PRODUCT INFORMATION

Product Type: PETRI DISHES 90mm

Cat No. PD104 - XLD AGAR

Intended Use:
Xylose Lysine Deoxycholate Agar, a selective and differential medium widely used for the isolation and differentiation of Salmonella and Shigella species from clinical, food, and environmental samples.
It uses sugar fermentation, lysine decarboxylation, and H_2S production to distinguish these pathogens from other enteric bacteria, with characteristic colony colors aiding identification

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Principle and Uses:

Yeast extract - source of vitamins and growth factors, L-Lysine – for lysine decarboxylation reactions, Xylose – fermentable sugars for differentiation, Sodium chloride – maintains osmotic balance, Sodium deoxycholate – inhibits Gram-positive bacteria (selective agent), Sodium thiosulfate – detects H_2S production, Ferric ammonium citrate – indicator for H_2S production (blackening), Phenol red - pH indicator, Agar – solidifying agent.
Selective: Sodium deoxycholate inhibits Gram-positive organisms, allowing Gram-negative enterics to grow.
Differential Components:
Xylose: Most enteric bacteria ferment xylose, producing acid and turning the medium yellow. *Shigella* does not ferment xylose, so its colonies remain red.
Lysine: *Salmonella* ferments xylose but then decarboxylates lysine, reverting the pH to alkaline and turning the colonies back to red, mimicking *Shigella.* However, *Salmonella* can be distinguished by H_2S production.
Lactose and Sucrose: Present in excess to prevent lysine-positive coliforms from reverting to alkaline conditions, ensuring they remain yellow due to acid production.
Sodium thiosulfate and ferric ammonium citrate: Allow detection of hydrogen sulfide (H_2S) production, resulting in black-centered colonies for H_2S producers like Salmonella.
Phenol red: Acts as a pH indicator, turning yellow in acid and red in alkaline conditions
Other coliforms: Ferment sugars, produce acid, and form yellow colonies

Limitations of XLD Agar:
False Positives from Non-Target Organisms: Some non-target bacteria, especially *Proteus, Pseudomonas*, and *Providencia* species, can produce colonies that mimic *Salmonella* or *Shigella* (e.g., red colonies with or without black centers), leading to possible misidentification.
Atypical Reactions by Target Pathogens: Certain strains of *Salmonella* (such as *S. Paratyphi A, S. choleraesuis, S. pullorum,* and *S. gallinarum)* may form red colonies without black centers, resembling *Shigella*. Conversely, some *Shigella* strains may ferment lactose or not grow well, resulting in atypical or false-negative results.
Over-Incubation Issues: Incubating plates for more than 48 hours can lead to false-positive results due to changes in colony color and morphology over time.
Not Suitable for All Enterics: Some enteric bacteria may not grow well or show typical characteristics on XLD agar, potentially missing certain pathogens or giving ambiguous results.
Need for Confirmatory Testing: Colony color and morphology on XLD agar are not sufficient for definitive identification. Further biochemical, serological, or molecular tests are required to accurately identify and confirm *Salmonella, Shigella*, or other pathogens.

Sample Handling Sensitivity: Delays in processing unpreserved stool specimens (over 2–3 hours) can reduce recovery rates of enteric pathogens due to acidification and temperature changes.
Limited Detection Spectrum: A single selective medium like XLD is rarely adequate to detect all potential pathogens in a specimen. It should be used alongside nonselective and other selective media for comprehensive screening.

Colony Appearance

Organism	**Colony Color & Features**
Salmonella	Red colonies with black centers (H_2S positive)
Shigella	Red colonies (no H_2S)
Coliforms	Yellow to orange colonies (acid production)
Pseudomonas	Pink, flat, rough colonies

Composition

Yeast extract: 3.0 g/L – source of vitamins and growth factors
L-Lysine: 5.0 g/L – for lysine decarboxylation reactions
Lactose: 7.5 g/L
Sucrose: 7.5 g/L
Xylose: 3.75 g/L – fermentable sugars for differentiation
Sodium chloride: 5.0 g/L – maintains osmotic balance
Sodium deoxycholate: 2.5 g/L – inhibits Gram-positive bacteria (selective agent)
Sodium thiosulfate: 6.8 g/L – detects H_2S production
Ferric ammonium citrate: 0.8 g/L – indicator for H_2S production (blackening)
Phenol red: 0.08 g/L – pH indicator
Agar: 13.5 g/L – solidifying agent

Storage: 2-8°C
Appearance: Reddish-Orange
pH Range: 7.2 - 7.6

Package contents: 10 plates in a package
Exp. Date: Printed on label and on the item.
Required materials not supplied: Laboratory equipment as required.

Warning and Precautions - For professional use only. Follow good microbiological lab practices while handling specimens and culture. Do not use Petri dishes if they show evidence of microbial contamination, discoloration, drying, cracking, or other signs of deterioration. Avoid freezing and overheating. The Petri Dishes may be used / inoculated up to the expiration date and incubated for the recommended incubation times. After use and prior to discarding, specimen containers and all contaminated material, including the used culture media and contaminated culture containers, must be sterilized or incinerated by validated procedures. Since the nutritional requirements of organisms vary, some strains may be encountered that fail to grow or grow poorly on this medium.
If excessive moisture is observed, invert the bottom over an off-set lid and allow to air dry in order to prevent formation of a seal between the top and bottom of the plate during incubation. Storage Instructions: On receipt, store plates in the dark at 2–8 °C. Avoid freezing and overheating. Do not open until ready to use.

Waste Disposal
After interpretation all plates should be destroyed by standard incineration methods.

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Implementation Date: 27/10/25
Version Number: 02

Performance Testing Results

GPT: Inoculum 10-100 cfu.

Inhibitory properties: Inoculum 10000 cfu.

Test	ATCC	Incubation Temp. (℃)	Incubation Cond	Reaction 1	
Salmonella typhimurium	14028	30-35 ℃	Aerobic, 18-24 hours	Growth	Pink-red with black center, H_2S
Salmonella enteritidis	13076	30-35 ℃	Aerobic, 18-24 hours	Growth	Pink- red with black center, H_2S positive
Shigella sonnei	29930	30-35 ℃	Aerobic, 18-24 hours	Growth	Pink-red
Shigella flexneri	29903	30-35 ℃	Aerobic, 18-24 hours	Growth	Pink-red
Salmonella abony	6017	30-35 ℃	Aerobic, 18-24 hours.	Growth	Pink-yellow with black center, H_2S positive
Escherichia coli	8739	30-35 ℃	Aerobic, 18-24 hours	Partially inhibited	
Enterococcus faecalis	19433	30-35 ℃	Aerobic, 18-24 hours	Inhibited	

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