Microbial and Chemical Analysis of Milk and Food Products

An Industrial Training Report submitted

For the partial fulfilment of the Degree of Bachelor of Science

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[B.Sc. (Biotechnology), Semester (VI)]

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2022-2023

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This is to certify that **Mr.Rajkumar Jitendrabhai Pipariya** (enrollment no - 200601038), 6th semester student of Atmiya university, has successfully completed his training in **THE EQUITY LABORATORIES**, Rajkot upto 120 Hours.

During this period we found him sincere and hard working, Proved skills and Qualification successfully with regard to task assigned to him.

This certificate was issued to his upon him own request to be submitted To Whom It May Concern without any liabilities towards others.

We wish good luck for his future endeavours.

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D E C L A R A T I O N

I hereby declare that the work incorporated in the present internship report entitled **"Microbial and chemical analysis of milk and food products**" is my own work and is original. This work (in part or in full) has not been submitted to any University for the award of any Degree or a Diploma.

Date: 22/2/2023

RAJKUMAR PIARIYA J.

Acknowledgement

Thanks God, to the merciful and the passionate, for providing us the opportunity to step in the excellent world of science. To be able to step strong and smooth in this way, we have also been supported and supervised by many people to would like to express our deepest gratitude.

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Rajkumar Pipariya

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Abstract

Milk and milk products are the tremendous source of nutrient for microorganism. It is important to check quality of milk and milk product before selling into market because it is concerned with health. Milk can be easily adulterated by using various chemicals and also easily contaminated with various microorganisms. Total plate count method and yeast and mould detection and enumeration method is used to determine total number of microorganism which are present in milk or milk sample. By using IS: 5887 (Part-II)-1976 detection of *staphylococcus aureus* is done into milk sample. With the help of milk adulteration kit detection of various chemical adulterant form milk is done.

1. Method for yeast & mould count from foodstuffs and animal feeds.

Aim: Detection and enumeration of Yeast and Mould from milk sample.

Introduction:

Foods (Milk product) are generally sources of different types of nutrients, generally foods contain carbohydrates, fats, proteins, water, minerals and vitamins etc. Because of both yeast and mould cause various degrees of deterioration and decomposition of foods, that's why need to detection of yeast and mould from the food sample is important. If foods are infected with pathogenic fungi like *Aspergillus* and *Candida* it may cause serious diseases in consumer body.

Principle:

Preparation of poured plates using a specified selective culture medium and a specified quantity of the test sample if the initial product is liquid, or of an initial suspension in the case of other products. Preparation of other plates, under the same conditions, using decimal dilutions of the test sample or -of the initial suspension. Aerobic incubation of the plates at 25°C for 3, 4 or 5 days. Calculation of the number of yeasts and moulds per gram or per millilitre of sample from the number of colonies obtained on plates chosen at dilution levels so as to give a significant result.

Materials:

1. Food sample (Penda)
2. Instruments: Autoclave, Laminar air flow, Incubator.
3. Media and reagents: PDA (Potato dextrose agar), Agar – agar powder, Isopropyl alcohol 70%, Distilled water.
4. Glassware: Test tubes, Flask, Spreader, Petri dish

Media preparation:

- Weigh 3.9gm **PDA media** and 2 gm agar powder
- Weigh 3.9gm **PDA media** and 2 gm agar powder
- Autoclaved the media at 121˚C and 15 lbs pressure for 20 minutes
- Then pour the media in Petri dish under laminar air flow

Sample preparation:

- Make 10 fold dilution [1:10,1:100,1:1000,1:10000,1:10000]

- First start the dilution with 9 ml water + 1ml sample
- If sample is solid that take 1 gm sample
- Do serial dilution till 1:100000 dilution

Procedure:

- Take 0.1ml sample from 1:10 tube and spread over a 1:10 PDA plate
- Same procedure will perform from 1:100, 1:1000,1:10000,1:100000 dilution, and spread over the respective PDA plates
- Incubation at **25˚C for 3, 4, 5 days**
- Observe the result and go for calculation.

Calculation: Count those plate only in which colonies less than 150 number.

SET-1	SET-2
D1-TNTC (Too few to count)	D1-TNTC (Too few to count)
D2-58	D2-43
D3-7	D3-0
D4-0	D4-0
D5-0	D5-0

- The number of Yeast and Mould per gm or per ml is equal to = $\Sigma c / [n_1+0.1(n_2)]d$
- Σc= the sum of the colonies counted on all the plates.
- n_1= the number of plate counted in the first dilution.
- n_2= the number of plates counted in the second dilution
- d= the dilution from which the first counts were obtain.

$= \Sigma c / [n1+0.1(n_2)]\ d$

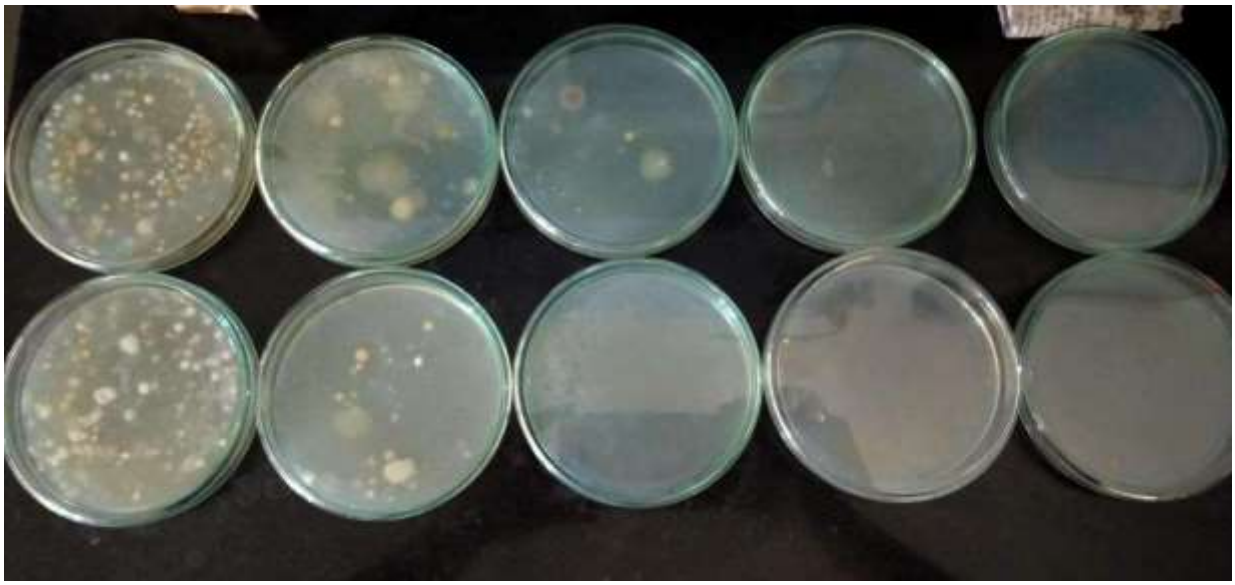
$= 108 / 2+0.1\ (2) \times 10^{-2}$

$= 108 / 0.022$

$= 4{,}909.09090$

$= 4.909 \times 10^3$ Cfu / ml.

Observation:



1. Yeast and Mould detection and enumeration set-1 and set-2

Result: By performing this experiment the value of yeast and mould enumeration to be found is 4.909 $\times 10^{3}$cfu / ml.

Conclusion: Given food sample not consumable.

NOTE- Consumable range of yeast and mould in milk and milk products is 10 cfu / ml.

2. Method for detection and enumeration of total bacterial count from milk.

Aim: Detection and Enumeration of bacteria from milk sample according to total plate count method.

Introduction:

Milk are highly susceptible to contaminated with various type of microorganisms along with this Milk also contain different types of normal flora like *Lactobacilli*. Milk is known as complete food that's why various types of microorganism grow easily in Milk. It is important to determine the number of microorganism which are present in the milk, for this purpose we are use A total plate count method.

Principle:

Two poured plates are prepared using a specified culture medium and a specified quantity of the test sample, if the initial product is liquid, or using a specified quantity of an initial suspension in the case of other products. Other pairs of poured plates are prepared, under the same conditions, using decimal dilutions of the test sample or of the initial suspension. The plates are aerobically incubated at 30 °C for 72 hrs. The number of microorganisms per millilitre or per gram of sample is calculated from the number of colonies obtained on selected plates.

Materials:

1. Milk sample
2. Plate count agar [PCA]
3. Spreader
4. Laminar air flow
5. Glass wares
6. Isopropyl alcohol – Disinfectant
7. Test Tubes for Dilution
8. Distilled Water

Media Preparation:

- Weigh 3gm PCA (plate count agar) media for 100ml
- Add 2gm agar powder

- Add 100 ml water and mix it
- Autoclaved the media at 121˚C and 15 lbs pressure for 20 minutes
- Then pour the media in Petri dish under laminar air flow

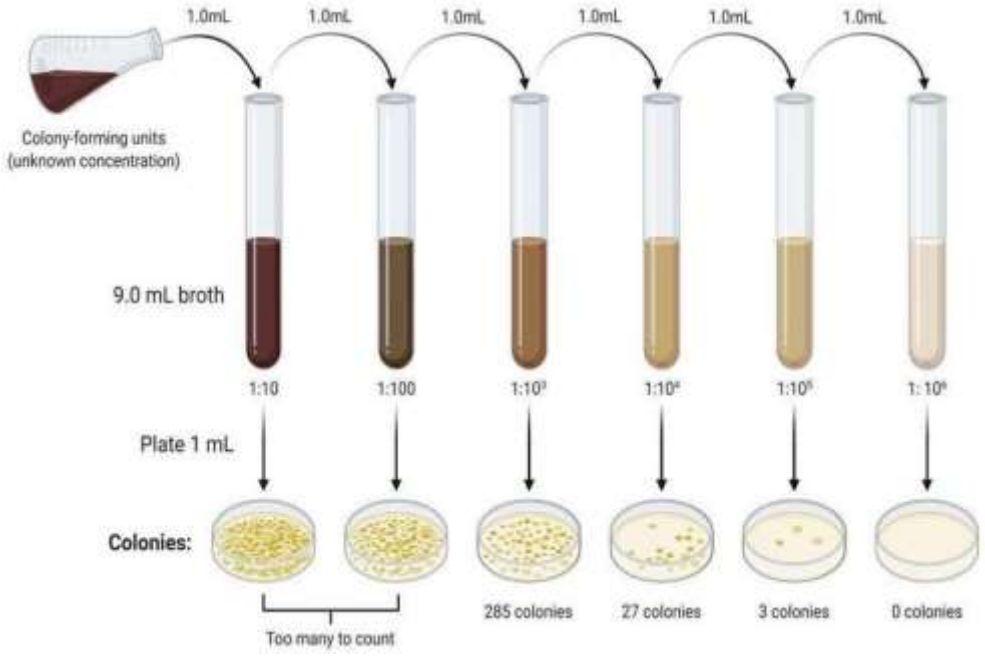
Sample Preparation:

- Make a 10 fold serial dilution, [1:10, 1:100, 1:1000, 1:10000, and 1:100000]
- First start the dilution with 9ml water + 1ml sample
- Do serial dilution till 1:100000 dilution

Procedure:

- After serial dilution take 0.1ml sample from 1:10 tube and spread into 1:10 PCA media plate.
- Again take 0.1ml sample from 1:100 tube and spread into 1:100 PCA agar plate
- Same procedure is done till 1:100000 dilution.
- Incubate plate at 30˚C for 3 days
- Observed the result and then go for calculation.

Serial Dilution Procedure:



2. Serial Dilution Procedure

Calculation: Count those plate only in which colonies between 15 to 300 numbers.

SET-1	SET-2
D1-TNTC (Too few to count) D2-219 D3-17 D4-4 D5-0	D1-TNTC (Too few to count) D2-228 D3-26 D4-0 D5-0

- The number of Yeast and Mould per gm or per ml is equal to = $\Sigma c / [n_1+0.1(n_2)]d$
- Σc= the sum of the colonies counted on all the plates.
- n_1= the number of plate counted in the first dilution.
- n_2= the number of plates counted in the second dilution
- d= the dilution from which the first counts were obtain.

$= \Sigma c / [n1+0.1(n2)]\ d$

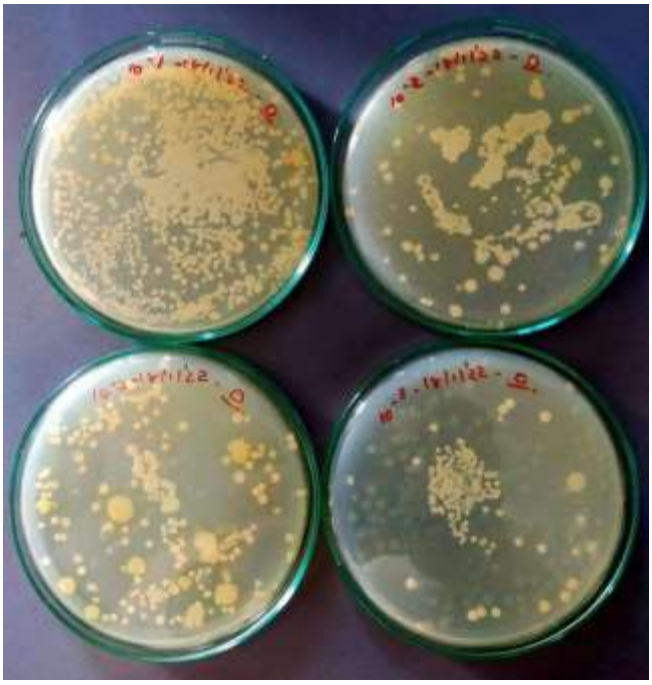
$= 490/\ 2+0.1\ (2) \times 10\ -2$

$= 490 / 0.022$

$= 22{,}272.727$

$= 2.2272 \times 10^4$ Cfu / ml.

Observation:



3. Detection and Enumeration of bacterial count from milk sample

Result: By performing this experiment the value of Bacterial enumeration to be found is 2.2272×10^{4}cfu / ml.

3. Isolation of *Staphylococcus aureus* from the milk sample.

Aim: Detection of *Staphylococcus aureus* from the milk sample.

Introduction:

Several microorganisms contaminating food give rise to clinical symptoms. These are abdominal pain, diarrhoea and sometime pyrexia. *Staphylococcus aureus* is capable of making several different toxins and is often the cause of food poisoning. For Example Alpha toxin (Pore forming toxin) penetrates host cell membrane causing osmotic swelling, rupture, lysis and subsequently cell death. *S.aureus* is aerobic, Gram positive, cocci, usually in pairs or short chains and it is fastidious organism. S.aureus form heat resistance lipase, which are cause hydrolysis of fat of milk and responsible for rancidity.

Classification:

Domain :Bacteria

Phylum :Firmicutes

Class :Bacilli

Order :Bacillales

Family :Staphylococcaceae

Genus :*Staphylococcus*

Species :*S. aureus*

Principle:

S.aureus aerobic, Gram positive, cocci shape bacteria which are found in milk. For the detection of *S.aureus* from milk first provide pre-enrichment medium (Non- selective medium) allows for repair of cell damage and facilitates the recovery of *S.aureus*. Then after sample spreading is done on selective medium, e.g. Baird parker agar and finally conformation is done by performing Gram staining and coagulase test.

Materials:

1. Glassware: Petri plates, Glass slide, Pipettes, Flask.

2.Media and reagent: Baird parker agar, Buffered peptone water, Gram staining reagents, Human or rabbit plasma, Egg yolk emulsion, Potassium tellurite solution.

3. Instrument: Incubator, Laminar air flow, Autoclave

4. Milk sample

Procedure:

- Take 25 ml to 50 ml milk sample
- Add in 225 ml 0.1% Buffered peptone water
- Keep it 37 ºC for 24 hrs in incubator
- Prepare Baird parker agar media and spread the sample accordingly dilution
- Incubate the plate at 37 ºC for 30 hrs
- Observe the result and perform conformation test

Conformation test: Slide method

- Emulsify a portion on suspected colony in normal saline water
- Mix with human or rabbit plasma
- Observe visible clumping immediately

Observation: Shiny black colonies with or without narrow grey white margin. (Note: if we not add Egg yolk and potassium tellurite then white colour colonies observed.

4. S. aureus on Baird parker agar media

5. Coagulase test for *S. aureus*

Result: Given milk sample is contaminated with *s.aureus.*

Conclusion: Given milk is not consumabl

4. Aim: Analysis of various components of milk with the help of milk analyser.

Introduction:

Milk is most widely consumable food and it is known as a complete food. Milk contain generally carbohydrates, proteins, fat, water, salt etc. Which component in how much amount present in milk, we can analyse with the help of milk analyser. Milk analyser is one type of instrument, by help of them we can analysed the fat, solid not fat (SNF), water, protein, lactose, salt.

About Instrument (Milk analyser):

Principle:

Milk analyser work on the principle of non-destructive ultrasonic technology. Milk analyser make fast analyse of milk major composition like fat, solid not fat (SNF), added water, protein, lactose, salt in percentage [%] and temperature of milk. The sample to be used are raw milk without any processing.

Silent Features:

- Dual ultrasonic sensor for fast measurement and high precision for high fat milk.
- Measurement based on non-destructive ultrasonic technology.
- No reagent are required for analysis.
- Bright and cool green display.
- Memory, Cleaning, Correction and calibration record with time stamp.

Parts and accessories:

Analyser packed box contains following components:

Sr. No	Description	Quantity
1	Milk analyser	1
2	Sample container	2

3	Daily cleaning solution	1 (250ml)
4	Weekly cleaning solution	1 (250ml)
5	Instruction manual	1
6	RS-232 serial cable(2meter)	1
7	Pluger	2
8	DC cable(1.8 meter)	1

Safety:

Do not block milk inlet while analysing. If the analyser was not used for many days, it is recommended to make many dummy analysing with water without considering the output data.

Panel:

Bright GREEN LCD Display

Materials:

1. Instrument: milk analyser, Digital ultrasonic stirrer

2. Reagent:
Daily cleaning solution (10ml daily cleaning solution+490ml water)
Weekly cleaning solution (50ml daily cleaning solution+450ml water)
3. Sterile distilled water
4. Milk sample

(1) (2)

1. Milk analyzer
2. Digital ultrasonic stirrer (Fig.7)

Procedure:

- Preparing milk sample for analysis: The most important requirement for the milk sample is, it should be homogeneous free from air bubbles and temperature of the milk should be between 10ºC to 40ºC.
- [Note: if milk is cooled, some of fat get separated. In this case first hit milk to 40ºC to 42ºC in water bath slowly and cool it down to 20ºC to 25ºC for dissolving separated fat]
- Then milk sample stirrer by help of digital ultrasonic stirrer (11sec).
- On the switch of milk analyser (Warming up for few minutes)
- First give rinse with water.
- Then select option for which type of milk analyse(Buffalo milk, cow milk, mix milk)
- Then fill up the container with test sample of milk.

- Put container for analysis.
- After approximately 42 seconds result shown on display.
- If we want to analyse second milk sample then it's necessary to give two times water wash before analysing second sample.

Cleaning: Periodic cleaning is the most important requirement for proper functioning of the milk analyser. Cleaning should be performed whenever prompted or after usage. IF cleaning is bypassed or skipped, then accuracy of milk analysers cannot be guaranteed.

- Before shut down milk analyser a very crucial step is cleaning.
- 1. Water cleaning - Two cycles
- 2. Daily cleaning – 1.Water rinse (3 times), 2. Daily cleaning chemical, 3. Water rinse (3 times)
- 3. Weekly cleaning – 1. Water rinse (five times), Weekly cleaning solution (5 times), and 3. Water rinse (five times)
- 4. Water for sucking

Observation:

Parameter	Range
Fat	0.5 ~ 15 %
SNF	3 ~ 15 %
Added Water	0 ~ 100 %
CLR	20 ~ 40
Lactose	1 ~ 8 %
Protein	1 ~ 6 %
Salt	0.2 ~ 1.5 %

Result : Given milk sample contain fat 4.7%, SNF 7.1%, water 11%, protein 3.4%, lactose 3.2%, A salt 0.5%

Conclusion : By, help of milk analyzer we can analyse various component of milk easily.

5.Detection of various adulterants from the milk sample.

Aim: Detection of various adulterants from the milk samples by help of NICE milk adulteration test kit.

Introduction:

Milk is adulterated by various substances like sugar, water, salt, urea, detergent and many more. Quality control of milk is most important aspect. Because milk known as a complete food, they contain protein, lactose, fat, vitamins, minerals etc. that's why various microbes are grow very rapidly in milk, which may cause some hazardous effects on consumer body. Simultaneously above mention all the adulterants cause hazardous effects on consumer body. That's why detection of adulterants from the milk sample is important.

Milk adulteration test kit from NICE chemicals private limited help to detect adulterants like hydrogen peroxide, urea, starch, neutralizer, detergents, glucose-dextrose, sodium chloride, acidity, mastitis, formaldehyde, maltose dextrin, nitrate-nitrogen from milk samples.

Why adulteration of milk? --- Unfortunately milk is being very easily adulterated throughout the world. Possible reason behind it may include Demand and supply gap, Perishable nature of milk, Increase the volume of milk for better prices.

- Various adulterants and their effect on milk:

ADULTERANTS	EFFECT ON MILK
Urea	To increase non protein nitrogen content
Hydrogen peroxide **(H2O2)**	Preservative
Starch	To increase solid (SNF- Solid not fat) content.
Neutralizer	To regulate the acidity of milk
Detergent	To prevent curdling and increase the shelf life of milk
Glucose-Dextrose	To increase SNF and make more sweet in test
Sodium chloride	Increasing the density of milk which has been adulterated with water
Acid	Generally acid produced by microbes which present in milk

Formaldehyde	Preservative
Maltose dextrin	To increase the volume of milk
Water	To increase volume of milk

1. Detection of urea from the milk sample.

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Reagent: Urea reagent -1

Procedure:

- Take 2 ml of milk sample in test tube.
- Add 2 ml urea reagent -1 and mix it.

Observation:

Normal pure milk: Slight yellow colour.

Adulterated milk: Distinct yellow colour.

Result:

Given milk sample does not adulterated with additional urea.

2. Detection of starch from milk.

Materials:

1. Milk sample
2. Measuring cylinder
3. Pipette
4. Test tube
5. Reagent- starch reagent-1

6. Water bath

Procedure:

- Take 3 ml milk in test tube.
- Boil for few min. in water bath.
- Add 3 drop of starch reagent- 1
- Mix it properly.

Observation:

Normal pure milk: Does not change the colour.

Adulterated milk: Blue colour.

Result:

Given milk sample does not adulterated with additional starch.

3. Detection of Neutralizer from milk sample.

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Reagent- neutralizer reagent- 1

Procedure:

- Take 5 ml milk sample in test tube.
- Add 4 drops of neutralizer reagent- 1
- Mix it properly.

Observation:

Normal pure milk: Pale yellow colour.

Adulterated milk: Dark purple colour.

Result:

Given milk sample does not contain neutralizer.

4. Detection of sugar from milk.

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Reagent- Sugar reagent- 1, Sugar reagent- 2
6) Boiling water bath

Procedure:

- Take 5 ml milk in test tube.
- Add 2 ml sugar reagent-1
- Add 4 drops of sugar reagent-2
- Mix it properly and put on boiling water bath for two minutes.

Observation:

Normal pure milk: Very light brown colour

Adulterated milk: Red colour additional

Result:

Given milk sample does not contain additional sugar

5. Detection of glucose-dextrose

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Glucose reagent-1, Glucose reagent-2

6) Boiling water bath

Procedure:

- Take 1 ml milk in test tube
- Add 1 ml glucose dextrose reagent-1
- Mix it properly and boil for 3 minutes in boiling water bath
- Cool down the test tube and add 1 ml glucose reagent-2
- Mix it properly.

Observation:

Pure normal milk: light blue colour.

Adulterated milk: Dark blue colour.

Result:

Given milk sample does not contain additional glucose-dextrose.

6. Detection of sodium chloride

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Sodium chloride reagent-1, Sodium chloride reagent-2

Procedure:

- Take 5 ml milk in test tube
- Add 0.5 ml sodium chloride reagent-1 and mix it
- Add 1 ml sodium chloride reagent-2
- Mix it properly

Observation:

Pure milk: Red colour

Adulterated milk: Yellow colour

Result:

Given milk sample does not contain sodium chloride.

7. Detection of hydrogen peroxide from milk sample

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Hydrogen peroxide reagent-1

Procedure:

- Take 5 ml milk in test tube
- Add 1 ml hydrogen peroxide reagent-1
- Mix it properly and wait for 5 minutes

Observation:

Normal pure milk: No change original colour

Adulterated milk: Distinct yellow colour

Result:

Given milk sample does not adulterated with hydrogen peroxide.

8. Detection of formaldehyde from the milk sample

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette

4) Test tube
5) Formaldehyde reagent-1, Formaldehyde reagent-2

Procedure:

- Take 5 ml milk in test tube
- Add two drops of formaldehyde reagent-1
- Add one ml of formaldehyde reagent-2[Slowly added to side of test tube]
- Observe the colour

Observation:

Pure milk: light brown colour ring at intersection of two layer

Adulterated milk: Violet colour ring intersection of two layer

Result:

Given milk sample does not adulterated with formaldehyde.

9. Detection of malto-dextrin from milk sample

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Malto-dextrin reagent-1, Malto-dextrin reagent-2
6) Boiling water bath
7) Filter paper

Procedure:

- Take 10 ml milk sample in test tube
- Add 1 ml malto-dextrin reagent-1 and mix it
- Boil for 2 minutes

- Filter the content
- Add two drops of malto-dextrin reagent-2
- Mix well and observe the colour

Observation:

Normal pure milk: Golden yellow colour

Adulterated milk: Brown colour

Result:

Given milk sample does not adulterated with malto-dextrin.

10. Detection of nitrate-nitrogen from milk sample

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Nitrate-nitrogen reagent-1

Procedure:

- Take 2 ml milk sample in test tube
- Add nitrate-nitrogen reagent-1[0.5 ml from the side of test tube slowly]
- Mix it well and observe the colour

Observation:

Normal pure milk: No any colour change

Adulterated milk: Blue colour at the bottom of test tube

Result:

Given milk sample is does not adulterated with nitrate-nitrogen.

11. Detection of acidity and heat sensitivity

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Acidity reagent-1

Procedure:

- Take 2 ml milk sample in test tube
- Add 2 ml acidity reagent-1
- Mix it and observe the mixture

Observation:

Normal pure milk: Do not form clumps

Adulterated milk: Forms clumps

Result:

Given milk sample form clumps after addition of acidity reagent-1.

12. Detection of Mastitis (Infection) from the milk sample

Materials:

1) Milk sample
2) Measuring cylinder
3) Pipette
4) Test tube
5) Mastitis reagent-1

Procedure:

- Add 5 ml milk in test tube
- Add 1 ml mastitis reagent-1 and mix it properly
- Observe the colour

Observation:

Normal pure milk: Do not form green colour

Adulterated milk: from green colour

Result: Given milk sample green colour formation, means particular animal infected with mastitis disease.

8. Milk adulteration tests- urea, neutralizer (NT), Starch, Detergent, Glucose-Dextrose, Sodium chloride, Hydrogen peroxide, Mastitis, Formaldehyde, Nitrate-nitrogen, Acidity, Mlato-dextrin.

6. Detection of added urea in milk:

Introduction:

Urea serves as source of nitrogen. In original Milk, Proteins are the source of nitrogen. People add urea in Milk to increase non protein nitrogen content. People also adulterate milk with urea so as to raise milk solid not fat (MSNF) percentage in milk to get higher price than the milk actually deserves (Milk is price based on fat percentage and MSNF percentage). Urea concentration in milk is variable within herd. Urea content in natural milk varies from 20 mg/100 ml to 70 mg/100 ml. However, urea content above 70 mg/100 ml in milk indicates milk containing 'added urea'.

Principle:

The addition of urea to milk can be detected by using para-dimethylaminobenzaldehyde (DMAB). This method is based on the principle that urea forms a yellow complex with DMAB in a low acidic solution at room temperature. (This method is qualitative method).

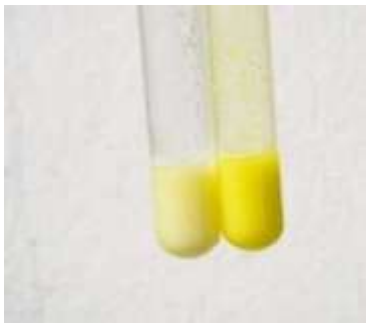
Materials:

1. Glassware : Flask, pipette, test tube
2. Reagent : para-dimethylaminobenzaldehyde (DMAB 1.6% W/V), Ethyl alcohol, concentrated HCL(Dissolved 1.6gm DMAB in 100ml Ethyl alcohol and add 10ml concentrated HCL)
3. Milk sample for test : Sample 1 and Sample 2

Procedure:

- Mix 1ml of milk with 1.6% DMAB reagent
- Then observe the colour

Observation: Distinct yellow (Dark Yellow colour) is indicate as Milk containing added urea. The light yellow (slight yellow) colour indicate natural urea presence in milk.



9. Detection of urea from milk, test tube-1 negative result while test tube-2 shown positive result.

Result: Milk Sample 1 not contain additional urea, Milk Sample 2 contain additional urea.

Conclusion: Milk sample 1 is safe for consuming, Where Milk sample 2 is not consumable.

7.Test for presence of formalin in milk

Aim: Detection of formalin from milk by Hehner's method.

Introduction:

It is a common practice by unscrupulous persons to add preservatives to liquid milk. The addition of preservatives is not permitted under law. Freshly drawn milk get contaminated with microorganisms which proliferate and multiply rapidly in milk. The growth of these microorganisms leads to an increase in acidity and souring of milk, which leads to spoilage. The problem is acute during summer months due to high temperatures. Their use is permissible under law only where sample is stored for testing. Formalin is a solution of 40% formaldehyde in water. By Hehner's test formalin/formaldehyde can be detected in milk.

Principle:

Formalin or formaldehyde forms characteristics violet colour with ferric salt and other oxidizing agents.

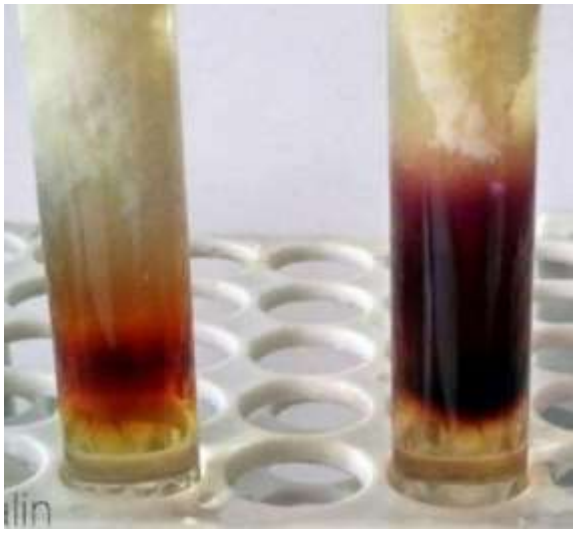
Materials:

4. Glassware: Pipettes, test tube
5. Reagent: concentrated sulphuric acid, 10% ferric chloride solution
6. Milk sample (10ml): Sample-1, Sample-2

Procedure:

- Take clean test tube
- Add 10ml milk sample
- Then add 0.5ml (10%) ferric chloride solution
- Thereafter add 5ml concentrated sulphuric acid from down the slide of test tube to form a separate layer without mixing with milk
- Observe the violet coloured ring formation or not formation.

Observation: If violet coloured ring add the junction of two liquid presence means milk adultrated with formalin.



10. Formalin detection by Hehner's method, Test tube-1 negative result and Test tube-2 positive result indicate.

Result: Milk sample-1 not contain formalin while Milk sample-2 contain formalin.

Conclusion: Milk sample-2 which contain formalin, it may be added for the checks the rise in acidity of milk due to microbial spoilage.

8.Documentation:

Documentation in Food laboratory is one of the most important aspect.

NABL certified lab have a various types of documentation which must be fill accordingly rules and regulation.

Which process at which time and date run, which types of instruments are used in it and last when you provide a result to customer all information is present in documentation.

Two nature documents in food laboratory...

LOG BOOKS

- 1. Sample register / Customer entry book
- 2. Sample entry book
- 3. Sample invert book
- 4. Media preparation book
- 5. Autoclave log book
- 6. Hygrometer log book
- 7. UV light log book
- 8. Incubator log book
- 9. Discard log book

FORMATES

- 1. Draft test record / DTR
- 2. formats for retest and replicate test
- 3. MU format
- 4. Incubator calibration format
- 5. Housekeeping data
- 6. Media verification format
- 7. Bio burden format

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