LYSINE IRON AGAR

Ready to use tubes

INTENDED USE

Ready to use differential medium for the identification of *Enterobacteriaceae* by ability to decarboxylate lysine and produce H_2S or deaminate lysine.

TYPICAL FORMULA (g/l)

Peptone	5.00
Yeast Extract	3.00
Glucose	1.00
L-Lysine	10.00
Fe-Ammonium Citrate	0.50
Sodium Thiosulphate	0.04
Brom Cresol Purple	0.02
Agar	15.00

Final pH 6.7 ± 0.2

Description

Lysine Iron Agar is a differential medium developed by Edwards and Fife to presumptively identify *Salmonella* spp. including lactose fermenting *S.arizonae*, which has been implicated in food-borne outbreaks of gastroenteritidis. Some *S.arizonae* strains ferment the lactose on Triple Sugar Iron Agar, causing strong acidification of the medium with consequent inhibition of hydrogen sulphide production. Lysine Iron Agar prepared without lactose permits detection of these strains of *S.arizonae.* The inclusion of lysine is another important addition, as most species of *Salmonella* produce lysine decarboxylase activity and cause alkalinisation of the medium. *Proteus* and *Providencia* deaminate lysine with a distinct red reaction in the slope of the tube and an alkaline reaction in the butt with purple colouration of the medium.

TECHNIQUE

Inoculate the strains by stabbing to the base of the butt and by streaking on the slope. The caps of the tubes must be replaced loosely so that aerobic conditions prevail on the slant. Incubate at 37°C for 18-24 hours.

- ✓ Purple colour: positive reaction: decarboxylation of lysine
- ✓ Yellow colour: negative reaction
- ✓ Red colour: deamination of the lysine
- ✓ Blackening of the medium: production of H_2S
- ✓ Bubbles presences: gas production

The table below reports the characteristic reactions of some *Enterobacteriaceae* on Lysine Iron Agar, after inoculation and incubation at 37°C for 24 hours.

Microorganism	Slope	Butt	Gas	H_2S
Escherichia coli	K	K o N	- o +	-
Salmonella typhi	K	K	-	-
Salmonella paratyphi A	K	K	+ o -	- o +
Salmonella arizonae	K	K o N	-	+ o –
Salmonella spp.	K	K	-	+
Proteus	*R*	*A*	-	*- (+)*
Providencia	*R*	*A*	-	-
Citrobacter	K	A	- o +	+
Shigella	K	A	-	-
Klebsiella	K	K	+ o -	-

K=purple alkaline reaction: decarboxylation of the lysine;
N= no reaction;
R = red colour: deamination of the lysine
A = yellow acid reaction: + black H_2S production

LIMITATIONS
Failure to stab the but invalidates this test. The integrity of the agar must be maintained when stabbing. Caps must be loosened during this test or erroneous results will occur.
An organism that produces H_2S may mask acid production in the butt of the medium. However, H_2S production requires an acid environment, thus the butt portion should be considered acid.
LIA is not so sensitive in detecting H_2S in comparison with other iron containing media. H_2S producing Proteus spp. do not blacken this medium.

PRECAUTIONS
For *in vitro* diagnostic use only. Observe approved biohazard precautions and aseptic techniques. To be used only by adequately trained and qualified laboratory personnel. Sterilize all biohazard waste before disposal.

STORAGE
Store at 2-8° away from direct light - When stored as directed the tubed media remain stable until the expiry date shown on the label. Do not use beyond stated expiry date. Media should not be used if there are any signs of deterioration (shrinking, cracking, discoloration) or contamination.

REFERENCES
• Edwards, P.R. & Ewing W.H. (1972) - Identification of *Enterobacteriaceae*, 3rd Ed. Minneapolis: Burgess Publishing Company.
• Edwards, P.R. and Fife Marg. A. (1961) - App. Microbiol. **9**, 478-480.

PACKAGING
551636 Lysine Iron Agar, 20 ready to use slanted tubes