



## Xylose Lysine Agar Base

M336

Xylose Lysine Agar Base is used for isolation and identification of pathogenic enteric bacilli.

### Composition\*\*

Ingredients	Gms / Litre
Yeast extract	3.000
L-Lysine	5.000
Lactose	7.500
Sucrose	7.500
Xylose	3.500
Sodium chloride	5.000
Phenol red	0.080
Agar	13.500
Final pH ( at 25°C)	7.4±0.2

\*\*Formula adjusted, standardized to suit performance parameters

### Directions

Suspend 45.08 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Add brilliant green if desired. Sterilize by autoclaving at 118°C for 10 minutes. Cool to 50-55°C and aseptically add 20 ml of sterile aqueous solution containing 34% sodium thiosulphate and 4% ferric ammonium citrate. Mix well and pour into sterile Petri plates.

### Principle And Interpretation

XL Agar Base is formulated as per the modifications of Taylor (1-5) for the selective isolation, differentiation and enumeration of gram-negative enteric bacilli. The medium can be made selective for enteric bacilli by the addition of sodium deoxycholate with the resulting medium being XLD Agar (1). It can also be made selective for *Salmonella* by the addition of brilliant green dye (6).

The medium contains yeast extract, which provides nitrogen and vitamins required for growth. Though the sugars xylose, lactose and sucrose provide sources of fermentable carbohydrates, xylose is mainly incorporated into the medium since it is not fermented by *Shigellae* but practically by all enterics. This helps in the differentiation of *Shigella* species. Sodium chloride maintains the osmotic balance of the medium. Lysine is included to differentiate the *Salmonella* group from the non-pathogens. *Salmonellae* rapidly ferment xylose and exhaust the supply. Subsequently lysine is decarboxylated by the enzyme lysine decarboxylase to form amines with reversion to an alkaline pH that mimics the *Shigella* reaction. However, to prevent this reaction by lysine-positive coliforms, lactose and sucrose are added to produce acid in excess. Degradation of xylose, lactose and sucrose to acid causes phenol red indicator to change its colour to yellow. Bacteria that decarboxylate lysine to cadaverine can be recognized by the appearance of a red colouration around the colonies due to an increase in pH. These reactions can proceed simultaneously or successively, and this may cause the pH indicator to exhibit various shades of colour or it may change its colour from yellow to red on prolonged incubation.

To add to the differentiating ability of the formulation, an H<sub>2</sub>S indicator system, consisting of sodium thiosulphate and ferric ammonium citrate is added for the visualization of hydrogen sulphide produced, resulting in the formation of colonies with black centers. The non-pathogenic H<sub>2</sub>S producers do not decarboxylate lysine; therefore, the acid reaction produced by them prevents the blackening of colonies (1).

### Quality Control

#### Appearance

Light yellow to light pink homogeneous free flowing powder

#### Gelling

Firm, comparable with 1.35% Agar gel.

**Colour and Clarity of prepared medium**

Red coloured clear to very slightly opalescent gel forms in Petri plates.

**Reaction**

Reaction of 4.51% w/v aqueous solution at 25°C. pH : 7.4±0.2

**pH**

7.20-7.60

**Cultural Response**

M336: Cultural characteristics observed with added sterile aqueous solution containing 34% sodium thiosulphate and 4% ferric ammonium citrate after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Colour of colony
<i>Enterobacter aerogenes</i> ATCC 13048	50-100	good-luxuriant	≥50%	yellow
<i>Escherichia coli</i> ATCC 25922	50-100	good-luxuriant	≥50%	yellow
<i>Proteus mirabilis</i> ATCC 25933	50-100	good-luxuriant	≥50%	grey with black centers
<i>Proteus vulgaris</i> ATCC 13315	50-100	good-luxuriant	≥50%	grey with black centers
<i>Salmonella Enteritidis</i> ATCC 13076	50-100	good-luxuriant	≥50%	red with black centers
<i>Salmonella Paratyphi A</i> ATCC 9150	50-100	good-luxuriant	≥50%	red
<i>Salmonella Paratyphi B</i> ATCC 8759	50-100	good-luxuriant	≥50%	red with black centers
<i>Salmonella Typhi</i> ATCC 6539	50-100	good-luxuriant	≥50%	red with black centers
<i>Salmonella Typhimurium</i> ATCC 14028	50-100	good-luxuriant	≥50%	red with black centers
<i>Shigella dysenteriae</i> ATCC 13313	50-100	good-luxuriant	≥50%	red
<i>Shigella sonnei</i> ATCC 25931	50-100	good-luxuriant	≥50%	red
<i>Shigella flexneri</i> ATCC 12022	50-100	good	≥30%	red

**Storage and Shelf Life**

Store below 30°C in tightly closed container and use freshly prepared medium. Use before expiry date on the label.

**Reference**

1. Taylor W. L., 1965, Am. J. Clin. Pathol., 44:471-475.
2. Taylor W. L. and Harris B., 1965, Am. J. Clin. Pathol., 44:476.
3. Taylor W. L. and Harris B., 1967, Am. J. Clin. Pathol., 48:350.
4. Taylor W. L. and Schelhart B., 1967, Am. J. Clin. Pathol., 48:356.
5. Taylor W. L. and Schelhart B., 1968, Am. J. Clin. Pathol., 16:1387.
6. Taylor W. L. and Schelhart B., 1969, Appl. Microbiol., 18:393-395.

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