Cefoperazone, Amphotericin B, Teicoplanin Selective Supplement (CAT Selective Supplement)

PRODUCT INFORMATION

C010-1g - Cefoperazone Sodium, Powder, 1g

C010-5g - Cefoperazone Sodium, Powder, 5g

A007-100mg - Amphotericin B, Powder, 100mg

A007-250mg - Amphotericin B, Powder, 250mg

A007-1g - Amphotericin B, Powder, 1g

A007-5g - Amphotericin B, Powder, 5g

DESCRIPTION

Blood Free Campylobacter Agar Base with Cefoperazone, Amphotericin B, Teicoplanin Selective Supplement can be used for the isolation of thermophilic *Campylobacter* species and improved recovery of *Campylobacter upsaliensis* from faeces.

BACKGROUND

Cefoperazone is a third generation cephalosporin antibiotic. It is one of few cephalosporin antibiotics effective in treating Pseudomonas bacterial infections which are otherwise resistant to these antibiotics.

Teicoplanin is an antibiotic with a similar spectrum of activity to vancomycin. Its mechanism of action is to inhibit bacterial cell wall synthesis.

Amphotericin B is a polyene antifungal drug, often used intravenously for systemic fungal infections. It was originally extracted from *Streptomyces nodosus*. Its name originates from the chemical's amphoteric properties. Two amphotericins, amphotericin A and amphotericin B are known, but only B is used clinically, because it is significantly more active in vivo.

Mechanism of action

As with other polyene antifungals, amphotericin B associates with ergosterol, the main component of fungal cell membranes, forming a transmembrane channel that leads to monovalent ion (K+, Na+, H+ and Cl−) leakage, which is the primary effect leading to fungal cell death.

APPLICATION IN BLOOD FREE CAMPYLOBACTER AGAR BASE

Because of the sensitivity of *Campylobacter upsaliensis* to a wide range of antibiotics, isolation of the organism from faeces using selective media has hitherto been difficult. The recommended isolation method uses a membrane filter culture technique on non-selective agar. This does not give good recovery from faeces containing less than 105 CFU/g, and is a technically demanding method which is relatively slow to perform.

CAT Supplement is based on the formulation described by Aspinall et al.. When added to Blood-Free Campylobacter Agar Base which contains charcoal, it gives good isolation of thermophilic *Campylobacter* spp. The isolation of *Campylobacter upsaliensis* on a selective medium is possible because CAT Supplement contains reduced levels of cefoperazone compared to other campylobacter supplements. This inhibits most Enterobacteriaceae, but not *enterococci*. Teicoplanin is included to inhibit *enterococci*. Amphotericin B is added as an antifungal agent.

Further work confirmed the effectiveness of CAT medium as an alternative to membrane filtration culture for selective isolation of thermophilic campylobacters including *Campylobacter upsaliensis*.

Atabay, Corry and On isolated a previously unknown catalase-negative, urease-positive *Campylobacter* from cattle faeces using CAT medium. This organism could not be cultured on blood-free Campylobacter medium (CCDA).

A study in which the productivity of CAT medium, blood-free media and semi-solid medium were compared, showed that CAT medium, used in parallel with membrane filtration on non-selective blood agar, is likely to be the most productive method for recovery of the greatest number of *Campylobacter* and *Arcobacter* species.

Content concentrations

Typical Formula*	**mg/litre**
Campylobacter Blood-Free Selective Agar Base	
`Lab-Lemco' powder	10

Peptone	10
Sodium chloride	5
Bacteriological charcoal	4
Casein hydrolysate	3
Sodium desoxycholate	1
Ferrous sulphate	0.25
Sodium pyruvate	0.25
Agar	12
Final pH 7.4 ± 0.2 @ 25°C	
CAT Selective Supplement	
Cefoperazone	16
Teicoplanin	8
Amphotericin B	20
* Adjusted as required to meet performance standards	

Table 1 - Typical Formula for Blood Free Campylobacter Agar Base and Cefoperazone, Amphotericin B, Teicoplanin Selective Supplement

METHOD

Preparation

Prepare 500 ml of sterile Blood-Free Campylobacter Agar Base as directed. Cool to 50°C and aseptically add CAT Selective Supplement reconstituted as directed. Mix well and pour the resulting CAT medium into sterile Petri dishes. Incubate cultures at 37°C for 48-72 hours in a microaerobic atmosphere.

Protocol

1. Prepare Campylobacter blood-free selective agar as described in the preparation.

2. Emulsify approximately 0.5 g of the specimen in 5 ml of sterile 0.1% peptone water to form an approximate 1:10 dilution.

3. Inoculate onto the selective medium with cotton tipped swabs so that single isolated colonies are formed.

4. Incubate the plates in an atmosphere consisting of approximately 5-6% oxygen, 10% carbon dioxide and 84-85% nitrogen for 48 hours at 37°C.

Quality control

Positive control:

Campylobacter upsaliensis ATCC® 43954: Good growth; pale colonies

Campylobacter jejuni ATCC® 33291: Good growth; grey coloured colonies

Negative control:

Enterococcus faecalis ATCC® 33186: Inhibited

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