



Lysine Iron Agar

LAB 54

Description

This is a differential medium for the detection of salmonellae and other enteric pathogens, by means of lactose fermentation, lysine decarboxylase activity and hydrogen sulphide production. *Salmonella* strains (including *Salmonella arizona*) which ferment lactose and produce black colonies on Bismuth Sulphite Agar (LAB13) can be recognised by the alkaline reaction (purple colour) produced throughout the medium, together with blackening due to sulphide production. Enteric organisms that do not decarboxylate lysine yield an alkaline slant over an acid butt (yellow). Thus no distinction between *Shigella* and *E. coli* is possible and Triple Sugar Iron Agar (LAB53) is recommended in parallel. *Proteus* and *Providencia* cultures characteristically produce a distinctive red slant over an acid butt since these organisms deaminate lysine but without sulphide production. *Salmonella arizona* strains which produce pink to red colonies on bile salt media are often overlooked in outbreaks of food poisoning, however the use of Bismuth Sulphite Agar with subculture into Lysine Iron Agar allows determination of their presence.

Formula	g/litre
Balanced Peptone No. 1	5.0
Yeast Extract	3.0
Glucose	1.0
L-Lysine	10.0
Ferric Ammonium Citrate	0.5
Sodium thiosulphate	0.04
Bromocresol Purple	0.02
Agar No. 2	12.0

Method for reconstitution

Weigh 31.5 grams of powder and disperse in 1 litre of deionised water. Allow the mixture to soak for 10 minutes, swirl to mix and bring to the boil, with frequent stirring to dissolve completely. Dispense into tubes and sterilise by autoclaving at 121°C for 15 minutes. Cool in a slanted position such that slopes are formed over deep butts approx. 3cm in depth.

Appearance: Clear purple gel.

pH: 6.7 ± 0.2

Storage of Prepared Medium: Tightly capped containers – up to 3 months at 15-20°C in the dark.

Inoculation: Subcultures for further identification are picked from the centre of isolated colonies on selective media and streaked across the slant and stabbed into the butt of tubes of Lysine Iron Agar.

Incubation: 37°C aerobically for 18-24 hours.

Growth Characteristics			
Organism	Butt	Slant	Sulphide Production
<i>Salmonella arizona</i>	Alkaline	Alkaline	+
<i>Salmonella</i>	Alkaline	Alkaline	+
<i>Salmonella paratyphi</i>	Acid	Acid	-
<i>Enterobacter aerogenes</i>	Alkaline	Alkaline	-
<i>Klebsiella</i>			
<i>Hafnia</i>			
<i>Serratia</i>			
<i>Citrobacter</i>	Acid	Alkaline	+
<i>Escherichia coli</i>	Acid (NC)	Alkaline	-
<i>Shigella</i>	Acid	Alkaline	-
<i>Proteus</i>	Acid	'red'	-
<i>Providencia</i>	Acid	'red'	-

References

Edwards, P.R. and Fife, M.A. (1961). Lysine iron agar in the detection of Arizona cultures. Appl. Microbiol. 9:478-480.

Edwards, P.R. and Ewing, W.H. (1964). Identification of Enterobacteriaceae. Burgess Publishing Co. Minn.