Selective Broth for MRSA

M1882

Selective Broth for MRSA is recommended for improved detection of Methicillin Resistant *Staphylococcus aureus* (MRSA).

Composition**

Ingredients	Gms / Litre
Casein enzymic hydrolysate	11.000
Peptic digest of animal tissue	3.000
Dextrose	2.000
Sodium chloride	26.000
Starch, soluble	1.000
Disodium phosphate	2.000
Sodium acetate	1.000
Magnesium glycerophosphate	0.200
Calcium gluconate	0.100
Cobaltous sulphate	0.001
Cupric sulphate	0.001
Ferrous sulphate	0.001
Zinc sulphate	0.001
Manganous chloride	0.002
Menadione	0.001
Cyanocobalamin	0.001
L-Cysteine hydrochloride	0.020
L-Tryptophan	0.020
Pyridoxine hydrochloride	0.003
Calcium pantothenate	0.003
Nicotinamide	0.003
Biotin	0.0003
Thiamine hydrochloride	0.00004
Adenine	0.010
Guanine	0.010
Xanthine	0.010
Uracil	0.010
Final pH (at 25°C)	7.4±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 46.4 grams in 1000 ml distilled water. Heat if necessary to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C. Aseptically add rehydrated contents of 1vial of Selective Supplement for MRSA (FD299). Mix well and dispense as desired.

Principle And Interpretation

Staphylococcus aureus is a common bacterium found on the skin of healthy people. It is responsible for infections ranging from superficial to systemic (1, 2). *Staphylococcus aureus* resistant to the antibiotic methicillin are referred to as Methicillin Resistant *Staphylococcus aureus* (MRSA) (3). The proportions of both hospital acquired and community acquired infections caused by MRSA have steadily been increasing worldwide. Initially staphylococcal infections were treated using penicillin. But over the years, resistance to penicillin developed, so methicillin was the next drug of choice. Unfortunately certain strains (MRSA) have now developed resistance to methicillin also. Patients with breaks in their skin due to wounds, indwelling catheters or burns are those with certain risk of developing MRSA infection (4). Symptoms in serious cases may include fever,

lethargy and headache. MRSA can cause UTI, pneumonia, toxic shock syndrome and even death. Spread of MRSA infections can be controlled to a great extent by maintaining personal hygiene after interaction with an MRSA infected person (3).

Methicillin-resistant strains of *Staphylococcus aureus* (MRSA) were recognized in 1980s as a major clinical and epidemiological problem. MRSA strains were heterogeneous in their expression of resistance to b-lactam agents, in that large differences in the degree of resistance were seen among the individual cells in a population. The basis of methicillin-resistance is the production of an additional penicillin-binding protein mediated by the mec A gene, an additional gene found in methicillin-resistant Staphylococci.

Casein enzymic hydrolysate, peptic digest of animal tissue, dextrose, and vitamins provides nitrogen, carbon compounds and other essential growth nutrients. Sodium chloride maintains the osmotic equilibrium of the medium as well as supports the growth of *Staphylococcus* species. Selective Supplement for MRSA (FD299) is used for the selective growth of MRSA. It contains cefoxitin which is principally aimed at inducing the expression of methicillin resistance (5) and inhibiting the growth of Methicillin Sensitive *Staphylococcus aureus* (MSSA). The supplement also contains aztreonam to inhibit most isolates of the family *Enterobacteriaeceae* and colistin which is active against *Pseudomonas* species.

Quality Control

Appearance
Cream to yellow homogeneous free flowing powder

Colour and Clarity of prepared medium
Light yellow coloured clear solution in tubes

Reaction
Reaction of 4.64% w/v aqueous solution 25°C. pH : 7.4±0.2

pH
7.20-7.60

Cultural Response
Cultural characteristics observed with added Selective Supplement for MRSA (FD299) after an incubation at 35-37°C for 18-48 hours.

Cultural Response

Organism	Inoculum (CFU)	Growth
Cultural Response		
Escherichia coli ATCC 25922	>=10^3	inhibited
Klebsiella pneumoniae ATCC 13881	>=10^3	inhibited
Staphylococcus aureus ATCC 25923	>=10^3	inhibited
Staphylococcus aureus ATCC 6538	>=10^3	inhibited
Staphylococcus aureus, MRSA ATCC 43300	50-100	good-luxuriant

Storage and Shelf Life

Store dehydrated and prepared medium at 2-8°C in tightly closed container. Use before expiry period on the label.

Reference

1.Doyle, Beuchat and Montville, (Eds.), 1997, Food Microbiology Fundamentals and Frontiers. American Society for Microbiology, Washington, D.C.
2.Murray P. R., Baron J. H., Pfaller M. A., Jorgensen J. H. and Yolken R. H., (Ed.), 2003, Manual of Clinical Microbiology, 8th Ed., American Society for Microbiology, Washington, D.C.
3.Methicillin Resistant Staphylococcus aureus, Copyright © 1997-2005, Canadian Centre for Occupational Health and Safety, Sept 19th, 2005.
4.Dr. Alan Johnson, Methicillin resistant Staphylococcus aureus (MRSA) infection, The support group for MRSA sufferers and Dependents, AUG 1st , 2005.
5.Okonogi, K., Y. Noji, M. Kondo, A. Imada, and T. Yokota. 1989. Emergence of methicillin-resistant clones from cephamycin-resistant ! Staphylococcus aureus @ . J. Antimicrob. Chemother. 24:637-645.

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