

Methods for detection of common adulterants in milk and milk products

MILK				
S no.	Product	Adulterant	Method of detection	Remarks
1	Milk	Water	The presence of water can be detected by putting a drop of milk on a polished slanting surface. The drop of pure milk flows leaving a white trail behind, whereas milk adulterated with water will flow immediately without leaving mark	
2	Milk	Starch	Add a few drops of tincture of iodine or iodine solution. Formation of blue colour indicates the presence of starch	Iodine solution is easily available in medical stores
3	Milk	Urea	Take a teaspoon of milk in a test tube. Add ½ teaspoon of soybean or arhar powder. Mix up the contents thoroughly by shaking the test tube. After five minutes, dip a red litmus paper in it. Remove the paper after half a minute. A change in colour from red to blue indicates the presence of urea in the milk.	
4	Milk	Vanaspati	Take 3 ml of milk in a test tube. Add 10 drops of hydrochloric acid. Mix up one teaspoonful of sugar. After 5 minutes, examine the mixture. The red colouration indicates the presence of Vanaspati in milk.	
5	Milk	Formalin	Take 10 ml of milk in a test tube and add 5 ml of conc. Sulphuric acid from the sides of the wall without shaking. If a violet or blue ring appears at the intersection of the two layers then it shows presence of formalin.	Formalin enhances the life of milk and thus is added for preservation purpose.
6	Milk	Detergent	Shake 5-10 ml of sample with an equal amount of water, lather indicates the presence of a detergent.	
7	Milk	Synthetic Milk	Synthetic milk has a bitter after taste, gives a soapy feeling on rubbing between the fingers and turns yellowish on heating.	
8	Milk	Synthetic milk-test for protein	The milk can easily be tested by urease strips because synthetic milk is devoid of protein.	
9	Milk	Glucose/ Inverted sugar	Milk does not contain glucose/inverted sugar, if test for glucose with urease strip is found positive. It means milk is adulterated.	If it is made synthetically by adding colour, water, paint, oils, alkali, detergent etc.Glucose/ inverted sugar syrup is added to milk to increase consistency and test.
10	Ghee, cottage cheese, condensed milk, khoa, milk powder etc.	Coal tar dyes	Add 5 ml of dilute sulphuric acid or conc. Hydrochloric acid to one teaspoon full of melted sample in a test tube. Shake well. Pink colour (in case of sulphuric acid) or crimson colour (in case of hydrochloric acid) indicates coal tar dyes. If hydrochloric acid does not give colour, dilute it with water to get colour.	

MILK PRODUCTS				
S. no	Food article	adulterant	Method for detection	Remarks
1	Sweet Curd	Vanaspati	Take 1 teaspoon full of curd in a test tube. Add 10 drops of hydrochloric acid. Mix up the contents shaking the test tube gently. After 5 minutes, examine the mixture. Red colouration indicates the presence of Vanaspati.	
2	Rabdi	Blotting paper	Take a teaspoon of rabri in a test tube. Add 3 ml of hydrochloric acid and 3 ml of distilled acid. Stir the contents with a glass rod. Remove the rod and examine. Presence of fine fibres to the glass rod will indicate the presence of blotting paper.	
3	Khoa and its products	Starch	Boil a small quantity of sample with some water, cool and add a few drops of iodine solution. Formation of blur colour indicates the presence of starch.	
4	Chhana or Paneer	Starch	Boil a small quantity of sample with some water, cool and add a few drops of iodine solution. Formation of blue colour indicates the presence of starch.	

OILS AND FATS				
S. no	Food article	adulterant	Method for detection	Remarks
1	Ghee	Vanaspati or Margarine	Take about on teaspoon full of melted ghee with equal quantity of conc. Hydrochloric acid in a stoppered test tube and add to it a pinch of sugar. Shake for 1 minute and leave for 5 minutes. Appearance of crimson colour in lower (acid) indicates presence of Vanaspati or margarine.	The test is specific for sesame oil which is compulsorily added to Vanaspati and Margarine. Some coal tar colours also give a positive test. If the test is positive i.e. red colour develops only by adding strong hydrochloric acid (without adding crystals of sugar) then the sample is adulterated with coal tar dye. If the crimson or red colour develops after adding and shaking with sugar, then alone Vanaspati or margarine is present.
2	Ghee	Mashed potatoes, sweet potatoes and other starches	The presence of mashed potatoes or sweet potatoes in a sample of ghee can be easily detected by adding a few drops of iodine, which is brownish in colour turns to blue if mashed potatoes/sweet potatoes/other starches are present.	
3	Butter	Vanaspati or margarine	Take about one teaspoon full of melted sample of butter with equal quantity of conc. Hydrochloric acid in a stoppered test tube and add to it a pinch of sugar. Shake for i minute and let it for 5 minutes. Appearance of crimson colour in lower (acid) of Vanaspati or margarine.	The test is specific for sesame oil which is compulsorily added to Vanaspati and Margarine. Some coal tar colours also give a positive test. If the test is positive i.e. red colour develops only by adding strong hydrochloric acid (without adding crystals of sugar) then the sample is adulterated with coal tar dye. If the crimson or red colour develops after adding and shaking with sugar, then alone Vanaspati or margarine is present.
4	Butter	Mashed potatoes and other starches	The presence of mashed potatoes or sweet potatoes in a sample of butter can easily be detected by adding a few drops of iodine (which is brownish in colour), turns to blue.	
5	Edible oil	Prohibited colour	Take 5 ml of sample in a test tube and add 5ml of conc. Hydrochloric acid. Shake gently; let it stand for 5 minutes. Colour will separate in the upper layer of the solution.	
6	Coconut oil	Ant other oil	Place a small bottle of oil in refrigerator. Coconut oil solidifies leaving the adulterant as a separate layer.	

Source: Food Safety and Standard Authority of India