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MILK ADULTERATION AND DIFFERENT METHODS OF DETECTION

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ABSTRACT

Milk is a source of good quality of protein, calcium and many other nutrients. It is sold by local vendors or sold under various brands. Now a day in developed and developing countries for economical purposes milk is adultered with various chemicals. This is very dangerous to human life. The paper highlights on some electrical and simple household methods to detect few adulterants in milk.

Keywords: Milk Adulteration, protein, calcium, many other nutrients

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INTRODUCTION

Milk is one of theessential commodities of human life. It is most common food in India. Milk adulteration is very common in both backward and advanced countries. It also creates health hazards like renal diseases eye and heart problems.

The adulteration is done to make aprofit. This cannot be detected due to lack of proper detecting technology. After treatment of mastitis residues of antibiotics remain in the milk of animal, if location is done early if done late there is wastage of milk.

Most of times water is added to milk to increase volume which decreases specific gravity of milk. To retain gravity and color hazardous chemicals like mariachi acid, starch, chlorine, sodium carbonate, formalin and ammoniumsulphate are added to milk. To decrease deficiency of milk synthetic milk is prepared by mixing urea, caustic soda, refined oil and common detergents which are similar to poison.

New simpler techniques have been developed to detect different kind of milk adulterants. Large numbers of research papers have been published.

In this paper, different methods are summarized to detect milk adulteration by laboratory methods or by simple household methods.

1. Water: - Water is most common adulterant added in the milk for economic purpose when water is added to milk it decreases nutritional value of milk and compensates for density and color milk is adulterated with harmful chemicals.

To identify water adulteration use of lactometer is most easy and cheap method. In addition to this measurement of pH is also one of method, with anincrease in water content acidity of milk decreases.

Conductivity measurements also help in this. Aswater content increases conductivity of milk decreases. The other simpler method includes freezing point osmometry and freezing point cryoscopic method.

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For simplest household detection of water as adulterant in milk is to allow milk to flow on polished surface if it is adulterated with water it will flow away and will not leave white trail.

2. Urea: - Urea is used to prepare synthetic milk or to increase theshelf life of milk. Urea can cause acidity, indigestion ulcers and cancer. It is harmful to heart, liver and kidneys. The potentiometric biosensor is used detect urea in milk. The sensor exhibits detection limit of 2.5 x 10-5 mol/lit. Another method is cyclic voltammetry it is simple inexpensive, rapid method.

pH measurement is another method. Urea has –NH2 groups which is converted into ammonium ion. These ions change pH of milk.

Urea can be detected quantitativelyspectroscopically. This method works on principle that Infrared absorbs ammonia at wavelength 1530 nm.

The method is liquid chromatography – isotopic dilution mass spectrometry.

The simplest method involves addition of 2 drops of bromo cresol blue appearance of blue color shows presence of urea.

At home,simple test with litmus paper can detect presence of urea. Milk + soyabean / arhar powder allow to stand for sometimes if it change in color of red litmus paper indicates presence of urea.

3. Detergent: - For economic purpose milk is produced by mixing together urea, detergent, and vegetable oil. Neutralizer, sugar and water.

There are many methods to measure quantitatively amount of detergents like spectrophotometric methods which involves formation of detergent – methylene blue complex which is extracted in chloroform and measuring absorbanceat 653 nm.

Anionic detergents also can be identified by using paper chromatography for which methylene blue dye-detergent complex is prepared was run on Whatman No.1 using chloroform as mobile phase.

At home presence of detergent can be located just by shaking milk with anequal quantity of water. Formation of lather indicates thepresence of detergent. Also, bad odour also signifies synthetic milk. Synthetic milk turns yellow on heating.

4. Chlorine :- Chlorine is added to the milk to increase thedensity of milk. It is dangerous as it causes slogging of arteries. Chlorine is detected by potentiometric titrations and also by conduct metric sequential injection analysis.

CONCLUSION

In above discussion simple and different electrical methods are discussed for detection of adulterants.

In addition to these many other adulterants like color, starch, wheyare added to milk. Also lack of hygienic conditions during lactation, wrong lactation times can lower quality of milk. The adulterated milk or synthetic milk is very harmful to human life. So paper tries to cover fewer methods to detect various adulterations in milk.

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