Specification

Medium for isolation of enteropathogenic species, especially *Shigella* and *Salmonella* in food and animal feeding stuffs, according to ISO standards.

Formula * in g/L

Xylose	3.750	Sodium deoxycholate	1.000
L-Lysine HCl	5.000	Sodium thiosulphate	6.800
Lactose	7.500	Ammonium iron(III) citrate	0.800
Sucrose	7.500	Agar	15.000
Sodium chloride	5.000		
Yeast extract	3.000		
Phenol red	0.080	Final pH 7.4 ±0.2 at 25 °C	

* Adjusted and /or supplemented as required to meet performance criteria

Directions

Suspend 55,43 g of powder in 1 L of distilled water. Heat with constant stirring until boiling (90-100ºC). Pour immediately into plates. Do not sterilize and avoid remelting.

Description

Xylose Lysine Deoxycholate Agar is a selective differential medium, suitable for the detection of pathogenic enterobacteria in food, especially *Shigella*. A modification in the original formulation of Taylor allows the medium to perform to the specifications of the ISO standards. Gram positive microbiota are inhibited by the low amount of deoxycholate, whilst *Shigella* grows. Xylose, lactose or sucrose fermentation produce acidification of the medium which is shown by the indicator surrounding the colonies turning yellow. This colour disappears after 24 hours, so readings must be carried out between 18 and 24 hours.
Sulfide production from thiosulfate is easily detected because colonies become darker, due to the ferric sulfide precipitate. Lysine decarboxylation to cadaverine may also be observed in the medium, since it produces alkalinization and consequently the indicator turns red.
All these reactions allow a good differentiation of *Shigella*, which other than *Edwarsiella* and *Proteus inconstans* are the only enterobacteria that do not ferment xylose and therefore show a negative fermentation reaction. *Salmonella* does ferment xylose, but it is consumed quickly and the medium becomes alkaline due to lysine decarboxylation, which may hide the reaction. The difference between *Shigella* and *Salmonella* is that the latter colonies become darker due to ferrous sulfide precipitates, which is also a common characteristic of *Edwarsiella*. Other types of enterobacteria do not suffer this phenomenon, since acid accumulation due to lactose and sucrose fermentation is so great that it avoids pH reversion by decarboxylation and even ferrous sulfide precipitate in the first 24 hours.
In the quality control appear the typical colonial aspects of Enterobacteriaceae after 24 ± 3 h of incubation at 37 ° C.

Quality control

Incubation temperature: 37 °C ± 1.0 **Incubation time:** 24 ± 3 h

Inoculum: Practical range 100 ±20 CFU. min. 50 CFU (productivity)/10^4-10^6 CFU (selectivity), according to ISO 11133:2014/Amd 1:2018.

Microorganism	Growth	Remarks
Enterococcus faecalis ATCC® 29212	Total inhibition	-
Escherichia coli ATCC® 25922	Partial inhibition	-
Salmonella abony NCTC® 6017	Productivity > 0.50	Colonies & cult. medium red / Black center (H_2S +)
Salmonella typhimurium ATCC® 14028	Productivity > 0.50	Colonies & cult. medium red / Black center (H_2S +)
Salmonella enteritidis ATCC® 13076	Productivity > 0.50	Colonies & cult. medium red / Black center (H_2S +)
Shigella flexneri ATCC® 12022	Productivity > 0.30	Colonies & cult. medium red / Black center (H2S -)

References

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· HORWITZ, W. (2000) Official Methods of Analysis of the AOAC Internacional. 17th ed. Gaithersburg. MD. USA.
· ICMSF (1978) Microorganisms in Foods 1. University of Toronto Press.
· ISO Standard 6579-1 (2017) Microbiology of food chain - Horizontal method for the detection, enumeration and serotyping of Salmonella - Part 1 : Detection of Salmonella spp.
· ISO 19250 Standard (2010) Microbiology of food and animal feeding stuffs.- Horizontal method for the detection of *Shigella spp.*
. ISO 11133:2014/ Adm 1:2018. Microbiology of food, animal feed and water. Preparation, production, storage and performance testing of culture media.
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· TAYLOR, W.J. (1965) Isolation of Shigella. I. Xylose Lysine Agars: New media for isolation of enteric pathogens. Am. J. Clin. Path 44:471-475.
· US FDA (Food and Drug Adminstrations) (1998) Bacteriological Analytical Manual 8th ed. AOAC Internacional. Gaithersburg. MD. USA.

Storage

For laboratory use only. Keep tightly closed, away from bright light, in a cool dry place (+4 ºC to 30 ºC).