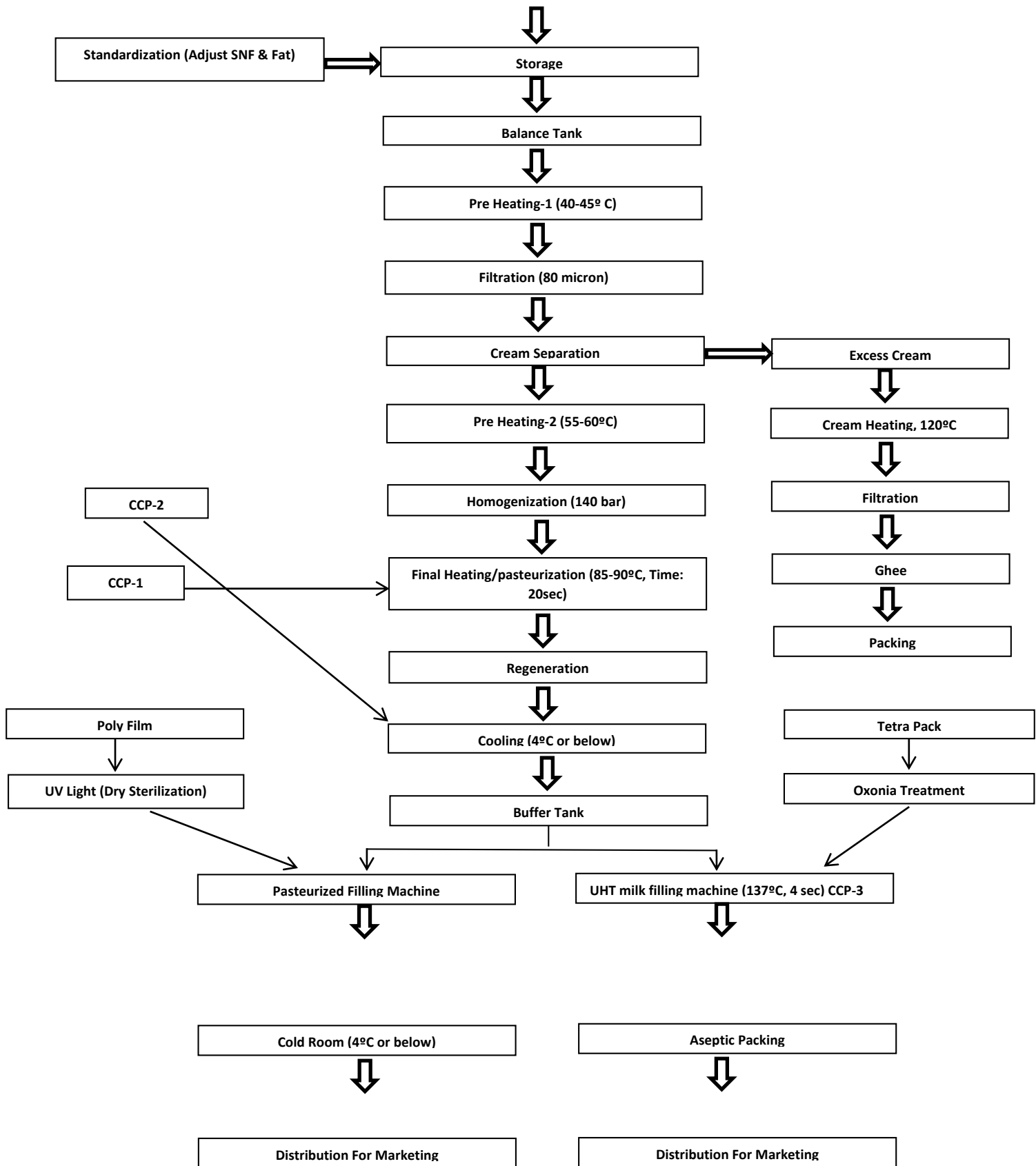


Figure:3.7:Flow chart of Yoghurt

### 3.8: Ghee Process:





**Figure 3.8 : Flowchart of Ghee**

### 3.10: Carbonated Soft Drinks Items

1. Speed 250 ml
2. Mojo (250ml, 500ml, 1ltr, 2ltr)
3. Clemon (250ml,500ml,1ltr, 2 ltr)
4. Lemu (250ml)
5. Wild Brew(250ml)
6. Twing (250ml,500ml)

#### Shelf Life (PET)

<b>Speed</b>	<b>4 months</b>
<b>Mojo</b>	<b>4 months</b>
<b>Clemon</b>	<b>4 months</b>
<b>Lemu</b>	<b>4 months</b>

#### Shelf Life (CAN)

<b>Speed</b>	<b>9 months</b>
<b>Mojo</b>	<b>9 months</b>
<b>Clemon</b>	<b>9 months</b>
<b>Lemu</b>	<b>9 months</b>

### 3.11: Carbonated Soft Drink Processing( PET)

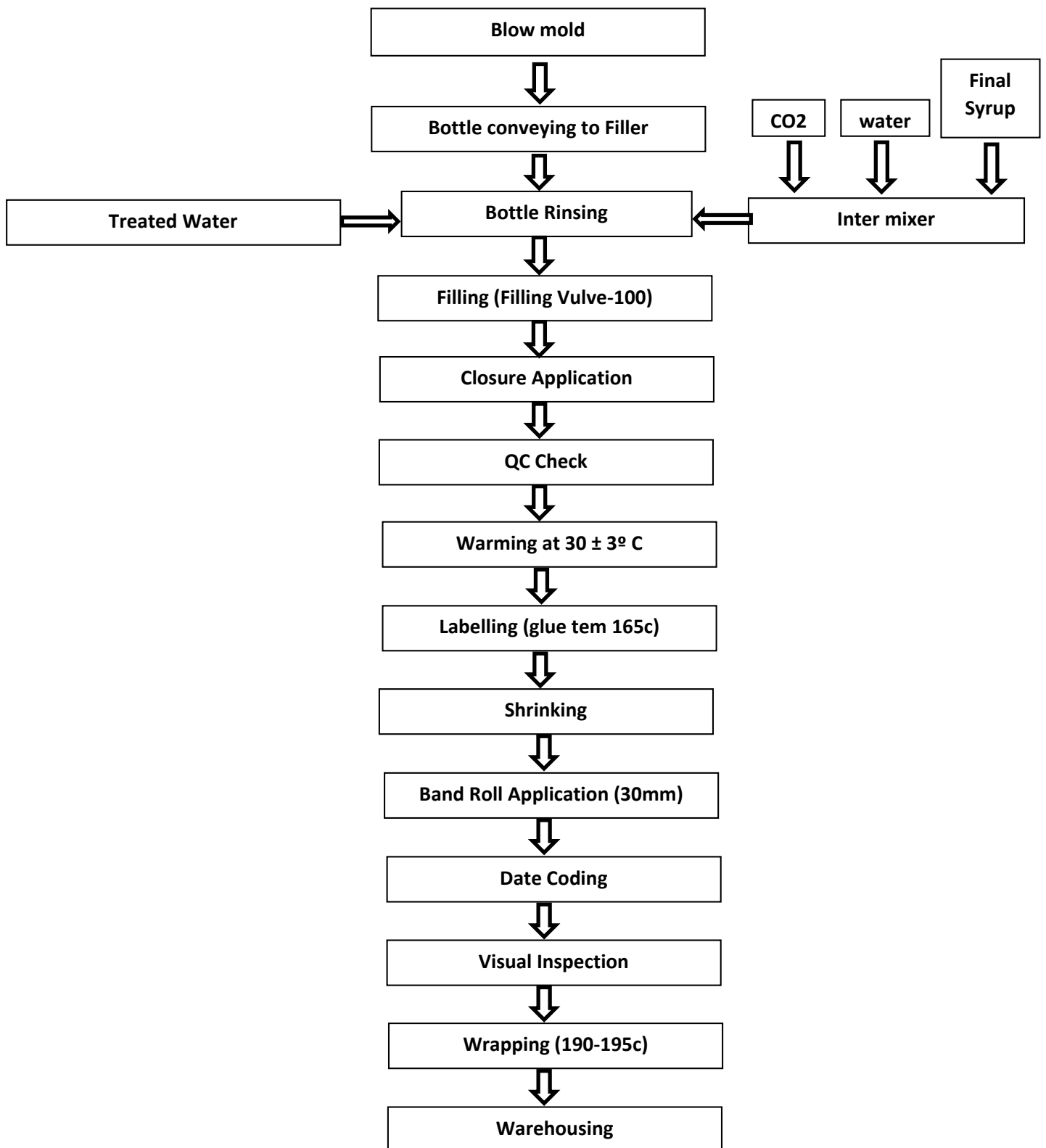


Figure 3.6 :Flowchart of CSD (PET)

### 3.12: Carbonated Soft Drink Processing( CAN)

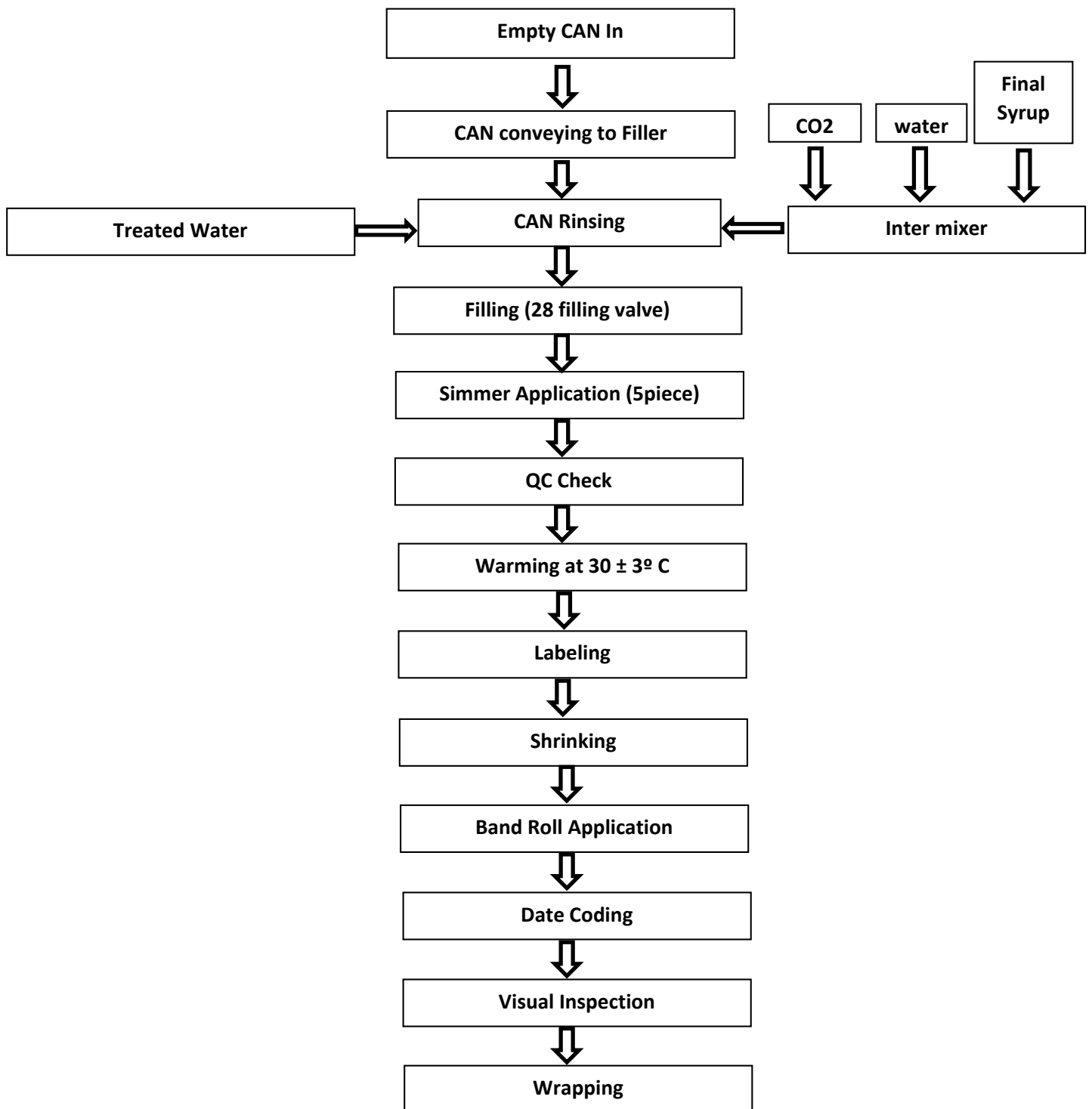


Figure 3.7: Flowchart of CSD (CAN)

## Chapter FOUR

### 4.1: LAB WORKS

#### Equipment list of Lab

1. Micro oven
2. SST (Secure Seal Tester)
3. Co2 cylinder
4. Magnetic stirrer
5. Moisture meter
6. Gauge tester
7. Digital meter
8. Viscometer
9. Water bath
10. Gas volume analyzer
11. BOD tester
12. CO2 purity tester/ CO2 volume tester
13. Enamel tester
14. COD analyzer
15. Distilled water plant
16. Density meter
17. Shaker
18. Thermometer
19. pH meter
20. Filter paper
21. Microscope
22. Colony counter
23. Digital Autoclave
24. Digital sterilizer
25. Laminar air flow
26. Refrigerator

## 4.2: Making of Indicator

### Phenolphthalein:

1. Take 0.5g dissolved in 50ml alcohol
2. Add 50ml distilled water

### Mixed indicator:

1. 0.33g Bromocresol Green.
2. 0.66g methyl red.
3. Dissolve them in 100ml distilled water.

### (0.1N) Sodium ThioSulphate:

1. Take 2.5g sodium thiosulphate.
2. Dissolve it into 100ml distilled water.

### Irriochrom Black T (Hardness Indicator):

1. Take 6.1g sample.
2. Dissolve it into 100ml methanol.

### Microbiological Test

#### 5.1: Name of the test: Total bacterial count

**Method:** Pour plate (For Water, Mango pulp, Fruit Drinks)

**Purpose:** The pour plate technique can be used to determine the number of microbes/ml or microbes/gram in a specimen.

**Requirements:**

- Sterile Petridis (90mm)
- Micropipette
- Alcohol (70%)
- Laminar Air Flow
- Autoclave
- Incubator
- Colony Counter
- Water bath
- Plate count Agar

**Procedure:**

1. Prepare the media and sterilized by autoclave at 121°C for 15 minutes, 14.5 psi.
2. Take specific amount of sample in Petridis.
3. After autoclaving media allow to cool in 40°C.
4. About 15-20ml of media is pour in Petridis and properly homogenized by clockwise & anticlockwise and allows to solidify.
5. After solidification incubate the plate at 37°C in inverted position for 24-48 hours.
6. After incubation count the colony by colony counter.
7. All the steps should be done under laminar air flow to maintain aseptic condition.

**Results:** count the result and record as cfu/ml or gm.



## 5.2: Name of the test: Total Yeast, mold count

**Method:** Pour plate (For Water, Mango pulp, Fruit Drinks)

**Purpose:** The pour plate technique can be used to determine the number of microbes/ml or microbes/gram in a specimen.

**Requirements:**

- Sterile Petridis (90mm)
- Micropipette
- Alcohol (70%)
- Laminar Air Flow
- Autoclave
- Incubator
- Colony Counter
- Water bath
- Orange serum agar

**Procedure:**

1. Prepare the media and sterilized by autoclave at 121°C for 15 minutes, 14.5 psi.
2. Take specific amount of sample in Petridis.
3. After autoclaving media allow to cool in 40°C.
4. About 15-20ml of media is pour in Petridis and properly homogenized by clockwise & anticlockwise and allow to solidify.
5. After solidification incubate the plate at 37°C in inverted position for 24-48 hours.
6. After incubation count the colony by colony counter.
7. All the steps should be done under laminar air flow to maintain aseptic condition.

**Results:** Count the result and record as cfu/ml or gm.

### **5.3: Name of the test: Total Coliform count**

#### **Method: Membrane Filtration (For Water)**

**Purpose:** Use the membrane filter technique to determine the coli form bacteria from the specimen

#### **Requirements:**

- Sterile membrane filter apparatus
- Sterile 0.45- $\mu\text{m}$  filters
- Forceps
- Alcohol (70%)
- 47-mm Petri plate containing Endo Agar
- Incubator
- Laminar Air Flow

#### **Procedure**

1. Sterilize the membrane filter unit including funnel
2. Keep it into laminar air flow & clean the holder with 70% alcohol.
3. Placed membrane filter paper on holder & fixed with funnel.
4. Pour the sample into funnel & switch vacuum pump on.
5. Sample passed through membrane due to negative pressure of vacuum pump & samples are collected in another vessel.
6. Carefully remove the filter from the filter holder using sterile forceps.
7. Carefully place the filter on the Endo agar. Do not bend the filter; place one edge down first, then carefully set the remainder down. Do not leave air spaces between the filter and agar.
8. Invert the plate and incubate it for 24 hours at 35-37°C.
9. Observe and count all colonies that are red and have a metallic sheen.

#### **Results**

Examine membrane filters for presence of colored colonies. All red colonies having the characteristic metallic sheen are coli forms.

## 5.4: Tests of Dairy products

1. Sensory test
2. Alcohol test
3. Fat % of milk
4. pH test
5. COB (Clot On Boiling)
6. Acidity test
7. Specific gravity test
8. Sugar test
9. Salt test
10. SMP test
11. Formalin test
12. Soda test
13. Starch test
14. Hydrogen peroxide test

### Sensory Test

**Chemicals / Equipment Required:**

No chemicals are required.

**Procedure:**

1. Milk is tested by physical/sensory method
2. This is done by using of eye, nose, and tongue.

**Result:** If the milk is discolored, contain bad smell, and the test is not good so far, then the milk must be rejected.

## Alcohol Test

### Chemicals / Equipment Required:

1. Test tube
2. Ethyl alcohol

### Procedure:

1. Take 2 ml of milk in a test tube
2. Add 2ml of ethyl alcohol and shake well

### Result:

If the solution makes homogenous and not adsorb on the interior surface of the test tube then milk is Alcohol negative.

## Clot on Boiling (COB) test

### Chemicals / Equipment Required:

1. Test tube
2. Spirit Lamp

### Procedure:

1. Take 5 ml milk in a test tube
2. Heat the test tube in spirit lamp for 2/5 minutes

**Result:** If the solution makes heterogeneous and adsorb on the interior surface of the test tube then the milk is COB positive.

## PH Test

### Chemicals / Equipment Required:

1. pH meter
2. beaker

### Procedure:

1. take 100 ml milk in a beaker
2. deep the pH meter into it
3. note down the reading

**Result:** The collected pH meter reading is the pH of the sample

## Acidity Test

### Chemicals / Equipment Required:

1. Beaker
2. Dropper
3. Phenolphthalein indicator
4. Sodium Hydroxide Solution

### Procedure:

1. Take 9 ml milk in a beaker.
2. Add ½ drops Phenolphthalein indicator.
3. Titrate with 0.1 N Sodium Hydroxide Solution until the color changes to pink/rose.

**Result:** Burette reading is the acidity of milk.

### Calculation:

Acidity-  $(\text{Burette Reading} \times \text{Normality of Alkali} \times \text{Equivalent weight of Acid} \times 100) \div (\text{Weight of Sample} \times 1000)$

## Specific Gravity Test

### Chemicals / Equipment Required:

1. Measuring cylinder
2. Hydrometer

### Procedure:

1. Heat the sample at 20°C
2. Fill the measuring cylinder by the sample
3. Now dip the hydrometer in the sample

**Result:** Hydrometer reading is the result.

## Fat % of milk

### Chemicals / Equipment Required:

1. Sulfuric Acid 93%
2. Amyl Alcohol 75%
3. Butyrometer
4. Centrifuge machine

### Procedure:

1. Take 10 ml sulphuric acid in a butyrometer.
2. Add 10.75 ml milk in the butyrometer by using of 10.75 ml pipette.
3. Now add 1 ml amyl alcohol and shake well.
4. Then place the butyrometer in a centrifuge for 5 minutes.

**Result:** Fat reading shows in the butyrometer's upper level scale.

## Starch Test

### Chemicals / Equipment Required:

1. Test tube
2. Spirit Lamp
3. Iodine Solution
4. Dropper

### Procedure:

1. Take 3 ml of milk in a test tube.
2. Heat the test tube for 5 minutes
3. Then cold the test tube in room temperature
4. Add 2/3 drops of iodine solution

**Result:** If the color of the solution changes to violet then the milk is adulterated with starch.

## Formalin Test

### Chemicals / Equipment Required:

1. Test tube
2. Sulfuric acid (conc.)

### Procedure:

1. Take 10 ml of milk in a test tube
2. Add 5 ml of sulfuric acid slowly

**Result:** If the violet color formed between two layers then milk is adulterated with formalin.

## Soda Test

### Chemicals / Equipment Required:

1. Test tube
2. Alizarin solution

### Procedure:

1. Take 2 ml of milk in a test tube
2. Add 2 ml alizarin and shake well.

**Result:** If the color changes into light violet then the milk is soda positive.

## Salt Test

### Chemicals / Equipment Required:

1. Test tube
2. Silver Nitrate Solution
3. Potassium Dichromate Solution
4. Dropper

### Procedure:

1. Take 1ml milk in a test tube.
2. Add 5 ml silver nitrate solution.
3. Add 2/3 drops potassium dichromate solution and shake well.

**Result:** If the color changes into yellow then the milk is salt positive.

## Sugar Test

### Chemicals / Equipment Required:

1. Test tube
2. Conc. Hydrochloric acid
3. Resorcinol
4. water bath

### Procedure:

1. Take 10 ml milk in a test tube.
2. Add 5 ml of conc. Hydrochloric acid
3. Add 1ml resorcinol and shake well
4. Then place the test tube in water bath for 5 minutes

**Result:** If the color is changed into red then the solution is adulterated with sugar

## Hydrogen Peroxide Test

### Chemicals / Equipment Required:

1. Test tube
2. Paraphenylene di amine

### Procedure:

1. Take 5 ml milk in a test tube
2. Add 5 drops of paraphenylene di-amine and shake well

**Result:** If the color changes into violet then the milk is hydrogen peroxide positive

## SMP Test

### Chemicals / Equipment Required:

1. Test tube
2. Pipette

### Procedure:

1. Take 10 ml of milk in a test tube
2. Add drop by drop of nitric acid

**Result:** If the color of the solution changes to orange then the milk is adulterated with SMP.



## Methylene Blue Reduction Test:

**Necessary Chemicals:** Methylene Blue Solution

**Necessary Equipment:**

- a. Pipette 10ml
- b. pipette 1ml
- c. culture tube
- d. Water Bath
- e. Thermometer

**Chemical Preparation:**

- i. Methylene blue solution 0.1 gm. of methylene blue powder is taken in 200ml distill water .Filter the solution by & sterilization by autoclave. Then place the solution in Refrigerator before use.

**Test Procedure:**

- I. 1ml Methylene blue solution is taken in a test tube.
- II. Add 9ml of milk in the test tube and close the test tube by the cork
- III. Mix the solution 4 time and place in the water bath at 37°c
- IV. After 5 min take the test tube from water bath and again mix and place in the water bath
- V. Observe results after half an hour.

**Results: Milk Sample Grading**

Reduction time	0 - 30minit	30 - 120minit	2 - 6hrs	6 - 8hrs
Milk quality	Very bad	Bad	Fair	Good

## Tests of Carbonated Soft Drinks

1. Gas volume
2. pH
3. Acidity
4. Torque
5. °Brix
6. SST

### **Name of Test: Determination of Beverage Acidity.**

#### **Required Equipment's:**

- Conical Flaks
- Burette
- Pipette with pipette filler
- Beaker
- Magnetic stirrer with magnet bar

#### **Required Chemicals:**

- NaOH 0.1N
- Phenolphthalein (Indicator)

#### **Test Procedure:**

- At first take beverage sample.
- Removed CO<sub>2</sub> properly from beverage.
- Take 10ml sample into a conical flaks by pipette.
- Add 2/3 drops phenolphthalein indicator into conical flask.
- Titration against 0.1N NaOH until pink color appeared.
- Take burette reading.
- Calculate % Acidity by using bellow calculation.

$$\text{Calculation: \% Acidity} = \frac{\text{Burette Reading} \times \text{Normality of NaOH} \times \text{Eq. Wt. of Acid} \times 100}{\text{Sample Wt.} \times 1000}$$

## **Name of Test: Determination of Beverage P<sup>H</sup>**

### **Required Equipment's:**

- Beaker
- Magnetic stirrer with magnet bar
- P<sup>H</sup> Meter

### **Test Procedure:**

- At first take beverage sample into a beaker.
- Add magnetic bar into beaker and removed CO<sub>2</sub> properly from beverage sample by using magnetic stirrer.
- Removed magnetic bar from beaker.
- Placed P<sup>H</sup> meter electrode into the beaker.
- Take reading from P<sup>H</sup> meter which shown sample P<sup>H</sup>.

## **Name of Test: Determination of Beverage %Brix**

### **Required Equipment's:**

- Beaker
- Magnetic stirrer with magnet bar
- Digital refract meter

### **Test Procedure:**

- At first take beverage sample into a beaker.
- Add magnetic bar into beaker and removed CO<sub>2</sub> properly from beverage sample by using magnetic stirrer and removed magnetic bar from beaker.
- Or removed CO<sub>2</sub> properly from beverage sample by shaking.
- Open sample chamber of refract meter.
- Take few drop sample into refract meter sample chamber.
- Take reading from refract meter which shown sample brix as percentage.

## **Name of Test: Organoleptic Test (Taste, Odor, Appearance)**

### **Required Equipment's:**

- Beaker

### **Test Procedure:**

- At first take beverage sample into a beaker.
- See beverage appearance and compare with existing one.
- Appearance should be complies.
  
- Take odor and compare with existing one.
- Must be not any bad odor and complies with existing one.
  
- Taste beverage sample.
- Compare with existing one.
- Taste should be complies.

## **Name of Test: Determination of Net Content.**

### **Required Equipment's:**

- Digital Balance Meter

### **Test Procedure:**

- Take sample bottle from line just after filling according to number of filling valve.
- Measure every bottle gross weight by using digital balance meter.
- Measure net weight followed by given formulation.
- Measure net content followed by given formulation.

Tare Weight = (Pack size in Ltr. X 1.856 X Gas Volume.) + Preform Wt. + Closure Wt. [For after filling bottle]

Net Weight = Gross Wt. – Tare Wt.

$$\text{Net Content} = \frac{\text{Net Weight}}{\text{Product Density}}$$

## **Name of Test: Determination of Beverage Bottle Opening Torque.**

### **Required Equipment's:**

- Torque Tester

### **Test Procedure:**

- Take sample bottle from line just after filling according to number of capper head.
- Placed bottle base on the torque tester and closed clump properly. This prevents the bottle rather than the cap rotating when torque is applied.
- Set torque tester reading zero to cancel any torque detected during placement of the bottle.
- Twists the cap in a counter-clockwise direction till open the closure.
- Take opening torque reading as lbs.-Inch.

## **Name of Test: Secure Seal Test (SST)**

### **Required Equipment's:**

- Secure Seal Tester

### **Test Procedure:**

- Take sample bottle from line just after filling according to number of capper head.
- Punched and adjust Pin with a sample bottle just in the gate point of closure.
- Seal it with a special clamp provided.
- Connect the sample with the measuring head. Put the sample into the water tank, and then close the machine cover. Please check whether the cover is locked well.
- Turn selector to TEST and observed pressure gauge for testing pressure 150 psi.
- After 150 psi pressure enter into the bottle then observe for bubble during test about 1/2 minutes.
- If bubble observed then indicate failure and if not any bubble observed then indicate passed.
- Turn selector to VENT and then removed bottle from tester.

## **Name of Test: Stress Cracking Test (SCT)**

### **Required Equipment's:**

- A testing bowl

### **Required Chemical:**

- NaOH 0.2% Sol<sup>n</sup>

### **Test Procedure:**

- Take sample bottle from line just after filling according to number of blow mold cavity.
- Prepared 0.2% NaOH sol<sup>n</sup> in a testing bowl about 1/2 liter or as per requirement.
- Immerge the base area of filled bottle into the 0.2% NaOH sol<sup>n</sup> for 5 minutes.
- Observed the base are of filled bottle after 5 minutes.
- If any crack shows on the base area, it means stress cracking test is failed.

## **Name of Test: Blown Bottle Performance Check.**

### **Required Equipment's:**

- Thickness Gage (Hall Effect)
- Bottle Hot Ware Cutter

### **Working Procedure (Bottle wall thickness):**

- Take sample blown bottle from blow mold according to blow mold m/c cavity no.
- Enter magnetic ball into the sample bottle.
- Checked various points' wall thickness (Shoulder, Label, and Base & Gate Area) by using Hall Effect thickness gage.
- Recorded the wall thickness reading and compare with standard.
- All values should be within standard.

### **Working Procedure (Sectional Weight of Bottle):**

- Take sample blown bottle from blow mold according to blow mold m/c cavity no.
- Set bottle at hot ware cutter according to bottle wise provided standard range.
- Cut at various points of bottle and separate bottle section (Base, Label & Shoulder)
- Take various sectional weight of bottle by using digital balance meter.
- Recorder measured weight and compare with standard.
- All values should be within standard.

## **Name of Test: Determination of Gas Volume (GV).**

### **Required Equipment's:**

- CO<sub>2</sub> Tester
- Carbonation Calculator

### **Working Procedure:**

- Take sample blown bottle from line after filler (Temp. about 40°F±3°F).
- Equilibrate line samples by gently inverting 15 times in 30 seconds (do not shake).
- Adjust bottle at CO<sub>2</sub> Tester.
- Removes excess air pressure in the headspace by opening snifting valve to ensure that only dissolved CO<sub>2</sub> is measured
- Shake it properly to a maximum constant pressure.
- Take pressure gauge reading as psi and thermometer reading as °F.
- Calculate CO<sub>2</sub> volume by using carbonation calculator from pressure and temperature.

## Chapter SIX

### Conclusion

Akij Food and Beverage Ltd. is one of the pioneers food company in Bangladesh. I feel proud for that I have got an opportunity to train myself in this company. Trainers are very sincere to us. They have given us enough time to try to give ideas about different sections of the production and quality control department completely. Hope this experience will be useful in our real life.

**END**