Xylose Lysine Deoxycholate (XLD) Agar (ISO)
700004393,700004394, 700004395, 700004396
NCM0021

NCM0021	500G, 5KG& 10KG DCM Packs
NCM3015	90mm Pre-Poured Plates*

* Shipping restrictions may apply, enquire for regional availability

Intended Use
Xylose Lysine Deoxycholate (XLD) Agar (ISO) is a selective agar for the detection of Salmonella spp. in food, animal feed and in environmental samples from the food production area as described in ISO 6579-1:2017. Xylose Lysine Deoxycholate (XLD) Agar (ISO) is not intended for use in the diagnosis of disease or other conditions in humans.

Description
A selective, diagnostic agar for the detection of Salmonella spp. in food, animal feed and in environmental samples from the food production area as described in ISO 6579-1:2017.
Originally formulated by Taylor to differentiate enteric pathogens, the agar is widely used as the preferred differential medium for Salmonella spp. The medium is void of peptones but instead uses yeast extract as a carbon, nitrogen and vitamin source and xylose, lactose and sucrose are fermentable carbohydrates. *Salmonella* are able to ferment xylose to produce acid but not lactose or sucrose. When the xylose is exhausted *Salmonella* will decarboxylate lysine shifting the pH back to neutral. At near neutral pH, *Salmonella* can reduce sodium thiosulfate producing hydrogen sulfide which creates a complex with ferric ammonium citrate to produce black or black centered colonies. Other organisms are able decarboxylate lysine but acid production from the fermentation of lactose and sucrose keeps the pH too acidic for H_2S production. Selectivity is achieved through the incorporation of sodium deoxycholate and phenol red acts as a pH indicator. According to ISO 6579-1:2017, subculture is performed separately from both Rappaport-Vassiliadis medium with Soya (RVS) and Muller-Kauffmann tetrathionate-novobiocin (MKTTn) broth. This medium conforms to the performance and formulation requirements of ISO 6579-1:2017.

Typical Formulation

Yeast Extract	3.0 g/L
Sodium Chloride	5.0 g/L
Xylose	3.75 g/L
Lactose	7.5 g/L
Sucrose	7.5 g/L
L-Lysine Hydrochloride	5.0 g/L
Sodium Thiosulfate	6.8 g/L
Ferric Ammonium Citrate	0.8 g/L
Phenol Red	0.08 g/L
Sodium Deoxycholate	1.0 g/L
Agar	13.0 g/L

pH: 7.4 ± 0.2 at 25°C
Formula is adjusted and/or supplemented as required to meet performance specifications.

Precaution
Refer to SDS

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Preparation

1. Suspend 53.5 grams of the medium in one liter of purified water.
2. Heat with frequent agitation until the medium reaches the boiling point. Once boiling has been reached remove from the heat immediately.
3. AVOID OVERHEATING. DO NOT AUTOCLAVE
4. Cool to 45-50°C.
5. Pour into plates as soon as the medium has cooled.
6. Protracted boiling or prolonged holding at elevated temperature induces precipitation.
   Note: It is advisable to not prepare large volumes which will require prolonged heating.

Test Procedure

• For detection and enumeration and Serotyping of Salmonella - Refer to ISO 6579-1:2017
• For detection of *Salmonella* spp. (Water Quality) - Refer to ISO 19250:2010

Quality Control Specifications

Dehydrated Appearance: Powder is homogeneous, free flowing, and light beige to pinkish beige.

Prepared Appearance: Prepared medium is bright red to red-orange, trace to slightly hazy.

Expected Cultural Response: Cultural response at 37 ± 1°C after 24 ± 3 hours incubation.

Microorganism	Approx. Inoculum (CFU)	Expected Results	
		Recovery	Reaction
Enterococcus faecalis ATCC® 19433	>10^4	Complete inhibition	N/A
Enterococcus faecalis ATCC® 29212	>10^4	Complete inhibition	N/A
Escherichia coli ATCC® 25922	>10^4	Growth or partial inhibition	Yellow colonies if recovered
Escherichia coli ATCC® 8739	>10^4	Growth or partial inhibition	Yellow colonies if recovered
Salmonella enteritidis ATCC® 13076	50-200	≥50%	Red colonies with black center
Salmonella typhimurium ATCC® 14028	50-200	≥70%	Red colonies with black center

The organisms listed are the minimum that should be used for quality control testing.

Results

Fermentation of xylose, lactose, and sucrose generates acid, resulting in a color change in the colonies and in the medium from red to yellow.

Hydrogen sulfide production under alkaline conditions results in colonies with black centers. This reaction is inhibited by the acid conditions that accompany carbohydrate fermentation.

Lysine decarboxylation, in the absence of lactose and sucrose fermentation, results in a reversion to an alkaline pH. This alkaline pH causes the color of the medium to change back to red.

Expiration

The dehydrated medium should be discarded if it is not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

1. Red, false-positive colonies may occur with *Proteus* and *Pseudomonas*.
2. Incubation in excess of 48 hours may lead to false-positive results.

Storage

Store dehydrated culture media (NCM0021) at 2 – 30°C away from direct sunlight. Once opened and recapped, place the container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

Store pre-poured plates (NCM3015) at 2 – 8°C away from direct sunlight

References

1. ISO 6579-1:2017 Microbiology of the food chain– Horizontal method for the detection, enumeration and serotyping of *Salmonella*. Part 1: Detection of *Salmonella* spp.
2. Taylor, W. I. (1965). Isolation of shigellae. I. Xylose lysine agars; new media for isolation of enteric pathogens. Am J Clin Pathol, 44(4), 471-475.

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