SF Medium • SF Broth

Intended Use
SF (Streptococcus Faecalis) Medium (Broth) is used for the differentiation of Enterococcus species from the Streptococcus bovis group and other streptococci.

Summary and Explanation
The formulation of SF Medium was developed by Hajna and Perry\(^1\) as a result of their comparative study of presumptive and confirmatory media for the detection of coliforms and fecal streptococci. It was recommended for use in the examination of waters and other materials for the presence of fecal streptococci as an indicator of pollution. The use of SF Medium in sanitary bacteriology has been replaced by more selective media recommended in current compendia of methods for the examination of waters and foods.\(^2\)\(^-\)\(^4\)

For diagnostic microbiology purposes, the medium is useful in differentiation of enterococci from streptococci. Pure cultures of streptococci are inoculated into SF Medium in order to determine if the respective culture is Enterococcus sp. Enterococci ferment dextrose and grow in the presence of the inhibitor sodium azide.

Principles of the Procedure
Peptone and dextrose supply the nutrients required for the growth of enterococci. Sodium chloride maintains the osmotic balance of the medium. Sodium azide exhibits a bacteriostatic effect on gram-negative bacteria through its inhibitory action on enzymes in the electron transport system. Bromcresol purple serves as a pH indicator.

Formula
Difco™ SF Medium
Approximate Formula* Per Liter

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tryptone</td>
<td>20.0 g</td>
</tr>
<tr>
<td>Dextrose</td>
<td>5.0 g</td>
</tr>
<tr>
<td>Dipotassium Phosphate</td>
<td>4.0 g</td>
</tr>
<tr>
<td>Monopotassium Phosphate</td>
<td>1.5 g</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>5.0 g</td>
</tr>
<tr>
<td>Sodium Azide</td>
<td>0.5 g</td>
</tr>
<tr>
<td>Bromcresol Purple</td>
<td>32.0 mg</td>
</tr>
</tbody>
</table>

*Adjusted and/or supplemented as required to meet performance criteria.

User Quality Control

Identity Specifications
Difco™ SF Medium
Dehydrated Appearance: Light beige to gray, may have a light greenish tint, free-flowing, homogeneous.
Solution: 3.6% solution, soluble in purified water. Solution is purple, clear.
Prepared Appearance: Dark purple, clear to slightly hazy, may contain a slight precipitate.
Reaction of 3.6% Solution at 25°C: pH 6.9 ± 0.2

Cultural Response
Difco™ SF Medium
Prepare the medium per label directions. Inoculate and incubate at 45-46°C for 18-48 hours.

<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>ATCC*</th>
<th>INOCULUM</th>
<th>CFU</th>
<th>RECOVERY</th>
<th>REACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterococcus faecalis</td>
<td>19433</td>
<td>10^5-10^6</td>
<td>Good</td>
<td>Yellow (acid)</td>
<td></td>
</tr>
<tr>
<td>Enterococcus faecium</td>
<td>27270</td>
<td>10^5-10^6</td>
<td>Good</td>
<td>Yellow (acid)</td>
<td></td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>25922</td>
<td>10^5-10^6</td>
<td>Inhibition</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td>Streptococcus bovis</td>
<td>33317</td>
<td>10^5-10^6</td>
<td>None to poor</td>
<td>No change</td>
<td></td>
</tr>
</tbody>
</table>

Directions for Preparation from Dehydrated Product
1. Dissolve 36 g of the powder in 1 L of purified water. For double strength medium, use 72 g/L of purified water. Rehydrate with proportionally less water when liquid inocula will exceed 1 mL.
2. Autoclave at 121°C for 15 minutes.
3. Test samples of the finished product for performance using stable, typical control cultures.

Procedure
Inoculate tubes of the medium with pure cultures of the test organisms. Incubate tubes for 18-48 hours at 45-46°C in an aerobic atmosphere.
Expected Results

A positive reaction is indicated by turbidity and a yellow-brown color due to the fermentation of dextrose and the resultant color change of the bromcresol purple indicator.

A negative reaction is indicated by no change in the purple color of the medium.

Streptococci yielding positive reactions:

- *E. faecalis*
- *E. faecium*

Streptococci yielding negative reactions:

- *S. bovis*
- *S. equinus*
- *S. mitis*
- *S. salivarius*
- Streptococcus species other than group D

Limitations of the Procedure

1. Pure cultures of enterococci (streptococci) should be inoculated into this medium.

2. Group D streptococci include both enterococcal and non-enterococcal strains. Consult appropriate references for further identification of group D streptococci.

References


Availability

**Difco™ SF Medium**
Cat. No. 231510 Dehydrated – 500 g

**BBL™ SF Broth**
Cat. No. 221712 Prepared Tubes – Ctn. of 100