Modified, McBride Listeria Agar Base (DM1100)

Intended Use

Modified, McBride Listeria Agar Base (DM1100) is recommended for selective isolation and cultivation of *Listeria monocytogenes*, from foodstuffs, clinical samples etc.

Product Summary and Explanation

Listeria monocytogenes is a widespread problem in public health and the food industries. This organism can cause human illness and death, particularly in immunocompromised individuals and pregnant women. [1] The first reported foodborne outbreak of listeriosis was in 1985, [2] and since then, microbiological and epidemiological evidence from both sporadic and epidemic cases of listeriosis has shown that the principal route of transmission is via the consumption of foodstuffs contaminated with *L. monocytogenes*. [3] Implicated vehicles of transmission include turkey frankfurters, [4] coleslaw, pasteurized milk, Mexican-style cheese, paté, and pickled pork tongue. The organism has been isolated from commercial dairy and other food processing plants, and is ubiquitous in nature, being present in a wide range of unprocessed foods and in soil, sewage, silage and river water. [5] The disease listeriosis is a frequent cause of abortions in cattle and sheep. In human, symptoms are manifested as septicemia, encephalitis and circulatory monocytosis. [6] *Listeria* was first definitively described by Murray et al[7] in connection with an epizootic disease among laboratory-raised guinea pigs and rabbits. *Listeria* multiplies over a wide range of temperatures, from 3°C to 45°C, and over a pH range of 5.0 to 9.6. [8] *Listeria* spp. are microaerophilic, gram-positive, asporogenous, non-encapsulated, non-branching, regular, short, motile rods. Motility is most pronounced at 20°C. The most common contaminating bacteria found in food sources potentially containing *Listeria* are: streptococci, especially the enterococci, micrococci and *Bacillus* species, *Escherichia coli*, *Pseudomonas aeruginosa* and *Proteus vulgaris*. [9] Modified McBride Listeria Agar Base differ from McBride Listeria Agar Base in the nutrient source available to *Listeria* species.

Principles of the Procedure

McBride Listeria Agar base contains casein enzymic hydrolysate and beef extract in the medium supply nitrogen, carbon, sulphur and trace nutrients required for the growth of *Listeria*. Sodium chloride maintains the osmotic balance. Phenyl ethyl alcohol is bacteriostatic for gram-negative bacteria as it selectively inhibits DNA synthesis. Glycine anhydride is used for improved recovery of *Listeria* and it also, inhibits certain gram-negative and gram-positive bacteria including *Escherichia coli* and *Enterococcus faecalis*, the common accompanying contaminants. Lithium chloride also has antibacterial activity. McBride Listeria Supplement (MS184) is added after autoclaving to inhibit staphylococci, bacilli and *Proteus* species.

Formula / Liter

Ingredients	Gms / Liter
Casein enzymic hydrolysate	5.00
Peptic digest of animal tissue	5.00
Beef extract	3.00
Sodium chloride	5.00
Glycine anhydride	10.00
Lithium chloride	0.50
Phenyl ethanol	2.50
Agar	15.00
Final pH: 7.3 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.
3. Lithium chloride is harmful. Avoid bodily contact and inhalation of vapours. On contact with skin, wash immediately with plenty of water.

Directions

1. Suspend 46.00 grams of the medium in one liter of distilled water.
2. Heat if necessary, to dissolve the medium completely.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. Cool to 50°C and before gelling, aseptically add sterilized rehydrated contents of 1 vial of McBride Listeria Supplement (MS184).
5. Mix well and pour into sterile petri plates.

Quality Control Specifications

Dehydrated Appearance	Cream to yellow homogeneous free flowing powder
Prepared Medium	Light amber coloured clear to slightly opalescent gel forms in Petri plates
Reaction of 4.6% Solution	pH : 7.3 ± 0.2 at 25°C
Gel Strength	Firm, comparable with 1.5% Agar gel

Expected Cultural Response: Cultural characteristics observed under anaerobic condition with added McBride Listeria Supplement (MS184) after an incubation at 35-37°C for 24-48 hours.

Sr. No.	Organisms	Results to be achieved		
		Inoculum (CFU)	Growth	Recovery
1.	*Listeria monocytogenes ATCC 19112*	50 - 100	good-luxuriant	>=50%
2.	*Escherichia coli ATCC 25922*	50 - 100	none-poor	0-10%
3.	*Pseudomonas aeruginosa ATCC 27853*	50 - 100	none-poor	0-10%
4.	*Enterococcus faecalis ATCC 29212*	50 - 100	none-poor	0-10%

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

1. The detection of *L.monocytogenes* is greatly improved by pre-enrichment in liquid media either by one step or two steps.
2. In one step method, infected material is inoculated directly in Listeria Selective Broth Base (DM1080), while in two steps method, infected material is inoculated in Listeria Enrichment Broth Base (UVM) (DM521) and incubated at refrigeration temperature of 4°C for few weeks (cold enrichment), as the organism has the ability to grow in low temperature.
3. It is then inoculated in Fraser Secondary Enrichment Broth Base (DM1293), followed by plating onto selective agar such as Modified McBride Listeria Agar.
4. Refer to appropriate references for procedures for selective isolation and cultivation of *Listeria* species from clinical specimen.

Results

1. The presumptive *Listeria* colonies are selected under 45° transillumination.
2. *Listeria* colonies are dense white to iridescent white appearing as crushed glass. Small colonies tend to be blue.
3. Non-Listeria show yellowish orange colonies that are further purified.

Store

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

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

Limitations of the Procedure

1. For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.

2. Consult appropriate texts for detailed information and recommended procedures.

Packaging
Product Name : Modified McBride Listeria Agar Base.
Product Code : DM1100
Available Pack sizes : 500gm

References

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5. Patel, Hwang, Beuchat, Doyle and Brackett. 1995. J. Food Prot. *58*:244.
6. Hyslop N., St. G. and Osborne A. D., 1959, Vet. Rec. 71 : 1082
7. Murray E. G. D., Webb R. A. and Swann M. B. R., 1926, J. Pathol. Bacteriol., 29:407.
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9. Kramer and Jones. 1969. J. Appl. Bacteriol. *32*:381.

Further Information

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