Lysine Iron Agar (NCM0140)

Intended Use
Lysine Iron Agar is used for the differentiation of microorganisms on the basis of lysine decarboxylase and hydrogen sulfide production. Lysine Iron Agar is not intended for use in the diagnosis of disease or other conditions in humans.

Description
Lysine Iron Agar is prepared according to the formulation of Edwards and Fife, who developed the medium to detect *Salmonella arizonae*. *S. arizonae* ferments lactose rapidly, and the authors found expected H_2S production on Triple Sugar Iron Agar was suppressed. Detection of *S. arizonae* is important because it has been implicated in food borne infections. By eliminating lactose and incorporating lysine, Edwards and Fife devised a medium differentiating enteric bacilli based on their ability to decarboxylate or deaminate lysine and produce abundant hydrogen sulfide. This medium is recommended for detecting rapid lactose-fermenting *S. arizonae*.

Typical Formulation

Enzymatic Digest of Gelatin	5.0 g/L
Yeast Extract	3.0 g/L
Dextrose	1.0 g/L
L-Lysine	10.0 g/L
Ferric Ammonium Citrate	0.5 g/L
Sodium Thiosulfate	0.04 g/L
Bromocresol Purple	0.02 g/L
Agar	*13.5 g/L

*10 -15 g according to gel strength

Final pH: 6.7 ± 0.2 at 25°C
Formula may be adjusted and/or supplemented as required to meet performance specifications.

Precaution
Refer to SDS

Preparation
1. Suspend 33 g of the medium in one liter of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
3. Dispense into test tubes and autoclave at 121°C for 15 minutes.
4. After autoclaving, allow medium to solidify in a slanted position.

Test Procedure
1. Inoculate medium by stabbing base of tube butt and streaking slant with a needle.
2. Loosely cap the tube to ensure aerobic conditions. Incubate at 35°C for 18 - 48 hours.
3. Examine at 18 – 24 and 40 – 48 hours for growth and color changes in tube butt and slant, and for blackening at the apex of slant.

Quality Control Specifications
Dehydrated Appearance: Powder is homogeneous, free flowing, and gray to gray-beige.

Prepared Appearance: Prepared medium is reddish purple and trace to slightly hazy.

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Expected Cultural Response: Cultural response on Lysine Iron Agar at 35 ± 2°C after 18 – 48 hours Incubation.

Microorganism	Approx. Inoculum (CFU)	Response	Reactions		
			Slant	Butt	H_2S
Citrobacter freundii ATCC® 8090	Direct Inoculation	Growth	K	A	+
Escherichia coli ATCC® 25922	Direct Inoculation	Growth	K	K	---
Proteus mirabilis ATCC® 29906	Direct Inoculation	Growth	R	A	---
Salmonella typhimurium ATCC® 14028	Direct Inoculation	Growth	K	K	+
Shigella sonnei ATCC® 25931	Direct Inoculation	Growth	K	A	---

The organisms listed are the minimum that should be used for quality control testing.
KEY: K, alkaline, R, red (oxidative deamination), A, acid +, H_2S produced, ---, H_2S not produced

Results

- A positive lysine decarboxylase reaction is purple (alkaline) butt, purple slant. A negative reaction is yellow (acid) butt, purple (alkaline) slant.
- A positive lysine deaminase reaction is a red slant. A negative reaction is a purple slant. (*Proteus* spp. and *Providencia* spp. produce a red slant over a yellow [acid] butt.)
- A positive hydrogen sulfide reaction is blackened medium at the apex of the slant.

Expiration

Refer to expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if appearance has changed from the original color. Expiry applies to medium in its intact container.

Limitations of the Procedure

1. *Salmonella paratyphi* A, unlike other *Salmonella* spp., does not produce lysine decarboxylase resulting in an alkaline slant and an acid butt.
2. H_2S-producing *Proteus* spp. do not blacken the medium. It is suggested that Lysine Iron Agar be used in conjunction with Triple Sugar Iron Agar or other media to confirm differentiation.
3. The reaction of *Morganella morganii* may be variable after 23 hours incubation and may require longer incubation.

Storage

Dehydrated culture media: Store sealed bottle containing the dehydrated medium at 2 - 30°C.
Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

References

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