Chromogenic Bacillus Cereus Selective Supplement (STAA Selective Supplement)

PRODUCT INFORMATION

S008-25g - Streptomycin Sulfate, Powder, 25g

S008-100g - Streptomycin Sulfate, Powder, 100g

D003-5g - Dihydrostreptomycin Sulfate, Powder, 5g

D003-25g - Dihydrostreptomycin Sulfate, Powder, 25g

D003-100g - Dihydrostreptomycin Sulfate, Powder, 100g

C001-1g - Cycloheximide, Powder, 1g

C001-5g - Cycloheximide, Powder, 5g

DESCRIPTION

STAA agar base with STAA selective supplement is a medium for the isolation of *Brochothrix thermosphacta* from food samples.

BACKGROUND

Streptomycin is an antibiotic drug, the first of a class of drugs called aminoglycosides to be discovered, and was the first antibiotic remedy for tuberculosis. It is derived from the actinobacterium Streptomyces griseus.

Thallous acetate is a salt of thallium and acetate. It is used in microbiology as a selective growth medium. It is poisonous and should be handled with care.

Cycloheximide is widely used in biomedical research to inhibit protein synthesis in eukaryotic cells studied in vitro (i.e. outside of organisms). Its effects are rapidly reversed by simply removing it from the culture medium.

Mechanism of action

Streptomycin is a protein synthesis inhibitor. It binds to the small 16S rRNA of the 30S subunit of the bacterial ribosome, interfering with the binding of formylmethionyl-tRNA to the 30S subunit. This leads to codon misreading, eventual inhibition of protein synthesis and ultimately death of microbial cells through mechanisms that are still not understood.

Cycloheximide is an inhibitor of protein biosynthesis in eukaryotic organisms, produced by the bacterium Streptomyces griseus. Cycloheximide exerts its effect by interfering with the translocation step in protein synthesis (movement of two tRNA molecules and mRNA in relation to the ribosome) thus blocking translational elongation.

APPLICATION IN STAA AGAR BASE

STAA agar base with STAA selective supplement is based on the formulation described by Gardner and is recommended for the microbiological examination of meat and meat products in the ISO Standard 13722:1996.

Brochothrix thermosphacta is a Gram-positive, non-motile, facultatively anaerobic rod-shaped micro-organism which occurs singly, in short chains or in long filamentous-like chains. It constitutes a significant proportion of the spoilage flora of meat and meat products stored aerobically or vacuum packed at chill temperatures, and is occasionally the dominant organism. It is, therefore, responsible for some of the off-odours which signal the onset of spoilage in vacuum packed meat products.

Although *Brochothrix thermosphacta* is not considered to be pathogenic, it is an economically important meat-spoilage organism because it grows in a wide variety of meats and meat products and produces malodorous metabolic end products which make affected meat unpalatable.

STAA medium is made selective by the inclusion of streptomycin sulphate, thallous acetate and actidione (cycloheximide).

Streptomycin sulphate inhibits some Gram-positive organisms and most Gram-negatives at higher concentrations, whilst *Brochothrix thermosphacta* remains resistant. Thallous acetate inhibits most yeasts as well as many aerobic and facultatively anaerobic bacteria. The incorporation of cycloheximide serves to further inhibit yeasts and filamentous fungi.

Content concentrations

Typical Formula*	mg/litre
STAA Agar Base	
Peptone	20
Yeast extract	2
Dipotassium hydrogen phosphate	1
Magnesium sulphate	1
Agar	13
Final pH 7.0 ± 0.2 @ 25°C	
STAA Selective Supplement	
Streptomycin sulphate	500
Thallous acetate	50
Cycloheximide	50
* Adjusted as required to meet performance standards	

Table 1 typical formula for STAA agar base and STAA selective supplement

METHOD

Preparation

Suspend appropriate amount of STAA agar base in distilled water and bring gently to the boil to dissolve completely. Add 7.5 g of glycerol and sterilise by autoclaving at 121° C for 15 minutes. Cool to 50°C and aseptically add appropriate amount of STAA selective supplement reconstituted as directed. Mix well and distribute into sterile Petri dishes.

Protocol

1. Homogenise the test sample in sterile 0.1% peptone water or maximum recovery diluent and prepare appropriate dilutions.

2. Transfer 0.1 ml volumes to the agar plate and spread across the surface. Incubate at 22°C for 48 hours aerobically.

3. Typical colonies of *Brochothrix thermosphacta* will grow as straw coloured colonies, 0.5-1.0mm in diameter.

4. *Pseudomonads* able to grow on STAA media may be differentiated from *Brochothrix thermosphacta* by performing an oxidase test. Pseudomonads are oxidase positive.

Quality control

Positive control:

Brochothrix thermosphacta ATCC® 11509: Good growth straw colonies

Negative control:

Staphylococcus aureus ATCC® 25923: No growth

REFERENCES

1.Sneath, P.H.A and D. Jones (1986) Genus Brochothrix. In: Bergey's Manual of Systematic Bacteriology, Vol.2, pp.1249-1253. Sneath, P.H.A., Mair, N.S. et al. (eds.). Williams & Wilkins, Baltimore.

2.Gardner,G.A.(1966)J. Appl. Bacteriol. 29 (3), 455-460.

3.Nordic Committee on Food Analysis: Brochothrix thermosphacta. Determination in Meat and Meat Products, No.141, 1991.