Lysine Iron Agar

Intended Use
Lysine Iron Agar is used for differentiation of enteric bacteria on the basis of hydrogen sulphide production and the decarboxylation or deamination of lysine.

Summary
Edwards P.R. and Mary A. Fife designed Lysine Iron Agar in 1961. Lysine Iron Agar is described and recommended for the detection of *Arizona* strains, which ferment lactose rapidly. Salmonellae and *Arizona* cultures produce a distinctive reaction since they are only recognized groups of enteric bacteria, which regularly produce lysine decarboxylase rapidly and form large amounts of hydrogen sulphide.

Principle
Peptic digest of animal tissue and yeast extract serves as a source of carbon, nitrogen, vitamins and minerals. Bromocresol purple acts as an indicator. An alkaline reaction is seen by the presence of a purple colour, and an acidic reaction is indicated by the appearance of a yellow colour. Sodium thiosulphate is the source of hydrogen sulphide, and ferric ammonium citrate as the indicator, which turns the butt black in the presence of free hydrogen sulphide gas. Lysine is added to show the decarboxylation reaction, which causes an alkaline situation to occur, seen as a purple butt. The yellow colour is seen only if lysine decarboxylation does not occur, as this reaction overcomes any acidic (yellow) conditions. If lysine is deaminated in the presence of oxygen (the reaction seen in the presence of *Proteus* and *Providencia* species), a red colour change is seen on the slant.

Formula*

Ingredients	**g/L**
Peptic Digest of Animal Tissue	5.0
Yeast Extract	3.0
Dextrose	1.0
L-Lysine HCl	10.0
Ferric Ammonium Citrate	0.50
Sodium Thiosulphate	0.04
Bromocresol Purple	0.02
Agar	15.0
Final pH (at 25°C)	6.7 ± 0.2

*Adjusted to suit performance parameters.

Storage and Stability
Store dehydrated medium below 30°C in tightly closed container and the prepared medium at 2°C-8°C. Avoid freezing and overheating. Use before expiry date on the label. Once opened keep powdered medium closed to avoid hydration.

Specimen Collection and Handling
Ensure that all samples are properly labelled.
Follow appropriate techniques for handling samples as per established guidelines.
Some samples may require special handling, such as immediate refrigeration or protection from light, follow the standard procedure.
The samples must be stored and tested within the permissible time duration.
After use, contaminated materials must be sterilized by autoclaving before discarding.

Directions
1. Suspend 34.56 g of the powder in 1000 mL purified / distilled water.
2. Mix thoroughly.
3. Boil with frequent agitation to dissolve the powder completely. DO NOT OVERHEAT.
4. Sterilize by autoclaving at 121°C (15 psi) for 15 minutes as per validated cycle.

Quality Control

Dehydrated Appearance: Light yellow to greyish yellow coloured, homogenous free flowing powder.
Prepared Appearance: Purple coloured, slightly opalescent gel forms in tubes as slants.
Cultural Response: Cultural characteristics observed after an incubation at 30°C -35°C for 18 -24hours.

Organism (ATCC)	Growth	Slant	Butt	H_2S
Salmonella enterica subsp. *enterica* serovar *Typhimurium* (14028)	Good	K	A	+
Escherichia coli (25922)	Good	K	K	-
Shigella flexneri serotype 2b (12022)	Good	K	A	-
Pseudomonas aeruginosa Strain Boston 41501 (27853)	Good	K	K	-
Citrobacter freundii (8090)	Good	K	A	+
Proteus mirabilis (25933)	Good	R	A	-

Key:
A - Acidic (Colour of the media changed to yellow)
K - Alkaline (No change in colour of the media or the colour of the media remains purple)
R - Lysine deamination (Deep red)
(+) - Positive (For H_2S positive colour of the media changed to black)
(-) - No reaction (No change in colour of the media).

Interpretation of Results

Lysine Decarboxylation is detected in the butt by an alkaline (Purple) reaction. Lysine deamination is detected by a red slant. Hydrogen sulphide production is detected by the formation of a black precipitate. A negative reaction (purple slant and yellow butt) indicates fermentation of dextrose only. Hydrogen sulphide may not be detected in this medium by organisms that are negative for lysine decarboxylase activity since acid production in the butt may suppress its formation. Because of this, hydrogen sulphide producing *proteus* species do not blacken this medium.

Performance and Evaluation

Performance of the product is dependent on following parameters as per product label claim:

1. Directions
2. Storage
3. Expiry

Precautions / Limitations

It is important to stab the butt of the medium. Failure to stab the butt invalidates this test. Do not use an inoculating loop to inoculate a tube of Lysine Iron Agar because while stabbing the butt, mechanical splitting of the medium occurs, causing a false positive result for gas production. Caps must be loosened during this test or erroneous results will occur.

Warranty

This product is designed to perform as described on the label and package insert. The manufacturer disclaims any implied warranty of use and sale for any other purpose.

Reference

1. P.R.Edwards and Mary A. Fife.1961.Appl.Microbiol.
2. Holt, Krieg, Sneath, Staley and Williams (ed.). 1994. Bergey's Manual™ of determinative bacteriology,9th ed. Williams & Wilkins, Baltimore, Md.
3. Murray, Baron, Jorgensen, Landry and Pfaller (ed.). 2007. Manual of clinical microbiology, 9th ed. American Society for Microbiology, Washington, D.C.
4. Johnson, Kunz, Barron and Ewing. 1966. Appl. Microbiol.
5. MacFaddin. 1985. Media for isolation-cultivation-identification maintenance of medical bacteria, vol.1. Williams & Wilkins, Baltimore Md
6. Data on file: Microxpress®, A Division of Tulip Diagnostics (P) Ltd.

Product Presentation:

Cat No.	Product description	Pack Size
201120330100	Dehydrated Culture Media	500 g
201120330500	Dehydrated Culture Media	500 g