76721 XLT4 Agar (Base) (Xylose Lysine Tergitol-4 Agar (Base)) NutriSelect® Plus

A selective medium for the isolation and identification of pathogenic *Enterobacteriaceae*, especially *Salmonella spp*, according to Miller and Tate (1990).

Composition:

Ingredients	Grams/Litre
Proteose peptone No.3	1.6
Yeast extract	3.0
L-lysine	5.0
Xylose	3.75
Lactose	7.5
Sucrose	7.5
Ammonium Iron (III) citrate	0.8
Sodium thiosulfate	6.8
Sodium chloride	5.0
Phenol red	0.08
Agar	18.0

Final pH 7.4 +/- 0.2 at 25°C

Store dehydrated powder below 30°C in a tightly closed container and the prepared medium at 2-8°C.

Appearance(color): Faintly brown to brown & Faint red to red, free flowing powder
Gelling: Firm, comparable with 1.8% Agar gel
Color and Clarity: Red coloured clear to slightly opalescent gel forms in Petri plates.

Directions:
Suspend 59 g in 1 litre distilled water, add 4.6 ml XLT4 Agar Supplement solution (Cat. No. 83714) and heat the medium in a boiling water-batch (not on a heating-plate!). Cool to approx. 50°C and pour plates.

Principle and Interpretation:
A variety of culture media have been developed for isolating and differentiating enteric pathogens. The majority were designed to recover a large spectrum of enteric pathogens (1). Therefore, overgrowth of nuisance or contaminating organisms can be a major issue when recovery of a specific organism or species is desired. This is particularly true for *Salmonella* isolation media where overgrowth of *Proteus, Providencia* and *Pseudomonas* can dramatically interfere with the detection and isolation of *Salmonella*. *Salmonella* is an enteric bacterial pathogen and a major pathogenic bacterium that causes food poisoning. Its routes of infection include contaminated foods and water. *Salmonella* is a gram-negative bacillus, causes paratyphoid fever, hematosepsis and gastroenteritis as food poisoning pathogens (2,3). Although most *Salmonella* cannot be distinguished by biochemical characteristics, one serotype, namely *S. Typhi* produce only a trace amount of hydrogen sulphide and is less active biochemically than the more common serotypes (4). XLT4 Agar Base is formulated as described by Miller and Tate (1) for isolating *Salmonella* from faecally contaminated farm samples, which contains other bacteria as well. XLT4 Agar Base enhances the recovery of *Salmonella* species other than *Salmonella Typhi* (5,6). Proteose peptone is a source of carbon, nitrogen and other essential amino acids and growth factors. Yeast extract is added as a source of vitamins and other cofactors. Differentiation of *Salmonella* from other organisms that also grow on this medium is based on fermentation of xylose, lactose and sucrose, decarboxylation of lysine and the production of hydrogen sulfide. To add to the differentiating

ability of the formulation, an H_2S indicator system, consisting of sodium thiosulphate and ferric ammonium citrate is included for the visualization of the hydrogen sulphide produced, resulting in the formation of colonies with black centers. The non-pathogenic H2S producers do not decarboxylate lysine; therefore, the acid reaction generated by them prevents the blackening of the colonies (7). Sodium chloride maintains the osmotic balance of the medium. Agar is the solidifying agent. Phenol red is added as an indicator of pH changes resulting from fermentation and decarboxylation reactions. XLT4 Agar Supplement is added to inhibit growth of non-*Salmonella* organisms.

Cultural characteristics after 18-24 hours at 35-37°C with added XLT4 Supplement.

Organisms (ATCC/WDCM)	Inoculum (CFU)	Growth	Recovery	Color of colony
Escherichia coli (25922/ -)	50-100	+/++	30-40%	yellow
*Proteus mirabilis (*25933/-)	50-100	+/-	≤10%	
Salmonella Enteritidis (13076/-)	50-100	++/+++	≥50%	red with black centres
Salmonella Typhimurium (14028/-)	50-100	++/+++	≥50%	red with black centres
Enterococcus faecalis (29212/-)	≥10^3	-	0%	
Staphylococcus aureus (25923/-)	≥10^3	-	0%	

References:

1. Miller and Tate. 1990. The Maryland Poultryman April:2
2. Santos R.L., Zhang S., Tsolis R.M., Kingsley R.A., Adams L.G., Baumler A.J. Animal models of Salmonella infections: enteritis versus typhoid fever. Microbes Infect. 3:1335–1344. doi: 10.1016/S1286-4579(01)01495-2.
3. Tsolis R.M., Young G.M., Solnick J.V., Baumler A.J. From bench to bedside: stealth of enteroinvasive pathogens. Nat. Rev. Microbiol. (2008);6:883–892. doi: 10.1038/nrmicro2012.
4. Koneman E. W., Allen S. D., Janda W. M., Schreckenberger P. C., Winn W. C. Jr., 1992, Colour Atlas and Textbook of Diagnostic Microbiology, 4th Ed., J. B. Lippinccott Company Chadwick P., Delisle G. H and Byer M., 1974, Can. J. Microbiol., 20.1653-1664.
5. Tate C. R., Miller R. G. and Mallinson E. T., 1992, J. Food. Prot. 55:964
6. Dusch H. and Altwegg M., 1995, J. Clin. Microbiol. 33: 802
7. Taylor W. J., 1965, Am. J. Clin. Pathol., 44:471-475.

Precautions and Disclaimer

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