# Internship Report

# on

# Quality Assurance Department at Dhaka Ice-Cream Industry

**Submitted to:**

Dr. Md. Bellal Hossain
Head
Department of Nutrition and Food Engineering
Daffodil International University

**Supervised by:**

Dr. Amir Ahmed
Associate Head
Department of Nutrition and Food Engineering
Daffodil International University

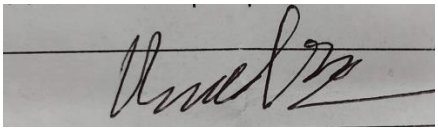
**Submitted by:**

Md. Shahnawaz Bishash
ID: 163-34-559
Department of Nutrition and Food Engineering
Daffodil International University

Date of Submission: 19.12.2019

## LETTER OF APPROVAL

This is to certify that this project entitled “Internship of Quality Assurance Department at Dhaka Ice-Cream Industry ltd” of Project. Md. Shahnawaz BIshash, ID: 163-34-559 B.Sc. Students, Departments of Nutrition and Food Engineering, Daffodil International University, has been carried out under my Supervision. This is further to certify that this project work is carried out as partial Requirement for fulfillments of the B.Sc. Degree in Nutrition and Food Engineering.



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**Professor Dr. Md. Bellal Hossain**

Professor and Head

Department and Nutrition and Food Engineering

Daffodil International University

## LETTER OF RECOMMENDATION

This is to certify that the Internship report entitled ***"Quality Assurance Department at Dhaka Ice-Cream Industry."*** submitted for assessment to the examination committee by **Md. Shahnawaz bishash** bearing ID: **163-34-559** is a student of the Department of Nutrition and Food Engineering (NFE), Daffodil International University. I am pleased to declared that this report is entirely written by the author and all the related research work have been conducted by the researcher under my strong supervision and observation. This is a piece of original work and has neither been submitted to, nor been published anywhere before for any other purpose.

I strongly recommend the approval of the report by the authority and I also request for a positive and fare evaluation of the work.

I wish Md. Shahnawaz bishash every success in his life.

Yours Sincerely

……

**Dr. Amir Ahmed**

Associate Head

Department of Nutrition and Food Engineering

Daffodil International University

## ACKNOWLEDGEMENT

First of all my gratitude and thanks to almighty Allah, the most merciful and kindness for making this work successful. I would like to say thanks to the honorable Vice Chancellor DIU for extending me this opportunity to fulfill my BSc. degree on Nutrition and Food Engineering.

My deep gratitude and sincere thanks to the honorable Head, Department of Nutrition and Food Engineering (NFE), **Professor Dr. Bellal Hossain**, for his kind cooperation and encouragement throughout my education journey in this department.

My deep and sincere appreciation to **Dr. Amir Ahmed**, Associate Head, Department Nutrition and Food Engineering (NFE) for his constructive suggestions and consistent guidance at this work which helped me to do it successfully.

I am also thankfully to my great teachers Dr. Sheikh Mahtabuddin, Associate Professor, Dr. Rezaul Karim, Assistant Professor, Ms. Fouzia Akter, Assistant Professor. I would also endrose my respected teachers senior Lecturer, Tasnia Tasneem, Lecturer, Nasima Akter Mukta, Lecturer, Effat Ara Zahan, for their countless inspiration and encouragement in my Student life.

My gratitude goes to entire NFE Department of Daffodil International University for arranging this research opportunity and facilitating the work throughout.

My warmest thanks to our Coordination Officer, Mr. Emran Hossain, Assistant Technical Officer, Mr. Reaz Mahmoud and Assistant Officer, Mr. Elahi Box as well as Lab Technician Mr Imdad Hossain.

# DEDICATION

This project work is dedicated to my honorable all Faculty Members and mostly my beloved teacher Dr. Amir Ahmed who has been bringing opportunity for students every year and who gave me the courage to fulfill this work successfully.

# ABSTRACT

This study is attempted to prepare an ice-cream with a unique combination of saffron and some other traditional items like date and pistachio in order to bring out an exceptional flavor, taste and aroma. This is an innovative idea for frozen dessert item in Bangladesh. In this frozen dessert I have utilized distinctive flavor of saffron enhance and upgraded its taste and supplemented esteem utilization of date molasses and khoya powder. Saffron, the dried marks of disgrace of Crocus sativus L., is broadly utilized basically as natural medication or nourishment shading, and as a seasoning specialist. It is developed uniquely in a couple of nations around the globe. In this study, using a flavor of Saffron, which is not as common in Ice-cream available in the market. In our country we have many types of flavored ice-cream. Proximate analysis of the product has also accomplished. Results show standard dene-cream (1.089 pa) and degree of brix 38. Viscosity is found 294 with total fat 12% only and 62% moisture. However, ice-cream with Saffron is not yet marketed by any company in Bangladesh. It is anticipated that Dhaka ice-cream industries with a brand name "POLAR" would be the pioneer in marketing Saffron flavored Ice-cream. Saffron is very costly and consequently Zafran Malai Ice-cream price would be a little higher and would be promoted as a premium variety. In my study I have received a very positive and favorable sensory evaluation. It is assumed that the product will hit the market with very positive feedback after penetration in the market.

**Particulars of the Trainee:**

- **Name of the Trainee :** Md. Shahnawaz Bishash
- **Course of the Study :** Industrial Attachment
- **Registration No :** **Batch no ……**
- **Identification No :** 163-34-559
- **Name of the Institute:** Daffodil International University
- **Period of the training:** 05.09.2019 to 10.11.2019
- **Letter of Reference :** Mehraj Hamid
- **Nominated Teacher :** Name : Professor Dr. Bellal Hossen

  Designation : HEAD, Department of Nutrition and Food Engineering

**Particulars of the Training Industry:**

- **Name of the Industry :** Dhaka Ice-Cream Industries ltd.
- **Letter of Reference :** Mehraj Hamid
- **Nominated person as trainer :** Name : Md. Mainul Islam

  Designation : Section Manager, Dept. Production

## Table of Content

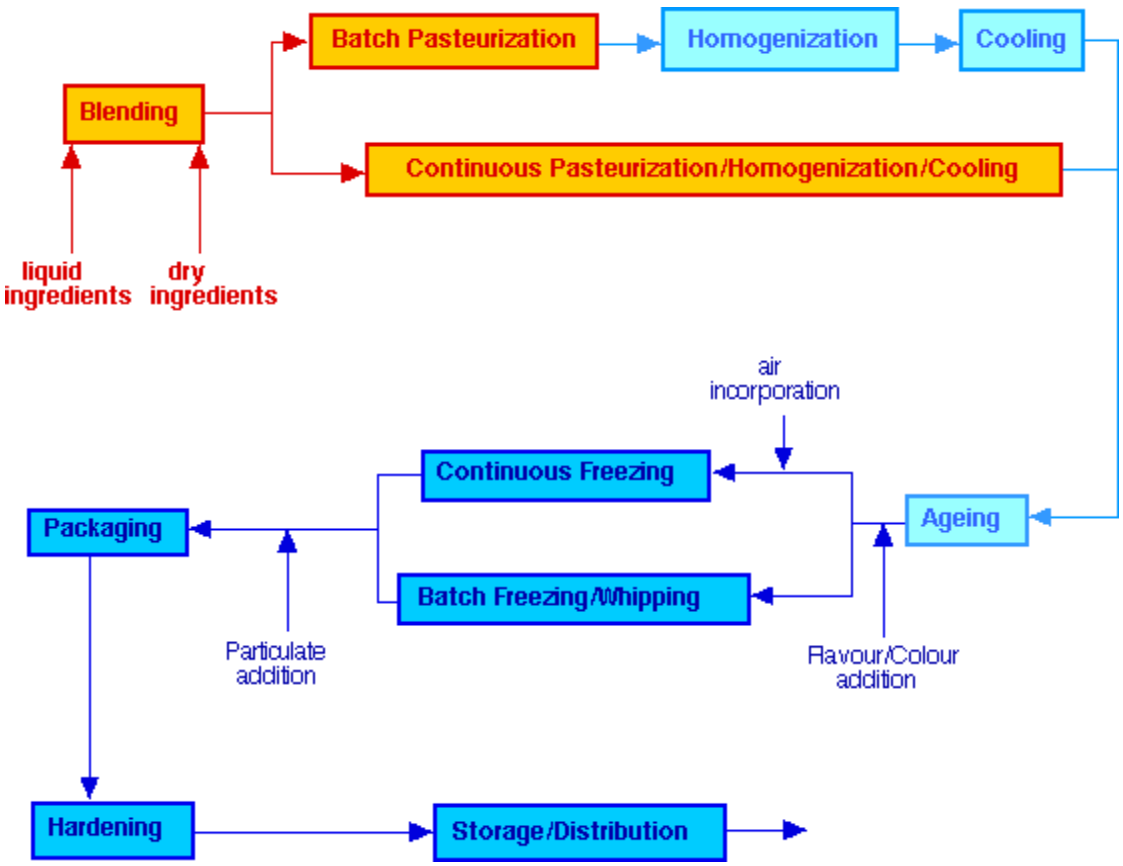
## 1. OBJECTIVE OF THE TRAINING:

The specific objectives of this study are as following:

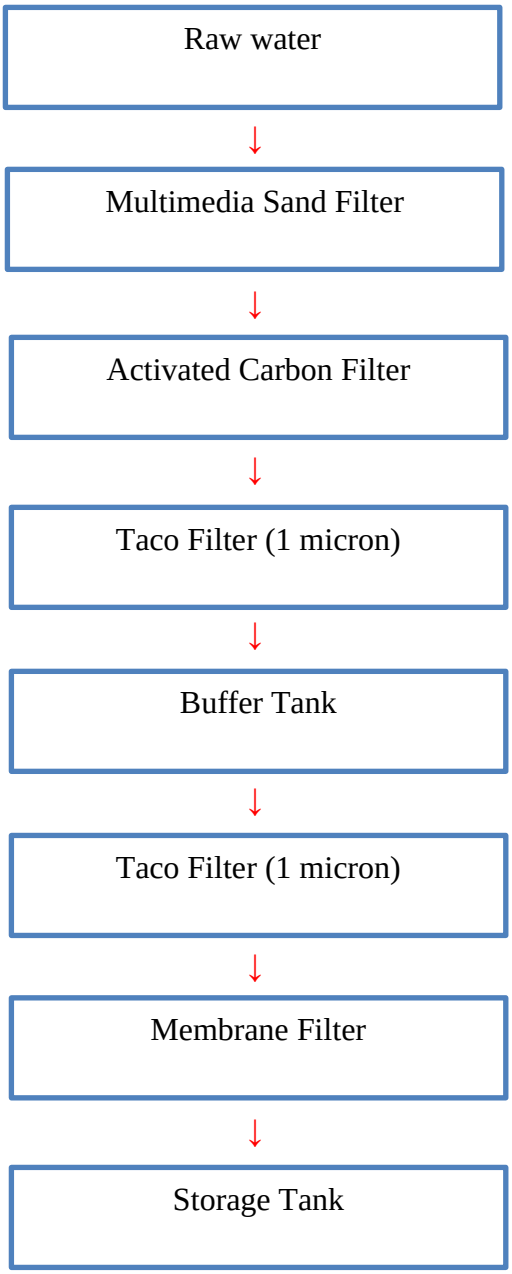
- To have an idea of system & activities of Ice-cream, dairy, Bake & other processing unit.
- To know different rules & methods of the organization.
- To identify the hazard during the processing & production of products in the plant & finding how to take necessary steps.
- To identify different critical control point in dairy & aseptic products.
- To describe the processing of all products.
- To maintain standard quality parameters.
- To give an overview of Dhaka Ice-cream Industries Limited.

## 2. PROCESS FLOW DIAGRAM:

### Ice-Cream Manufacture:



## 03. FLOW DIAGRAM OF RO WATER:



## 4. SUMMARY OF WORK DESCRIPTION:

| Summary of work description | Department |
|---|---|
| **Name the Types of Works:** Check the proper dozing of ice-Cream, Maintain the Standard of products, the chocolate temperature, Chocolate Spraying, Proper Packaging | Production Plant |

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Signature of Trainee Signature of Trainer

**5. WORK DESCRIPTION:**

<table>
<tr><th>Day and Date</th><th colspan="3">Time</th><th>Name of Work</th><th>Name of Dept.</th></tr>
<tr><td rowspan="2">Monday<br>09.09.2019</td><td>From</td><td>To</td><td>Total Hours</td><td rowspan="2">Production monitoring</td><td rowspan="2">Production</td></tr>
<tr><td>10.00am</td><td>03.00pm</td><td>5 hrs.</td></tr>
<tr><td colspan="4">Used Equipment’s & Plants:<br>Aging tank, Stick Ice-cream, Chocolate Tank, Weight machine,</td><td></td></tr>
<tr><td colspan="4">Production Plant-2,OnLine laboratory</td><td></td></tr>
<tr><td colspan="4">Check the proper dozing , chocolate temperature, Maintain the proper packaging,</td><td></td></tr>
</table>

<table>
<tr><th>Day and Date</th><th colspan="3">Time</th><th>Name of Work</th><th>Name of Dept.</th></tr>
<tr><td rowspan="2">Wednesday<br>11.09.2019</td><td>From</td><td>To</td><td>Total Hours</td><td rowspan="2">Production monitoring</td><td rowspan="2">Production</td></tr>
<tr><td>10.00am</td><td>03.00pm</td><td>5 hrs.</td></tr>
<tr><td colspan="4">Used Equipment’s & Plants:<br>Gelmark-3, Aging Tank</td><td></td></tr>
<tr><td colspan="4">Production Plant-2, Online laboratory, Hardening Tunnel.</td><td></td></tr>
<tr><td colspan="4">Name the types of work:<br>Check the Hardening products; Check the mix of ice-cream.</td><td></td></tr>
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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Saturday 14.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | Production |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Rollo-23 Ice-cream machine Butyrometer , Ice-cream cup, Refractometer , Density bottle, H2SO4, Amyl Alcohol, Distilled water , Pipette , Centrifuge machine | | | | | |
| Production Plant-2, Online laboratory. | | | | | |
| **Name the types of work:** Check the fat% of mix, check the over run of the ice-cream product, check the brix , check the density of mix | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 16.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | Production |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Gelmark-2, Aging Tank, Bottle, Butyrometer, Ice-cream cup, $H_2SO_4$, Refractometer, Density, Amyl Alcohol, Distilled water, Pippete, Centrifuge Machine. | | | | | |
| Production Plant-2, Online Laboratory | | | | | |
| **Name the types of work:** Check the fat% of mix, check the over run of the ice-cream product, check the brix , check the density of mix | | | | | |

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Wednesday 18.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | Production |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Aging tank, Cup filing Machine, Thermometer, Weight Machine. | | | | | |
| Production Plant-1, Online Laboratory | | | | | |
| **Name the types of work:** Check the proper dozing of ice-cream, Maintain the standard of products, Proper packaging | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Saturday 21.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | Production |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Aging tank, Kf Freezer, Ice-cream Machine, Thermometer, Weight machine. | | | | | |
| Production Plant-1, Online Laboratory | | | | | |
| **Name the types of work:** Check the proper dozing of ice-cream, Maintain the standard of products, Proper packaging | | | | | |

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 23.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | Production |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Aging Tank, Hardening tunnel-1,cold storage ,Platter room | | | | | |
| Production Plant-1, Online Laboratory | | | | | |
| **Name the types of work:** Check the Hardening of products, Check the Mix of Ice-cream, and check the platters. | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Wednesday 25.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | Production |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Cup filling Machine, Butyrometer, Ice-cream cup, Refractometer, Density, | | | | | |
| Production Plant-1, Online Laboratory **Used:** Amyl Alcohol, Distilled Water, Pippete, Centrifuge Machine. | | | | | |
| **Name the types of work:** Check the fat% of mix, check the over run of the ice -cream product, check the brix , check the density of mix | | | | | |

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Saturday 28.09.2019 | **From** | **To** | **Total Hours** | Production monitoring | **QC/QA** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** KF freezer Ice-cream machine Butyrometer , Ice-cream cup, Refractometer, Density bottle, $H_2SO_4$, Amyl Alcohol, Distilled water , Pipette , Centrifuge machine. | | | | | |
| Production Plant-1,OnLine laboratory | | | | | |
| **Name the types of work:** Check the fat% of mix, check the over run of the ice-cream product, check the brix , check the density of mix | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 30.09.2019 | **From** | **To** | **Total Hours** | Water treatment plant Monitoring | **Water treatment plant** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Lime tank, Ferrous tank, Chlorine tank, Coagulation tank, Buffer tank, Sand filter, Carbon filter, Micron filter of 5, 1, 0.2 micron etc. | | | | | |
| Water treatment plant | | | | | |
| **Name the types of work:** Raw water collection, Chemical (lime, ferrous sulphate & bleaching powder) dosing, Coagulation, Buffer tank, Sand filtration, Storage, Carbon filtration, Filtration by micron filter, Reserve tank. | | | | | |

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Wednesday 02.10.2019 | **From** | **To** | **Total Hours** | Processing of soft water and RO water | **Water treatment plant** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:**<br>Reserve tank, Multimedia filter, Resin tank, Storage tank of soft water, Multimedia sand filter, Activated carbon filter, Taco filter, Buffer tank, Membrane filter, Micron filter, RO water storage tank. | | | | | |
| Processing of soft water and RO water | | | | | |
| **Name the types of work:**<br>**Soft water:** Raw water collection, Filtration by Multimedia filter, Soften by Resin tank, Soft water storage tank etc.<br><br>**RO water:** Soft water collection Multimedia sand filter, Activated carbon filter, Taco filter (1 micron),Buffer tank, Taco filter, Membrane filter (0.0001 micron), Micron filter (1 micron),RO water storage tank. | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Saturday 05.10.2019 | **From** | **To** | **Total Hours** | Cone biscuit Production monitoring | **Cone biscuit Production plant** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:**<br>Ingredients parameter list of cone biscuit, Weight machine, ingredients mixer, Mix tank, Biscuit making oven, conveyor belt. | | | | | |
| Cone biscuit Production plant | | | | | |
| **Name the types of work:**<br>Check standard weight of ingredients , Check mixing, Check the filling the mixing tank, Maintain the oven temperature | | | | | |

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Signature of Trainee Signature of Trainer

<table>
<tr><th>Day and Date</th><th colspan="3">Time</th><th>Name of Work</th><th>Name of Dept.</th></tr>
<tr><td rowspan="2">Monday<br>07.10.2019</td><td>From</td><td>To</td><td>Total Hours</td><td rowspan="2">Khoya Production monitoring</td><td rowspan="2">Khoya Production Unit</td></tr>
<tr><td>10.00am</td><td>03.00pm</td><td>5 hrs.</td></tr>
<tr><td colspan="5">Used Equipment’s & Plants:<br>Ingredients parameter list of khoya, Weight Machine, ingredients mixer, Boiler, Mix tank , Mixer, Roasting pot, Spreader</td><td></td></tr>
<tr><td colspan="5">Khoya Production Unit</td><td></td></tr>
<tr><td colspan="5">Name the types of work:<br>Check standard weight of ingredients , Check mixing, Check Proper Boiling of mix, Check the roasting of khoya, Maintain the Roasting temperature</td><td></td></tr>
</table>

<table>
<tr><th>Day and Date</th><th colspan="3">Time</th><th>Name of Work</th><th>Name of Dept.</th></tr>
<tr><td rowspan="2">Wednesday<br>09.10.2019</td><td>From</td><td>To</td><td>Total Hours</td><td rowspan="2">Introduce with laboratory instruments and apparatus</td><td rowspan="2">Online LAB</td></tr>
<tr><td>10.00am</td><td>03.00pm</td><td>5 hrs.</td></tr>
<tr><td colspan="5">Used Equipment’s & Plants:<br>PH meter, SST tester, Analytical balance, Agnatic stirrer, Thermometer, Test tube, Beaker, Pippete, Conical flask, COD Analyzer, Digital balance, Pressure gauge calibrator, Colony counter, Microscope etc.</td><td></td></tr>
<tr><td colspan="5">Introduce with laboratory instruments and apparatus</td><td></td></tr>
<tr><td colspan="5">Name the types of work:<br>Introduce with laboratory Equipment’s</td><td></td></tr>
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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Saturday 12.10.2019 | **From** | **To** | **Total Hours** | PH, TDS, Hardness test of Water | **Online** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** TDS measuring machine, Conical flask, pippete, Distilled water, Buffer solution, Black-T indicator. | | | | | |
| PH, TDS, Hardness test of Water | | | | | |
| **Name the types of work:** **LAB:** Measuring total dissolve solid and hardness of feed water, cooling tank water. | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 14.10.2019 | **From** | **To** | **Total Hours** | PH, TDS, Hardness test of Water | **Online** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** TDS measuring machine, Conical flask, pippete, Distilled water, Buffer solution, Black-T indicator. | | | | | |
| PH, TDS, Hardness test of Water | | | | | |
| **Name the types of work:** **LAB:** Measuring total dissolve solid and hardness of feed water, cooling tank water. | | | | | |

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Signature of Trainee Signature of Trainer

<table>
<tr><th>Day and Date</th><th colspan="3">Time</th><th>Name of Work</th><th>Name of Dept.</th></tr>
<tr><td rowspan="2">Wednesday<br>16.10.2019</td><td>From</td><td>To</td><td>Total Hours</td><td rowspan="2">Chloride and Alkanity test of water</td><td rowspan="2">Online lab</td></tr>
<tr><td>10.00am</td><td>03.00pm</td><td>5 hrs.</td></tr>
<tr><td colspan="5">Used Equipment’s & Plants:<br>Conical flask, burette, Potassium chromate, AgNO3, distilled water conical flax phenolopthelin Indicator, .02H2 SO4, Green methyl red indicator, pippete</td><td></td></tr>
<tr><td colspan="5">Chloride and Alkanity test of water</td><td></td></tr>
<tr><td colspan="5">Name the types of work:<br>LAB: Measuring Chloride & Alkanity of feed water , cooling tank water, drinking water.</td><td></td></tr>
</table>

<table>
<tr><th>Day and Date</th><th colspan="3">Time</th><th>Name of Work</th><th>Name of Dept.</th></tr>
<tr><td rowspan="2">Saturday<br>19.10.2019</td><td>From</td><td>To</td><td>Total Hours</td><td rowspan="2">Introduce into Microbiology</td><td rowspan="2">Microbiology Laboratory</td></tr>
<tr><td>10.00am</td><td>03.00pm</td><td>5 hrs.</td></tr>
<tr><td colspan="5">Used Equipment’s & Plants:<br>Laminar air flow, Incubator, Autoclave, Spirit lamp etc.</td><td></td></tr>
<tr><td colspan="5">Introduce into Microbiology</td><td></td></tr>
<tr><td colspan="5">Name the types of work:<br>Introduction with microbiology lab equipment.</td><td></td></tr>
</table>

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 21.10.2019 | **From** | **To** | **Total Hours** | Total bacterial count | **Microbiology Laboratory** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Sterile petri dish(90mm), Micro pippete, laminar air flow, Auto clave, Incubator, Colony counter, water bath etc. | | | | | |
| Total bacterial count | | | | | |
| **Name the types of work:** Media preparation, sterilization, cooling, sample handling, media handling, homogenization, solidification, incubation, colony counting | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Wednesday 23.10.2019 | **From** | **To** | **Total Hours** | Yeast, Mold test | **Microbiology Laboratory** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Sterile Petridis(90mm),Micropipette, Laminar Air Flow, Autoclave, Incubator, Colony Counter, Water bath etc | | | | | |
| Yeast, Mold test | | | | | |
| **Name the types of work:** Media preparation, sterilization, cooling, sample handling, media handling, homogenization, solidification, incubation, colony counting. | | | | | |

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Saturday 26.10.2019 | **From** | **To** | **Total Hours** | Date Coding area monitoring | **Production** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Date coding machine, rubber, basket, Conveyor belt etc. | | | | | |
| Date Coding | | | | | |
| **Name the types of work:** Monitoring coding on the lid and packaging materials. | | | | | |

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 28.10.2019 | **From** | **To** | **Total Hours** | Stickering area | **Production** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Hand Sanitizer, Hand Gloves, Stickering plant. | | | | | |
| Stickering Process | | | | | |
| **Name the types of work:** Check the manual stickering on the packaging materials. | | | | | |

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Signature of Trainee Signature of Trainer

| Day and Date | Time | | | Name of Work | Name of Dept. |
|---|---|---|---|---|---|
| Monday 04.11.2019 | **From** | **To** | **Total Hours** | Discussion | **QC** |
| | 10.00am | 03.00pm | 5 hrs. | | |
| **Used Equipment's & Plants:** Qc and production department. | | | | | |
| Discuss with the trainer about whole intern programme. | | | | | |
| **Name the types of work:** Revision & Discuss with trainer through whole works | | | | | |

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Signature of Trainee Signature of Trainer

**Report of the practical training received:**

| Sl No | Name of the training industry | Dhaka Ice-cream Industries ltd |
|---|---|---|
| 1 | Name of the trainee | Md. Shahnawaz bishash |
| 2 | Course of the study | B. Sc. In Nutrition and food engineering |
| 3 | Registration no | Batch no. |
| 4 | Identification no | 163-34-559 |
| 5 | Name of the Department | Nutrition and food engineering |
| 6 | Name of the institute | Daffodil International University |

**(Not Applicable for the trainee)**

**Evaluation of the mark:**
**Full Marks-100**

**Pass Mark-60**

| **Attendance** | **Work** | **Day to day work record** | **Report writing** | **Total** | **Activities** |
|---|---|---|---|---|---|
| 25 | 40 | 10 | 25 | 100 | **Fixed mark** |
| 18 | 26 | 6 | 20 | 70 | **Value mark** |
| | | | | **Pass** | **Result** |

**……..**
**Signature of the Examiner**

**……**
**Signature of Nominated teacher**

**Expression of Gratitude:**

All praises are due to “Almighty Allah” who enables me pursue high education in Food Engineering & Technology and to complete the endeavor successfully.

It is also a proud privilege to express my heartiest appreciation and gratitude to my teachers and lecturers department of Food Engineering & Technology of State University of Bangladesh. For their hearty guidance, valuable suggestion, affection encouragement, helpful comment, constructive criticize and continuous supervision throughout the whole period of the work.

I gratefully admire to honorable Section Manager Md. Mainul Islam sir, Manufacturing Manager Md. Mostafa Kamal Sir .The QC Executives Officers and the QC officers of Dhaka ice-cream industries. They are very helpful & friendly.

**Work Description list:**

| Department | Total days | Name of the work |
|---|---|---|
| Production plant-2 | 6 | Production Monitoring |
| Production plant-1 | 6 | Production Monitoring |
| Mix Unit | 2 | Mix unit Monitoring |
| Cone Biscuit and Khoya unit | 4 | Monitoring Cone biscuit and Khoya production |
| Online Laboratory | 5 | Introduce with laboratory instruments and apparatus Chloride and Alkalinity, TDS and Hardness of water test. |
| Microbiology Laboratory | 3 | Introduce with laboratory instruments and apparatus, total count, yeast, mold etc. |

## 7.2 Works Description (In Details):

(Processing details including description, Raw materials used, Flow diagram, Tables and Process Control. If needed extra sheets can be added)

General Ice Cream Processing Steps

- Blend Ingredients
- Pasteurize Mix
- Homogenize
- Age Mix
- Add Liquid Flavors and Colors
- Freeze
- Add Fruits, Nuts, and Bulky Flavorings
- Package
- Hardening

### 1. Blend the Ice Cream Mixture

The milk fat source, nonfat solids, stabilizers and emulsifiers are blended to ensure complete mixing of liquid and dry ingredients.

### 2. Pasteurize Mix

Ice cream mix is pasteurized at 155°F (68.3°C) for 30 minutes or 175°F (79.4C) for 25 sec. The conditions used to pasteurize ice cream mix are greater than those used for fluid milk because of increased viscosity from the higher fat, solids, and sweetener content, and the addition of egg yolks in custard products.

**3. Homogenize**

Ice cream mix is homogenized (2500 to 3000 psi) to decrease the milk fat globule size to form a better emulsion and contribute to a smoother, creamier ice cream. Homogenization also ensures that the emulsifiers and stabilizers are well blended and evenly distributed in the ice cream mix before it is frozen.

**4. Age the Mix**

Ice cream mix is aged at 40°F (5°C) for at least 4 hours or overnight. Aging the mix cools it down before freezing, allows the milk fat to partially crystallize and the gives the proteins stabilizers time to hydrate. This improves the whipping properties of the mix.

**5. Add Liquid Flavors and Colors**

Liquid flavors and colors may be added to the mix before freezing. Only ingredients that are liquid can be added before the freezing, to make sure the mix flows properly through the freezing equipment.

**6. Freeze**

The process involves freezing the mix and incorporating air. Ice cream mix can be frozen in batch or continuous freezers and the conditions used will depend on the type of freezer. The continuous freezing process is much faster than the batch freezing process.

The addition of air is called overrun and Up to 50% of the volume of the finished ice cream (100% overrun) can be air that is incorporated during freezing. Premium ice creams have less overrun (approximately 80%) and are denser than regular ice cream.

**7. Add Fruits, Nuts and Bulky Flavorings (candy pieces, etc.)**

Fruits, swirls, and any bulky type of flavorings (nuts, candy pieces, etc.) are added at this point. These ingredients cannot be added before freezing or they would interfere with the smooth flow of the mix through the freezer. The ice cream at this point is soft and it is easy to mix in the bulky flavorings so they are uniformly distributed throughout the ice cream. Mixing in bulky flavorings after freezing also prevents damage to the pieces and allows them to remain whole or in large chunks.

**8. Package**

As desired, depending on the product.

**9. Harden**

The ice cream is cooled as quickly as possible down to a holding temperature of less than -25°C. The temperatures and times of cooling will depend on the type of storage freezer. Storage at 25°C will help to stabilize the ice crystals and maintain product quality.

**Raw materials used:**

- Skimmed milk
- Full cream milk
- Sugar
- Stabilizer & Emulsifier
- Glucose
- Flavors & colors
- Hydrogenated coconut oil, palm oil
- Chocolate coating
- Cocoa powder
-

**Package materials:**

- Ice cream stick
- Wrapper
- Cartoon
- Cup
- Litter box
- Lid

## 6. PROCESS CONTROL:

### Hardness Test

### Chemicals

- Buffer Solution
- Eriochrome Black T indicator
- EDTA

### Test procedure

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

### Result

Hardness=Burette reading × 10 ppm

### Chlorine Test

### Chemicals & Equipment Required

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

### Procedure:

- Take 5 ml water sample in the Test Tube.
- Add 3 to 4 drops of Ortho Toludine 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**

No chemical is used.

pH meter

**Test procedure**

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

**Tests of Mix**

**over Run**

Used chemicals & equipment

No chemical use

- Ice-cream cup
- Scale
- Digital Balance

**Test Procedure**

1. Fill the cup with Mix n Ice-cream individually & level the surface
2. Weight mix & Ice-cream Individually

**Calculation:**

Over run= {(mix Weight-Ice cream weight) ÷ Mix Weight} × 100

**Brix test**

**Used chemicals & equipment**

No chemical use

Digital Refractometer

**Test Procedure**

- Firstly set zero the refractometer with distilled water
- Then dry it
- Place small volume of sample
- Close it

**Result:**

Refractometer reading appears after temperature reach at 20 degree Celsius.

**Acidity Test**

**Chemicals & Equipment Required:**

- Beaker
- Dropper
- Pipette
- Burette
- Phenolophthelin indicator
- Sodium Hydroxide Solution(As Alkali)

**Procedure:**

- Take 5ml mix in a beaker.
- Add 2-3 drops of phenolphthalein indicator.
- 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)

**Viscosity test**

**Required chemicals & equipment**

No chemical is used.

Viscosity meter

**Test procedure**

- Take 250ml mix as sample.
- Viscosity meter make ready.
- Deep the splendor of viscosity meter into it.
- Start measuring.
- Collect the reading.

The reading is the result.

## 7. MICROBIOLOGICAL ASSESSMENT:

**Name of the test: Total bacterial count**

**Method:** Pour plate (For Final Products)

**Purpose:** The pour plate technique can be used to determine the number 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:**

- Prepare the media and sterilized by autoclave at 121ºc for 15 minutes, 14.5 psi.
- Take specific amount of sample in Petridis.
- After autoclaving media allow to cool in 40ºc.
- About 15-20ml of media is pour in Petridis and properly homogenized by clockwise & anticlockwise and allows solidifying.
- After solidification incubate the plate at 37ºc in inverted position for 24-48 hours.
- After incubation count the colony by colony counter.
- 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, Fruits pulp, Date Molasses)

**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:**

- Prepare the media and sterilized by autoclave at 121ºc for 15 minutes, 14.5 psi.
- Take specific amount of sample in Petridis.
- After autoclaving media allow to cool in 40ºc.
- About 15-20ml of media is pour in Petridis and properly homogenized by clockwise &anticlockwise and allow to solidify.
- After solidification incubate the plate at 37ºc in inverted position for 24-48 hours.
- After incubation count the colony by colony counter.
- 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

## 8. CONCLUSION:

This study shows how to maintain the hygiene production and quality control of food & Ice-cream. The industrial attachment program 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.