

Koser's Citrate Medium

LQ091

To differentiate *Escherichia coli* and *Enterobacter aerogenes* on the basis of citrate utilization.

Composition**

Ingredients	Gms / Litre
Sodium ammonium phosphate	1.500
Monopotassium phosphate	1.000
Magnesium sulphate	0.200
Sodium citrate	3.000
Final pH (at 25°C)	6.7±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Label the ready to use LQ091 bottle. Inoculate the sample and Incubate at specified temperature and time .

Principle And Interpretation

Coliform bacteria serve as bacterial indicators of sanitary quality of food and water. These bacteria are normally found in the intestinal tract of humans and many warm-blooded animals (1). Coliforms encompasses mostly of *Enterobacteriaceae* from the genera *Enterobacter*, *Klebsiella*, *Escherichia* , and *Citrobacter* . The characteristics of the members of *Enterobacteriaceae* are that they are gram-negative rods and ferment glucose to form acid along with gas production (2). Two important members of the *Enterobacteriaceae* family are *Escherichia coli* and *Enterobacter aerogenes* . Both can be differentiated on the basis of IMViC test. *Enterobacter* species are able to utilize sodium citrate as the sole carbon source while *E.coli* fail to do so. This property is used to differentiate the coli-aerogenes group (3). Koser Citrate Medium is used as a base for studying citrate utilization tests. This medium is recommended by APHA, and others, to presumptively identify coliforms encountered in the food and dairy industry (3-7). The various salts used serve as source of carbon and nitrogen to the organisms. Citric acid or its sodium salt is utilized as a sole source of carbon and ammonium salt as the sole source of nitrogen by *E.aerogenes* while *E.coli* does not utilize these salts and hence fail to grow. Koser Citrate Medium may be used in place of Simmon Citrate Agar (M099). Inoculating into Koser Citrate Medium further identifies coli-like colonies from Endo or EMB Agar plates. After 24-48 hours incubation, tubes showing marked turbidity may be assumed to contain organisms from aerogenes group and if the medium remains clear it may be considered as coli. Presumptive positive organisms identified on this medium should be further confirmed by performing the biochemical tests.

Quality Control

Appearance

Sterile Koser's Citrate Medium in bottles.

Colour

Colourless clear solution.

Quantity of Medium

5ml of medium in bottles.

Reaction

6.50- 6.70

Sterility test

Passes release criteria

Cultural response

Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Growth	Citrate Utilisation
<i>Escherichia coli</i> ATCC 25922	None-poor	Negative
<i>Enterobacter aerogenes</i> ATCC 13048	Luxuriant	Positive
<i>Enterobacter cloacae</i> ATCC 23355	Luxuriant	Positive

Storage and Shelf Life

Store between 2-8°C. Use before expiry date on the label.

Reference

1.Alcamo I. E., 2001, Fundamentals of Microbiology, 6th Edition, Jones and Bartlett Publishers. 2.Murray P. R., Baron J. H., Pfaller M. A., Jorgensen J. H. and Tenover F. C., (Eds.), 2003, Manual of Clinical Microbiology, 8th Ed., American Society for Microbiology, Washington, D.C. 3.Koser S. A., 1923, J. Bacteriol., 8:493. 4.U. S. Food and Drug Administration, 1995, Bacteriological Analytical Manual, 8th Ed., AOAC International, Gaithersburg, Md. 5.Williams, (Ed.), 2005, Official Methods of Analysis of the Association of Official Analytical Chemists, 19th Ed., AOAC, Washington, D.C. 6.Downes F. P. and Ito K., (Eds.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th Ed., APHA, Washington, D.C. 7.Wehr H. M. and Frank J. H., (Eds.), 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

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