Technical Information

Litmus Milk

Product Code: DM 1609

Application: Litmus Milk is used for maintenance of Lactobacilli and for determining the action of bacteria on milk.

Composition**

Ingredients	Gms / Litre
Skim milk powder	100.000
Litmus	0.500
Sodium sulphite	0.500
Final pH (at 25°C)	6.8±0.2

**Formula adjusted, standardized to suit performance parameters

Principle & Interpretation

Litmus Milk is a differential medium used to determine different metabolic functions The various metabolic functions are lactose fermentation, litmus reduction, clot formation, peptonization (digestion) and gas formation [2]. These metabolic properties of litmus milk helps in identification of different bacteria [1]. Milk is also useful in the maintenance and propagation of lactic acid bacteria.

Litmus is a good indicator of acidity, alkalinity and its oxidation-reduction potential is useful in milk media with lower toxicity to microorganisms than bromocresol purple. Addition of 1% w/v dextrose and/or 5% w/v yeast extract to Litmus Milk accelerates the growth of some organisms, which cannot grow in plain Litmus Milk [3- 5].

For detection of *Clostridium perfringens* in water, freshly heated tubes of Litmus Milk are inoculated with various quantities of water and heat at 80°C for 10-15 minutes to destroy non-spore-forming organisms. Tubes are Examin every 24 hours for positive Stormy Clot reaction when kept at 35°C for up to 5 days [6, 7]. Anaerobiosis in Litmus Milk can be obtained by adding a small heated iron nail or 0.1 gram of reduced iron [8]. Skim milk is the substrate, metabolized by particular species of bacteria in different ways. There actions of bacteria are categorized as follows,

ACID REACTION CAUSE

1 .Pink to red colour due to Fermentation of lactose of the milk and/or dextrose in milk. 2. Acid coagulation Lactic acid production, producing a casein curd in clear watery fluid. 3. Stormy clot Gas formation in coagulatated casein curd.

ALKALINE REACTION

1 .Blue colour of the Formation of basic amines or ammonia milk due to proteolysis.

2. Alkaline coagulation Paracasein formation from casein by enzyme rennin with a soft, blue clot.

3. Peptonization Digestion of casein, evident by clearing of the medium and dissolution of the clot REDOX REACTION

Reactions obtained in this medium are not specific and further tests must be carried out.

Methodology

Suspend 101 grams of powder media in 1000 ml distilled water, agitating continuously. Dispense 10 ml amounts into 15 x 150 mm tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 5 minutes. AVOID OVERHEATING.

Quality Control

Physical Appearance
Pinkish purple to grey homogeneous free flowing powder may contain minute to small particles

Colour and Clarity of prepared medium
Light purple coloured opaque milky solution

Reaction
Reaction of 10.1% w/v aqueous solution at 25°C. pH : 6.8±0.2

pH range
6.60-7.00

Cultural Response/Characteristics
DM 1609: Cultural characteristics observed after an incubation at 35-37°C for upto 14 days and record the reactions of various intervals during the incubation

Organism	Growth	Reaction
Clostridium perfringens ATCC 13124	Good-Luxuriant	Stormy fermentation(gas)
Lactobacillus acidophilus ATCC 11506	Good-Luxuriant	Acid clot (pink)
Pseudomonas aeruginosa ATCC 27853	Good-luxuriant	Peptonization (Clearning)

Storage and Shelf Life

Dried Media: Store below 30°C in tightly closed container and use before expiry date as mentioned on the label.
Prepared Media: 2-8^0 in sealable plastic bags for 2-5 days.

Further Reading

1.Cantarow A., Schepartz B., Biochemistry, 3rd Ed., Philadelphia: W B Saunders, 1962:273,792-793
2. MacFaddin J. F., 2000, Biochemical tests for Identification of Medical Bacteria, 3rd Ed., Lippincott, Williams and Wilkins, Baltimore.
3. Davis J. G., 1935, J. Dairy Res., 6:121.
4. Davis J. G., 1955, A Dictionary of Dairying, 2nd Ed., Leonard Hill.
5. Davis J. G., 1959, Milk Testing, 2nd Ed., United Trade Press.
6. Department of Health and Social security, 1969, Report No. 21, HMSO, London.
7. MacFaddin J. F., 1985, Media for Isolation-Cultivation-Maintenance of Medical Bacteria, Vol. I, Williams and Wilkins, Baltimore.
8.Townsend C. T., Somers J. J., Lamb F. C. and Olson N. A., 1956, A Laboratory Manual for the Canning Industry, 2nd Ed., National Canners Association, Washington.

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