Nitrofurantoin Broth Base

M857

Intended Use:

Recommended for enrichment and isolation of *Pseudomonas* species.

Composition**

Ingredients	Gms / Litre
Peptone	7.500
Tryptone	7.500
Sodium chloride	5.000
Final pH (at 25°C)	7.2±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 20 grams in 1000 ml purified/distilled water. Heat if necessary to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to room temperature and aseptically add 50 ml sterile 0.2% nitrofurantoin solution. Mix well and dispense in tubes or flasks as desired. Sterile nitrofurantoin solution (0.2%) is prepared by dissolving 1 gm Nitrofurantoin in 500 ml polyethylene glycol 300.
Note: Autosterilization takes place in 3 months. This solution can be stored for 6 months or longer.

Principle And Interpretation

Selective and differentiating media consisting of simple chemical components have been developed, both in solid and in liquid form, for culturing *Pseudomonas aeruginosa*. Nitrofurantoin, in the form of Macrodantin, has been shown to be active against most strains of *Escherichia coli*, *Staphylococcus aureus* and *Enterococcus faecalis* both in vitro and in clinical infections. Nitrofurantoin is not active against most strains of *Proteus* species or *Serratia* species. It has no activity against *Pseudomonas* species (3). Therefore nitrofurantoin incorporated in medium can be used as a selective medium for culturing of *Pseudomonas* species.
Peptone and tryptone provide the essential nutrients especially nitrogenous sources. Nitrofurantoin, 1-[(5-nitrofurfurylidene) amino] hydantoin, is a synthetic antibacterial agent which is effective against most common gram-negative and gram-positive urinary tract pathogenic bacteria (4).

Type of specimen

Dairy samples; Water samples

Specimen Collection and Handling

For dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (1,7).
For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (2).
After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Due to nutritional variations and fastidious nature of organisms certain strains may show poor growth.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance
Cream to yellow homogeneous free flowing powder

Colour and Clarity of Prepared medium
With added nitrofurantoin : Fluorescent yellow coloured clear solution without any precipitate
Reaction
Reaction of 2.0% w/v aqueous solution at 25°C. pH : 7.2±0.2
pH
7.00-7.40
Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth
Escherichia coli ATCC 25922 (00013*)	>=10^4	inhibited
Pseudomonas aeruginosa ATCC 27853 (00025*)	50-100	good-luxuriant
Staphylococcus aureus subsp. *aureus* ATCC 25923 (00034*)	>=10^4	inhibited

Key : (*) Corresponding WDCM numbers.

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 15-25°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with sample must be decontaminated and disposed of in accordance with current laboratory techniques (5,6).

Reference

1. American Public Health Association, Standard Methods for the Examination of Dairy Products, 1978, 14th Ed., Washington D.C.
2. Baird R.B., Eaton A.D., and Rice E.W., (Eds.), 2015, Standard Methods for the Examination of Water and Wastewater, 23rd ed., APHA, Washington, D.C.
3. Clinical and Laboratory Standards Institute, 2006, Performance standards for antimicrobial susceptibility testing. Approved standard M100-S15, Vol. 25, CLSI, Villanova, Pa.
4. Chamberlain R. E., 1976, Chemotherapeutic properties of prominent nitrofurans, J. Antimicrob. Chemother. 2:325336.
5. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
6. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
7. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

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