Name of experiment :- Determination of food adulterants in the given food items.

Introduction :-
Adulteration of food mean internal addition of cheap and harmful materials or deliberate removal of some essential constituents of the foods. It has been seen that it becomes common today, even the cheapest food articles - salt is adulterated.
Some of the common adulterants in common food stuff's are listed below.

	Food stuff	Common Adulterant
①	Milk	water, fatless milk, starch
②	Sugar	chalk powder, washing soda, semolina
③	Red chilli Powder	Brick powder or injurious
④	Pepper	Dried Papaya seeds
⑤	Teermeric powder	Yellow chalk powder
⑥	Rice	Stone chips resembling
⑦	Arhar dal & Gram Dal	Khesari dal

Adullerated foods has not only effect budget but also causes serious diseases like diarrhoea ulcers even cancer.

Health from the ill effect of these common food adullerants can be saved by performing the following test which are suspected in food by simple chemical tests.

(A) **Objective :-** To test the presence of water and starch in the given sample of milk.

Theory :- Addition of water to milk dilutes its fat contents and therefore, lower its specific density, Hence presence of water in the milk may be detected by measuring it specific density.

N.B - Specific density of pure milk is always more then 1.026.

The presence of starch material in the milk can be detected by exploiting the formation of blue-coloured complex with I_2 solution or tincture I_2.

Apparatus required :-
1. Test tube.
2. Lactometer measuring cylinder.

Chemical required :-
1. Given sample of milk
2. Sulphuric acid

3. I_2 soln or tincture I_2.
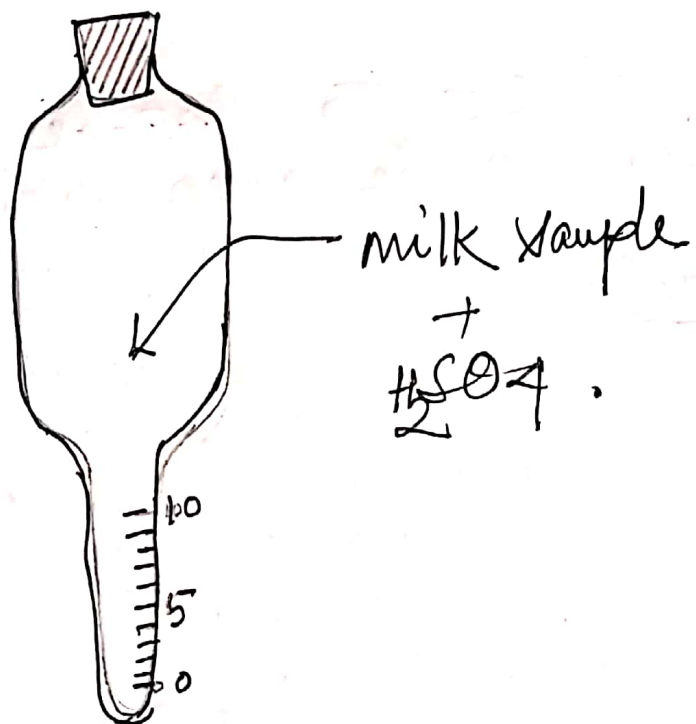
milk sample
+
H_2SO_4.

FIG.: FLASK FOR MEASURING FAT IN MILK

Procedure :-

① Put few drops of milk sample on the smooth and oily surface, if the milk is pure than its drops will be stable for some time and leaves while streak.

② To measure the specific density of milk with the help of Lactomer.

③ Babcock test for purity of milk :-

This determines the fat content in the milk. In this process about 20 ml (say) milk sample is taken with the help of pipette in a small narrow necked graduated flask as shown in diagram and H_2SO_4 is mixed in it and the flask is shaken well untill the mixture becomes dark coloured.
The acid does not effect fat, but it dissolves other solids present in the milk. The flask is then centrifuged in centrifugal machine by which the fat is forced towards the neck being lighter than other contents.
Now sufficient warm water is added to bring the fat in the narrow neck where the exact % is read on gruduation mark.

④ Testing the presence of starch in milk :-

5 ml of milk sample is taken in a T.T and heated it to almost boiling, cool and then added few drops of Iodide solution or Tincture iodine solution, and shaken, if blue colouration appears, it indicats the presence starch in the milk.

If it is pure, then there will be a deep yellow colouration due to Casein, a protein in milk.

② **Objective :-** To test the presence of Adulterants in a given sample of sugar.

Theory :-
Common adulterants of sugar are
1. washing soda
2. Chalk powder
3. Semolina.

Sugar is soluble in water, so if any undissolved substance is left after dissolving sugar in water, This is indicated of adulterant presence in the sample.

The presence of washing soda and chalk-powder gives effervesence with dil HCl.

Apparatus required - 1. Test tube and T.T stand
Chemical required =. dilute HCl and distilled water.

Procedure :- ① About 1 gm of the sugar sample is taken in the T.T and then added about 10 ml of distilled water, The whole content is shaken for about 4-5 minutes, Presence of undissolved substance indicates adulteration in the sugar sample.

② About 1 gm of sugar sample is taken in a clean and dry test tube and then, added 5 ml of dil HCl, if effervescence is occured, indicates the presence of chalk powder or washing powder in the sugar sample.

N.B :- It should be powdered before testing its solubility in water

③ To find out the possibility of Adulteration in the given sample of Chilli powder.

Theory :- Red chilli powder is adultrated with either colour or brick powder. Since, brick powder is being heavier than chilli powder, therefore, settle at the bottom on dissolving it in a glass of water. If colour being added to the chilli powder, then water becomes coloured.

Apparatus Required :- Beaker & Glass rod

Chemical required :- Distilled water

Procedure :- A small amount of given sample of chilli powder is taken in a beaker & stirred the content with the help of glass rod for few minutes and wait for 2 to 5 minutes. Settling of brick's powder at the bottom and the appearance of red colour indicates the adulteration in the sample.

(D) To find out whether a given sample of turmeric powder is pure or not.

Theory :- Yellow ≠ calk powder, a common adultarant of the turmaric gives the effervesense with dilute hydrochloric acid.

Apparatus Required :- Test tube & test tube stand

Chemical required : Dilute hydrochloric acid and distilled water.

Procedure :- (1) About 0.5 gm (say) of a powdered sample is taken in a dry test tube and then added about 5 ml of dilute hydrochloric acid if effervesense is observed indicates the presence of chalk powder in the given sample.

(11) Dilute the contents of the test tube

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with 25 to 30 ml of water. Disappearance of
the violet colour formed previously indicates
the purity of turmeric powder. If violet colour
first formed with dilute HCl, persist that
it is contaminated with yellow dyes.

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