INTERNSHIP REPORT

On

Prince Food Products Limited

Submitted to:

Ms.Najia kamrul

Lecturer

Department of Nutrition and Food Engineering

Faculty of Allied Health Sciences

Daffodil International University

Submitted by:

Sonjoy Kumar Biswas

Evening

ID: 161-34-483

Department of Nutrition & Food Engineering

Daffodil International University.

Date of submission

LETTER OF TRANSMITTAL

Date:

To
Professor Dr. Md. Bellal Hossain
Head,
Department of Nutrition & Food Engineering
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 me 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 Prince Food Products Ltd. It is great achievement to work under your active supervision. I have got the opportunity to work in Prince Food Products Limited.
In "Quality Control and Production Department "for 30 days.
This is the first times this project gave me both academic and practical exposures. Firstly of all I have gained knowledge about the organizational culture of a prominent consumer 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,

Sonjoy kumar Biswas
ID: 161-34-483
Evening
Department of Nutrition and Food Engineering
Daffodil International University

CERTIFICATE OF APPROVAL

I am pleased to certify that the internship report on Prince Food Products Limited, Conducted by Sonjoy Kumar Biswas bearing ID No: 161-34-483 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 Sonjoy Kumar Biswas.
I strongly recommended the report presented by Sonjoy Kumar Biswas for further academic recommendations and defense/viva-voice. Sonjoy Kumar Biswas 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.

Professor Dr. Md. Bellal Hossain

Head,
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences
Daffodil International University

Acknowledgement

Prince Food Products Limited. It would have been very difficult to prepare this report up to this mark First I wish to express my gratitude to the almighty God for giving me the strength and opportunity to perform my responsibilities as an intern and complete the report within the stipulated time.

I am deeply indebted to my Supervisor **Mr.Najia Kamrul**, Lecturer, Department of Nutrition & Food Engineering, Daffodil International University for his whole-hearted supervision during my organizational attachment period. I am also grateful to **Dr. Bellal Hossain** my departmental Head. 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 NFE 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 **Mr.Najia Kamrul**.

I am also grateful to **Mr.MD.Kamruzzan**, Manager (Quality Control Department) at Prince Food Products Limited without their guidance.

My gratitude goes to entire NFE Department of Daffodil international University for arranging.

Internship program that facilitates integration of theoretical knowledge with real life situation. Moreover, I would also like to express my gratitude Prince Food Products Limited., fellows, seniors and colleagues who gave me good advice, suggestions, inspiration and support. I must mention the wonderful working environment and group commitment of this organization that has enabled me to deal with a lot of things.

Chapter-1

1.1. Objective of the Training:

There are two objectives of the training:

- General objective.
- Specific objective.

 # General Objective:

The main objective of this study is to hazard free safe production and quality control of beverage, dairy, Cake & other food products, that's help to gain real life exposure and get a clear idea about processing of these products as well as promoting brand.

 # Specific Objective:

The specific objectives of this study are as following:

- To focus on the hygienic production and quality control of Prince Food Products Limited.
- To have an idea of system & activities of beverage, dairy, Cake & other processing unit.
- To know different rules & methods of the organization.
- To identify the hazard during the processing & production of products in the plant & finding how to take necessary steps.

- To identify different critical control point in dairy & other products.
- To describe the processing of all products.
- To maintain standard quality parameters.
- To give an overview of Prince Food Products Limited.

1.2. Company Information

Prince Group is one of the leading diversified business conglomerates of Bangladesh. Prince Food Products Limited unit of Prince Group Started its operation in the year 1985.Prince Food products Limited has been established at a beautiful site of Shyampur,Baghbari,Hemayetpur,Savar ,Dhaka.It has come with the best food & beverage in Bangladesh. Most of the raw materials are come from various foreign countries. The quality is very strictly controlled. Prince food products Limited is the leading Food producing industry in Bangladesh.

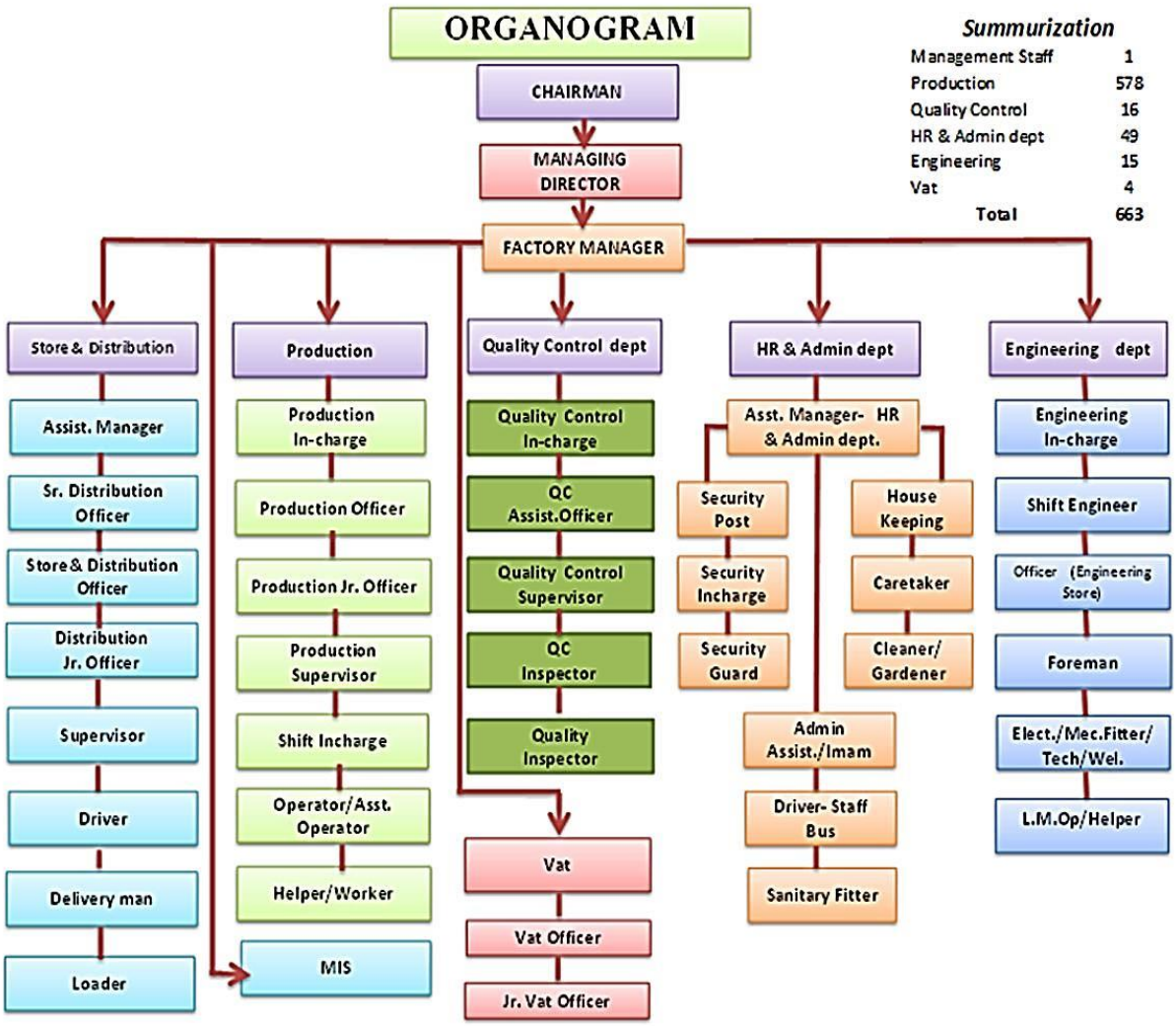
1.3. Company Mission:

Prince Food Products is a private-sector industrial of Bangladesh. It currently has 25 on-going concerns, management to manufacturing and services. The Prince Food Products has a particular focus on urban area, and commercial ventures. We will always try to explore beyond the boundaries of possibilities. Consumer need and the consumer need alone will be our guiding philosophy in manufacturing and marketing of products those people who are the victim by poison food and satisfy their life.

1.4. Company Vision:

Prince Food Products Industry has to focus on customer's satisfaction and value and ensures quality of product. It also Grow share of customer. Fulfill customer needs and wants and Develop customer relationship

1.5.Organo gram of Prince Foods Ltd



1.6 Company Production Items:

1. Beverage
    - Oranze 250ml

2. Mineral Drinking Water
    - PrincePani 600ml,1Ltr,1.5Ltr,2Ltr,5 Ltr

3. Flavored Drinks
    - Orange Drinks(HDPE)170ml
    - Lychee Drinks(HDPE)170ml
    - Lychee Drinks(HDPE)170ml

4. Snacks
    - Prince(Hot) Chanachur 20gm,70gm,170gm,350gm
    - Prince(Special) 170gm,350gm gm
    - Lachcha Shamai 200gm,500gm
    - Vermicelli Shamai 200gm.350gm
    - Dal Vaja 20gm
    - Motor Vaja22

5. Dairy Products
    - Prince Sweet
    - Row Milk

6. Cake

- Plain Cake 18gm
- Cup Cake 35gm
- Custard Cake 25gm
- Slice Cake 50 gm
- Bar Cake 90gm

7. Biscuit

- Time Pass Vanilla cookies Biscuit(20gm,240gm,480gm)
- Time Pass Chocolate cookies Biscuit(20gm,240gm,480gm)
- Time Pass cookies Butter Biscuit(125gm,250gm)
- Dry Cake 40gm

8. Jelly/Jam

- Prince Orange Jelly(250gm,500gm)
- Prince Grape Jelly(250gm,500gm)
- Prince Apply Jelly(250gm,500gm)
- Prince Mango Jam(250gm,500gm
- Prince Mixed Fruit Jam(250gm,500gm

9. Pickle

- Prince Mango Pickle 400gm
- Prince Olive Pickle 400gm
- Prince Mixed Pickle 400gm

10. Mustard Oil

- Prince Mustard Oil(80ml,200ml,500ml,1000ml)

11. Sauce/

- Prince Tomato Sauce(10gm,340gm,1000gm,4.5kg)
- Prince Tomato Ketchup(340gm,1000gm)
- Prince Thai Chili Sauce(340gm,1000gm)

1.7. Quality Management System (QMS)

Prince Food Products Limited. manufacture its products under strict quality control standards and norms to ensure that the finished product is high qualified and durable. In the process of manufacturing of different products, quality checks are maintained from the stage of sourcing raw materials, during the preparation of materials for making of products and through the various stages of manufacture. Finished products are finally checked and assured of quality desired. Prince Food Products Limited is certified by BSTI.

Chapter-2

2.1. Summary of work Description

1. Daily Activities Record of the Trainee in Following Preformat:

Date	Time			Name of the Work	Name of the Departments
02.09.2018	**Form**	**To**	**Total Hour**	Processing of treated water	
	8.00 AM	5.00 PM	9 hrs		
Used Equipment's: Raw Water Reserve tank, Sand filter, Carbon filter, resin tank, Micron filter (Polisher) of 5, 1 & 0.2 micron ,Middle Water tank, reverse osmosis Treated water tank, ozone tank ulti violet ray etc.					1.Water Treatment Plant
Name the Types of Works: Raw water collection, , Sand filtration, Carbon filtration, resin Filtration , reverse osmosis Treatment, Filtration by micron filter, UV ,Ozone treatment, Reserve water tank.					

Date	Time			Name of the Work	Name of the Departments
03.09.2018	**Form**	**To**	**Total Hour**	Chlorine & PM alkalinity test of treated water	
	8.00 AM	05.00 PM	9 hrs		
Used Equipments : **Equipment for Chlorine test:** Slide comparator range scale, Test tube, Dropper, Conical flask etc. **Equipment for PM test:** Conical flask, P-indicator, M-indicator, T-solution, Pipette, 0.02N Sulfuric acid etc.					1. Water Treatment Plant
Name the Types of Works: **Work for chorine test:** Correctly measurement of sample, chemical adding, and color detection. **Work for PM test:** Taking sample, adding P-indicator, adding T-solution, titration, adding M-indicator, titration.					

Date	Time			Name of the Work	Name of the Departments
03.09.2018	**Form**	**To**	**Total Hour**	Hardness test of RO water	
	8.00 AM	8.00 PM	9 hrs		
Used Equipment's: Conical flask, EDTA solution, Buffer solution, Hard indicator etc.					1. Water Treatment Plant
Name the Types of Works: Taking sample, adding chemicals & indicator, titration and color detection point.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
04.09.2018	8.00 AM	5.00 PM	9 hrs	Introduce into sugar syrup	
Used Equipment's: Dumping hopper, Dissolver tank, Filter, Pasteurization tank, Reaction tank, Press filter, Bag filter, Reserve tank etc.					Beverage Plant
Name the Types of Works: Introduce with different equipments.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
04.11.2017	8.00 AM	5.00 PM	9 hrs	Sugar syrup sampling	
Used Equipment's: Glass beaker, Filter paper of 45 micron, Filter etc.					Beverage Plant
Name the Types of Works: Taking sample, filtration by filter paper.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
04.09.2018	8.00 AM	5.00 PM	9 hrs	Acidity test of Orange Drinks	
Used Equipment's: Burette, Conical flask, Pipette, Dropper etc.					Beverage Plant
Name the Types of Works: Sample measurement & taking, adding indicator, titration till color appear, end point detection, calculation.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
04.09.2018	9.00 AM	6.00 PM	9 hrs	Brix & viscosity test of Orange Drinks	
Used Equipment's: Digital Refractometer, Viscosity Meter etc.					Beverage Plant .
Name the Types of Works: **Brix test:** Set zero the refractometer, sample taking in refractometer, press start button, result detection after temperature reach 20 celcious. **Viscosity test:** Press on button of viscosity meter, set it for measurement, keep splinter into sample, press start button, result detection.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
05.09.2018	8.00 AM	5.00 PM	9 hrs	Gas volume test of beverage	
Used Equipment's: Gas volume tester, Pressure gauge, Thermometer, Carbonation calculator etc.					1. Beverage Plant
Name the Types of Works: Shaking PET or CAN slowly, Place in gas tester, take thermometer in proper place, Set pressure gauge zero, Shaking sometime, Measurement of pressure & temperature, Calculation.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
05.09.2018	8.00 AM	5.00 PM	9 hrs	Brix test of beverage	
Used Equipment's: Digital refract meter.					1. Beverage Plant
Name the Types of Works: Set zero the refractometer, sample taking in refractometer, press start button, result detection after temperature reach 20 celcious.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
06.09.2018	9.00 AM	4.00 PM	7 hrs	Acidity test of beverage	
Used Equipment s: Burette,Conical flask, Pipette, Dropper etc.					Beverage Plant
Name the Types of Works: Sample measurement & taking, adding indicator, titration by sodium hydroxide till color appear, end point detection, calculation.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
06.09.2018	8.00 AM	5.00 PM	9 hrs	Torque test of PET bottle	
Used Equipment's: Torque tester. Beverage Plant					Beverage Plant
Name the Types of Works: Machine on, Set machine zero, Place the PET, Measurement.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
6.06.2018	9.00 AM	5.00 PM	7 hrs	Introduce into the total plant	
Used Equipment's and Plant: Preform hopper, Blow molding machine, Closure hopper, Filling room, Blower,Contiroll(label) machine, Contiform(wrapping) machine etc.					Beverage Plant
Name the Types of Works: Introduce with all machineries.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
06.11.201	8.00 AM	5.00 PM	9 hrs	Introduce into the filling room	
Used Equipment's: Blow molding machine,Rinser,Filler machine, Checkmate,Flowliner,Gas volume tester, Carbonation calculator, Torque tester, Digital weight balance etc.					Beverage Plant
Name the Types of Works: Introduce with the filling room equipments.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
07.09.2018	8.00 AM	5.00 PM	9hrs	CLR test of Raw milk	
Used Equipment's: QC laboratory side: Beaker,Lactometer,Measuring cylinder etc.					Sweet Plant
Name the Types of Works: Beaker & lactometer handling system, measurement of liquid level in cylinder, correctly recording system of lactometer reading.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
07.09.2018	8.00 AM	5.00 PM	9 hrs	Alcohol test of raw milk	
Used Equipment's: Pipette, Beaker, Test tube etc.					Sweet Plant
Name the Types of Works: Sample taking, add ethyl alcohol and shake it very well.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
08.09.2018	8.00 AM	5.00PM	9 hrs	Hydrogen per-oxide test of Raw milk	
Used Equipments and Plant: Pipette,Beaker,Test tube etc.					Sweet Plant
Name the Types of Works: Measurement of sample & chemical, chemical adding,shaking,colour detection etc.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
08.09.2018	8.00 AM	5.00 PM	9 hrs	Fat test of Raw Milk	
Used Equipment's: Pipette,Beaker,Butyrometer,Centrifuge-machine,Lock-stopper,Auto filler etc.					Sweet Plant
Name the Types of Works: Acid taking system, sample taking & adding system, alcohol & water adding system, lock-stopper locking system, balance maintaining of the centrifuge machine, correctly recording system.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
10.09.2018	9.00 AM	4.00 PM	7 hrs	Salt test of Raw Milk	
Used Equipment's: Beaker(small),Magnetic stirrer,Analitycal balance,Spoon,Salt tester etc.					Sweet Plant
Name the Types of Works: Analytical balance handling system, sample taking, adding water, magnetic stirrer handling system, salt tester handling system, result recording.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
10.09.2018	8.00 AM	5.00 PM	79hrs	Acid test of ghee	
Used Equipment's: Pipette, Beaker, Test tube ,Centrifuge Machine Heater etc.					Sweet Plant
Name the Types of Works: Measurement of sample & chemical, chemical adding, shaking, color detection etc.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour	Moisture content test of Lachcha	
11.09.2018	8.00 AM	5.00 PM	9 hrs		
Used Equipments and Plant: Moisture Analyzer.					Lachcha Plant
Name the Types of Works: Moisture analyzer machine handling, sample taking, measurement.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour	peroxide value test of Lachcha	
11-09-18	8.00 AM	5.00 PM	9 hrs		
Used Equipment's: Conical flask, Burate, BurateStand,Fanel, Masuring Cylider, Etc					Lachcha Plant
Name the Types of Works: sample oil, chloroform, saturated potassium iodide, starch solution.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour	Moisture content test of Chanachur	
1209.2018	8.00 AM	5.00 PM	9 hrs		
Used Equipment's: Moisture Analyzer.					Lachcha Plant
Name the Types of Works: Moisture analyzer machine handling, sample taking, measurement.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour	Peroxide value of Chanachur	
12-09-18	8.00 AM	5.00 PM	9 hrs		
Used Equipment's:: Conical flask.Burate,BurateStand,Fanel, Masuring Cylider, Etc					Lachcha Plant
Name the Types of Works: sample oil, chloroform, saturated potassium iodide, starch solution.					

Date	Time			Name of the Work	Name of the Departments
13.09.201	Form	To	Total Hour	Moisture content test of Plian Cake	
	8.00 AM	5.00 PM	9 hrs		
Used Equipment's: Moisture Analyzer .					Cake Plant
Name the Types of Works: Moisture analyzer machine handling, sample taking, measurement.					

Date	Time			Name of the Work	Name of the Departments
14.11.2017	Form	To	Total Hour	Brix test of Orange jelly	
	8.00 AM	5.00 PM	9 hrs		
Used Equipment's: Digital refract meter					Pickle Plant
Name the Types of Works: Set zero the refractometer, sample taking in refractometer, press start button, result detection after temperature reach 20 celcious.					

Date	Time			Name of the Work	Name of the Departments
14.09.2018	Form	To	Total Hour	Acidity test of Orange Jelly	
	8.00 AM	5.00 PM	9 hrs		
Used Equipment: Burette,Conical flask, Pipette, Dropper etc..					Pickle Plant
Name the Types of Works: Sample measurement & taking, adding indicator, titration till color appear, end point detection, calculation .					

Date	Time			Name of the Work	Name of the Departments
14.09.2018	Form	To	Total Hour	Acidity test of Mango Pickle	
	8.00 AM	5.00 PM	9 hrs		
Used Equipments: Burette,Conical flask, Pipette, Dropper etc					Pickle Plant
Name the Types of Works: Sample measurement & taking, adding indicator, titration till color appear, end point detection, calculatio.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
15.09.2018	8.00 AM	5.00 PM	9 hrs	Effluent water treatment	
Used Equipment's : Equalizer Tank, Oil & Grease Separator, Trickling Filter, Aeration Tank, Secondary Clarifier Tank, Sludge Tank ,Burette, Pipette, Conical Flask etc.					1.ETP
Name the Types of Works: Influent water reserve, oil & grease separator, filtration, aeration, clarification, final discharge.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
15.09.2018	9.00 AM	6.00 PM	9 hrs	Dissolve Oxygen(DO) test of water	
Used Equipments and Plant: Pipette,Burette,Beaker,Conical Flask, Glass Bottle etc.					1.ETP
Name the Types of Works: Sample collection, chemical adding, reagent adding, precipitate detection, acid addition, invention, sample & flask handling, chemical addition, colour detection, titration system, end point calculation.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
17.09.2018	8.00 AM	5.00 PM	9 hrs	Moisture content test of Cookies Biscuit	
Used Equipment's: Moisture Analyzer					Biscuit Plant
Name the Types of Works: Moisture analyzer machine handling, sample taking, measurement.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
17.09.18	8.00 AM	5.00 PM	9 hrs	Moisture content test of Dry Cake Biscuit	
Used Equipment's: Moisture Analyzer					Biscuit Plant
Name the Types of Works: Moisture analyzer machine handling, sample taking					

Date	Time			Name of the Work	Name of the Departments
18.09.2018	Form	To	Total Hour	Introduce with laboratory instruments & apparatus	
	8.00 AM	5.00 PM	9 hrs		
Used Equipment's: pH meter, SST tester, Analytical balance, Thermometer,Test tube, Beaker ,Pipette, Conical flask, COD analyzer ,Can cutter, Digital balance, Pressure gauge calibrator, Colony counter, Microscope etc.					Main LAB
Name the Types of Works: Introduce with laboratory equipments.					

Date	Time			Name of the Work	Name of the Departments
19.09.2018	Form	To	Total Hour	Introduce into microbiology laboratory	
	8.00 AM	5.00 PM	9 hrs		
Used Equipments and Plant: Laminar Air Flow,Incubator,Autoclave,Spirit Lamp etc.					Microbiological LAB
Name the Types of Works: Introduction with microbiology lab equipments.					

Date	Time			Name of the Work	Name of the Departments
20.09.2018	Form	To	Total Hour	Swab test	
	8.00 AM	5.00 PM	9 hrs		
Used Equipments : Sterile Petridish,Sterile SwabStick,Micropipette, Laminar Air Flow,Autoclave,Incubator,Water bath etc.					Microbiological LAB
Name the Types of Works: Mediapreparation,terilization,cooling,inoculation,sampling, store, inoculation, homogenization, Solidification, invention, incubation.					

Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
24.09.2018	8.00 AM	5.00 PM	9 hrs	Total Bacterial Count	
Used Equipment : Sterile Petridis(90mm),Micropipette, Laminar Air Flow,Autoclave,Incubator,Colony Counter, Water bath etc.					Microbiological LAB
Name the Types of Works: Media preparation, sterilization, cooling, sample handling, media handling, homogenization, solidification, incubation, colony counting.					

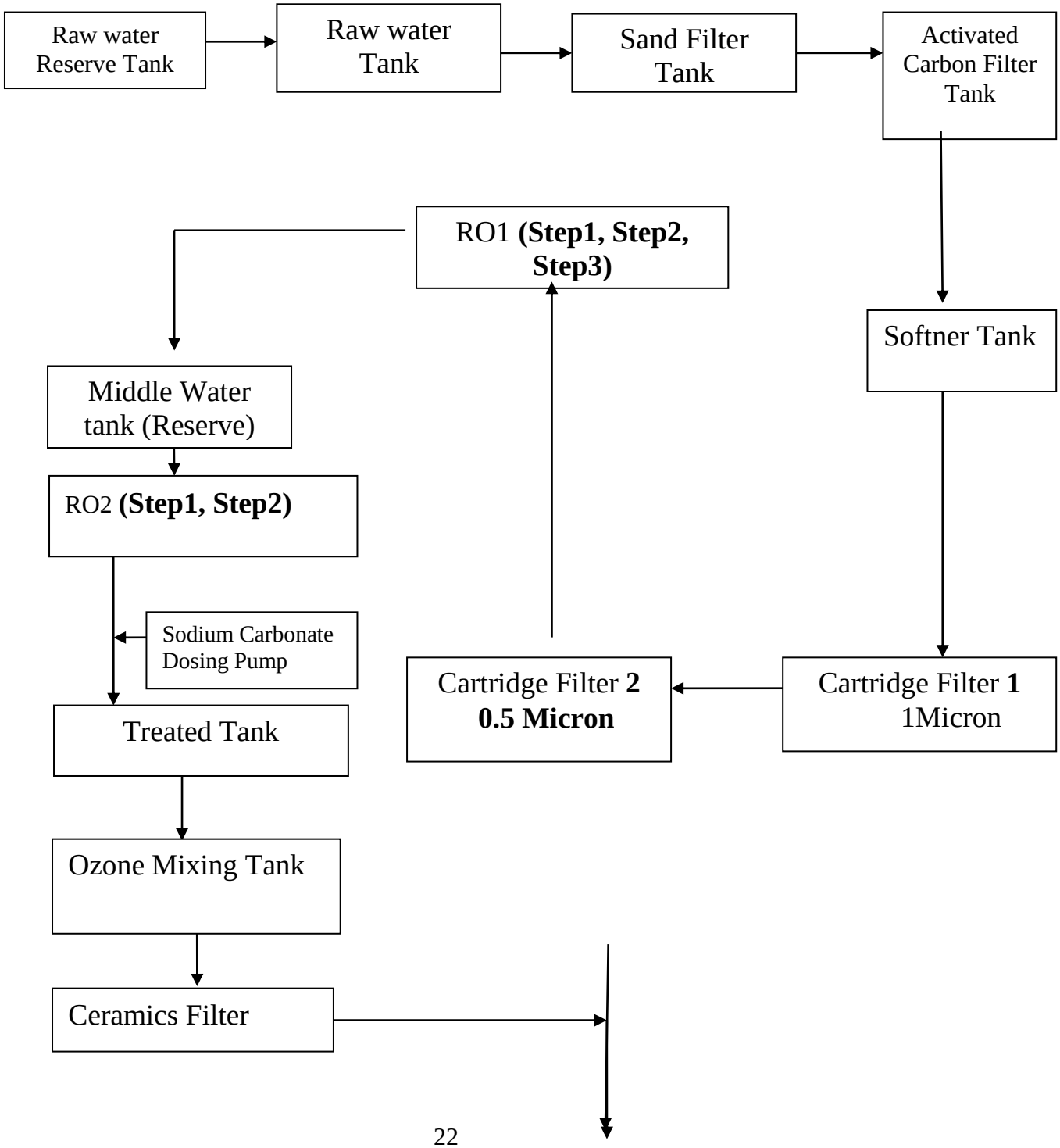
Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
27.09.2018	08.00 AM	5.00 PM	9 hrs	Coliform test	
Used Equipment's: Sterile Petridis(90mm),Micropipette, Laminar Air Flow,Autoclave,Incubator,Colony Counter, Water bath etc					**Microbiological** LAB
Name the Types of Works: Media preparation, sterilization, cooling, sample handling, media handling, homogenization, solidification, incubation, colony counting					

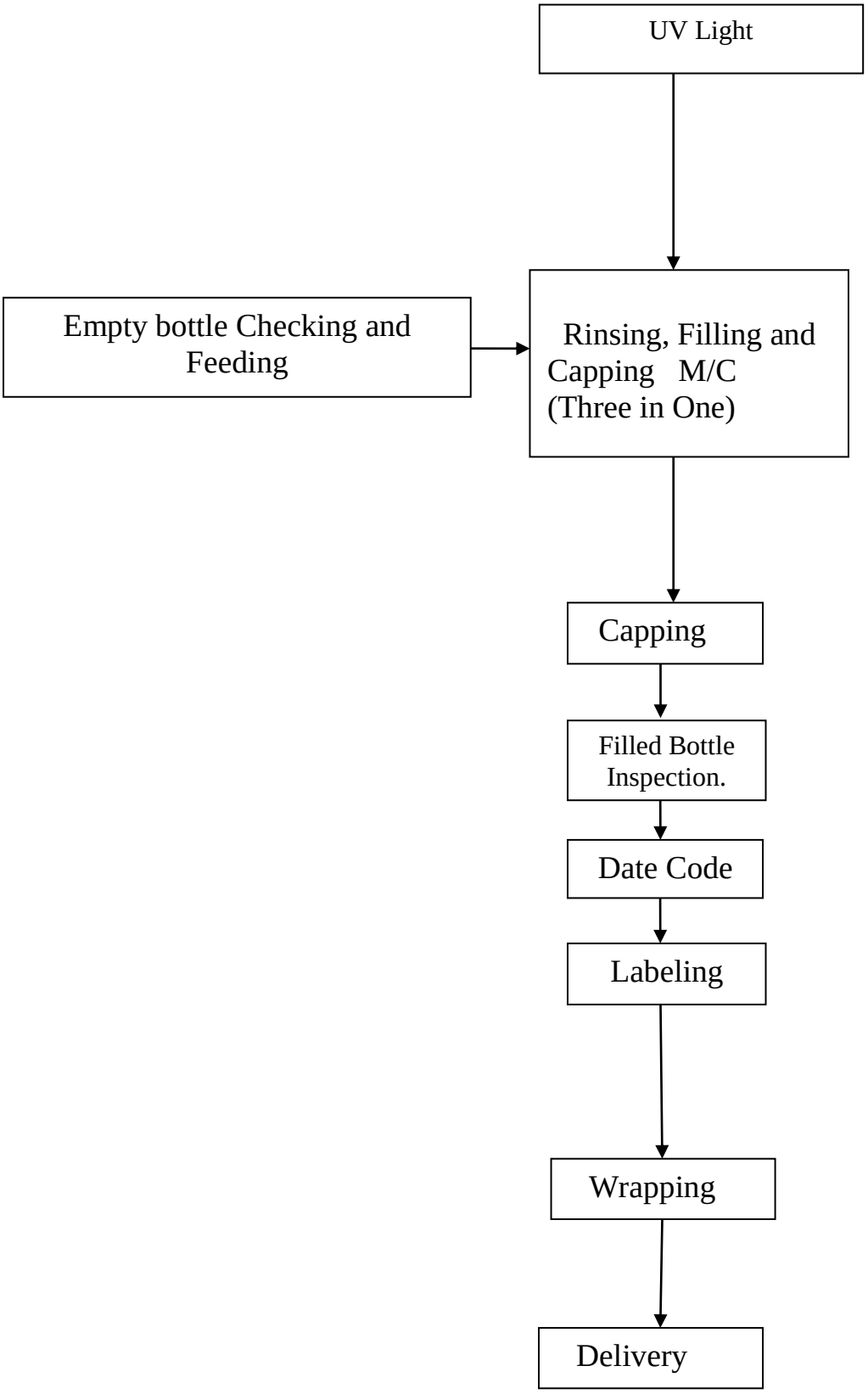
Date	Time			Name of the Work	Name of the Departments
	Form	To	Total Hour		
30.09.2018	5.00 AM	5.00 PM	9 hrs.	Training Review	
Used Equipment's and Plant:					All Plant
Name the Types of Works:					

2.2. PROCESS FLOW DIAGRAM

Water Treatment Plant

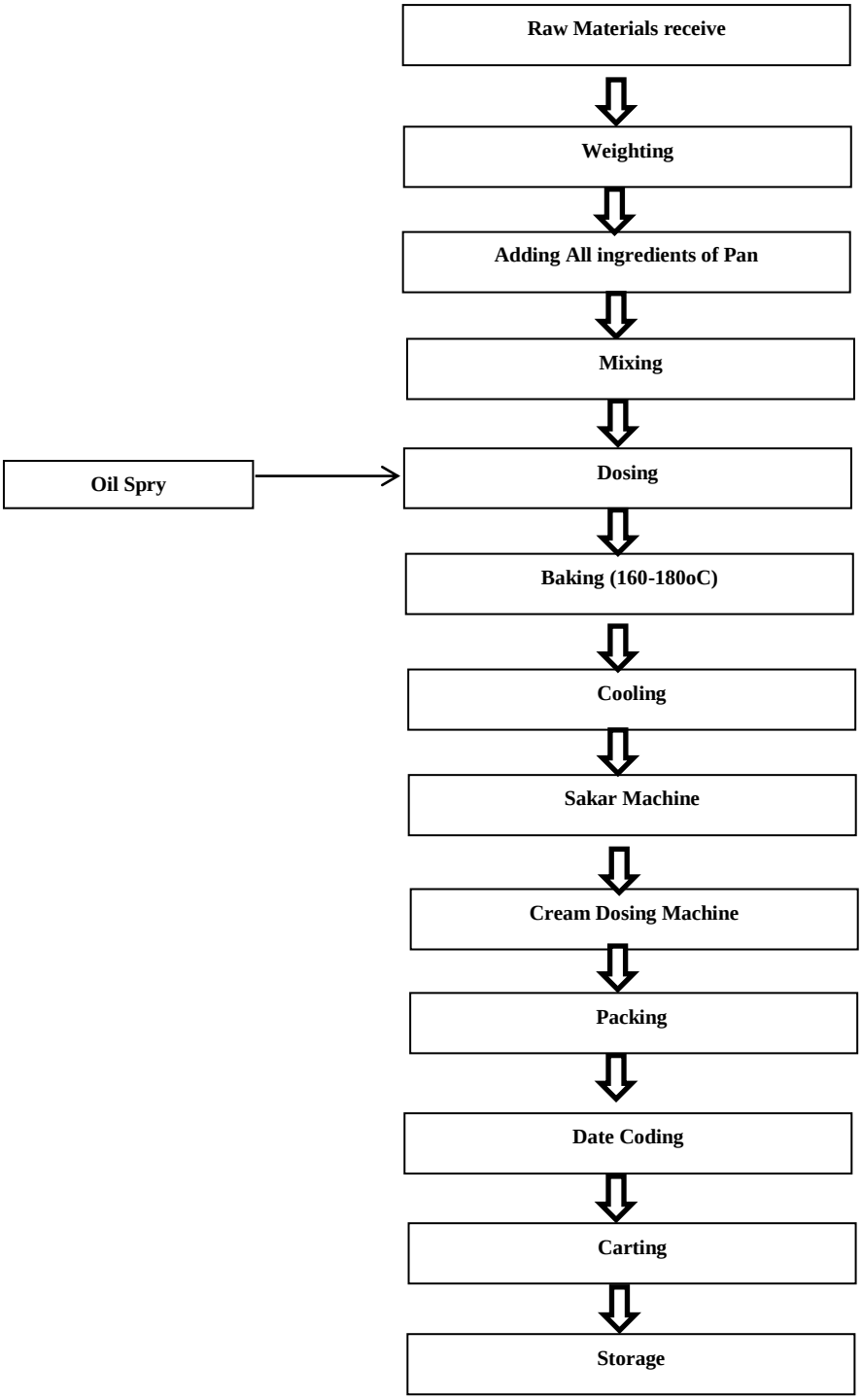
#Flow diagram of treated water:




UV Light
Empty bottle Checking and Feeding
Rinsing, Filling and Capping M/C (Three in One)
Capping
Filled Bottle Inspection.
Date Code
Labeling
Wrapping
Delivery

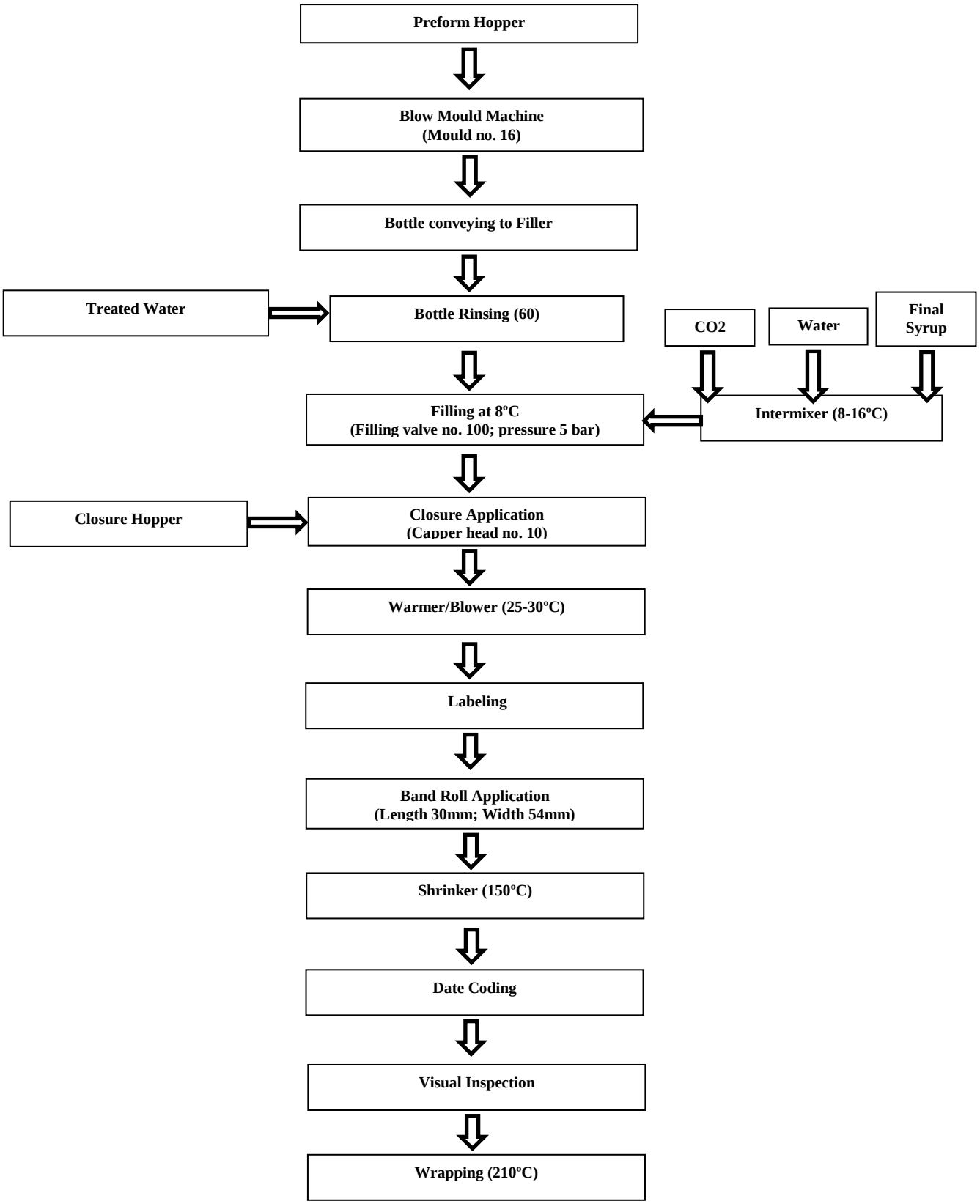
Flow Diagram of Cake Plant:

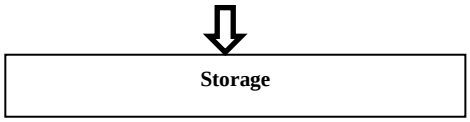
Custard Cake



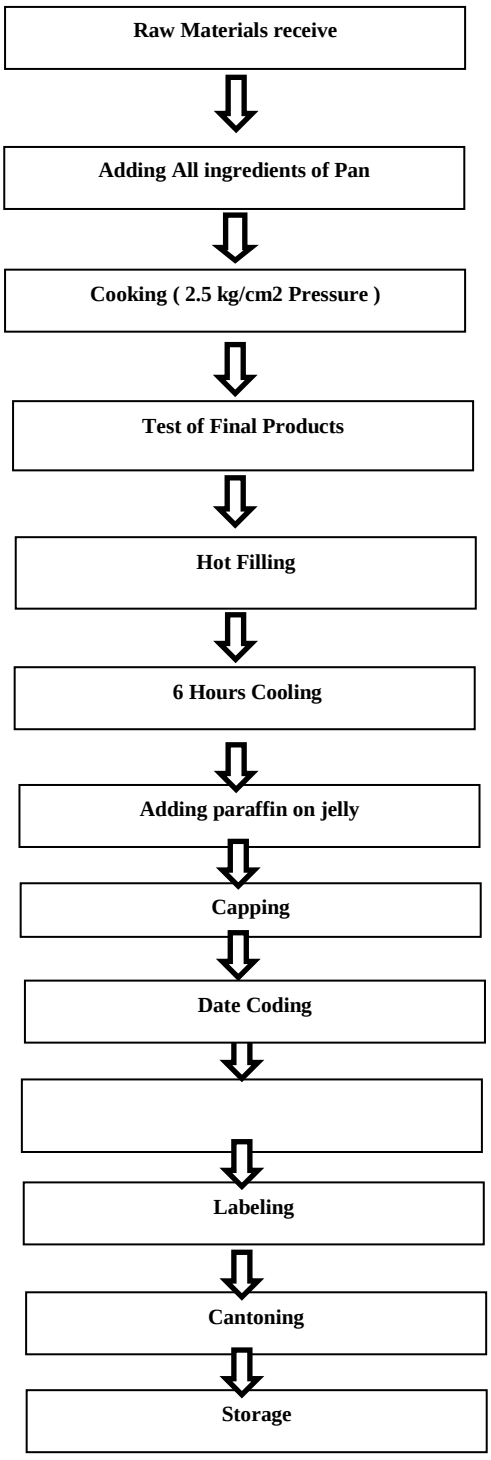
Carbonated Soft Drinks (CSD) Plant

#Flow Diagram of CSD (PET Bottle) Processing:

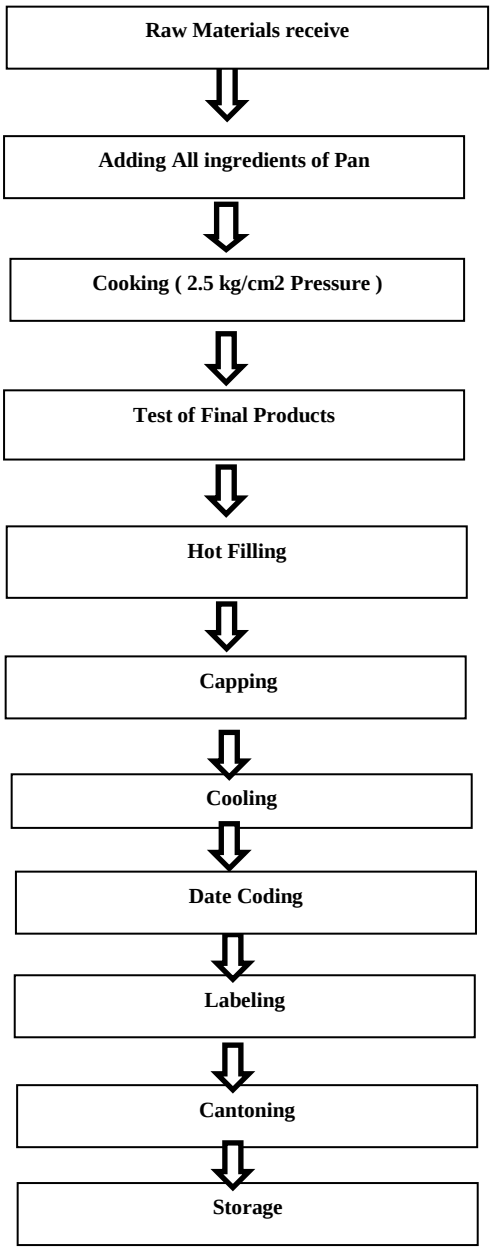




#Flow Diagram of Jelly/jam Processing:

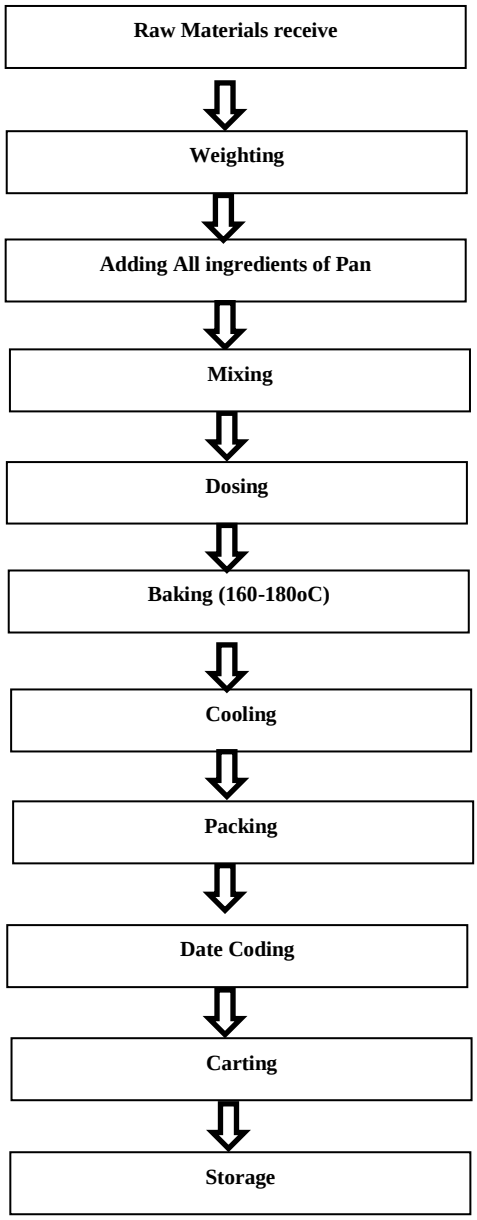


Flow Diagram of Sauce/ ketchup Processing:



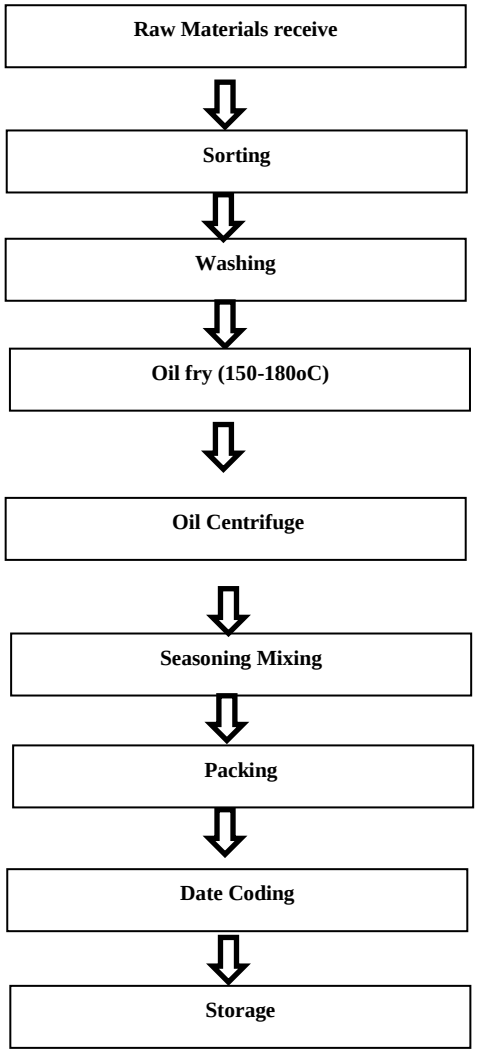
Flow Diagram of Biscuit Plant:

Cookies Biscuit



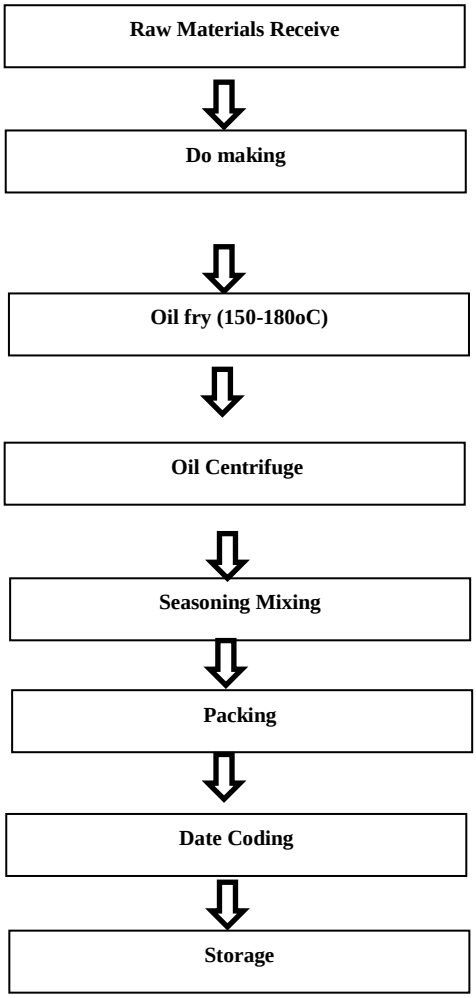
Flow Diagram of Dal Vaja:

Mug Dal



Flow Diagram of Chanchur Processing :

Jhal Chanchur



2.3. QC PARAMETER

Tests of Water Treatment Plant

#P& M Alkalinity test procedure:

The standard Alkalinity for water to be used for production purpose is maximum 50 ppm. 2P – M value should be between + 2 to + 7 ppm.

i. Chemicals & equipments required

- 0.02N sulfuric acid
- P- indicator
- M- indicator
- T- solution
- Burette
- 250 ml Erlenmeyer glass flask
- 100 ml graduate cylinder

ii. Sample collection & chemical preparation

- Fill burette with acid; make sure air is expelled from petcock.
- Collect sample from sand raw water tank, filter & polisher.

ii. Test procedure:

- Clean the glassware with detergent & distil water.
- Collect the water sample. Take 100 ml in a Erlenmeyer glass flask
- Add 3 drops of p-indicator & stir.
- If pink color develops, titrate with .02N sulphuric acid & stirring unit pink color just disappears. The volume of acid used (in ml), times 10, equals ppm of p- Alkalinity.
- Add 2 drops of t- solution to the same sample & stir.
- Add 3 drops of M-indicator. Sample color will turn greenish & stir.

- Do not refill the burette. Continue to titrate with acid & stirring unit color turns to Pink color. The volume of acid (in ml) for both “p” & “M” titration times 10 equals the total alkalinity in ppm as calcium carbonate.

#Hardness Test

Chemicals

1. Buffer Solution
2. Ferrochrome Black T indicator
3. EDTA

Test procedure

1. Take 100 ml water in a conical flask
2. Add buffer solution
3. Add 2/3 drops of T indicator
4. Titration by EDTA.

Result

Hardness=Burette reading × 10 ppm

#Chlorine Test

i. Chemicals & Equipment Required

- Ortho Toluidine(OT) Solution
- Test Tube (5ml)
- Slide comparator range 0.2-12 ppm.

ii. Procedure:

- Take 5 ml water sample in the Test Tube.
- Add 3 to 4 drops of Ortho Toluidine solution.
- Shake gently.
- Place the test tube in the Comparator Cavity.
- Move the slide for matching color.
- Record the nearest range in ppm of free chlorine.

#pH test

Required chemicals/equipment

1. No chemical is used.
2. pH meter

Test procedure

1. Take 100ml water in a beaker as a sample.
2. Deep the pH meter into it.
3. Collect the reading.
4. pH meter reading is the result

#TDS test

Required chemicals & equipment

3. No chemical is used.
4. TDS meter

Test procedure

5. Take 100ml water in a beaker as sample.
6. Deep the TDS meter into it.
7. Collect the reading.
8. TDS meter reading is the result.

#Chloride test:

Chemicals

1. 0.1N silver nitrate
2. Potassium chromate

Test procedure

1. Take 100 ml water in a conical flask
2. Add 2/3 drops of potassium chromate indicator
3. Titration with 0.1N silver nitrate

Result

Chloride=Burette reading × 10 ppm

Tests of Drinks Mixing Unit

#Brix test:

Used chemicals & equipment

1. No chemical use
2. Digital Refractometer

Test Procedure

1. Firstly set zero the refractometer with distilled water
2. Then dry it
3. Place small volume of sample
4. Close it
5. Refractometer reading appear after temperature reach at 20 degree celcious.

#Acidity Test:

Chemicals & Equipment Required:

1. Beaker
2. Dropper
3. Pipette
4. Burette

5. Phenaphtholin indicator
6. Sodium Hydroxide Solution (As Alkali)

Procedure:

1. Take 5ml juice in a beaker.
2. Add 2-3 drops of phenolphthalein indicator.
3. Titration with 0.1 N Sodium Hydroxide Solution until the color changes to pink/rose.

Result:

Burette reading is the acidity of milk.

Calculation:

Acidity= (Burette Reading× Normality of Alkali × Equivalent weight of Acid×100) ÷(Weight of Sample×1000)

#pH test:

Required chemicals & equipment

1. No chemical is used.
2. pH meter

Test procedure

1. Take 100ml juice in a beaker as a sample.
2. Deep the pH meter into it.
3. Collect the reading.
4. PH meter reading is the result

#Viscosity test

Required chemicals & equipment

1. No chemical is used.
2. Viscosity meter

Test procedure

1. Take 250ml juice as sample.
2. Viscosity meter make ready.
3. Deep the spliender of viscosity meter into it.
4. Start measuring.
5. Collect the reading.
4. The reading is the result.

Tests of Carbonated Soft Drink (CSD) Plant

#Gas Volume Test:

Required chemicals & equipment

1. No chemical is used.
2. Gas Volume Tester
3. Carbonation Calculator.

Test procedure

1. Take PET bottle/Can.
2. Shake slowly.
3. Place it in gas volume taster.
4. Deep the thermometer into it.
5. Close gas removal hole tightly.
6. Make ‘0’ the pressure gauge by removing gas.
7. Shake & reverse quickly.
8. Take the pressure gauge & thermometer reading.
9. Measure the gas volume from carbonation calculator.

#Brix test:

Used chemicals & equipment

1. No chemical use
2. Digital Refractometer

Test Procedure

1. Firstly set zero the refractometer with distilled water.
2. Then dry it.
3. Place small volume of sample in it.
4. Close it.
5. Press start button.
6. Refractometer reading appear after temperature reach at 20^0 C.

Required chemicals & equipment

1. No chemical is used.
2. pH meter

Test procedure

1. Take 100ml beverage in a beaker as a sample.
2. Deep the pH meter into it.
3. Collect the reading.
4. pH meter reading is the result

#Viscosity Test:

Required chemicals & equipment:

1. No chemical is used.
2. Viscosity meter

Test procedure :

1. Take 250ml beverage as sample.
2. Viscosity meter make ready.
3. Deep the splendor of viscosity meter into it.
4. Start measuring.
5. Collect the reading.
4. The reading is the result.

#Acidity Test:

Chemicals & equipment required:

1. Beaker
2. Dropper
3. Pipette
4. Burette
5. Phenolphthalein indicator
6. Sodium Hydroxide Solution(As Alkali)

Procedure:

1. Take 5ml beverage in a beaker.
2. Add 2-3drops of phenolphthalein indicator.
3. Titration by 0.104 N Sodium Hydroxide Solution until the color changes to pink.
4.

Result Calculation:

Acidity= (Burette Reading× Normality of Alkali × Equivalent weight of acid×100) ÷ (Weight of Sample×1000)

#Torque Test of PET Bottle:

Chemicals & equipment required:

1. No chemical use.
2. Torque Tester

Procedure:

4. Make torque tester ready.
5. Place PET bottle on it.
6. Measure the torque of the PET.

#Stress Cracking Test of PET Bottle:

Chemicals & equipment required:

1. Sodium Hydroxide Solution 0.2% or 2.04gm Sodium Hydroxide Pallet
2. Bowl

Procedure:

1. Take 1litre water in bowl.
2. Add 2.04gm Sodium Hydroxide Pallet in it.
3. Mix properly.
4. Immerge PET bottles according to blow mold number.
5. Wait 5min.
6. If any crack shows on the base area it means, stress cracking test is failed.

Test of Raw Milk

#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.

#Corrected Lactometer Reading (CLR) Test:

Chemicals & Equipment Required:

1. Measuring cylinder
2. Lactometer

Procedure:

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

Result:

Hydrometer reading is the result.

#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. Pipette
4. Burette
5. Phenaphtholin indicator
6. Sodium Hydroxide Solution (As Alkali)

Procedure:

7. Take 9 ml milk in a beaker.
8. Add ½ drops of phenaphtholin indicator.
9. Titration by 0.1 N Sodium Hydroxide Solution until the color changes to pink/rose.

Calculation:

Acidity= (Burette Reading× Normality of Alkali × Equivalent weight of Acid×100) ÷ (Weight of Sample×1000)

#Specific Gravity Test:

Chemicals & Equipment Required:

3. Measuring cylinder
4. Hydrometer

Procedure:

4. Heat the sample at 20˚C
5. Fill the measuring cylinder by the sample
6. 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 sulfuric 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 level reading shows in the butyrometer's upper scale.

#Starch Test:

Chemicals & Equipment Required:

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

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 diamine
3. Pipette

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.

Tests of Lab

Purity measurement equation of raw materials:

Purity =Burette Reading ×Normality×Equvalent weight of sample×100) ÷ (sample weight×1000)

#How to make solution for solid and liquid sample?

{Equvalent weight of sample×N (?)×100} ÷purity of sample
=…… (gm.)/L

For liquid sample:

{Equvalent weight of sample×N (?)×100} ÷purity of sample×Density of sample
=….ml/L

#How to make standardization of volumetric solution?

Primary standard solution= (weight taken÷weight to be taken) ×target normality
Then standard by this equation…

V1.S1=V2.S2
V1=BR of primary standard
S1=Strength of primary standard
V2=Volume of sample solution
S2=?

#Hardness measurement equation of water:

Hardness= (BR×N×equvalent weight of EDTA×100) ÷weight of sample×1000

Microbiological Test:

#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 121ºc for 15 minutes, 14.5 psi.
2. Take specific amount of sample in Petridis.
3. After autoclaving media allow to cool in 40ºc.
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 37ºc 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.

#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 121ºc for 15 minutes, 14.5 psi.
2. Take specific amount of sample in Petridis.
3. After autoclaving media allow to cool in 40ºc.
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 37ºc 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

#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-µm 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 coliforms.

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

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

Purpose: Use the Pour Plate Method to determine the coliform bacteria from the specimen

Requirements:

- Sterile Petridis
- Micropipette
- Alcohol (70%)
- Laminar Air Flow
- Autoclave
- Incubator
- Water bath
- Endo Agar

Procedure:

1. Prepare the media and sterilized by autoclave at 121ºc for 15 minutes, 14.5 psi.
2. Take specific amount of sample in Petridis.
4. After autoclaving media allow to cool in 40ºc.
5. About 15-20ml of media is pour in Petridis and properly homogenized by clockwise &anticlockwise and allow to solidify.
6. After solidification incubate the plate at 37ºc in inverted position for 24-48 hours.
7. Observe and count all colonies that are red and have a metallic sheen

Results

All red colonies having the characteristic metallic sheen are coliforms.

#Name of the test: Total bacterial count

Method: Membrane Filtration (For Beverage)

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

Requirements:

- Sterile membrane filter apparatus
- Sterile 0.45-µm filters
- Forceps
- Alcohol (70%)
- 47-mm Petri plate containing Plate Count Agar
- Autoclave
- 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. Place 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 collect in another vessel.
6. Carefully remove the filter from the filter holder using sterile forceps.
7. Carefully place the filter on the plate count agar plate. 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. Place the filter on the agar as it was in the filter holder
8. Invert the plate and incubate it for 24 hours at 35-37°C.
9. After incubation count the colony by colony counter.
10. All the steps should be done under laminar air flow to maintain aseptic condition.

Results: Count the result and record as cfu/ml

#Name of the test: Total Yeast & Mold count

Method: Membrane Filtration (For Beverage)

Purpose: Use the membrane filter technique to determine the Yeast & mold from the specimen.

Requirements:

- Sterile membrane filter apparatus
- Sterile 0.45-µm filters
- Forceps
- Alcohol (70%)
- 47-mm Petri plate containing Plate Count Agar
- Autoclave
- 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. Place 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 orange serum agar plate. 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. Place the filter on the agar as it was in the filter holder
8. Invert the plate and incubate it for 48-72 hours at 25-30°C.
9. After incubation count the colony by colony counter.
10. All the steps should be done under laminar air flow to maintain aseptic condition.

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

Test of Effluent Treatment Plant(ETP)

#Dissolve Oxygen (DO) Test

Titrimetric Winkler Method

Reagents:

1. Manganese Sulfate Solution
2. Alkali-iodide-azide Solution
3. Starch Solution
4. Concentrated Sulfuric Acid
5. Sodium Thiosulfate 0.025N.

Procedures:

1. Collect surface water sample in bottles of 300ml capacity. Avoid entraining atmospheric oxygen.
2. Add 1ml Manganese Sulfate solution, followed by Alkali-iodide-azide reagent.
3. Observe a brown solution with precipitation.
4. Add 1ml of concentrated Sulfuric Acid & mix by reverting several times until dissolution of brown

Precipitation complete.

5. Transfer 200ml of sample to a 250ml flask.
6. Add sufficient amount of starch solution (3ml) till color develops & continue titration till first appearance of blue color.
7. Titration with 0.025N Sodium Thiosulfate solution to a pale straw color.
8. Record the volume of titrate.

Calculation of DO Concentration:

For titration of 200ml sample,1ml 0.025N Sodium Thiosulfate equivalent of 1mg/L.Express DO in mg/L (ppm).

#Chemical Oxygen Demand (COD) Test

Chemicals:

1. Potassium Dichromate 1.5ml.
2. Catalyst Solution (Sulfuric Acid +Silver Nitrate) 3ml.
3. Ferrous Ammonium Sulfate 0.25N as titration.
4. Ferroin Indicator.

Procedure:

1. Take 2.5ml sample by dropper.
2. Add 1.5ml Potassium Dichromate & shake well.
3. Add Catalyst Solution 3ml & shake well.
4. Set the sample in COD analyzer for 120min.
5. After 120min. or 2hrs place the sample in a conical flask.
6. Add Ferroin indicator & shake well.
7. Titrate the sample by Ferrous Ammonium Sulfate.

Calculation:

COD (mg/L) = [(Blank-Sample) × Normality of FAS ×8000] ÷Weight of Sample

Result should be in mg/L.

#Sattalable Sludge Volume (SSV) Test

Required Equipment: Measuring Cylinder.

Procedure:

1. Collect 1000ml sample from aeration tank.
2. Wait 30min. for settling sludge.
3. Measure the SSV from sludge level of cylinder.

#Mixed Liquid Suspended Solids (MLSS) Test

Required Equipment:

1. Filter Paper
2. Woven
3. Analytical Balance.

Procedure:

1. Firstly take weight of blank filter paper.
2. Filter the sample of aeration tank.
3. Then keep the filter paper in woven to dry at 150°C for 2hrs.
4. Take weight of dried filter paper.

Calculation:

MLSS= (Weight of filter paper with sample – Weight of empty filter paper)

Result should be in mg/L

Tests of Lachcha Plant

Peroxide Value of Oil

Required Equipment: Burette, Pipette, And Conical Flask.

Procedure:

1. Take 5gm sample oil in conical flask.
2. Then 20ml acetic acid: chloroform (3:2)
3. Add 0.5ml saturated potassium iodide & shake properly.
4. Put it dark for 15min.
5. Add 5ml starch solution (1%).
6. Titrate against 0.1N sodium thiosulfate.

Calculation:

Peroxide Value = [Burette reading× Normality of Na2S2O3×100] ÷Weight of Sample

#Moisture Content Test of Lachcha & Chanachur

Required Equipment: Moisture Analyzer.

Procedure:

1. Set Moisture Analyzer for test.
2. Tare the machine.
3. Take 1gm sample in it.
4. Close the machine.
5. Wait for 15min.

Result: After 15min. the Moisture Analyzer shows the result.

#Leak Test of Lachcha Shamai & Chanachur Packet

Required Equipment: Leak Tester.

Procedure:

1. Set the leak tester.
2. Remove the cover of leak tester.
3. Immerge the chips/chanachur packet into water.
4. Close the cover.
5. Open the air line of leak tester.
6. If there has any leakage in packet bubble creates in water.

Chapter-3

Conclusion:

In case of my study production and Quality Control of Prince Food Products Ltd. was selected and permitted by my honorable supervisor, **Ms.Najia kamrul** Lecturer Department of Nutrition and Food Engineering, Daffodil International University.

This study shows how to maintain the hygiene production and quality control of food & beverage. The industrial attachment programme has covered both hygiene production and quality control of food products. To ensure hygiene production and quality control different types of test parameter including Physical, Chemical, Microbiological has been taken. Actually a BSTI standard maintains or regulates its quality parameter. Physical and chemical tests are done routinely in the lab. Microbiological test is also important especially for final product.