Lauryl Tryptose (LST) Broth (NCM0032)

Intended Use
Lauryl Tryptose (LST) Broth is used for the detection of coliform bacteria in water and wastewater. Lauryl Tryptose Broth is not intended for use in the diagnosis of disease or other conditions in humans.

Description
Lauryl Tryptose Broth is a selective medium for the detection of coliforms in water, dairy products and other foods. The American Public Health Authority (APHA) recommend Lauryl Tryptose Broth for the Most Probable Number Presumptive Test of coliforms in waters, effluent or sewage and as a confirmation test of lactose fermentation with gas production from milk samples and for the detection of coliforms in foods.

Lauryl Tryptose Broth is prepared according to the formulation of Mallmann and Darby. Mallmann and Darby showed that tryptose at a concentration of 2% increased the early logarithmic growth phase when compared to meat peptone. These researchers added phosphate buffers and sodium chloride, which improved gas production by "slow lactose fermenting" organisms. Sodium lauryl sulfate was incorporated as a selective agent for the inhibition of non-coliform organisms.

This medium can also be used with the addition of MUG (4- methylumbelliferyl-β-D-glucuronide) according to the ISO Standard 11866-2 to give enhanced detection of *Escherichia coli*.

Typical Formulation

Tryptose	20.0 g/L
Lactose	5.0 g/L
Sodium Chloride	5.0 g/L
Dipotassium Phosphate	2.75 g/L
Potassium Dihydrogen Phosphate	2.75 g/L
Sodium Lauryl Sulfate	0.1 g/L

Final pH: 6.8 ± 0.2 at 25°C
Formula may be adjusted and/or supplemented as required to meet performance specifications.

Precaution
Refer to SDS

Preparation
1. Dissolve 35.6 grams of the medium in one liter of purified water.
2. Mix thoroughly.
3. Dispense into tubes or bottles containing inverted Durham tubes.
4. Autoclave at 121ºC for 15 minutes.

Test Procedure
Follow the methods and procedures for the detection of coliform organisms as described in standard methods.

Quality Control Specifications
Dehydrated Appearance: Powder is homogeneous, free flowing, and off-white to light beige.

Prepared Appearance: Prepared medium is yellow to gold and clear to trace hazy.

Expected Cultural Response: Cultural response in Lauryl Tryptose (LST) Broth incubated at 33-38°C and examined for growth after 18 - 48 hours.

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Microorganism	Approx Inoculum (CFU)	Growth	Reaction (Gas)
Citrobacter freundii ATCC® 43864	10-100	Good to Excellent	Positive
Enterococcus faecalis ATCC® 29212	$>10^4$	Partial to complete Inhibition	Negative
Enterococcus faecalis ATCC® 19433	$>10^4$	Partial to complete Inhibition	Negative
Escherichia coli ATCC® 25922	10-100	Good to Excellent	Positive
Escherichia coli ATCC® 8739	10-100	Good to Excellent	Positive
Salmonella typhimurium ATCC® 14028	10-300	Good to Excellent	Negative
Staphylococcus aureus ATCC® 25923	$>10^4$	Partial to Complete Inhibition	Negative

The organisms listed are the minimum that should be used for quality control testing.

Results

After incubation of the tubes at 35°C for 24 hours, examine for turbidity and gas production. If no gas has formed in the inverted tube, re-incubate and re-examine after 48 hours. A positive presumptive test for coliform organisms is a turbid broth, accompanied by gas production (bubbles) in the Durham tube. A negative test is no growth and/or no gas production after 48 hours.

Expiration

Refer to expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Due to varying nutritional requirements, some strains may be encountered that grow poorly or fail to grow on this medium.
2. Turbidity alone is not indicative of a positive test.
3. Lauryl Tryptose Broth may form a precipitate when stored at refrigerated temperatures. This precipitate dissipates upon warming to room temperature.

Storage

Store dehydrated culture media at 2 – 30°C away from direct sunlight. Once opened and recapped, place the container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

References

1. American Public Health Association (2017) Standard Methods for the Examination of Water and Wastewater. 23rd Ed. APHA Inc. Washington DC.
2. American Public Health Association (2004) Standard Methods for the Examination of Dairy Products. 17th Ed. APHA Inc. Washington DC.
3. Vanderzant, C., and D. F. Splittstoesser (eds.). 2015. Compendium of methods for the microbiological examination of foods, 4th ed. American Public Health Association, Washington, D.C.
4. Mallmann, W.L. and Darby, C.W. (1941) Am. J. Pub. Hlth. 31. 127-134.
5. ISO Standard 11866-2 Milk and Milk Products –Enumeration of presumptive *Escherichia coli* – part 2: Most probable number technique using 4-methyl umbelliferyl-®-D-glucuronide.

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