Government of the People's Republic of Bangladesh
Bangladesh Food Safety Authority
Ministry of Food

BFSA LABORATORY FOOD TEST GUIDELINE

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Introduction

A mobile laboratory, hence thereafter called mobile food safety laboratory, is a laboratory that is transportable by a vehicle and provides opportunity for sampling, testing and analysis of food products. It can be used to test samples in remote areas and in rapid response to an occurrence. But being equipped with basic laboratory infrastructure, mobile food safety laboratories need modified methods to detect and determine adulterants, toxins or microbes in a food sample. Thus, to test parameters related to food safety, specific methods have to be selected and developed.

Scope

The guideline describes the methods of performing analyses of different parameters of food products in the conditions of a mobile food safety laboratory.

Methods

The process of developing and selecting methods for different parameters of food analysis in a mobile laboratory is a complex process. It involves a number of practical as well as technical issues. Many considerations must be taken into account including, but not limited to, method source, level of validation, accuracy, sensitivity, robustness, precision and the practicality of carrying out the analysis in the constraints of a mobile laboratory environment.

Methods selected for testing are to be consistent with the ISO/IEC 17025 standard as much as possible. They shall contain the description of required reagents, equipment, operating procedures, inference of results, safety precaution and reference. However, because of the challenges of conducting the testing in a mobile laboratory, deviations to standards procedures may be introduced in the methods.

The Annex contains the selected methods of food testing in a mobile food safety laboratory.

Testing and Reporting

The analyst shall perform tests on collected food samples using the methods provided in this guideline. The testing shall be done with adherence to good laboratory practices and any necessary improvisation made to the methods has to be documented.

The reporting format shall be in alignment with established ISO/IEC 17025 procedures including indication of test protocols adopted for every test. However, the reporting system should maintain flexibility to allow for the accommodation of additional reporting requirements in accordance with requirements of remote and rapid testing. The reports must be stored both in hard copy forms with soft copy back up.

Reference

- ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories.

Detection of detergents in milk	BFSA_ ML_SOP_01
	Revision Version: 01

1. Scope

This method applies to the detection of detergents in milk.

2. Equipment

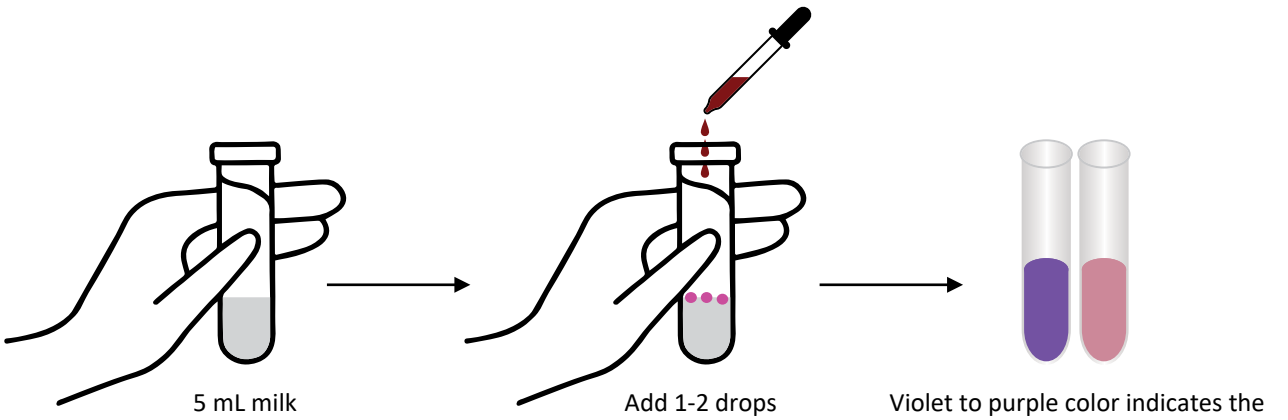
1. Pasteur pipettes / Dropper
2. Test Tube

3. Reagent

1. Bromocresol purple (0.5%): Dissolve 0.5 g of Bromocresol purple in distilled water and dilute to 100 mL.

4. Procedure

1. Take 5 mL of milk sample in a test tube.
2. Add 1-2 drops of 0.5% Bromocresol purple solution.
3. Observe color of the milk



5. Inference / Decision

1. A violet to purple color indicates the presence of detergent in milk.
2. A faint violet color indicates the absence of detergent in milk.

6. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI Manual of Simple Methods for Testing of Common Adulterants in Food – Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- BIS (1961). Indian Standard – Methods of Test for Dairy Industry. Part II Chemical Analysis of Milk (IS 1479 (Part II): 1961)

Detection of Starch and Cereal Flours in Milk	BFSA_ ML_SOP_02
	Revision Version: 01

1. Scope

This method is applicable for the detection of starch and cereal flours in milk.

2. Equipment

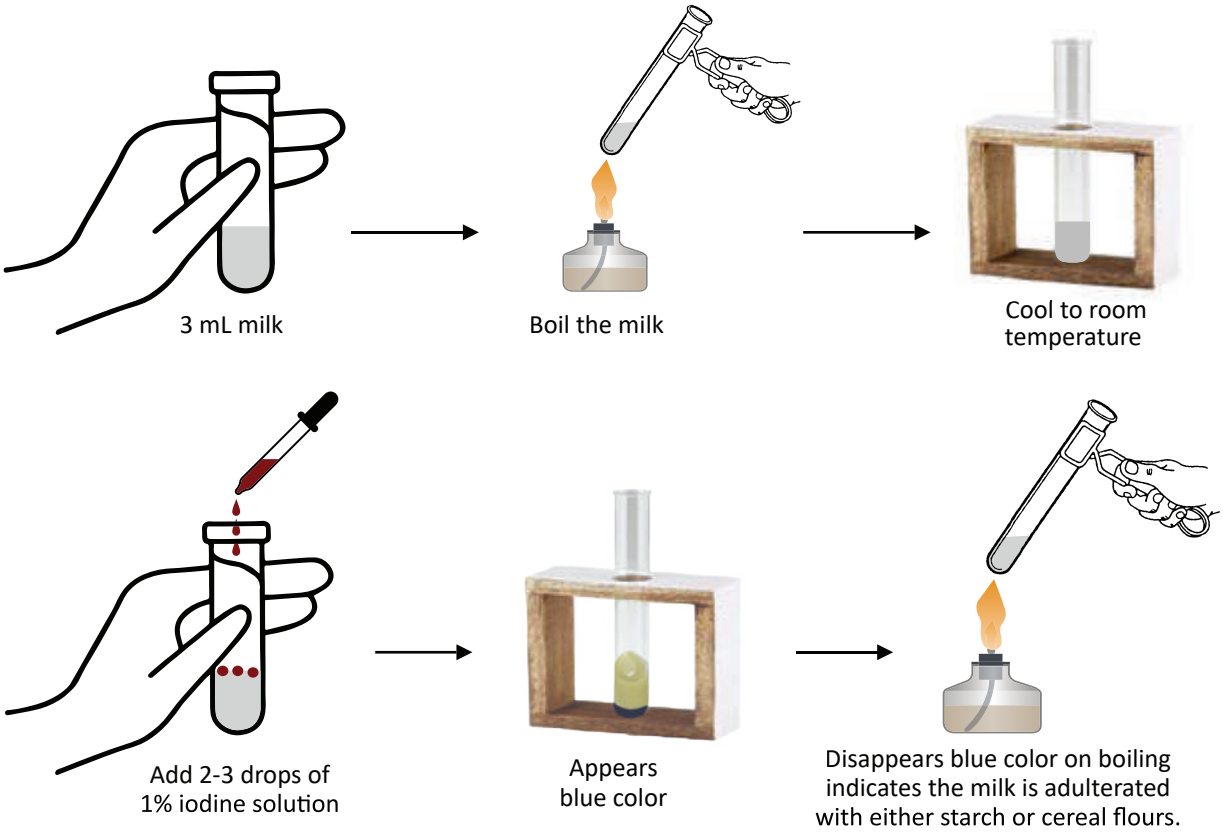
1. Test tube
2. Bunsen burner

3. Reagent

1. Potassium iodide
2. Iodine
3. Iodine solution (1%): Dissolve 2 g of potassium iodide in 20 mL of distilled water; add 1 g of iodine; stir to dissolve then dilute to 100 mL. Store in a dark brown bottle with a dropper cap.

4. Procedure

1. Take about 3 mL of well mixed milk sample in a test tube.
2. Boil the milk over a burner.
3. Cool to room temperature (25±2°C)
4. Add 2-3 drops of 1% iodine solution
5. Observe color of the milk



5. Inference / Decision

1. Appearance of blue or bluish black color which disappears on boiling indicates the milk is adulterated with either starch or cereal flours.
2. Iodine will remain brown in color, if starch is absent.

6. Safety Precautions:

Be careful as you carry out the test, because the iodine solution can stain skin and clothes. Prepare iodine solution in a fume hood.

7. Limit of Detection

The limit of detection of this method is 0.02%

8. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Simple Methods for Testing of Common Adulterants in Food – Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- BIS (1961). Indian Standard – Methods of Test for Dairy Industry. Part II Chemical Analysis of Milk (IS 1479 (Part II): 1961)
- FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products

Detection of Hydrogen Peroxide in Milk	BFSA_ ML_SOP_03
	Revision Version: 01

1. Scope

This method is applicable for the detection of Hydrogen Peroxide in milk.

2. Equipment

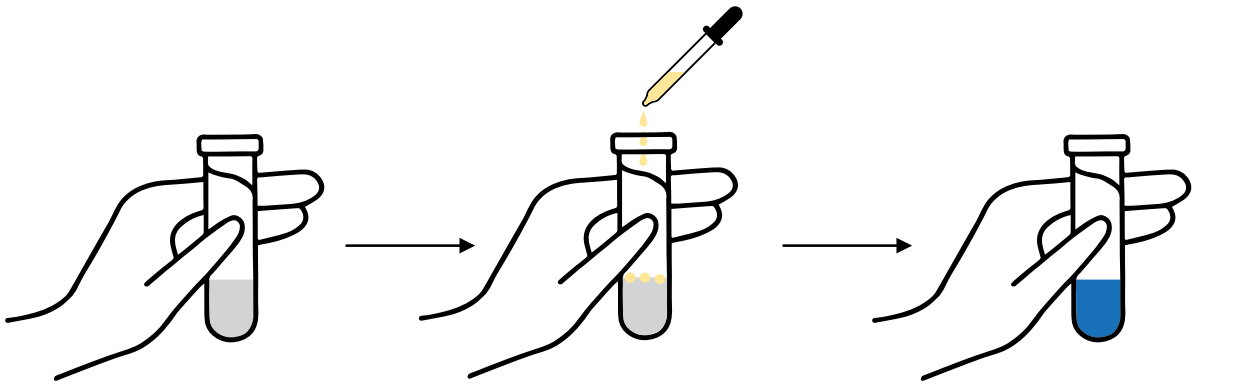
1. Test tube
2. Dropper
3. Pipette

3. Reagent

Para-phenylenediamine solution: Weigh 2.0 g of para-phenylenediamine and dissolve it in distilled water to obtain 100 mL solution i.e., 2% aqueous solution, w/v. Dissolution of para-phenylenediamine in water is difficult and requires thorough mixing. The solution will appear pale yellow and should be freshly prepared.

4. Procedure

1. Take 2 mL of milk sample in a test tube
2. Add 2-5 drops of para-phenylenediamine solution and mix well.
3. Observe the color of the milk



2 mL milk | Add 2-5 drops of para-phenylenediamine solution and mix well | Deep blue color indicates the presence of hydrogen peroxide.

5. Inference / Decision

1. The development of a deep blue color indicates the presence of hydrogen peroxide.
2. No color change indicates the absence of hydrogen peroxide.

Note:

1. Hydrogen peroxide is destroyed in milk when it is heated/pasteurized or stored for a long period. The test may not detect hydrogen peroxide in such milks. High amount of H_2O_2 is known to inactivate peroxidase, it is always advisable to add to the sample an equal volume of raw unpreserved milk and to follow with addition of a few drops of a 0.2% solution of p-phenylenediamine. Under these circumstances a blue color will develop immediately if H_2O_2 has been added to the milk sample.
2. It may be recommended that 0.14% H_2O_2 is suitable to extend the milk shelf-life where milk cooling facilities are not available.

6. Safety Precautions:

p-phenylenediamine is highly toxic. It can cause respiratory distress and renal failure.

Wear protective gloves and safety glasses.

7. Limit of Detection (LOD):

The limit of detection for this method is 0.025% (v/v) H_2O_2 in milk

8. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Simple Methods for Testing of Common Adulterants in Food – Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- (Ref: - IS 1479 (Part I) 1961 (Reaffirmed 2003) Methods of test for Dairy Industry – Rapid Examination of Milk. Bureau of Indian Standards, New Delhi)
- FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products

Detection of Benzoic acid and Sodium Benzoate in Milk	BFSA_ ML_SOP_04
	Revision Version: 01

1. Scope

This method is applicable for the detection of Benzoic acid and Sodium Benzoate in Milk.

2. Equipment

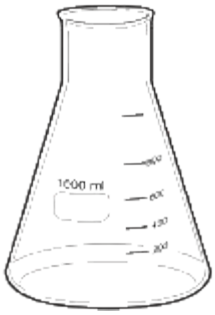
1. Pipette
2. Water bath
3. Dropper
4. Hot plate
5. Porcelain dish
6. Filter paper

3. Reagent

1. HCl (1:3): Add 25 mL of concentrated HCl slowly to 75 mL of water and cooled it in an ice bath.
2. Neutral Ferric chloride solution 0·5 % (w/v): Dissolve 0.5 g of Ferric chloride in distilled water and dilute to 100 mL.
3. Diethyl ether
4. Ammonium hydroxide (sp gr 0·88).
5. Petroleum ether

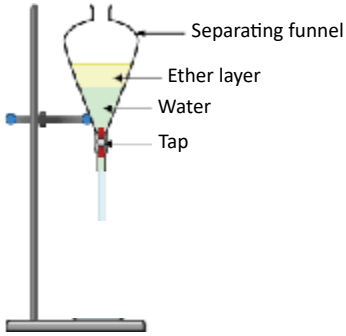
4. Procedure

1. Acidify 100 mL of milk with 5 mL of dilute HCl. Shake until curdled.
2. Filter and extract the filtrate with 50 mL of diethyl ether and shaking.
3. The water and ether layer are allowed to separate in a separating funnel
4. If emulsion is formed and layers do not separate add 10-15 mL petroleum ether (b.p.600 C).
5. The ether layer is carefully removed in a porcelain dish.
6. The ether layer in a porcelain dish is carefully evaporated on a water bath
7. Make alkaline by adding a few drops of NH_4OH solution.
8. Expel the excess of ammonia by evaporation
9. Dissolve the residue in a few mL of hot water.
10. Add a few drops of the neutral ferric chloride solution.
11. Observe the color of the precipitate

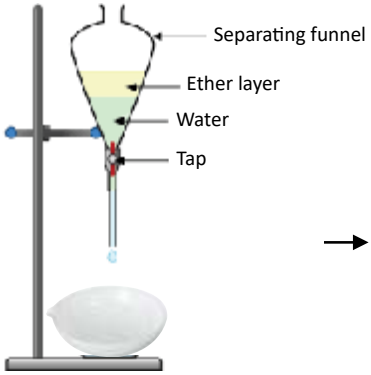


Take 100 mL of milk and acidify with 5 mL dilute HCL then shake until curdled

Filter



Filtrate + 50 mL diethyl ether, shake and allow to separate



Collect ether layer in a porcelain dish

Evaporate on a water bath

Alkaline by adding a few drops of NH_4OH

Evaporate to expel the excess ammonia

Dissolve the residue with few mL of hot water

Add few drops of neutral ferric chloride solution

Salmon pink colored precipitate indicates the presence of benzoic acid

5. Inference / Decision

1. A salmon pink colored precipitate indicates the presence of benzoic acid.
2. No color change is observed in pure milk sample

6. Safety Precautions:

Take care while handling concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents. Do not inhale Ammonium hydroxide directly.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Simple Methods for Testing of Common Adulterants in Food – Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- BIS (1961). Indian Standard – Methods of Test for Dairy Industry. Part II Chemical Analysis of Milk (IS 1479 (Part II): 1961)
- FSSAI MANUAL FOR ANALYSIS OF MILK AND MILK PRODUCT (2016) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of urea in Milk	BFSA_ ML_SOP _05
	Revision Version: 01

1. Scope

This method is applicable for the detection of urea in Milk.

2. Equipment

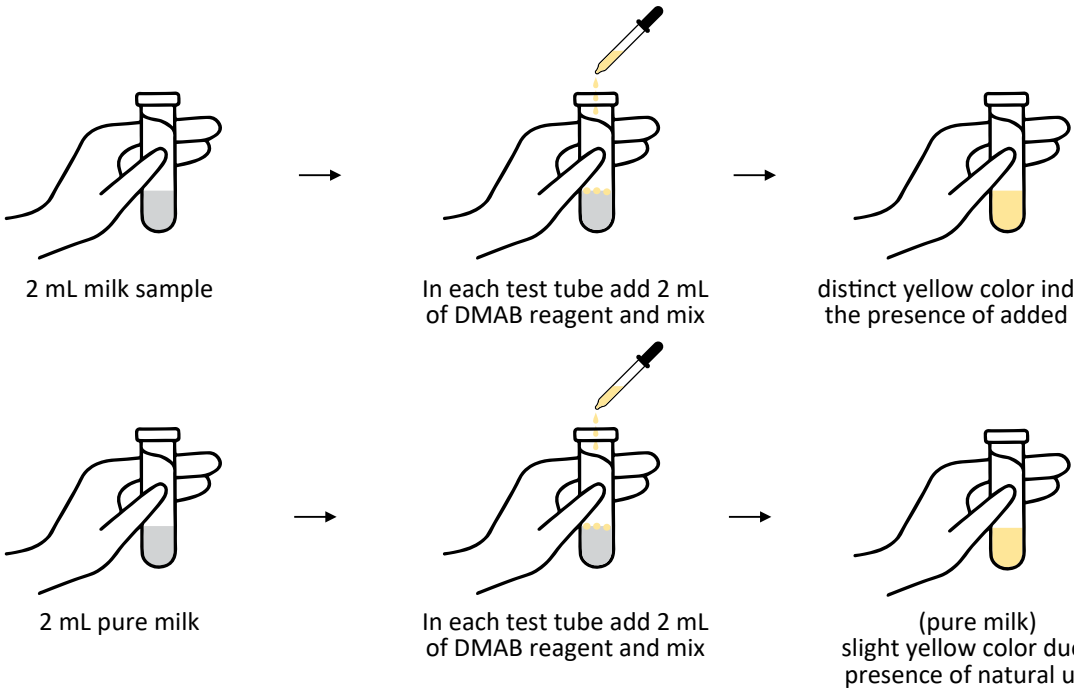
1. Test tube

3. Reagent

1. p-Dimethylaminobenzaldehyde (DMAB) reagent (1.6%, w/v): Dissolve 1.6 g of DMAB in small amount of ethanol (95%), add 10 mL of concentrated HCl and dilute to 100 mL with ethanol. The reagent is stable for one month.
2. Ethyl alcohol
3. Concentrate HCl.

4. Procedure

1. Take 2 mL of milk sample in a test tube.
2. Take 2 mL of pure milk (known to be free from added urea) in another test tube.
3. In each test tube add 2 mL of DMAB reagent and mix.
4. Observe the color change in both tubes.



5. Inference / Decision

1. A distinct yellow color is observed in milk containing added urea.
2. The control (pure milk) shows a slight yellow color due to presence of natural urea.

6. Limit of detection (LOD):

Limit of detection for this method is 0.2% (w/v)

7. Safety Precautions:

Take care while handling concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

Note: Concentration of urea in natural milk varies from 0.2 -0.7 g/L. Maximum allowable limit for urea in milk is 70 mg/100 mL.

8. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Simple Methods for Testing of Common Adulterants in Food – Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- BIS (1961). Indian Standard – Methods of Test for Dairy Industry. Part II Chemical Analysis of Milk (IS 1479 (Part II): 1961)
- FSSAI MANUAL FOR ANALYSIS OF MILK AND MILK PRODUCT (2016) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Vanaspati/Hydrogenated Edible Fat in Ghee	BFSA_ ML_SOP _06
	Revision Version: 01

1. Scope

This method is applicable for the detection of Vanaspati/Hydrogenated Edible Fat in Ghee.

2. Equipment

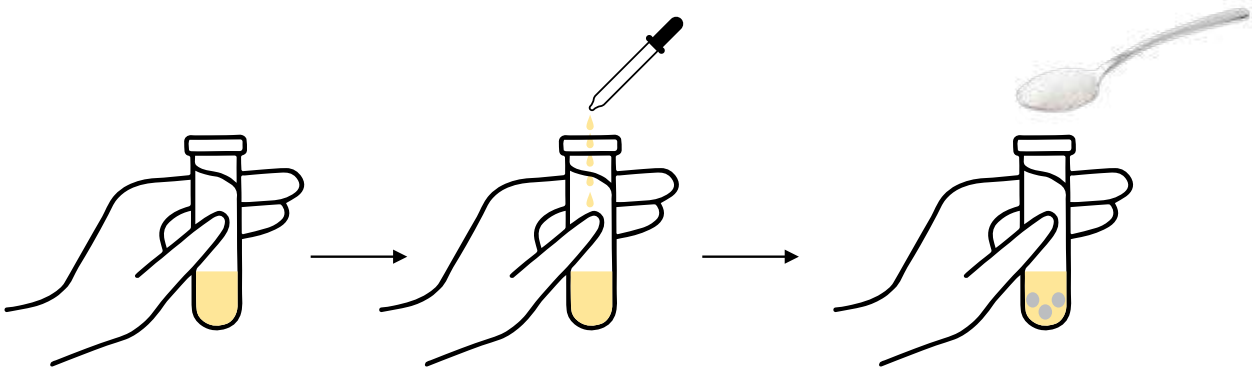
1. Test tube
2. Bunsen burner
3. Tea spoon

3. Reagent

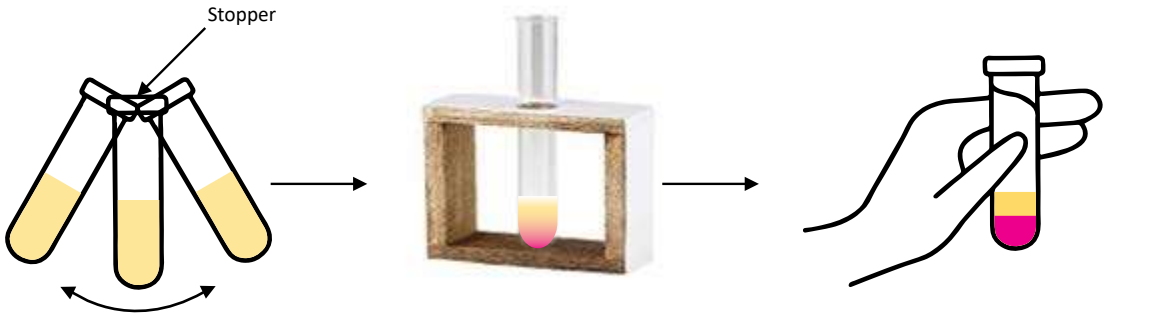
1. Fuming HCl
2. Sugar (Sucrose)

4. Procedure

1. Take 5 mL melted ghee in a test tube then add 5 mL conc. HCl
2. Add half tea spoon table (cane) sugar.
3. Stopper and shake vigorously for 2 minutes and allow the mixture to separate.
4. The development of red (crimson) or pink color in acid layer indicates the presence of vanaspati/Hydrogenated Edible Fat.
5. This is confirmed by adding 5 mL water and shaking again.
6. If color in acid layer persists, vanaspati/Hydrogenated Edible Fat is added.

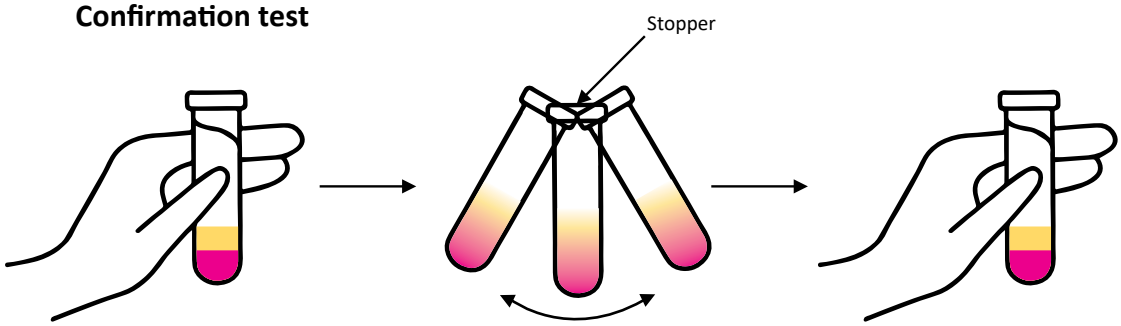


Take 5 mL melted ghee | Add 5 mL conc. HCl | Add half tea spoon table (cane) sugar



Stopper and shake vigorously for 2 minutes | Allow the mixture to separate | Red (crimson) or pink color in acid layer indicates the presence of vanaspati/sesame oil

Confirmation test



Add 5 mL water | Stopper and shake vigorously for 2 minutes | Color in acid layer persists, sesame oil/vanaspati is added

5. Inference / Decision

1. Persistent pink (crimson) color in acid layer indicates that vanaspati/Hydrogenated Edible Fat added
2. Absence of pink color indicates absence of Vanaspati/Hydrogenated Edible Fat

Note: The test does not differentiate between sesame oil and vanaspati. Some Coal Tar dyes also give the pink color with dilute HCl. If the test is positive i.e., the crimson g develops with adding Conc. HCl and without adding sugar, then the sample is adulterated with coal tar dyes.

6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FAO (2009). Milk Testing and Payment Systems Resource Book – A Practical Guide to Assist Milk Producer Groups. FAO, Rome. Pp. 38-43.
- FSSAI MANUAL FOR ANALYSIS OF MILK AND MILK PRODUCT (2016) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- BIS (2006). Indian Standard: Quick methods for Detection of Adulterants/Contaminants in Common Food Products – Chemical methods (IS 15642 (Part 2): 2006)
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of sesame oil in Ghee	BFSA_ ML_SOP _07
	Revision Version: 01

1. Scope

This method is applicable for the detection of sesame oil in Ghee.

2. Equipment

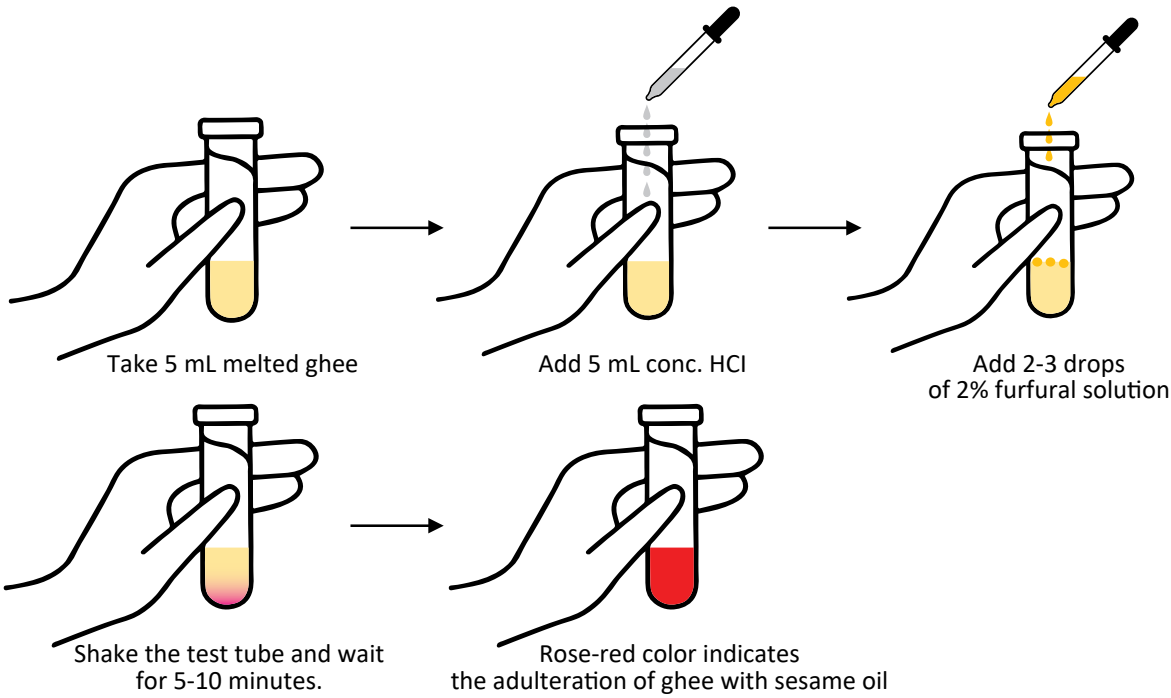
1. Test tube
2. Spatula
3. Bunsen burner

3. Reagent

1. Furfural solution (2%)
2. Concentrated HCl

4. Procedure

1. Take 5 mL of melted ghee in a test tube.
2. Add 5 mL of conc. HCl.
3. Add 2-3 drops of 2% furfural solution in alcohol
4. Shake the test tube well and keep it for 5 - 10 minutes.



5. Inference / Decision

Appearance the rose-red color indicates the adulteration of ghee with sesame oil.

6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FAO (2009). Milk Testing and Payment Systems Resource Book – A Practical Guide to Assist Milk Producer Groups. FAO, Rome. Pp. 38-43.
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Detection of Coal Tar Dyes in Ghee, Butter, Khoa, Cheese, Condensed Milk, Milk Powder	BFSA_ ML_SOP _08
	Revision Version: 01

1. Scope

This method is applicable for the detection of Coal Tar Dyes in Ghee, Butter, Khoa, Cheese, Condensed Milk, Milk Powder.

2. Equipment

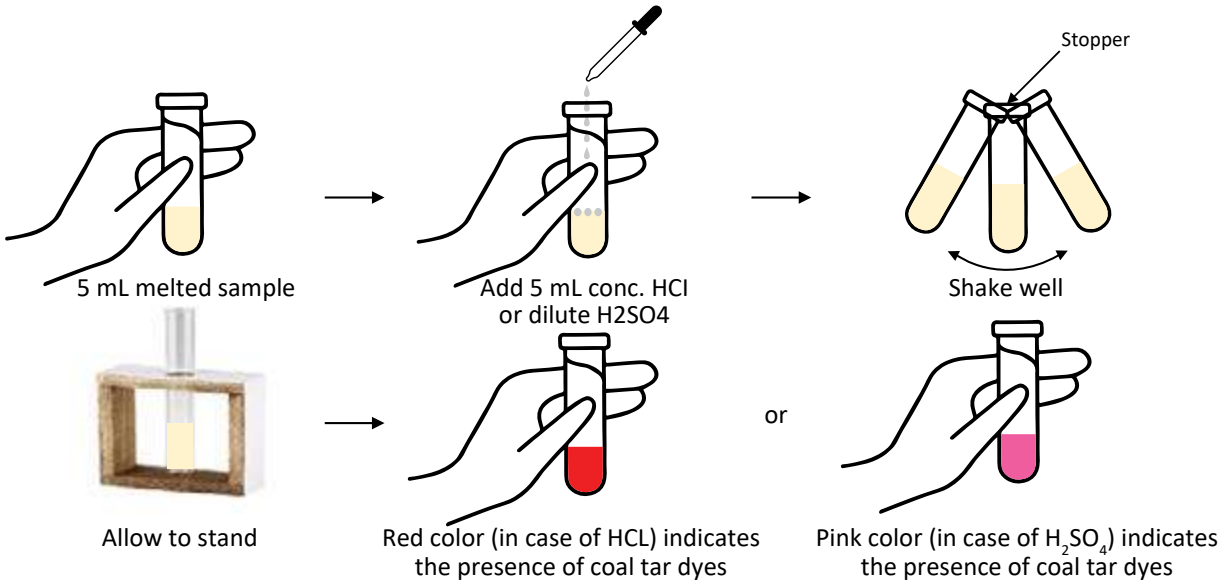
1. Test tube
2. Bunsen burner
3. Spatula
4. Test tube holder
5. Pipette

3. Reagent

1. Concentrated HCl
2. Dilute H_2SO_4

4. Procedure

1. Take one full teaspoon (5 mL) of melted sample in a test tube.
2. Add 5 mL of concentrated HCl or dilute H_2SO_4.
3. Shake well and allow it to stand.
4. Observe the color.



5. Inference / Decision

Appearance of crimson (red) color (in case of HCL) and pink color (in case of H_2SO_4) indicates the presence of coal tar dyes.

6. Safety Precautions:

Take care while handling Concentrated HCl and H_2SO_4. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Milk and Milk Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI MANUAL FOR ANALYSIS OF MILK AND MILK PRODUCT (2016) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- BIS (2006). Indian Standard: Quick methods for Detection of Adulterants/Contaminants in Common Food Products – Chemical methods (IS 15642 (Part 2):2006)
- IS 15642 (Parts 1 and 2):2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.
- FAO (2009). Milk Testing and Payment Systems Resource Book – A Practical Guide to Assist Milk Producer Groups. FAO, Rome. Pp. 38-43.

Detection of mashed potatoes, sweet potatoes and other starches in ghee/butter	BFSA_ ML_SOP _09
	Revision Version: 01

1. Scope

This method is applicable for the detection of mashed potatoes, sweet potatoes and other starches in ghee/ butter.

2. Equipment

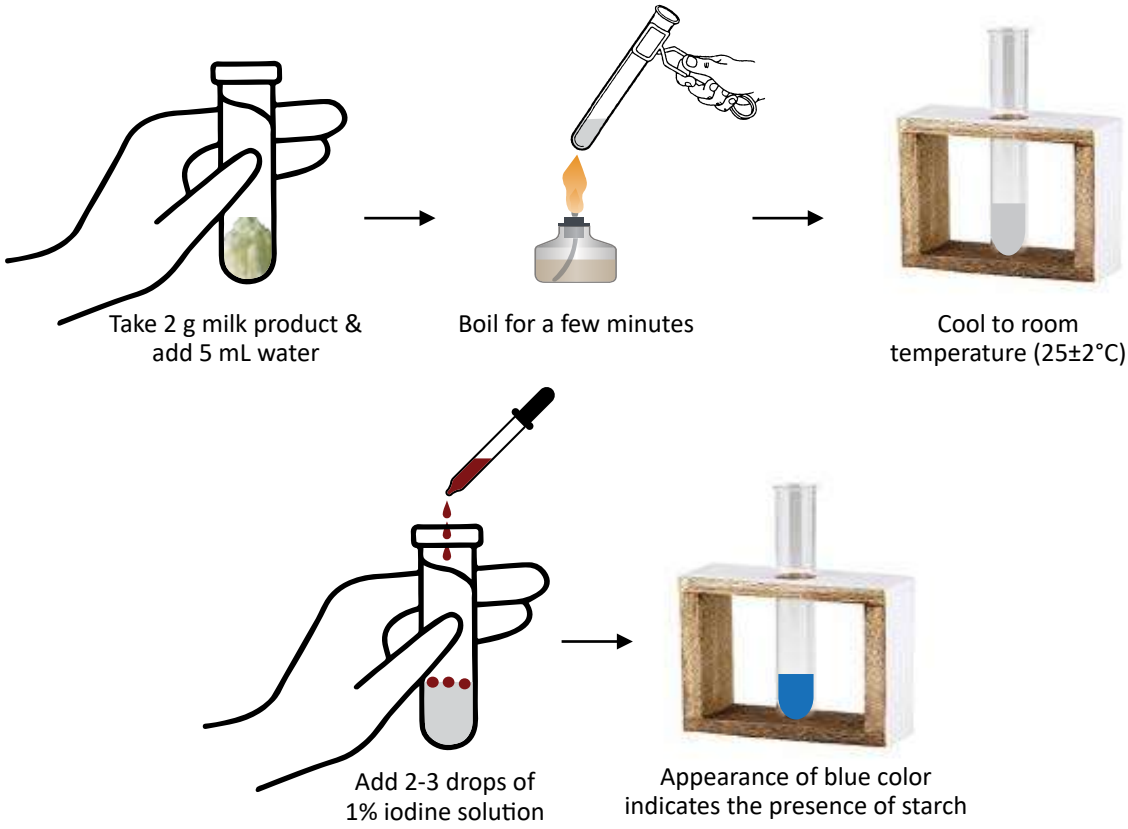
1. Test tube
2. Bunsen burner
3. Tea spoon
4. Pipette
5. Measuring cylinder (Graduated)
6. Balance
7. Amber bottle
8. Glass rod (Stirrer)

3. Reagent

1. Potassium iodide
2. Iodine
3. Iodine solution (1%): Dissolve 2 g of potassium iodide in 20 mL of distilled water; add 1 g of iodine; stir to dissolve then dilute to 100 mL. Store in a dark brown bottle with a dropper cap. Prepare in a fume hood.

4. Procedure

1. Take about 2 g of milk product in a test-tube
2. Add about 5 mL of water and boil for a few minutes
3. In case of butter and ghee melt the sample.
4. Cool to room temperature (25±2°C)
5. Add 2-3 drops of 1% iodine solution
6. Observe the color



5. Inference / Decision

The appearance of a blue color indicates the presence of starch

6. Safety Precautions:

Be careful as you carry out the test because the iodine solution can stain skin and clothes. Prepare iodine solution in a fume hood.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Cereals and Cereal Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI MANUAL FOR ANALYSIS OF MILK AND MILK PRODUCT (2016) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of chalk powder in turmeric powder	BFSA_ ML_SOP _10
	Revision Version: 01

1. Scope

This method is applicable for the detection of chalk powder in turmeric powder.

2. Equipment

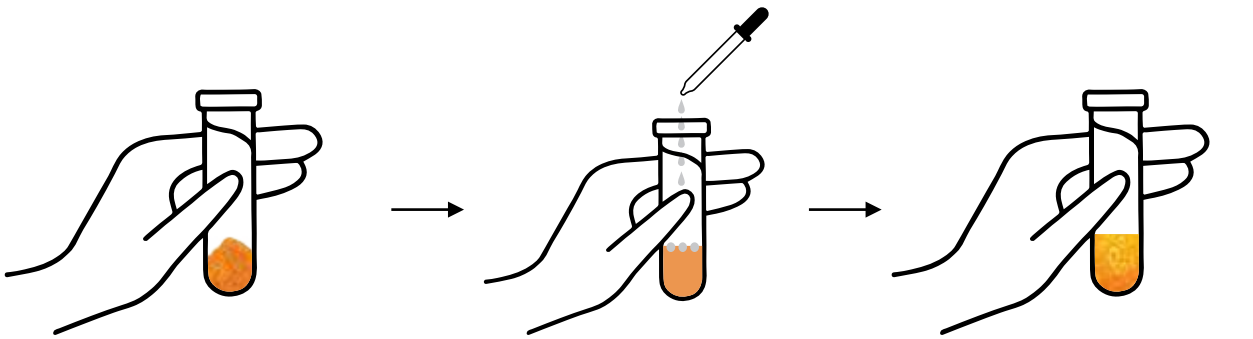
1. Test tube
2. Spatula

3. Reagent

1. Concentrated HCl

4. Procedure

1. Take about 2 g of turmeric powder in a test tube.
2. Add few drops of water and then few drops of concentrated Hydrochloric acid to it.



5. Inference / Decision

Effervescence will indicate the presence of chalk powder

6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products

Detection of Lead Chromate in Turmeric Powder	BFSA_ ML_SOP _11
	Revision Version: 01

1. Scope

This method is applicable for the detection of Lead Chromate in Turmeric Powder

2. Equipment

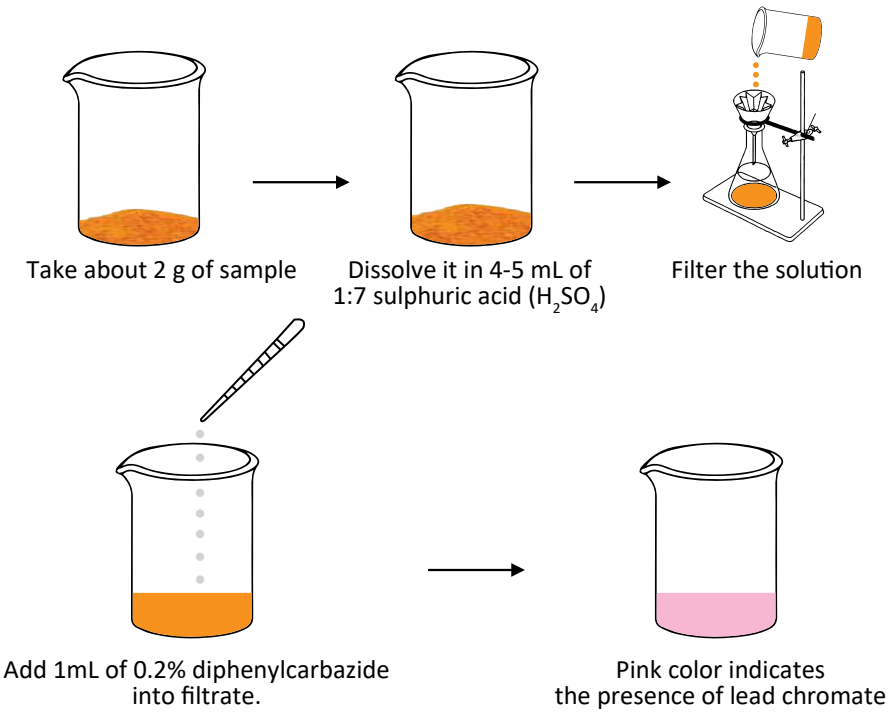
1. Pasteur pipettes/ Dropper

3. Reagent

1. 1:7 H_2SO_4 solution: Add 10 mL of concentrated H_2SO_4 carefully to 70 mL of distilled water.
2. Diphenylcarbazide (0.2%): Weigh 200 mg of Diphenylcarbazide and dissolve in 100 mL of 95% alcohol.
3. Ethyl alcohol

4. Procedure

1. Ash about 2 g of the sample.
2. Dissolve it in 4-5 mL of 1:7 sulphuric acid (H_2SO_4) and filter.
3. Add 1 mL of 0.2% diphenylcarbazide into filtrate.
4. Observe any change in color



5. Inference / Decision

A pink color indicates the presence of lead chromate.

6. Safety Precautions:

Take care while handling Concentrated H_2SO_4. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Metanil Yellow in Turmeric Powder	BFSA_ ML_SOP _12
	Revision Version: 01

1. Scope

This method is applicable for the detection of Metanil Yellow in Turmeric Powder.

2. Equipment

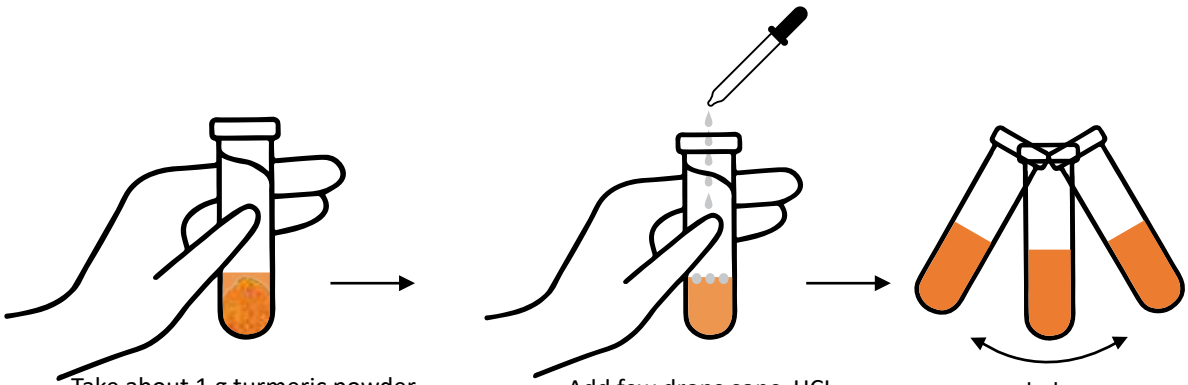
1. Test tube
2. Dropper

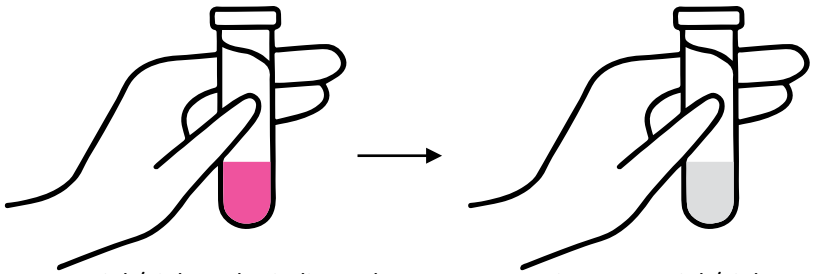
3. Reagent

1. Concentrated HCl.

4. Procedure

1. Take about 1 g turmeric powder in a test tube.
2. Add 5 mL of water.
3. Add a few drops of concentrated hydrochloric acid, and shake it.
4. Observe any change in color





5. Inference / Decision

1. Appearance of pink/violet color which disappears on dilution with water shows the presence of unadulterated turmeric.
2. If the color persists, indicates the presence of metanil yellow.

6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Lead Salts (yellow lead) in Turmeric powder	BFSA_ ML_SOP _13
	Revision Version: 01

1. Scope

This method is applicable for the detection of Lead Salts (yellow lead) in turmeric powder.

2. Equipment

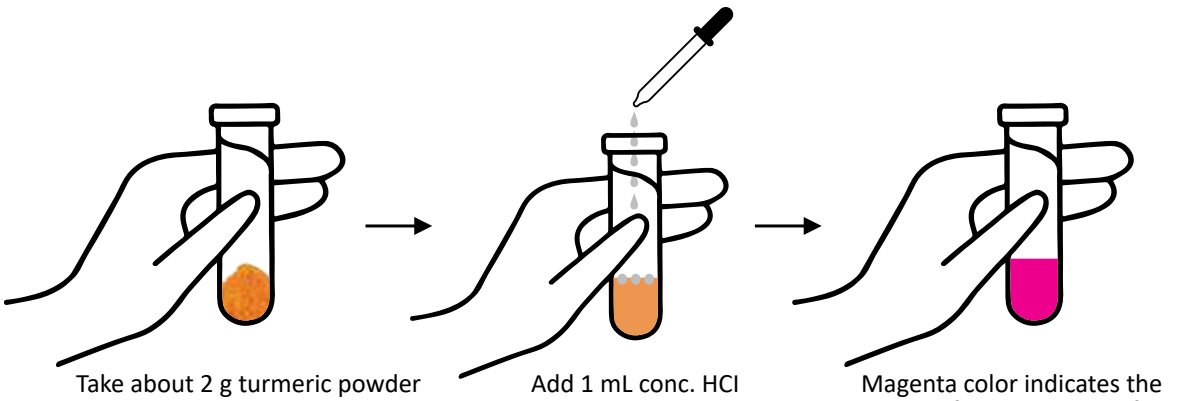
1. Test tube
2. Dropper

3. Reagent

1. Concentrated HCl.

4. Procedure

1. Take about 2 g of turmeric powder in a test tube.
2. Add 1 mL concentrated HCl.
3. Observe the change in color



Take about 2 g turmeric powder | Add 1 mL conc. HCl | Magenta color indicates the presence of yellow oxides of lead

5. Inference / Decision

The appearance of magenta color shows the presence of yellow oxides of lead in turmeric powder.

6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Added Starch in Powdered Spices other than Turmeric Powder	BFSA_ ML_SOP _14
	Revision Version: 01

1. Scope

This method is applicable for the detection of added starch in powdered spices other than turmeric Powder.

2. Equipment

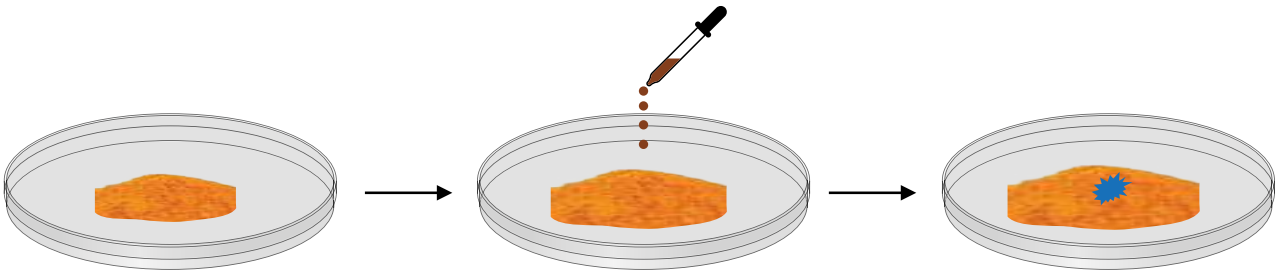
1. Petri dish
2. Spatula

3. Reagent

1. Iodine solution (1%): Dissolve 2 g of potassium iodide in 20 mL of distilled water; add 1 g of iodine; stir to dissolve then dilute to 100 mL. Store in a dark brown bottle with a dropper cap. Prepare in a fume hood.
2. Potassium iodide
3. Iodine

4. Procedure

1. Add a few drops of iodine solution to the spice powder in a petri dish.
2. Observe the development of blue color if any.



Take some spice powder | Add a few drops of Iodine solution | Blue color indicate the presence of starch

5. Inference / Decision

A blue color shows the presence of starch.

6. Safety Precautions:

Be careful as you carry out the test, because the iodine solution can stain skin and clothes. Prepare iodine solution in a fume hood.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Brick Powder in Chili Powder	BFSA_ ML_SOP _15
	Revision Version: 01

1. Scope

This method is applicable for the detection of Brick Powder in Chili Powder.

2. Equipment

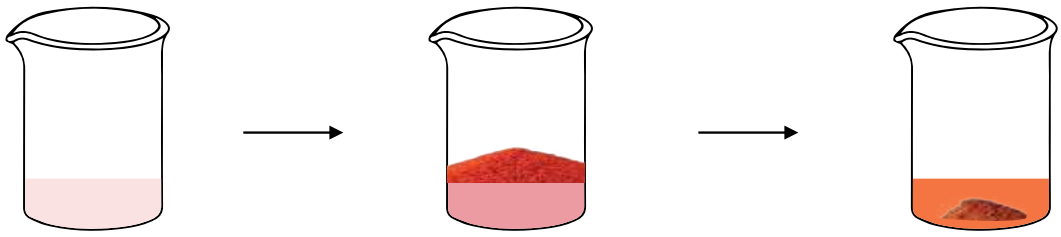
1. Beaker 100 mL
2. Spatula

3. Reagent

1. Chloroform
2. Carbon tetrachloride
3. Chloroform-Carbon tetrachloride mixture: Mix equal volumes of the two solvents

4. Procedure

1. Take chloroform-Carbon tetra chloride mixture in a beaker
2. Pour the sample in a beaker containing a mixture of chloroform and carbon tetrachloride.
3. Observe the bottom of the beaker.



Take Chloroform-Carbon tetrachloride mixture

Pour the sample in a beaker containing Chloroform-Carbon tetrachloride mixture

Brick powder and dirt will settle at the bottom

5. Inference / Decision

Brick powder and dirt will settle at the bottom.

6. Safety Precautions:

Chloroform and Carbon tetrachloride are suspect carcinogens. Avoid inhaling vapor and contact with eyes, skin and clothing. Use only with adequate ventilation.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Oil Soluble Color in Chili Powder	BFSA_ ML_SOP _16
	Revision Version: 01

1. Scope

This method is applicable for the detection of Oil Soluble Color in Chili Powder.

2. Equipment

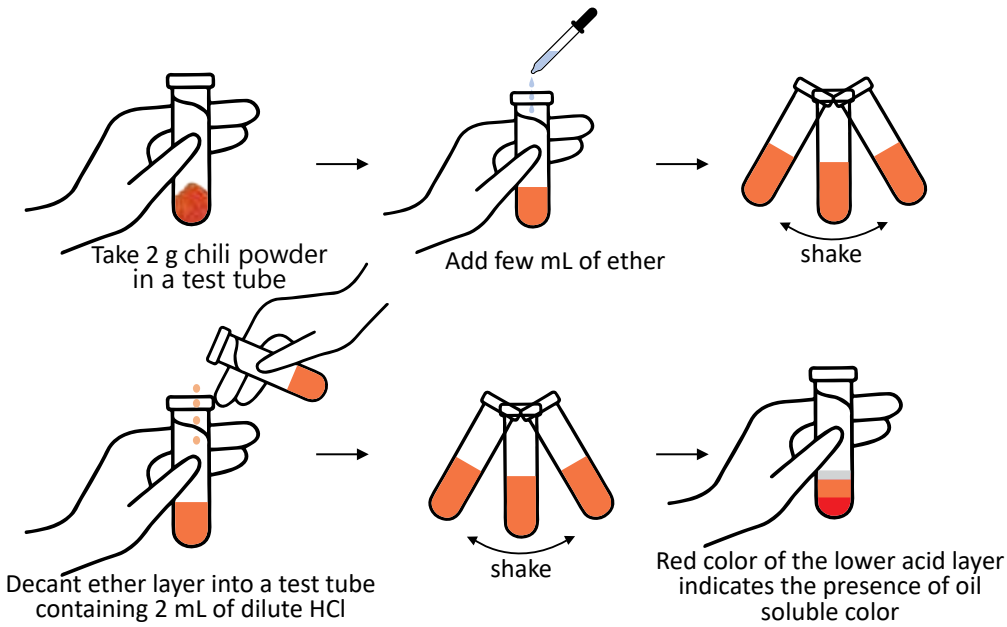
1. Test tube
2. Balance
3. Spatula
4. Graduated pipette
5. Beaker

3. Reagent

1. 50% HCl: Add 50 mL of concentrated HCl to 50 mL of distilled water.
2. Petroleum ether.

4. Procedure

1. Take 2 g of the sample in a test tube.
2. Add few mL of ether and shake.
3. Decant ether layer into a test tube containing 2 mL of dilute HCl (50%) and shake.
4. Observe color of the lower acid layer



5. Inference / Decision

Red color of the lower acid layer indicates the presence of oil soluble color.

6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents. Petroleum ether is highly flammable. Store away from open flame.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Rhodamine B in Chili Powder	BFSA_ ML_SOP _17
	Revision Version: 01

1. Scope

This method is applicable for the detection of Rhodamine B in Chili Powder

2. Equipment

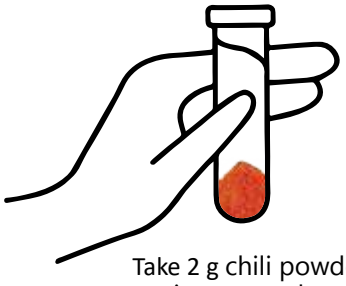
1. Test tube
2. Spatula
3. Graduated pipette
4. Balance

3. Reagent

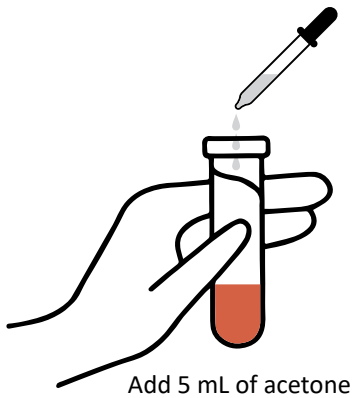
1. Acetone

4. Procedure

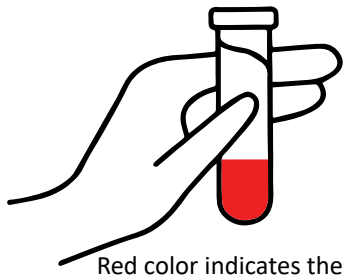
1. Take 2 g sample in a test tube.
2. Add 5 mL of acetone.
3. Observe color of acetone layer.



Take 2 g chili powder in a test tube



Add 5 mL of acetone



Red color indicates the presence of Rhodamine-B

5. Inference / Decision

Immediate appearance of red color indicates the presence of Rhodamine-B.

6. Safety Precautions:

Acetone is highly flammable solvent. Keep away from open flame. Store in appropriate cabinet.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of red lead salts in chili powder	BFSA_ ML_SOP _18
	Revision Version: 01

1. Scope

This method is applicable for the detection of red lead salts in chili powder.

2. Equipment

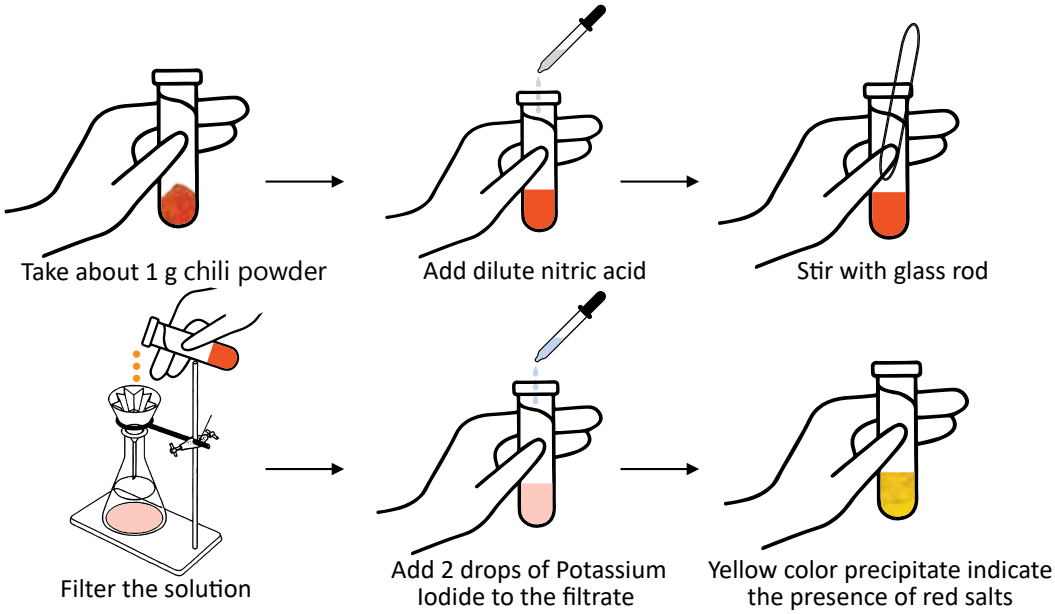
1. Test tube
2. Spatula
3. Glass rod
4. Filter paper
5. Beaker

3. Reagent

1. Nitric acid (Dilute): Add 50 mL of concentrated HNO_3 to 50 mL of distilled water.
2. Potassium iodide solution

4. Procedure

1. Take about 1 g chili powder in a beaker/test tube.
2. Add dilute nitric acid to the sample and stir with glass rod.
3. Filter the solution.
4. Add 2 drops of Potassium Iodide to the filtrate.
5. Observe the precipitate into the filtrate.



5. Inference / Decision

If formation of yellow colored precipitate indicate the presence of red salts.

6. Safety Precautions:

Nitric acid is highly corrosive. Exposure to nitric acid can cause irritation to the eyes, skin, and mucous membrane; it can also cause delayed pulmonary edema, pneumonitis,bronchitis, and dental erosion. Use in ventilated areas. Wearing compatible gloves, safety goggles, and a lab coat. Avoid contact with metals.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Spices and Condiments (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2): 2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of papaya seeds in black pepper	BFSA_ ML_SOP _19
	Revision Version: 01

1. Scope

This method is applicable for detecting the adulteration of black pepper with papaya seeds.

2. Principle:

Papaya seeds float in ethyl alcohol of 0.8 sp. gr. along with immature seeds and light berries whereas mature seeds of black pepper sink.

3. Equipment

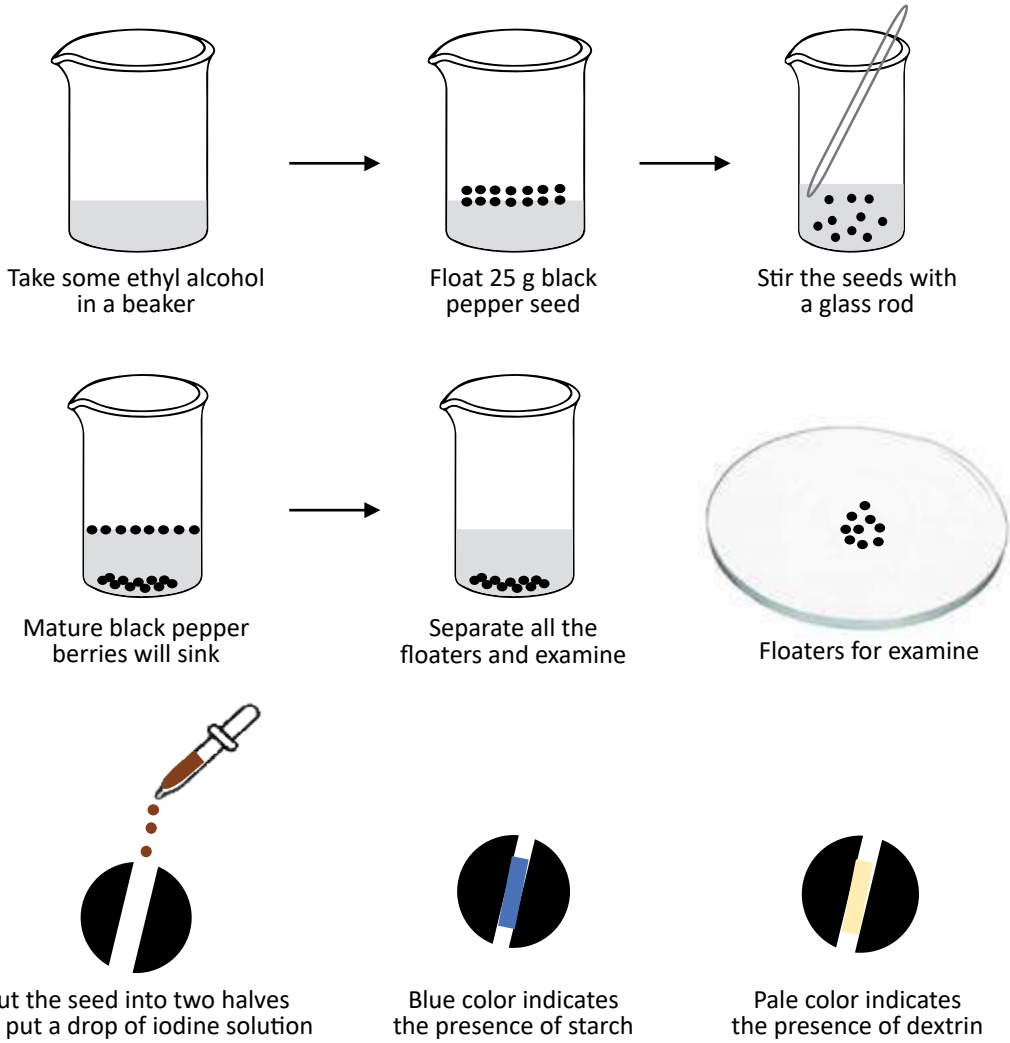
1. Beaker
2. Glass rod
3. Knife

4. Reagent / Chemicals

1. Ethyl alcohol (Specific gravity 0.8)
2. Iodine solution : Dissolve 2 g of potassium iodide in 20 mL of distilled water; add 0.2 g of iodine; stir to dissolve then dilute to 100 mL with alcohol. Store in a dark brown bottle with a dropper cap.

5. Procedure

1. Weigh about 25 g of black pepper seed
2. Float the sample in ethyl alcohol of sp. gr. 0.8,
3. Stir the seeds with a glass rod
4. Mature black pepper berries will sink
5. Separate all the floaters and examine
6. Cut the seed into two halves and put a drop of iodine solution.
7. Observe the developed color



6. Inference / Decision

1. A blue color indicates it is pepper due to the presence of starch
2. A pale color indicates it is papaya, due to the presence of dextrin
3. Papaya is a dicot; a thin line partition shows two cotyledons.
4. Pepper is a monocot, the seed halves will show a central hole

7. Safety Precautions

Be careful as you carry out the test, because the iodine solution can stain skin and clothes.Prepare iodine solution in a fume hood.

8. Reference

- Manual Methods of Analysis for Adulterants and Contaminants in Foods I.C.M.R. 1990, page23.
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- FSSAI Manual of Methods of Analysis of Foods – Spices, Herbs and Condiments (2021) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- Pearsons' Composition and Analysis of Food 9th Edition

Detection of Common Salt in Coriander Powder	BFSA_ ML_SOP _20
	Revision Version: 01

1. Scope

This method is applicable for the detection of Common Salt in Coriander Powder.

2. Equipment

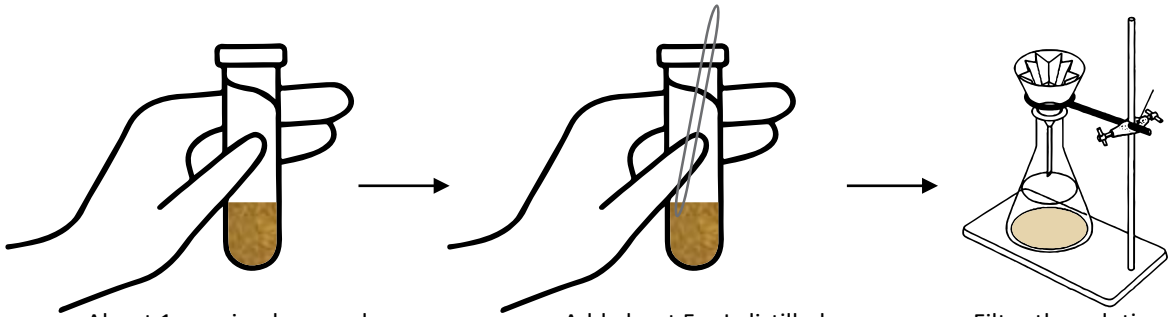
1. Test tube
2. Beaker
3. Glass rod

3. Reagent /Chemicals

Silver nitrate (0.1 M): Weigh 1.7 g of silver nitrate and dissolve in 100 mL distilled water. Store in an amber-colored bottle.

4. Procedure

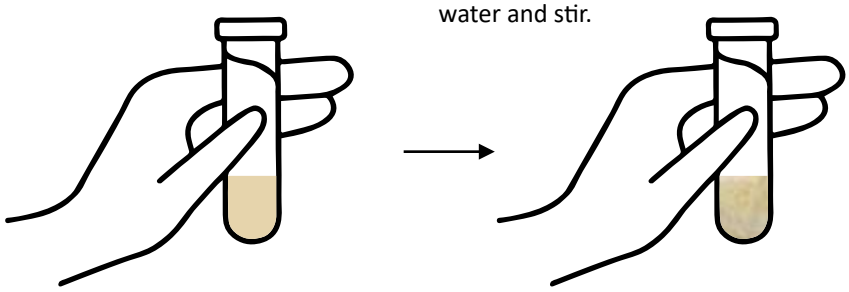
1. Take about 1 g coriander powder in a beaker/test tube.
2. Add about 5 mL distilled water in it and stir.
3. Filter the solution.
4. Add a few drops of silver nitrate reagent to the filtrate.
5. Look for a white precipitate



About 1 g coriander powder

Add about 5 mL distilled water and stir.

Filter the solution.



Add a few drops of silver nitrate solution to the filtrate

A white precipitate indicates the presence of sodium chloride.

5. Inference / Decision

A white precipitate indicates the presence of sodium chloride.

6. Safety Precautions

Silver nitrate causes severe skin burns and eye damage; very toxic to aquatic life. Avoid contact with skin and eyes. Avoid inhalation. Silver nitrate should be stored in sealed containers or packages and not exposed to light.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Spices, Herbs and Condiments (2021) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI Manual of Simple Methods for Testing of Common Adulterants in Food – Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- Pearsons' Composition and Analysis of Food 9th Edition
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products.

Detection of Rancidity in Edible Oil and Fat	BFSA_ ML_SOP _21
	Revision Version: 01

1. Scope

This method is applicable for the detection of Rancidity in Edible Oil and Fat.

2. Equipment

1. Graduated pipette
2. Test tube
3. Balance
4. Spoon
5. Bunsen burner

3. Reagent

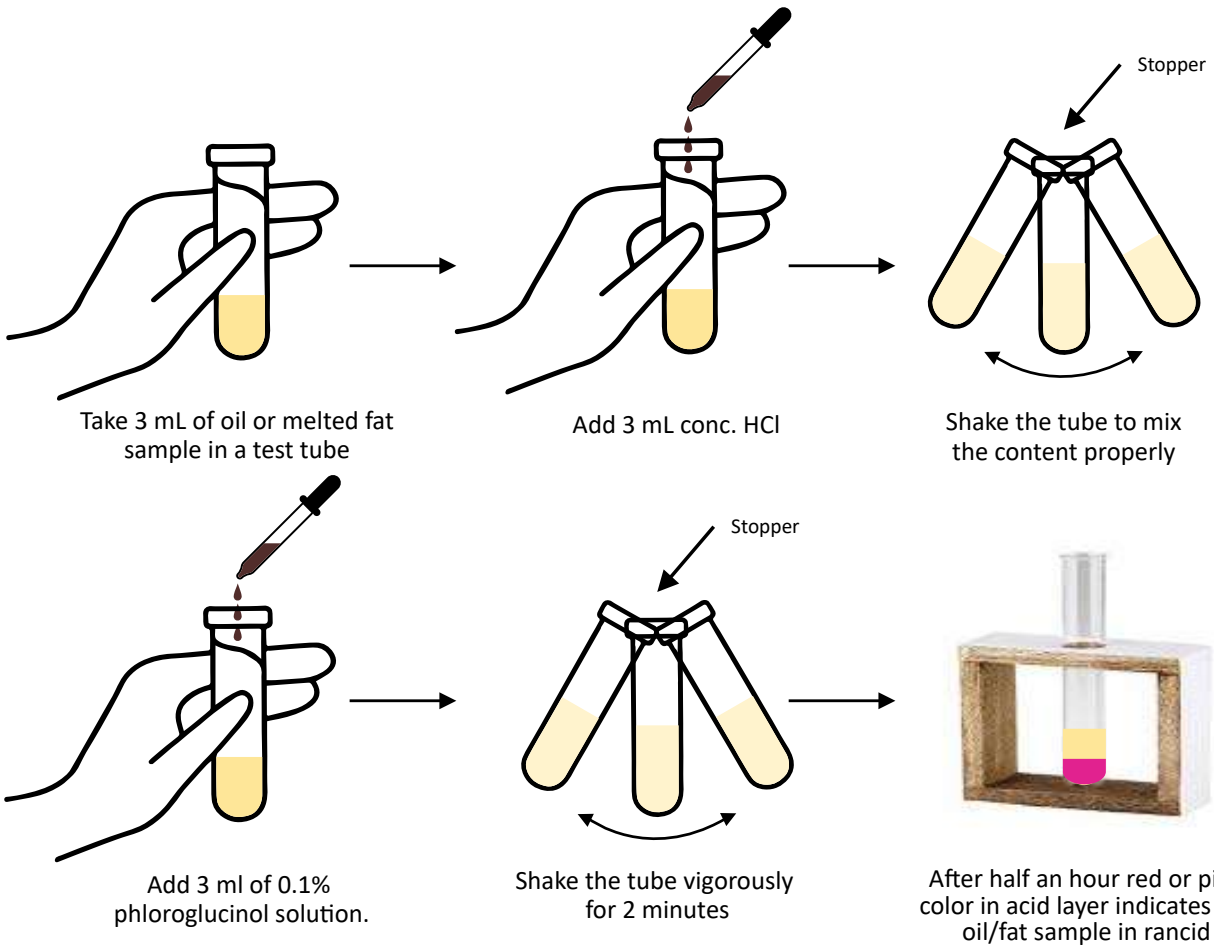
1. Phloroglucinol solution (0.1%): Dissolve 100 mg Phloroglucinol powder into 100 mL diethyl ether. Store in dark and cool place. Prepare the solution freshly before use.
2. Diethyl ether
3. Concentrated HCl.

4. Procedure

1. Take 3 mL of oil or melted fat sample in a test tube
2. Add 3 mL of concentrated hydrochloric acid into it.
3. Shake the tube to mix the content properly.
4. Add 3 mL of 0.1% phloroglucinol solution.
5. Shake the tube vigorously for 2 minutes and keep it aside.
6. Examine the tube after half an hour.

5. Inference / Decision

1. A red or pink coloration in acid layer indicates that the oil/fat sample in rancid
2. The absence of color development indicates the oil is not rancid



6. Safety Precautions:

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 “Indian Standard Methods of Sampling And Test For Oilsand Fats Part II Purity Test (Third Revision)
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in CommonFood Products
- Azadmard-Damirchi and Torbati, Adulterations in Some Edible Oils and Fats and Their Detection Methods, Journal of Food Quality and Hazards Control 2 (2015) 38-44
- Shukla, AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324

Detection of Argemone Oil in edible oil/fat	BFSA_ ML_SOP _22
	Revision Version: 01

1. Scope

This method is applicable for the detection of Argemone Oil in edible oil/ fat.

2. Equipment

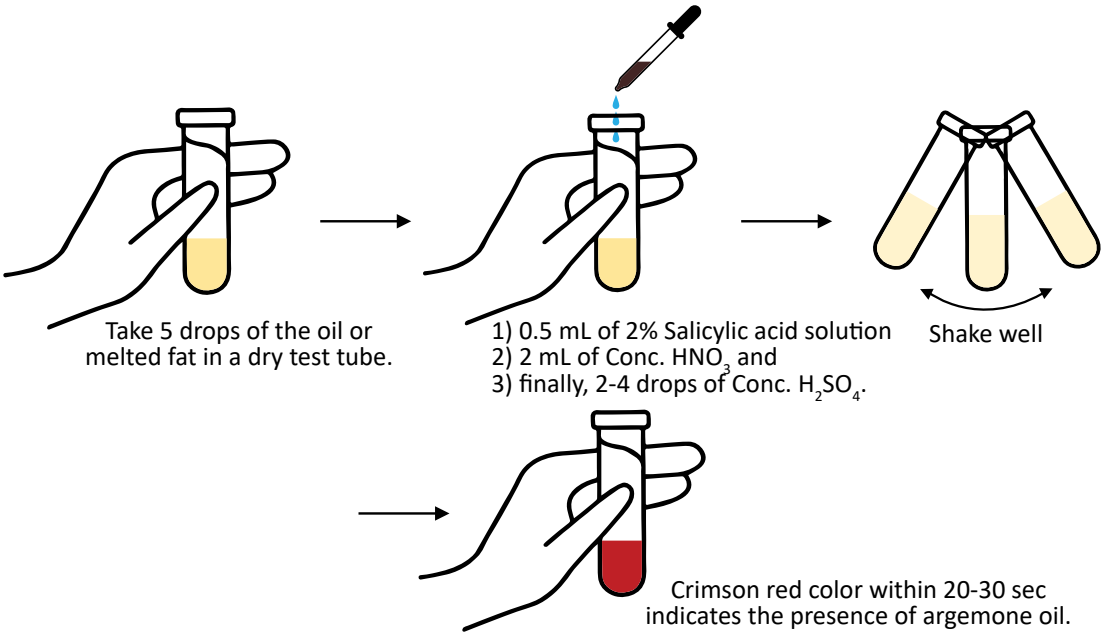
1. Test tube
2. Pipette
3. Dropper
4. Balance

3. Reagent

1. 2% Salicylic acid in methanol: Weigh 2 g of Salicylic acid and dissolved in 100 mL methanol.
2. Concentrated HNO_3
3. Concentrated H_2SO_4

4. Procedure

1. Take 5 drops of the oil or melted fat in a dry test tube.
2. Add successively 1) 0.5 mL of 2% Salicylic acid solution, 2) 2 mL of conc. HNO_3 and 3) finally, 2-4 drops of Conc. H_2SO_4.
3. Shake well.
4. Observe the development of color within 20-30 sec.



5. Inference / Decision

1. A crimson red color within 20-30 sec indicates the presence of argemone oil.
2. No color change is observed in pure oil.

6. Safety Precautions:

Safety precautions: Concentrated HNO_3 and its vapors are corrosive to the eyes, skin, and mucous membranes. Concentrated H_2SO_4 is highly corrosive. Contact with these acids can cause severe burns and permanent damage. Handle with care. Use a Pasteur pipette or automated pipetting device.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 "Indian Standard Methods of Sampling And Test For Oils and Fats Part II Purity Test (Third Revision)
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- Azadmard-Damirchi and Torbati, Adulterations in Some Edible Oils and Fats and Their Detection Methods, Journal of Food Quality and Hazards Control 2 (2015) 38-44.
- Shukla,AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324

Detection of Mineral Oil in edible oil	BFSA_ ML_SOP _23
	Revision Version: 01

1. Scope

This method is applicable for the detection of Mineral Oil in edible oil.

2. Equipment

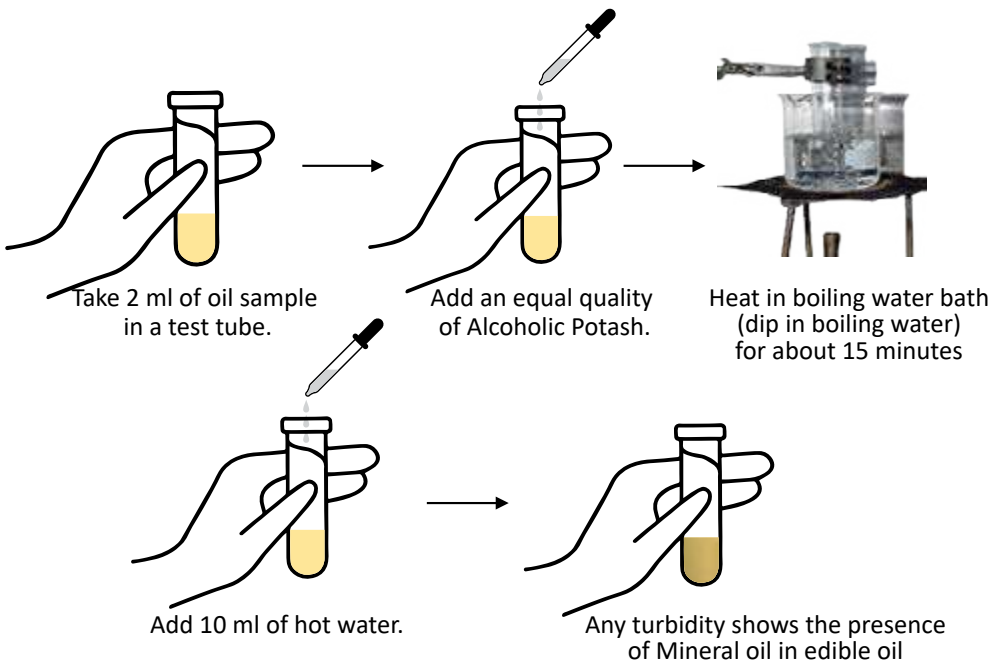
1. Water bath
2. Test tube

3. Reagent /Chemicals

1. Alcoholic potash: Dissolve 8.6 g of KOH pellets in 2 mL of water. Then dilute to 100 mL with aldehyde free alcohol.
2. Potassium hydroxide
3. Alcohol

4. Procedure

1. Take 2 mL of oil sample in a test tube.
2. Add an equal quality of Alcoholic Potash.
3. Heat in boiling water bath (dip in boiling water) for about 15 minutes.
4. Add 10 mL of hot water.
5. Look for turbidity.



5. Inference / Decision

1. Any turbidity shows the presence of Mineral oil greater than 1%.
2. The depth of turbidity depends on the percentage of mineral oil present.
3. A clear solution indicates the absence of mineral oil.

Note: This method is not applicable on high content un-saponifiable value and below 1% content of Mineral oil.

6. Safety Precautions:

Use safety goggles and hand gloves when handling boiling water to avoid burns.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 "Indian Standard Methods of Sampling And Test For Oils and Fats Part II Purity Test (Third Revision)
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- Azadmard-Damirchi and Torbati, Adulterations in Some Edible Oils and Fats and Their Detection Methods, Journal of Food Quality and Hazards Control 2 (2015) 38-44.
- Shukla,AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324

Detection of Karanja Oil in Edible Oil	BFSA_ ML_SOP _24
	Revision Version: 01

1. Scope

This method is applicable for the detection of Karanja Oil in Edible Oil

2. Equipment

1. Test tube
2. Beaker
3. Dropper

3. Reagent /Chemicals

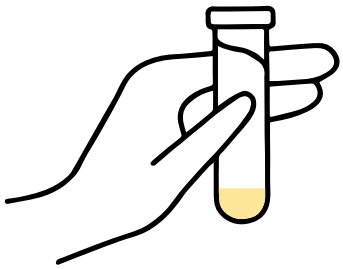
1. Antimony trichloride solution 20% (w/v) in chloroform:

   Weigh 20 g antimony trichloridecrystals in a beaker and add it to 100 mL chloroform. Shake for a few minutes till the crystals dissolve.

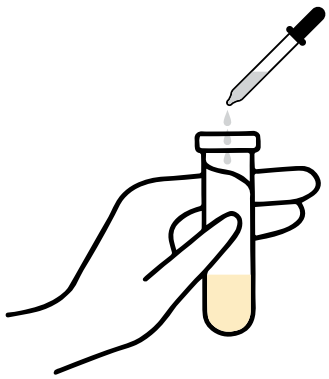
2. Chloroform

4. Procedure

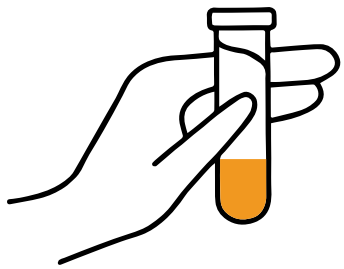
1. Take 1-2 drops of the oil in a test tube.
2. Add 1-2 mL of antimony trichloride solution and mix well.
3. Look for yellow or orange color.



Take 1-2 drops of the oil in a test tube.



Add 1-2 mL of antimony trichloride solution and mix well.



Yellow or orange color indicates the presence of Karanja oil.

5. Inference / Decision

1. Appearance of a canary yellow or orange color indicates the presence of Karanja oil.
2. No color change indicates the absence of Karanja oil.

6. Safety Precautions

Chloroform is a carcinogen. Avoid prolonged exposure to vapors of the solvent.

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 "Indian Standard Methods of Sampling And Test For Oils and Fats Part II Purity Test (Third Revision)
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- Azadmard-Damirchi and Torbati, Adulterations in Some Edible Oils and Fats and Their Detection Methods, Journal of Food Quality and Hazards Control 2 (2015) 38-44.
- Shukla, AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324

Detection of Cyanide in Edible Oil	BFSA_ ML_SOP _25
	Revision Version: 01

1. Scope

This method is applicable for the detection of Cyanide in Edible Oil.

2. Equipment

1. Test tube
2. Dropper

3. Reagent /Chemicals

1. Potassium Hydroxide (2 N): Dissolve 11.2 g of KOH in 100 mL of distilled water.
2. Ferrous sulphate solution (2 %): Dissolve 2 g of Ferrous sulphate in 100 mL distilled water.
3. Ferric chloride solution (20 %): Dissolve 20 g of Ferric Chloride in water to which sufficient HCl has been added to prevent hydrolysis.
4. Concentrated HCl.

4. Procedure

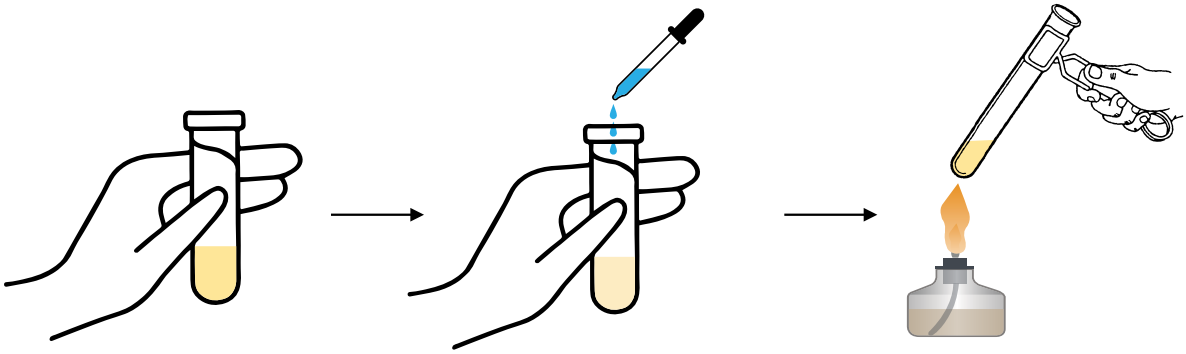
1. Take 3 mL of oil sample in a test tube.
2. Add 10 drops of 2N KOH solution and heat the tube on the flame.
3. Add a few drops of ferrous sulphate solution and shake well.
4. Acidify with a few drops of HCl and warm gently.
5. Filter if necessary.
6. Add a few drops of Ferric Chloride solution.
7. Observe the development of a blue color.

5. Inference / Decision

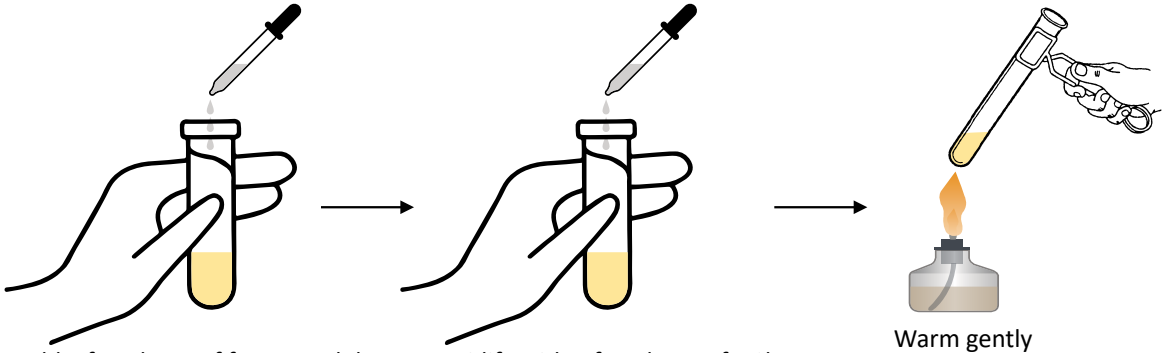
A blue coloration indicates the presence of hydrocyanic acid which is produced due to presence of cyanide in edible oil.

6. Safety Precautions

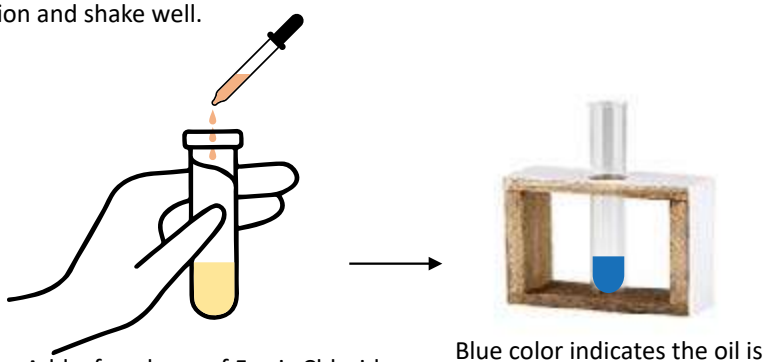
Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.



Take 3 ml of oil sample in a test tube. Add 10 drops of 2N KOH solution Heat the tube on flame.



Add a few drops of ferrous sulphate solution and shake well. Acidify with a few drops of HCl Warm gently



Add a few drops of Ferric Chloride solution. Blue color indicates the oil is adulterated with cyanide

7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 "Indian Standard Methods of Sampling And Test For Oils and Fats Part II Purity Test (Third Revision)
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- Azadmard-Damirchi and Torbati, Adulterations in Some Edible Oils and Fats and Their Detection Methods, Journal of Food Quality and Hazards Control 2 (2015) 38-44.
- Shukla,AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324

Detection of Mobile (Lube) Oil in Edible Oil	BFSA_ ML_SOP _26
	Revision Version: 01

1. Scope

This method is applicable for the detection of Mobile (Lube) Oil in Edible Oil.

2. Equipment

1. Test tube
2. Dropper
3. Balance
4. Graduated cylinder

3. Reagent /Chemicals

1. Alcoholic Potassium Hydroxide Solution: Dissolve 70 to 80 g of potassium hydroxide pellets in an equal quantity of distilled water and add two liters of ethyl alcohol or aldehyde-free rectified spirit. Allow to stand overnight decant the clear liquid and keep in a bottle closed tightly with a cork or rubber stopper.
2. Dichloroquinone chlorimide Solution (Gibbs reagent): Dissolve 1 g of 2,6-dichloroquinone-4-chlorimide in 200 mL of absolute ethyl alcohol. Store at 10 °C and use within 5 days.

4. Procedure

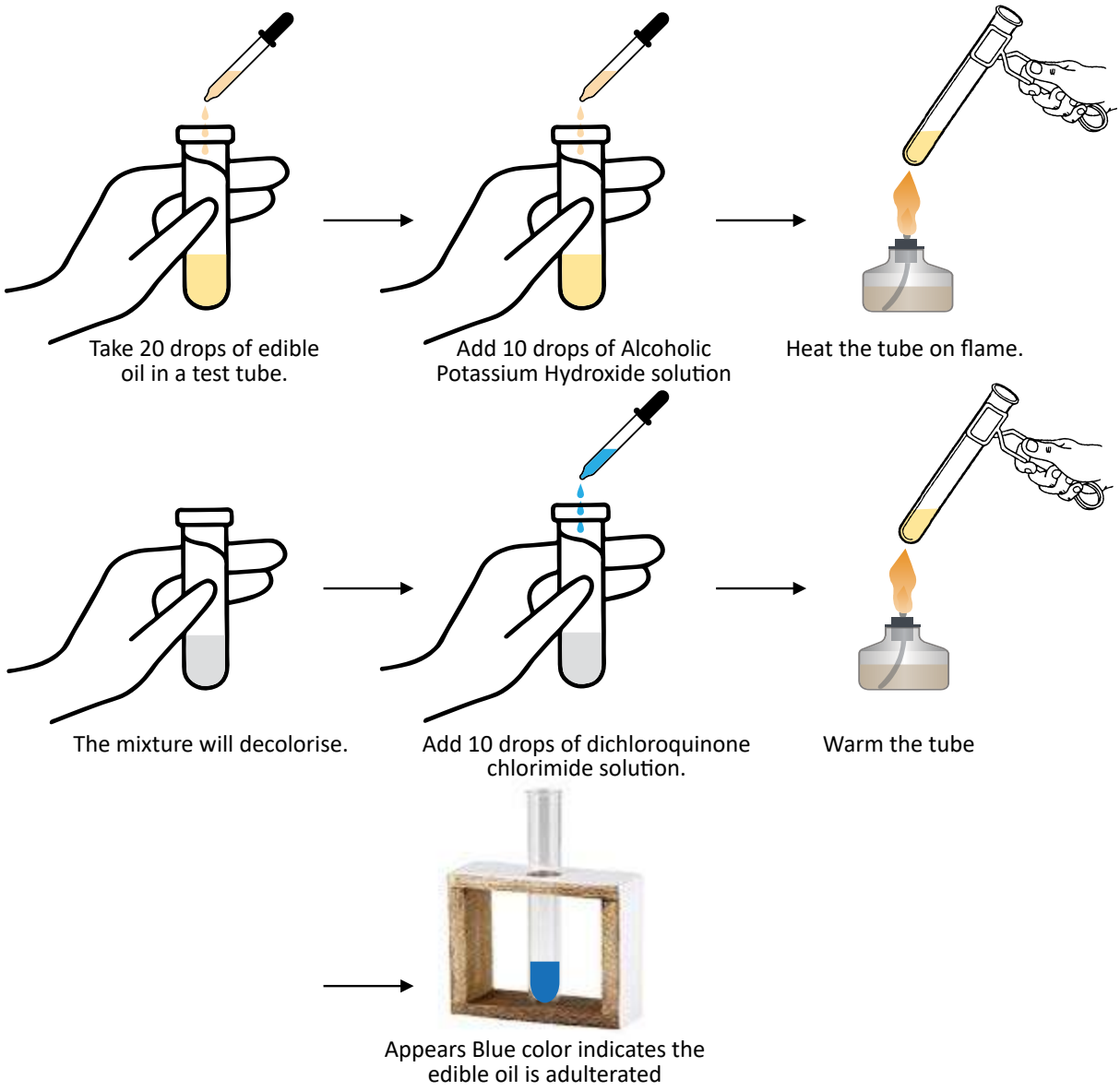
1. Take 20 drops of edible oil in a test tube.
2. Add 10 drops of Alcoholic Potassium Hydroxide Solution
3. Heat the tube on flame.
4. The mixture will decolorise.
5. Now add 10 drops of dichloroquinone chlorimide solution.
6. Warm the tube.

5. Inference / Decision

appearance of the blue color indicates the presence of a compound of Triorthocresyl phosphate (TOCP). Traces of this compound in edible oil, point to adulteration of edible oil, with lube/mobile/engine oil.

6. Safety Precautions

Potassium hydroxide is corrosive and can cause burns.



7. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 "Indian Standard Methods of Sampling And Test For Oils and Fats Part II Purity Test (Third Revision)
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- Shukla,AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324

Detection of Adulteration in Coconut Oil	BFSA_ ML_SOP _27
	Revision Version: 01

1. Scope

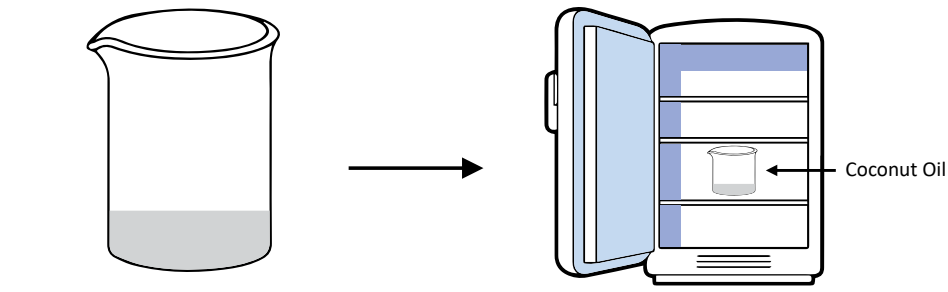
This method is applicable for the detection of Adulteration in Coconut Oil

2. Equipment

1. Beaker
2. Refrigerator

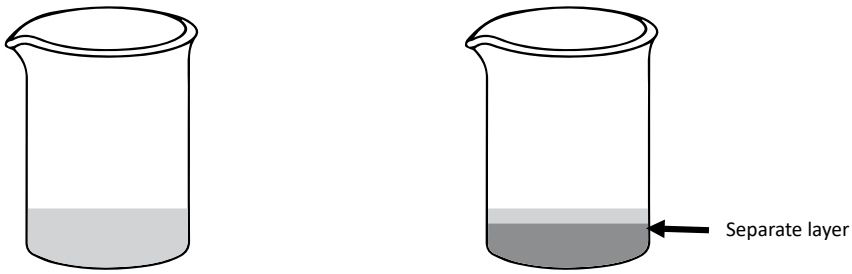
3. Procedure

1. Take some coconut oil in a beaker.
2. Keep the beaker inside the refrigerator with a temperature between 5-10 degree Celsius.
3. Wait for 60-90 minutes.



Take some coconut oil in a beaker.

Keep the beaker inside the refrigerator with a temperature between 5-10 degree celsius and wait 60-90 min.



Pure coconut oil solidifies completely with no separate layer

Adulterated Coconut Oil has a separate layer

4. Inference / Decision

1. Pure Coconut oil solidifies completely with no separated layer
2. Adulterated coconut oil has a separate layer on top after solidification which is due to the separate freezing points of different oils.

5. Reference

- FSSAI Manual of Methods of Analysis of Foods – Oils and Fats (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS: 548 (Part II) 1976 Reaffirmed 2010 "Indian Standard Methods of Sampling And Test For Oils and Fats Part II Purity Test (Third Revision)
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- Shukla,AK, Dixit, AK and Singh, RP, Detection of Adulteration in Edible oils, Journal of Oleo Science (2005), 54, 317-324.

Detection of Metanil Yellow in Pulses/ Parboiled Rice/Sweetmeats/Ice Cream	BFSA_ ML_SOP _28
	Revision Version: 01

1. Scope

This method is applicable for the detection of Metanil Yellow in Pulses/Parboiled Rice/Sweetmeats/ Ice Cream.

2. Equipment

1. Vortex mixture
2. Test tube
3. Beaker
4. Bunsen burner
5. Dropper
6. Balance

3. Reagent/Chemicals

1. Concentrated HCl.

4. Procedure

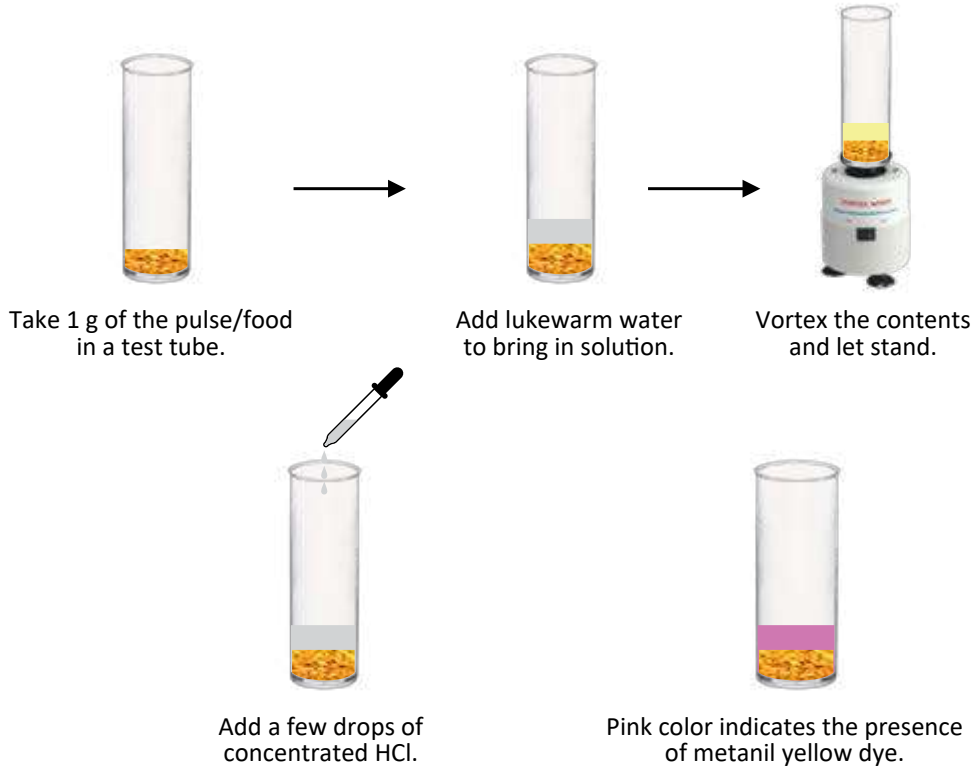
1. Take 1 g of the pulse/food in a test tube.
2. Add lukewarm water to bring in solution.
3. Vortex the contents and let stand.
4. Add a few drops of concentrated HCl.
5. Observe the change in color.

5. Inference / Decision

The immediate development of pink color indicates the presence of metanil yellow dye.

6. Safety Precautions

Take care while handling Concentrated HCl as it can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.



7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Cereals and Cereal Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- Purba MK, Agrawal, N and Shukla, SK, Detection of Non-Permitted Food Colors in Edibles (2015) Journal of Forensic Research S4:3, Wood,R; Foster, L;Damant, A and Key, P in Analytical Methods for Food Additives
- Woodhead Publishing Ltd and CRC Press LLC, 2004

Detection of Lead Chromate in Pulses/other Foods	BFSA_ ML_SOP _29
	Revision Version: 01

1. Scope

This method is applicable for the detection of Lead Chromate in Pulses/Other Foods.

2. Equipment

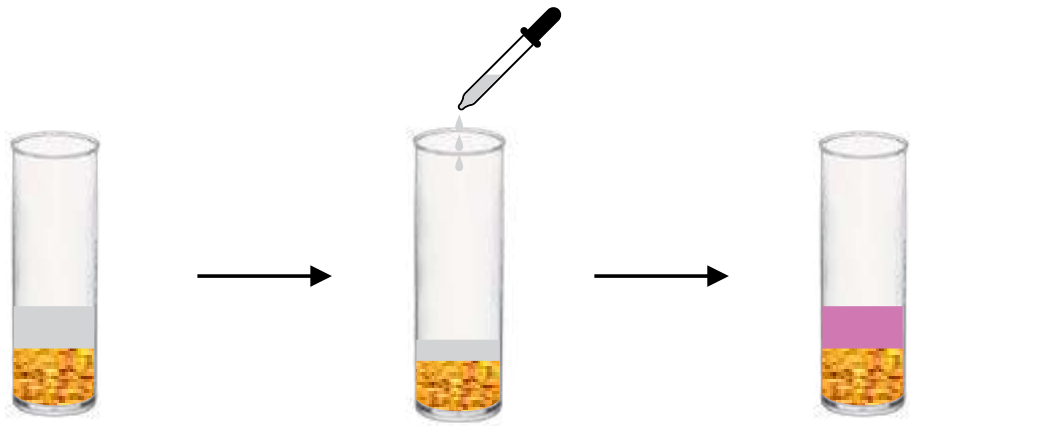
1. Test tube
2. Balance
3. Spatula

3. Reagent /Chemicals

1. Concentrated HCl.

4. Procedure

1. Shake 5 g of pulse/food with 5 mL of water.
2. Add a few drops of concentrated HCl.
3. Observe any change in color.



Shake 5 g of pulse/food with 5 mL of water.

Add a few drops of conc. HCl.

If the solution turns pink color indicates the presence of lead chromate in sample.

5. Inference / Decision

If the solution turns pink color indicates the presence of lead chromate in sample.

6. Safety Precautions

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Cereals and Cereal Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI Manual of Methods of Analysis of Foods – Beverages, sugars and Confectionary (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
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- Purba MK, Agrawal, N and Shukla, SK, Detection of Non-Permitted Food Colors in Edibles (2015) Journal of Forensic Research S4:3
- Wood,R; Foster, L;Damant, A and Key, P in Analytical Methods for Food Additives, Woodhead Publishing Ltd and CRC Press LLC, 2004

Detection of Malachite Green in Green Vegetables	BFSA_ ML_SOP _30
	Revision Version: 01

1. Scope

This method is applicable for the detection of Malachite Green in Green Vegetables

2. Equipment

1. Blotting paper/ cotton ball.

3. Reagent /Chemicals

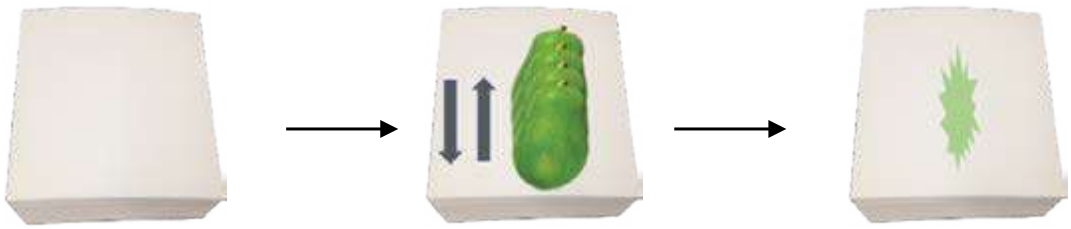
1. Liquid paraffin

4. Procedure

1. Take a piece of white blotting paper and moist it with liquid paraffin.
2. Rub the moist blotting paper on the outer green surface of the vegetable.

5. Inference / Decision

1. The color on the blotting paper remains the same, the vegetable is unadulterated.
2. If it turns green, then malachite green has been used on it.



Take a piece of white blotting paper and moist it with liquid paraffin.

Rub the moist blotting paper on the outer green surface of the vegetable.

Turns green color on the blotting paper indicates malachite green has been used on vegetables

6. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Cereals and Cereal Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI Manual of Methods of Analysis of Foods – Beverages, sugars and Confectionary (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- Wood,R; Foster, L;Damant, A and Key, P in Analytical Methods for Food Additives, Woodhead Publishing Ltd and CRC Press LLC, 2004

Detection of Artificial Invert Sugar Syrup in Honey (Fiehe's Test)	BFSA_ ML_SOP _31
	Revision Version: 01

1. Scope

This method is applicable for the detection of Artificial Invert Sugar Syrup in Honey (Fieh's Test)

2. Equipment

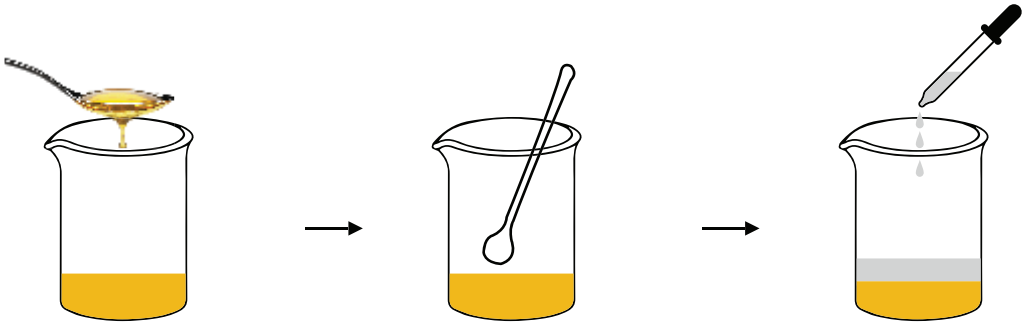
1. Beaker
2. Graduated pipette
3. Petri dish
4. Porcelain dish
5. Stirrer
6. Balance

3. Reagent /Chemicals

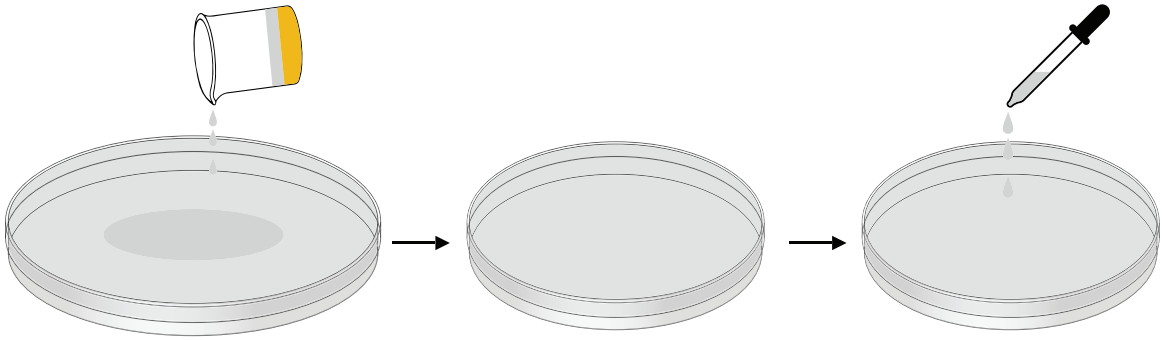
1. Resorcinol reagent freshly prepared: Weigh 1 g of resorcinol and dissolve in 100 mL Concentrated HCl
2. Diethyl ether
3. Aniline chloride solution: To 100 mL of aniline add 30 mL of 25% concentrated HCl.
4. Concentrated HCl.

4. Procedure

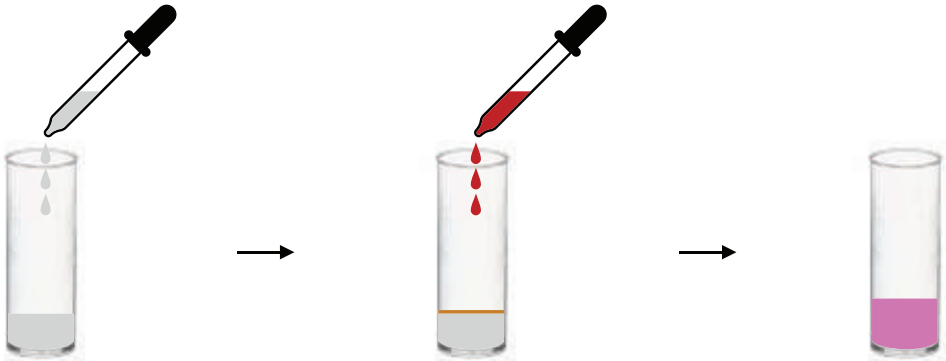
1. Take 5 mL of honey in a small beaker.
2. Add 5 mL of cold water and mix well.
3. Extract with 10 mL of ether.
4. Decant the ether layer in a Petri dish and allow the ether to evaporate.
5. Dissolve the residue in 5 mL ether.
6. To 2 mL of above (5) add 2 mL of freshly prepared resorcinol reagent.
7. Look for color change.



Take 5 mL of honey in a small beaker. Add 5 mL of cold water and mix well. Extract with 10 mL of ether.



Decant the ether layer in a Petri dish Allow the ether layer to evaporate (without heat) Dissolve the residue in 5 mL ether.



Take 2 mL dissolve residue Add 2 mL of freshly prepared resorcinol solution. Pink to cherry red color indicates the presence of invert sugar

5. Inference / Decision

A pink to cherry red color means Fiehe's Test is positive and indicates the presence of invert sugar. Proceed confirmation test if Fiehe's Test is positive.

<u>ConfirmationTest</u>

6. Procedure

1. Take 5 g of honey in a porcelain dish.
2. Add 2.5 mL of aniline chloride solution and stir well.
3. Observe any changes in color

5 g of honey in a porcelain dish. Add 2.5 mL of aniline chloride solution Stir with glass rod

Orange red color indicates the presence of invert sugar.

7. Inference / Decision

Orange red color indicates the presence of invert sugar.

8. Safety Precautions

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents. Diethyl ether is inflammable. Do not open or use near open flame.

9. Reference

- Pearsons' Composition and Analysis of Food 9th Edition
- FSSAI Manual of Methods of Analysis of Foods – Cereals and Cereal Products (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- FSSAI Manual of Methods of Analysis of Foods – Beverages, sugars and Confectionary (2015) Food Safety and Standards Authority of India, Ministry of Health and Family Welfare Government of India New Delhi
- Purba MK, Agrawal, N and Shukla, SK, Detection of Non-Permitted Food Colors in Edibles (2015) Journal of Forensic Research S4:3
- IS 15642 (Parts 1 and 2) :2006 (Reaffirmed 2011) Quick Methods for Detection of Adulterants/ Contaminants in Common Food Products
- Wood,R; Foster, L;Damant, A and Key, P in Analytical Methods for Food Additives, Woodhead Publishing Ltd and CRC Press LLC, 2004

Detection of Potassium bromate in bread (Potassium Iodide Method)	BFSA_ ML_SOP _32
	Revision Version: 01

1. Scope

This method is applicable for the detection of Potassium bromate in bread.

2. Equipment

1. Test tube
2. Balance
3. Graduated pipette

3. Reagent /Chemicals

1. Potassium iodide (0.5%): Take 0.5 g Potassium iodide in 100 mL volumetric flask. Dissolve it in distilled water and dilute to 100 mL.
2. 0.1 N Hydrochloric acid solution: Add 0.83 ml of 37% HCl to 100 mL distilled water.

4. Procedure

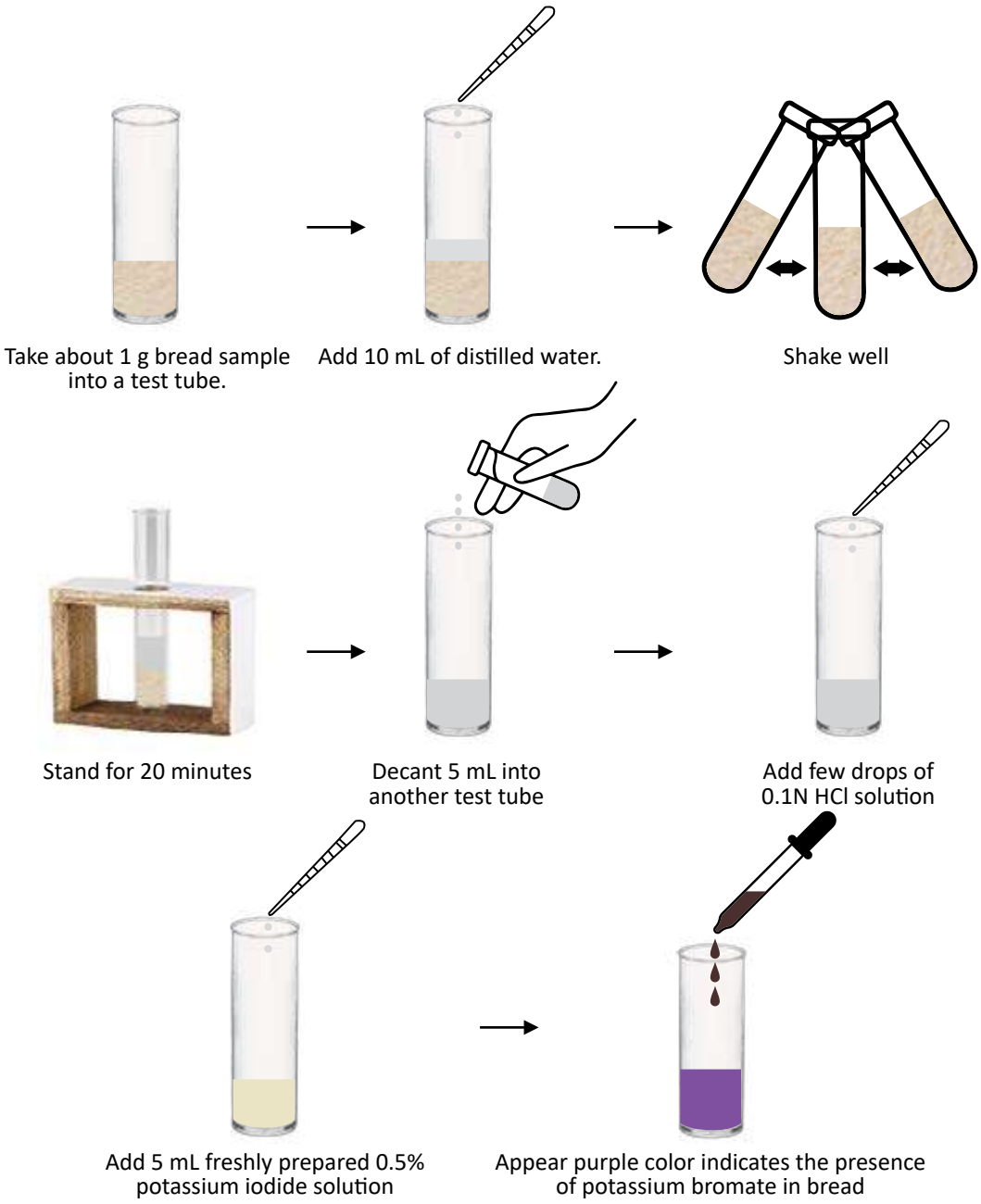
1. Take 1 g bread sample into a test tube.
2. Add 10 mL of distilled water.
3. Shake well and allow to stand for 20 minutes at 28 ± 10 °C.
4. Decant 5 mL into another test tube and add few drops of 0.1N HCl solution.
5. Add 5 mL freshly prepared 0.5% potassium iodide solution.
6. Observe the color change.

5. Inference / Decision

The presence of potassium bromate was indicated by change in color from light yellow to purple.

6. Safety Precautions

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.



7. Reference

- Asian Food Science Journal 7(4): 1-7, 2019; Article no. AFSJ.48064 ISSN: 2581-7752

Detection of Potassium bromate in bread (Promethazine Method)	BFSA_ ML_SOP _33
	Revision Version: 01

1. Scope

This method is applicable for the detection of Potassium bromate in bread.

2. Equipment

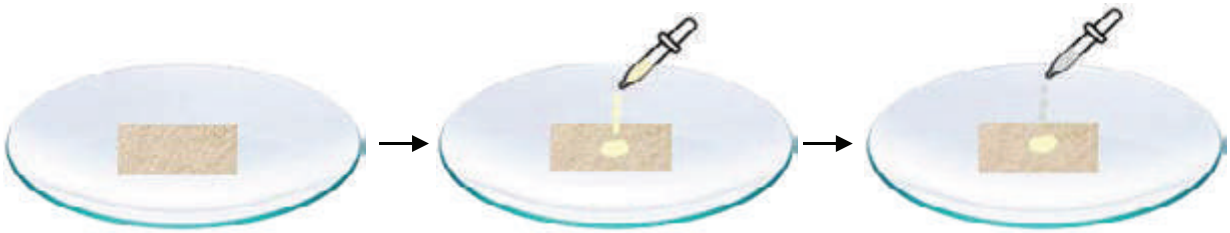
1. Watch glass.
2. Graduated pipette.

3. Reagent /Chemicals

1. 0.01M promethazine reagent: Take 0.2844g promethazine or 0.321g promethazine hydrochloride in 100 mL. volumetric flask. Dissolve it with deionized water and dilute to 100 mL.
2. Concentrated HCl.

4. Procedure

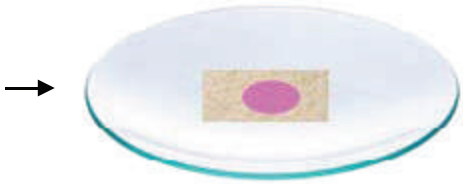
1. Take a portion of bread sample on watch glass.
2. Use 2 mL of 0.01M promethazine and 0.6 mL of 12M hydrochloric acid on bread.
3. Observe the color of bread.



Take a portion of bread sample.

Add 2 mL of 0.01M Promethazine on bread

Add 0.6 mL of 12M hydrochloric acid on bread



Pink (Purple) color on bread indicates the presence of potassium bromate.

5. Inference / Decision

The change in color of bread sample to pink (Purple) indicates the presence of potassium bromate.

6. Safety Precautions

Take care while handling Concentrated HCl. Concentrated acids can cause severe skin burns and damage. Concentrated acids should be opened and used only in a fume hood. Always add acid to water when diluting or preparing reagents.

7. Reference

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