



An Internship Report

On

Dairy Products Quality Control Assurance & Production

At

Dhaka Dairy Plant (Milk-vita)

Milk-vita road, Mirpur section-7, Dhaka

Submitted To:

Prof. Dr. Md. Bellal Hossain

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Date of Submission: 10th, December 2018

LETTER OF TRANSMITTAL

Date: 10th, December 2018

To

The Professor Dr. Md. Bellal Hossain
Head of the Department
Department of Nutrition & Food Engineering
Daffodil International University.

Subject: Submission of an internship report on Dairy Products Quality Control Assurance & Production.

Dear Sir,

It is a great pleasure and honor for me to have the opportunity to submit Internship report on **Dairy Products Quality Control Assurance & Production** as a part of the Nutrition & Food Engineering (NFE) program curriculum.

I have completed this report based on the acquired taste knowledge during my internship period in Dhaka Dairy Plant (Milk-vita). It is great achievement to work under your active supervision. This report is based on Quality control & Production of Dairy Products. I have got the opportunity to work in Dhaka Dairy Plant (Milk-vita) in “Quality Control and Production Department” for thirty days, under the supervision of **Dr. Khondokar Aminul Islam**, Additional General Manager of Dhaka Dairy Plant.

This is the first times this project gave me both academic and practical exposures. First 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

Md. Shafiul islam
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CERTIFICATE OF APPROVAL

I am pleased to certify that the internship report on production & quality control of dairy products conducted by **Md. Shafiul islam**, bearing respectively **ID No: 151-34-348** 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. Shafiul islam**. I strongly recommended the report presented by **Md. Shafiul islam**, for further academic recommendations and defense/viva-voice. **Md. Shafiul islam**, 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

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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 my creator the almighty Allah for enabling me the strength and opportunity to complete the report in time successfully. I am grateful 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 Dean, Faculty of Allied Health Science, **Professor Dr. Ahmed Ismail Mostafa** for his kind cooperation and to accept this Degree.

I am deeply indebted to my supervisor **Prof. Dr. Md Bellal Hossain**, Head of Department of Nutrition & Food Engineering, Daffodil International University for his whole-hearted supervision during my organizational attachment period.

I would also like to express my great respect & warmest thanks to my project co-supervisor **Nazia kamrul(Engineer)**, Lecturer of Department of Nutrition & Food Engineering for her whole-hearted help and supervision during my project work and organizational attachment period.

I am also grateful to all the other **NFE Faculty member** for their great help during university life.

I would also like to give thanks to my seniors, juniors and my classmates and colleagues of Dhaka dairy plant for their help, advice, and suggestions, inspiration and support.

I am also thankful to **Dr. Khondokar Aminul Islam**, Additional General Manager of Dhaka Dairy Plant (Milk-Vita) for his permission to carry out this internship in his organization.

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

EXECUTIVE SUMMARY

Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) which is known as Milk-vita is a leading government organization for milk & milk products provider in Bangladesh. This report is prepared on my two-month practical experience at BMPCUL. This Internship program gives me lot of knowledge about milk and milk products practically.

This report has been presented based on my observation and experience gathered from the company. The organization has many divisions and department but I got the opportunity to work in production department and quality control department. This report mentions about both raw and processed milk and milk products qualities and processing knowledge.

Bangladesh Government & Bangladesh Milk Producers Co-operative Union Limited works together for this company. It ensure quality products for consumers. It promise to serve pure and quality products to the consumers.

Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) provide facilities for internship opportunity for students there. Major objective of this report is to identify quality milk and milk products.

It also concern for developing the production and quality of dairy products. Customer's choice are very important to Bangladesh Milk Producers Co-operative Union Limited (BMPCUL).

My report is based on quality control and production of dairy products of BMPCUL. The first part of the report contains information of the organization itself. The second part of the report contains the raw milk test and quality parameters. The third part of the report contains production of dairy products. The last part contains the concluding part. This research's result that found is much considerable.

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CHAPTER-ONE

INTRODUCTION

Milk is an essential food for all kinds of man and animals (basically mammals). Milk produces from mammary glands of mammals. Basically pure milk of cow, goat and buffalo found in local market but processed milk are found in local market or grocery shop as packaged milk.

In the modern age a number of milk producer companies are available in Bangladesh. Their purpose is to provide good products to consumer. Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) or Milk-vita is a leading milk processed company.

Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) or Milk-vita provide pure products than any other milk-producer company in Bangladesh. Their goal is to achieve consumer satisfaction. they are far away from achieving more benefit than the consumer satisfaction.

Milk-vita collect milk from whole Bangladesh by co-operative union. Before collecting their milk, milk-vita test the quality of milk by their local technical experts. Then they transfer collected milk to their all milk processed plant. Before sending them they chilled their collected milk for ensuring quality of milk and they also lock the milk tanker.

1.1 Definition of Milk

Milk is an opaque white fluid rich in fat and protein, secreted by female mammals for the nourishment of their young. It is the primary source of nutrition for young mammals before they are capable of digest other foods. Milk is also defined as lacteal secretion free from colostrum. Milk is obtained from healthy cows 15 days before and 5 days after parturition.



1.2 Origin of the Report

Internship program is a parts of graduation requirement for Nutrition and Food Engineering students. Daffodil International University & Department of NFE authorities provide Internship opportunity for students in different company and different sectors. Their main goal is to provide the student knowledge about practical experience and real work place. It gives an opportunity to student to get closer to job seekers. Main challenge for an intern student is to use theoretical concepts in real life experience.

The study and internship program have following purposes:

- To come out from textbooks and learn about practical work.
- To learn about talent and efficiency of real work environment
- To help students to express dependability, initiative, and professionalism and tasks they are assigned
- To get closer contact with job seekers.
- To complete the requirement of NFE Program.
- To compare the real continuity with the lessons learned in DIU
- To know about Milk-vita
- To learn about production and quality control of dairy production.
- To learn Different types of dairy products and their production process.

This report is the result of one month long internship program conducted in Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) is prepared as a requirement for the completion of the NFE program of Daffodil International University. As a result I need to submit this report based on the “Quality control Assurance and Production of Dairy Products at BMPCUL.

1.3 Objective of the Study

Objective study is divided into two types.

- General Objective.
- Specific Objective.

General Objective:

- The main purpose of this internship program is to learn production and quality control of milk & milk products.
- To complete the Bachelor degree requirement of Nutrition & Food Engineering Faculty of Allied Health Science of Daffodil International University.

Specific Objective:

More specifically contains :

- ✓ Focus on the hygienic production and quality control of Dhaka Dairy Plant (Milk-vita)
- ✓ To have a complete idea about the activities of Bangladesh Milk Producers Co-operative Union Limited (BMPCUL)
- ✓ To know different activities of this organization.
- ✓ To give an overview of Bangladesh Milk Producers Co-operative Union Limited (BMPCUL).

1.4 Scope of the study

The main intention of this study is the Production and Quality Control of Milk & Dairy Products compositional standard and quality and processing of dairy products by the Dairy products Producers Company. The report covers details about the Production and Quality Control of Dairy Products under Hygienic Condition. However I got an opportunity to work in both Production & Quality Control Assurance Department.

1.5 Methodology

A systematic procedure is requires for the preparation of the final report. Methodology starts from selection of topic, data source, interpreted results in a systematic manner and key points are to be found out. The overall process of methodology are as follows:

Selection of the topic:

The selection of the topic for any research is very important. It depends on gained knowledge and on-practical experience from the assigned organization.

Source of data:

Essential data can be collected from both primary and secondary source.

Primary Source of data:

- Primary data is collected from the practical work
- Data is collected from employee.

Secondary Source of data:

- From the officers of the organization
- From newspaper, journal, articles etc.
- Different websites that is related to dairy science.
- From manuals and practical fields of the organization.

Tools Used:

Some arithmetic, graphical tools are used in this report for analyzing the data and classification of different types of data.

1.6 Limitation of the report:

Every works on report have some limitation so this report have also some limitation. These are given below:

1. Due to some rules and regulation they did not give me some information because that is against their policy.
2. Due to some limitation some information, especially from ultimate employees could not be collected.

CHAPTER-TWO

OVERVIEW OF THE ORGANIZATION

2.1 Historical Background of the Company

Milk-vita was first introduced when Bangladesh wasn't born. It starts its journey in 1946 at Lahirimohonpur, Pabna. It was established to send milk products to Calcutta market.

After divination private company named Eastern milk products Limited purchase this dairy company in 1952 from original owner. In 1965 the first milk producer's co-operative union was formed as named Eastern Milk Producers Co-operative Union Limited (EMPCUL). After that dairy plants were run by Eastern Milk Producers Co-operative Union Limited (EMPCUL).

In 1973 Bangladesh government has taken it under their management. The name of the organization was changed when Bangladesh Government became the owner of the company. In 1977 a brand name of the company was fixed as Milk-vita.

Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) established different plants in Baghabarighat (Bogra), Tekerhat (Madaripur) Mirpur-7 (Dhaka).

At the early age Bangladesh Milk Producers Co-operative Union Limited (EMPCUL) has started its journey to provide raw milk countrywide. Then it started to provide different kind of dairy products.

The Head office of this organization named "Dugdha Bhaban" is situated at Dhaka. At present it is one of the leading dairy industry in Bangladesh based on their production quality.

2.2 Objective of the Company

Bangladesh Government has taken a functional step by starting Bangladesh Milk Producers Co-operative Union Limited (EMPCUL) earlier to run away the poverty among rural people.

Other objectives are given below-

- To promote production and improvement of nutrition & quality.
- To increase purchasing power.
- To ensure customers satisfaction
- To keep business morality
- To create new employment opportunity.
- To increase quantity and quality products for consumers.
- To ensure adulteration free final product.
- To develop local farmers condition

2.3 Products and Services:

- Pasteurized milk (HTST packaged milk)
- Powder milk.
- Chocolate milk.
- Gee
- Laban
- Sweet Yoghurt
- Sour Yoghurt
- Rosh-malai
- Chocolate Ice-cream
- Vanilla Cup Ice-cream
- Butter

CHAPTER-THREE

DESIGN OF THE STUDY

3.1 Study Area

Study area divided into two areas. These are:

1. Laboratory areas. And the second one is
2. Production areas.

3.2 Laboratory

A laboratory is essential for quality controls of different ingredients and final products. It also ensure safety of consumers. It works for development of any kind of different products. Many kinds of operational test occurred in the laboratory, some of them given below as example-

- Organoleptic test
- CLR test .
- Platform test / Alcohol test .
- Fat test .

3.2 Production

Production area is a place where fresh raw milk are processed for further processing.

Production area also divided into different sector, these are-

- Processing area/pasteurization area.
- Mixing area
- Packaging area
- Storage area

Different Production plant is used for different types of products manufacturing. sometimes same plant can be used for many products.

CHAPTER-FOUR

PROCESSING SECTION

Composition of milk:

- Water-87.3%
- Total solid- 12.7%
- Fat- 3.4%
- SNF- 9%
- Lactose(carbohydrate) – 4.5%
- Mineral – 0.7%
- Protein – 3.3%
- Casein- 3.3%
- Albumin & Gluten- 0.5%

4.1 PASTEURIZED MILK

Procedure:

1. Raw milk is collected from dairy farm and from co-operative union office/ chilling center.
2. After then Collected raw milk is ready to passed through platform test and others adulteration test.
3. After then passed milk is chilled in a storage vat at 4⁰C
4. Storage milk is balanced or recombined with skim milk or full cream milk for maintaining fat percentage (3.5%) according to BSTI standard.
5. If raw milk have higher fat percentage then skim milk is added to make a balance
6. Full cream milk is added to make a balance if raw milk have less fat percentage.
7. After then these recombined milk is pasteurized at 80 to 85⁰C for 15 seconds(HTST).



Figure: 3.1 Milk Pasteurizer

8. The milk homogenizer homogenized the pasteurized milk.



Figure: 3.2 Milk Homogenizer

9. After then cooling them at 4°C

10. Then cooled milk is stored in storage vat

11. Then cooled milk is taken in the packaging machine



Figure: 3.3 Milk Packaging Machine

12. At the packaging area milk is packaged in different amount of packs such as 250ml, 500ml, 1Litre etc.



Figure: 3.4 Packaged Milk (1Litre Packet)

13. If found any fault in pasteurized packaged milk then it is run away from packaging area and follow the procedure instruction again

14. Well packaged pasteurized milk is stored in the freezing room at 0 to 4⁰C

4.2 Chocolate Milk :

Chocolate milk is an another dairy product that is made by milk-vita. It is popular in Bangladesh especially in among the children.

Ingredients/Recipe: (For 500kg)

1. SMP- 15kg
2. FCMP-37.5kg
3. Sugar- 41kg
4. Stabilizer- 0.75kg
5. Cocoa powder- 3.5kg
6. Color- 0.04kg
7. Water- 401.95kg

Procedure:

1. At the beginning of this process some hot water (approximately 60°C) is added into the blending vat. After then full cream milk powder (FCMP), skim milk powder,(SMP), sugar, stabilizer and finally remaining water are added. The mixing operation is blended at 80°C in the mixing vat so that the warm mix which completely dissolve all of the ingredients.
2. After mixing operation the mixture is pasteurized by a continuous heating process (HTST). Then the liquid mixture is heated in a vat to at 81°C for 15 seconds and instantly cooled by the chilled water which helps to diminish the growth of pathogenic bacteria present in the mixture.
3. Then homogenizer mix the product equally that's known as homogenized products.
4. After then chocolate milk are packaged by foil paper packaging
5. Then well packaged chocolate milk are stored in the storage room at 4°C temperature
6. Then they distribute in the local market or grocery shop to provide the consumers.



Health Benefits Of Chocolate Milk:

- . Improves Digestion
- . Regulates Blood Pressure
- . Strengthens Bones
- . Boosts Immunity
- . Speeds-up Recovery

4.3 Ice-cream :

Ingredients/Recipe: (For 500kg)

1. Sugar-16% (80kg)
2. Butter-8% (40kg)
3. Stabilizer-0.5% (2.5kg)
4. FCMP- 13.5%(67.5kg)
5. Flavor- 0.21%(1.05kg)
6. SMP- 1.1%(5.5kg)
7. Water- All the rest (approximately 60% of water are required)

Procedure:

1. At the beginning of this operation some hot water (approximately 60⁰C) is added into the blending vat. Then full cream milk powder (FCMP), skim milk powder,(SMP), sugar, stabilizer and finally

required water are added. The mixing operation is blended at 80⁰C in the mixing tanker in order to dissolve perfectly all of the ingredients.

2. After then the mixing ingredients is pasteurized by a continuous heating process(HTST).

The liquid mixture is heated in a pasteurizer tank at 81⁰C for 15 seconds and instantly cooled by the chilled water that helps to destroy or inhibit the activities of pathogenic bacteria that are present in the mixture.

3. After then Homogenization process is need to helps or achieve the smoothness of Ice-Cream which gives fine dispersion of butterfat globules in the mixture. The function of homogenizer is to break downs the large fat globules into smaller or equal.

4. After the homogenization the mixture is cooled down to 4⁰C. This process is known as aging. The mix held in a tanker at a temperature of 50C from 3 to 24 hours.

5. Then fill the mixtures in the ice-cream container.

6. Then freezing the ice cream mixture in at freezing temperature.

7. Then ice-cream mixtures are need to hard in order to achieve a satisfactory physical shape and the mixture kept at hardening room for 1 hour at -20⁰C as a view to semi-solid become solid ice-cream.

8. After hardening ice-cream are kept in the storage room.at the storage room temperature controlled at -4⁰ c to -20⁰ c.

9. Then they are ready supply or consumers marketing.

Health Benefits of Ice Cream:

- ✓ Vitamins source.
- ✓ Energy provides.
- ✓ Minerals sources.
- ✓ Work as Brain stimulus.

4.4 Sweet Yoghurt & Sour Yoghurt

4.4.1 Sweet Yoghurt Manufacturing Process

Sweet yoghurt:

Sweet yoghurt is a most popular dairy product. It is not only popular in young but also in children.

Particularly in all aged people. Sweet yoghurt is another delicious product that is made by milk-vita.

Ingredients/Recipe:

1. Milk
2. Sugar
3. Yoghurt Culture

Procedure:

1. At the beginning of this process milk are taken in a cleaned vessels
2. Then boil raw milk at boiling temperature until milk is reduced 40% by its weight, Milk-vita wants to produce good product to people so they do this.
3. After then they add 15% sugar in the milk
4. Then heat the mixer properly
5. Remove from the heat and let it be cooled at 40⁰C
6. After then they added starter culture in the mixer
7. Then preserve it 6 hours to make yoghurt.
8. They keep them at 4⁰C temperature
9. Then they are ready for packaging
10. Then marketing them for consumer consumption.



Benefits of using Sweet Yoghurt:

1. Beneficial to digestion
2. Delicious and easy to eat
3. Price is reasonable

4.4.2 Sour Yoghurt manufacturing process

Sour Yoghurt:

Milk-vita also produce sour yoghurt. It is popular because of it widely using in cooking specially in roast-making or also used in beef curry.

Ingredients/Recipe:

1. Raw milk
2. Skim milk
3. Culture(starter yoghurt culture)

Procedure:

1. At the beginning raw milk are taken in a cleaned vessels
2. After then they add skim milk into it
3. Then boil the mixture at boiling temperature
4. Then cool as soon as possible to 40 to 45⁰C
5. Added starter yoghurt culture in this mixture
6. Then wait for 4 hours because its helps to coagulate the mixer
7. Then packaged in plastic box
8. After then they kept them in the refrigeration at 4⁰C temperature
9. Then they are ready to marketing for selling



Benefits of using sour yoghurt:

1. Good for making delicious taste of food
2. Improve flavor
3. Economical benefits

4.5 LABAN A Yoghurt Drink

Laban is a dairy product which is also known as liquid yoghurt drink. It found of all over the world but specially in South-Asian country. Milk-vita serve 80% of yoghurt in their laban production.

Ingredients:

1. Yoghurt
2. Salt
3. sugar
4. stabilizer

Procedure:

1. For making Laban at the beginning yoghurt is taken into the mixer machine
2. After then salt and sugar are added into the yoghurt
3. Then stabilizer is used in the mixture.
4. After adding the stabilizer in the mixture started the mixer machine and mixed it completely for an hour with heat
5. Well mixing is ready to fill as Laban into the packaging bottle or jar.
6. Poured bottles are sealed and labeled them nicely
7. After Labelling bottles are stored in the freezing room for 24hours
8. Then stored them in the storage room.

Benefits of Laban:

1. Beneficial to digestion
2. Its help to increase palatability.

4.6 Rash-malai:

It is one of the sweetest dairy products made by the milk-vita. It is also a popular in South-Asian country.

Ingredients/Recipe:

1. Yoghurt
2. Whole Flour
3. Baking powder
4. Green Cardamom
5. Syrup

Procedure:

1. At the beginning some baking powder and yoghurt without water are mixed together properly to make dough.
2. After then Some flour are used in the dough to make easier handle and its help to make good shapes of sweet.
3. After then small sweet balls are kept in the syrup for few hours
4. Then syrup are separated from sweet balls
5. At the same time milk are heated until they become half by volume
6. After then hot milk are added into the sweet balls
7. Some green cardamom are used that improve the flavor.
8. Then they kept for being cool
9. After then cool rash-malai are packed in 1kg box
10. After packaging they kept in the storage room
11. Then they are ready to distribute to the seller



CHAPTER-FIVE

Quality Control Section

5.1 Quality control check of raw milk such as:

- Platform test/ Alcohol test,
- CLR test
- Soda test
- Fat test
- Sugar test
- Salt test.

5.2 Quality control check of final products:

- Peroxide test of pasteurized milk (H₂O₂ test),
- Microbiological test &
 - Checking Sensory evaluation .

5.3 C.I.P:

Elaboration of C.I.P is Cleaning-in-Place. C.I.P is use to ensure safety and to avoid microbial or other contamination. Using caustic soda as a chemical for ensure C.I.P

Procedure:

1. At the beginning cold water is used to wash the pipe/vat/tanker
2. Then they use hot water to wash the pipe/vat/tanker
3. Then they use sodium Hydroxide NaOH (caustic soda) 0.5 to 2% / Volume of water to wash again
4. After then use hot water to clean the sodium hydroxide NaOH.

5. Finally collect last using water as a sample to ensure C.I.P
6. Phenolphthalein indicator with the water with a view to ensure hygienist if no color change that means C.I.P has been done perfectly.
7. But if water turns into pink color with Phenolphthalein indicator that means C.I.P has not been done perfectly and this is still contaminated.
8. Then again have to follow the same process of C.I.P procedure

Purpose of C.I.P:

1. To avoid contamination
2. To ensure safety
3. To maintain the reputation

Use:

1. Use for storage vat & pipes
2. Use for transport tanker.

5.4 Platform test:

The another name of Platform test is alcohol test. 68% ethanol is used for this test. This test is correct for find out milk acidity. In milk-vita it done by the ratio of 2:1, ethanol : sample (milk).

Apparatus & equipment:

1. Ethanol
2. Pipette
3. Test tube
4. Sample (Milk)

Procedure:

1. At the beginning of this chemical test 2ml of 68% ethanol is taken into a test tube by a pipette
2. After then 1ml of milk is added into the test tube
3. Shake properly the sample for a while
4. If milk sample is getting coagulate and stable with the test tube's body then alcohol positive, so this milk is not perfect for further process as pasteurized milk.
5. If milk is not get coagulate then alcohol negative and this milk this good for further process.
6. There is a concern that have to be careful about the use of apparatus.

5.5 CLR test:

CLR is the short form of Corrected Lactometer Reading. It also known as specific gravity test or density test. In this test lactometer and temperature reading is important. If temperature found below 20°C then for per 1°C , 0.2 will be deducted from lactometer reading. Similarly temperature found greater than 20°C then for per 1°C , 0.2 will be added with lactometer reading. This test is used to know the density of milk. Normal specific gravity of milk is 1.026 to 1.028.

Apparatus & Equipment:

1. Sample (milk)
2. Lactometer with thermometer
3. Lactometer jar

Procedure:

1. Clean the lactometer and jar finely
2. Then put the lactometer into the jar
3. Then then put the milk into the jar
4. To adjust temperature flow the water on the jar
5. Then measure the lactometer reading and temperature.
6. Then calculate the CLR.



5.6 Soda Test:

It is one type of adulteration test.

Apparatus & Equipment:

1. Test tube
2. 100% Ethanol
3. Rosalic acid
4. Sample milk

Procedure:

1. Take 2ml 100% alcohol in a test tube
2. Add 2ml milk in it
3. Add 2ml rosolic acid
4. If pink color seen then soda positive
5. If orange color seen soda negative.

5.7 Fat test:

Fat test is another quality control test parameters of milk. It also important for pricing the milk. Because milk-vita fixed price of milk by fat percentage. Different animal have different fat percentage in their milk.

Apparatus & equipment:

1. Butyrometer, Nockstop, & pin
2. Sulfuric acid
3. Amyl alcohol
4. Centrifuge machine
5. Sample (Milk)
6. Centrifuge machine

Procedure:

1. 1st 10ml sulfuric acid are taken into butyrometer
2. Then 10.47ml milk is added into it
3. Then 1ml amyl-alcohol also added into the mixer
4. Some water has been added to adjust the mixer
5. Then nock-stop and pin is used to lock the butyrometer

6. Then shake the mixer for some times
7. Then put the butyrometer in the centrifuge machine for 5 minutes with 110RPM at 60⁰C.
8. Then measure the fat percentage by open eyes.
9. Normally 3.5 is expected but it can be 3.2 to 4.2
10. Need to be careful in time of using centrifuge machine.



Purpose of Fat test:

1. To know the fat percentage
2. To extract extra fat from milk
3. Extracted extra fat can be useful for making other dairy products
4. To minimize cost
5. To know how much skim milk should use
6. To fixed the price of milk.

5.8 Salt test:

It is another adulteration test. People add salt to increase SNF of milk.

Apparatus & Equipment:

- 1, Test tube
2. Silver Nitrate (AgNO_3)
3. K_2CrO_4
4. Sample milk

Procedure:

1. Take 5ml Silver Nitrate in a test tube
2. Add 4 to 5 drops K_2CrO_4 in it
3. Then finally take 1ml milk
4. If brown color seen in the mixer it means salt negative
5. If color turns into slightly yellowish color that means salt positive

5.9 Sugar Test:

Sugar test is one kind of adulteration test. Because some bad peoples are intentionally add some sugar in milk to increase the density of milk. So to find out this officials do this test.

Apparatus & Equipment:

1. Test tube
2. Test tube holder
3. Bunsen burner
4. Resorcinol solution
5. Sample milk

Procedure:

1. 1st 5ml resorcinol solution are taken into a test tube
2. Then add 1ml milk into the test tube
3. After added milk it become coagulate
4. Then use holder to hold the test tube to put it into the Bunsen burner's flam
5. Keep it until boiling
6. Then take away from flam and gives time to cool the mixer
7. Then within few minutes if mixer turns brick red color which means sugar test positive
8. If mixer shows slightly red color then it is sugar test negative
9. Sugar test positive milk are not acceptable

Purpose of sugar test:

1. To check adulteration
2. To ensure there is no added sugar in milk
3. To ensure safety

5.10 Peroxidase test:

This test is conducted to verify the effectiveness of pasteurization of milk. It is another quality control parameters of pasteurized milk

Apparatus & Equipment:

1. Test tubes
2. Pipette
3. NaOH

4. H₂O₂
5. Paraphenylenediamine

Procedure:

1. Take 5ml milk in a test tube
2. Add 1 drop Sodium Hydroxide and shake it
3. Add 1 drop Hydrogen Peroxide and shake it
4. Add 2 drops paraphenylenediamine and shake the mixer for a few seconds
5. Wait 30 seconds
6. If any color change seen in the mixer then peroxidase positive that means pasteurization has not been done properly
7. If seen no color change then peroxide negative that means pasteurization done properly.

Purpose of this test:

1. To check the pasteurization is done properly or not
2. To check the quality of pasteurized milk.

5.11 Microbiological /Bacteriological test:

Microbiological test is important to know the bacterial count in milk and milk products. Because bacteria such as E. coli can cause contamination in milk. And E. coli can cause many problems in consumers if there number is high in the milk. Normally total count of bacteria range is 30 to 35 thousand. E. coli cause dysentery. More than this is not acceptable. Also Coliform bacteria are concern to count. If found more coliform then have to do C.I.P again in production channels.

Characteristic of Coliform:

1. Group of bacteria
2. Gram negative bacteria
3. Gas producer (CO₂)
4. Rod Shape
5. Their production mainly occurs in soil

6. 10/ml

Apparatus:

1. Pipettes
2. Bunsen burner
3. Petri dishes
4. Dilution tubes
5. Autoclave
6. Incubator
7. Spirit lamp
8. Refrigerator

Procedure:

1. At first make a ringer solution by water and salt (Such as sodium chloride NaCl, potassium chloride KCl, calcium chloride CaCl etc.)
2. Then pour them in the dilution tube
3. Then heat them until boil and remove from heat & let them cool

4. Spirit lamp is used to sterilize the pipette every-time before when use taken sample into the petri dish.
5. For coliform take 0.5ml and for total count take 1ml milk into the ringer solution and shake it to dilution the solution
6. Then take 1ml from the dilution solution into another ringer solution and dilute them
7. Then take 1ml from it and transfer it into petri dish.
8. Then transfer red agar into the sample containing petri dish for coliform but transfer white agar into the sample containing petri dish for total count
9. Adding red agar 2 times is good for growth of bacteria
10. Then keep them in the incubator at 40 to 42⁰C for 18 hours.
11. After 18 hours count the bacteria by open eyes.
12. For total count calculate the bacteria by divided the petri dish into 4 parts and count 1 parts bacteria and multiply with 4 and multiply the digit by 100.
13. But for coliform count the colony and write them in the note.
14. If any unexpected result found then warn the operators to make sure proper C.I.P next time.



Purpose of Microbiological test:

1. To ensure proper C.I.P
2. To ensure there is no contamination
3. To ensure safety of consumers health

Chapter Six

Results & Discussion

6.1 Alcohol Test:

Alcohol Positive (+) = Coagulation of milk

Alcohol Negative (-) = No coagulation of milk

In milk-vita we mostly found alcohol negative. Alcohol Positive milk must be rejected for further process.

6.2 CLR Test :

Milk-vita Tested milk's specific gravity was 1.0286 which means no water was added in it.

Specific gravity of milk vary from animal to animal. Normal gravity of Cow milk range is between 1.028 – 1.030 and for Buffalo milk 1.030 to 1.032. Sugar and flour is added to rise the density of milk by lying people.

6.3 Fat Test :

From the butyrometer reading fat percentage was calculated as 3.4.

Normally 3.5 is expected as standard but 3.2 to 4.2 also found in some animal's milk. But less than 2 % fat containing milk must be rejected.

6.4 Soda Test:

Soda Positive (+) = Red rose or Brick red

color Soda Negative (-) = Orange color

In milk-vita soda test was negative. To increase the foaming of milk soda is intentionally added by dishonest people. Soda Positive milk must be rejected.

6.5 Peroxidase Test :

Peroxidase Positive (+) = Blue color

Peroxidase Negative (-) = White Color

In milk-vita we found peroxidase positive regularly. Peroxidase Positive milk must be rejected for further process.

6.6 Sugar Test:

Sugar Positive (+) = Brick red color
Sugar Negative (-) = Slightly red color

Milk-vita Sugar test was negative all the time. Sugar positive milk is adulterated milk. Sugar is added intentionally by dishonest people to increase the carbohydrate content of milk. It also added to increase the density of milk.

6.7 Salt Test:

Salt Positive (+) = Yellow color
Salt Negative (-) = Brown color

Salt test was negative in milk-vita. Salt test positive milk is known as adulterated milk. So salt test positive milk must be rejected. Salt is added to milk to increase the SNF content of milk.

6.8 Clot-on-Boiling Test:

Generally above 0.22% of lactic acid in milk gives test positive. Such milk can't stand for heat treatment. So this kind of milk is not acceptable for processing or further heat treatment.

6.9 C.I.P :

Positive (+) = Pink color
C.I.P Negative (-) = No color

In milk vita C.I.P found negative regularly except 1time.

6.10 Microbiological Test:

Total bacterial count was 18thousand/ml. 30 to 35 thousand total bacterial count is acceptable. Coliform count was 8/ml. According to standard coliform count range should be less than 10/ml is acceptable. Proper Pasteurization is necessary to kill these micro-organisms. It is essential to kill them because they are harmful for consumption. They can cause many disease in human

Conclusion:

This internship program helped to learn lots of things about dairy products. It has covered both production and quality control site. It was a great opportunity to know about milk-vita and its regular works. Further, it enriched the knowledge about processing of some dairy products such as pasteurized milk, chocolate milk, ice-cream, Laban, yoghurt etc. It will be supportive in future to conduct adulteration test of dairy products. Adulteration test of milk such as soda test, salt test, sugar test etc have been learned there. Hopefully during this internships the knowledge gathered about doing products specially the information about BSTI standards of different doing products would be helpful in future life.

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