Moeller Decarboxylase HiVeg™ Broth Base / Broth with Lysine Hydrochloride / Broth with Ornithine Hydrochloride /Broth with Arginine Hydrochloride MV393/MV687/MV688/MV689

Moeller Decarboxylase HiVeg Broth Base with the addition of appropriate L-amino acid, is used to differentiate bacteria on the basis of their ability to decarboxylate the specific amino acids.

Composition ** :

Ingredients	MV393 Grams/Litre	MV687 Grams/Litre	MV688 Grams/Litre	MV689 Grams/Litre
HiVeg peptone	5.00	5.00	5.00	5.00
HiVeg extract	5.00	5.00	5.00	5.00
Dextrose	0.50	0.50	0.50	0.50
Bromo cresol purple	0.01	0.01	0.01	0.01
Cresol red	0.005	0.005	0.005	0.005
Pyridoxal	0.005	0.005	0.005	0.005
L-Lysine hydrochloride	—	10.00	—	—
L-Ornithine hydrochloride	—	—	10.00	—
L-Arginine hydrochloride	—	—	—	10.00

Final pH (at 25°C) 6.0 ± 0.2
** Formula adjusted, standardized to suit performance parameters.

Directions :

Suspend 10.52 grams of MV393 and 20.52 grams of MV687/ MV688/MV689 in 1000 ml distilled water. Add 10 gm. of L-Lysine, L-Arginine, L-Ornithine or other L-amino acids in MV393. When using DL-amino acids, use 2% concentration. Heat if necessary to dissolve the medium completely. When L-Ornithine is added, readjustment of the pH is required. Dispense in 5 ml amount in screw-capped tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 10 minutes. Suspend 20.52 grams of MV687 or MV688 or MV689 in 1000 ml distilled water and sterilize as mentioned above.

Principle and Interpretation :

These media are used for differentiating gram-negative enteric bacilli on the basis of their ability to decarboxylate amino acids. The Decarboxylase Broth was introduced by Moeller for detecting the production of lysine and ornithine decarboxylase and arginine dihydrolase (1). Prior to Moeller's work, bacterial amino acid decarboxylases were studied by Gale (2) and Gale and Epps (3). These HiVeg media are prepared by replacing animal based peptones with vegetable peptones which are BSE/TSE risks free. Production of ornithine decarboxylase is a helpful criterion in differentiating *Klebsiella* and *Enterobacter* species. *Klebsiella* are non-motile and do not produce ornithine decarboxylase while *Enterobacter* are motile and produce ornithine decarboxylase except *Enterobacter agglomerans* (4).
These media contain HiVeg extract and HiVeg peptone which provide nitrogenous nutrients for the growth of bacteria. Dextrose is the fermentable carbohydrate and pyridoxal is the co-factor for the decarboxylase enzyme. Bromo cresol purple and cresol red are the pH indicators in the medium. When the medium is inoculated with the dextrose fermenting bacteria, the pH is lowered due to acid production which changes the colour of the indicator from purple to yellow. Acid produced stimulates decarboxylase enzyme. Decarboxylation of lysine yields cadaverine while putrescine is produced due to ornithine decarboxylation. Arginine is first hydrolyzed to ornithine which is then decarboxylated to form putrescine. Formation of these amines increases the pH of the medium, changing the colour of the indicator from yellow to purple. If the organisms do not produce the appropriate enzyme, the medium remains acidic, yellow in colour. Each isolate to be tested should also be inoculated into the basal medium tube lacking the amino acid.
Inoculated tubes must be protected from air with a layer of sterile mineral oil. Exposure to air may cause alkalinization at the surface of the medium which makes the test invalid.

Product Profile :

Vegetable based (Code MV)◉	Animal based (Code M)
MV393/MV687/MV688/MV689 HiVeg peptone HiVeg extract	**M393/M687/M688/M689** Peptic digest of animal tissue Beef extract

Recommended for	:	Differentiating bacteria on the basis of their ability to decarboxylate the amino acids.
Reconstitution	:	(MV393) : 10.52 g/l
	:	(MV687/MV688/MV689) : 20.52 g/l
Quantity on preparation (500g)	:	(MV393) : 47.52 L
(100g)	:	(MV393) : 9.50 L
(100g)	:	(MV687/MV688/MV689) : 4.87 L
pH (25°C)	:	6.0 ± 0.2
Supplement	:	(MV393) : Amino acids.
Sterilization	:	121°C / 10 minutes

Storage : Dry Medium-Below 30°C, Prepared Medium 2 - 8°C.

Quality Control :

Appearance of powder
Greenish yellow coloured, homogeneous, free flowing powder.
Colour and Clarity
Purple coloured, clear solution without any precipitate.
Reaction
Reaction of 1.05% w/v of MV393 or 2.05% w/v of MV687/ MV688 / MV689 aqueous solution is pH 6.0 ± 0.2 at 25°C.

Continued...

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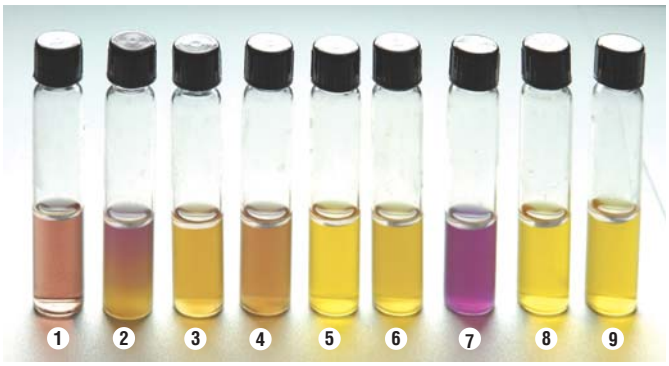
Cultural Response

Cultural characteristics observed after inoculating tubes, overlaying with sterile mineral oil and incubating at 35 - 37°C for upto 4 days.

Organisms (ATCC)	Lysine	Arginine	Ornithine
Citrobacter freundii (8090)	—	±	±
Enterobacter aerogenes (13048)	+	—	+
Escherichia coli (25922)	±	±	±
Klebsiella pneumoniae (13883)	+	—	—
Proteus vulgaris (13315)	—	—	—
Proteus mirabilis (25933)	—	—	+
Pseudomonas aeruginosa (9027)	—	+	—
Salmonella serotype Paratyphi A	—	(+) or +	+
Salmonella serotype Typhi (6539)	+	(+) or —	—
Shigella flexneri (12022)	—	— or (+)	—
Shigella sonnei (25931)	—	±	+
Shigella dysenteriae (13313)	—	— or (+)	—
Serratia marcescens (8100)	+	—	+

Key : + = positive reaction, purple colour
— = negative reaction, yellow or no colour change
± = variable
(+) = delayed positive reaction



MV689 Moeller Decarboxylase HiVeg Broth with Arginine Hydrochloride

1. Control
2. *Citrobacter freundii*
3. *Enterobacter aerogenes*
4. *Escherichia coli*
5. *Klebsiella pneumoniae*
6. *Proteus vulgaris*
7. *Pseudomonas aeruginosa*
8. *Salmonella* serotype Typhi
9. *Shigella flexneri*

References :

1. Moeller V., 1955, Acta Pathol. Microbiol. Scand. 36:158.
2. Gale G. F., 1940, Biochem. J., 34:392.
3. Gale and Epps, 1943, Nature, 152:327.
4. MacFaddin J., 2000, Biochemical Tests for Identification of Medical Bacteria, 3rd ed., Williams and Wilkins, Baltimore.