

XLD AGAR (XYLOSE LYSINE DEOXYCHOLATE)

AGXL-0EP-500

- **Principle**

XLD Agar (Xylose Lysine Deoxycholate Agar) was developed principally for isolating and differentiating Gram-negative enteric bacilli, particularly Shigella and Salmonella. It has been shown to be more effective than other enteric differential media.

The reactions that take place are the degradation of the three fermentable carbohydrates: xylose, lactose and sucrose, with the production of acid, manifested in the colour change from red to yellow. Sodium thiosulfate serves as a reactive substance, with Ferric ammonium citrate as an indicator of the formation of hydrogen sulphide under alkaline conditions. Lysine allows the Salmonella group to be differentiated from the non-pathogens since, without it, salmonellae would quickly ferment the xylose and be indistinguishable from non-pathogenic species. Once the salmonellae consume the xylose, lysine is attacked via the enzyme, lysine decarboxylase, with a reversion to an alkaline pH which is similar to the Shigella reaction. The bacteria that decarboxylate the L-Lysine to cadaverine are identified by the presence of a purple-red colour around the colonies due to the elevation of the pH. Phenol red is the pH indicator. Yeast extract is the source of vitamins, particularly of the B-group essential for bacterial growth. Sodium chloride supplies essential electrolytes for transport and osmotic balance. Sodium deoxycholate is the selective agent inhibiting Gram-positive microorganisms. Bacteriological Agar is the solidifying agent.

The European Pharmacopoeia, USP recommends this media in the paragraph 2.6.13: "Microbiological examination of non-sterile products: Test for specified microorganisms" for the testing of Salmonella in products.

- **Regulatory compliance**

This product is manufactured under a quality management system in accordance with ISO 9001 and ISO 13485, and its formulation and quality control comply with applicable international standards, such as ISO 11133, where relevant.

For this specific medium, compliance is also established with the relevant requirements of the USP as well as the European Pharmacopoeia reference methodology.

- **Composition**

Ingredients	g/L
Bacteriological agar	13.50
L-Lysine	5.00
Sodium chloride	5.00
Sodium thiosulfate	6.80
Xylose	3.50
Lactose monohydrate	7.50
Ferric ammonium citrate	0.80
Phenol red	0.08
Sodium deoxycholate	2.50

Sucrose	7.50
Yeast extract	3.00

- **Preparation**

Suspend 55.2 grams of the medium in one litre of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. AVOID OVERHEATING. DO NOT AUTOCLAVE. Dispense into appropriate containers.

Preparation of large volumes, overheating and prolonged storage in water bath is to be avoided. Precipitates may be formed but do not affect the performance of the culture media.

- **Applications and use**

For clinical diagnosis, the type of sample is faecal and rectal sample.

- Inoculate on the surface. Parallel striae with the handle or hyssop.
- Incubate in aerobic conditions at 35±2 °C for 18-24 hours.
- Reading and interpretation of the results.

For other uses not covered by the CE marking:

Test of specified microorganisms (Salmonella) according to European Pharmacopoeia:

- Inoculate a suitable amount of casein soya bean digest broth and incubate at 30-35 °C for 18-24 hours.
- Transfer 0.1 ml of casein soya bean broth to 10 ml of Rappaport Vassiliadis Salmonella Enrichment Broth (RSVB-00E-500) and incubate at 30-35 °C for 18-24 hours.
- Subculture on plates of XLD and incubate at 30-35 °C for 18-48 hours.
- The possible presence of Salmonella is indicated by the growth of well-developed red colonies, with or without black centres. This is confirmed by identification tests.
- The product complies with the test if colonies of the types described are not present or if the confirmatory identification tests are negative.

Characteristics of the colonies: Arizona: Red and transparent with a black centre. Citrobacter: Yellow and opaque. Can present a black centre and clear edges. *E. coli*, Enterobacter and Serratia: Yellow and opaque. Zone of yellow precipitation around the colonies. Edwardsiella: Red with a black centre and clear edges Klebsiella: Large, yellow, pale, mucoid and opaque. Zone of yellow precipitation around the colonies. Proteus mirabilis and P. vulgaris: Yellow, transparent, with clear edges. Black centre especially *P. mirabilis*. *Proteus morgani* and *P. rettgeri*: Red and transparent Salmonella: Red, transparent with black centres and, if H₂S is produced, yellow edges. Providencia and Shigella: Red and transparent.

- **Quality control**

Solubility	w/o rests
Appearance	Fine powder
Colour of the dehydrated medium	Pink
Colour of the prepared medium	Red-orange
Final pH (25 °C)	7.4 ± 0.2

- **Microbiological test**

According to Pharmacopoeia; Salmonella typhimurium ATCC 14028.

Incubation conditions: 30-35 °C / 18-48 h.

Inoculation conditions: ≤100 CFU.

Rest of strains: Incubation conditions: 30-35 °C / 18-48 h.

Microorganisms	ATCC	Specification	Characteristic reaction
<i>Shigella flexneri</i>	12022	Good growth	Red colonies
<i>Salmonella typhimurium</i>	14028	Good growth	Clear red colonies (black centre)
<i>Escherichia coli</i>	25922	Partial inhibition	Yellow (precipitate) colonies
<i>Staphylococcus aureus</i>	25923	Inhibition	-
<i>Staphylococcus aureus</i>	6538	Inhibition	-
<i>Escherichia coli</i>	8739	Partial inhibition	Yellow (precipitate) colonies

- **Storage**

The product is highly hygroscopic; keep the container always closed and store it properly as per the conditions mentioned on the label. The declared expiry is valid only when stored as per the conditions mentioned on the label. Temp. Min.:2 °C Temp. Max.:25 °C.

Note: Sterilize media immediately after reconstitution.

- **Bibliography**

Taylor, A. J. Clin. Path. 44:471. 1965. Taylor and Harris, A.J. Clin. Path. 44:476. 1965.

Rollender, W. U. Beckford; R.D. Belsky, B. Krostoff (1969) Comparison of Xylose Lysine desoxycholate agar and MacConkey agar for the isolation of Salmonella and Shigella from clinical specimens (tech. Bull. Reg. Med. Tech, 39 (1) 8-p)

European Pharmacopoeia. 9.3

- **Product use limitation**

This product is developed, designed and supplied exclusively for research use only. It is not intended for diagnostic applications or drug development, and it is not suitable for administration to humans or animals.