## 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 The use of SF Medium in sanitary bacteriology has been replaced by more selective media recommended in current compendia of methods for the examination of waters and foods.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 <br> Difco ${ }^{\text {TM }}$ SF Medium

Approximate Formula* Per Liter
Tryptone .............................................................. 20.0 g
Dextrose .................................................................5.0 g
Dipotassium Phosphate ............................................... 4.0 g
Monopotassium Phosphate ........................................ 1.5 g
Sodium Chloride ......................................................... 5.0 g
Sodium Azide...............................................................0.5 g
Bromcresol Purple ....................................................... 32.0 mg
*Adjusted and/or supplemented as required to meet performance criteria.

## User Quality Control

## Identity Specifications <br> Difco ${ }^{\text {TM }}$ SF Medium

Dehydrated Appearance: Light beige to gray, may have a light greenish tint, free-flowing, homogeneous.
Solution: $\quad 3.6 \%$ 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 $25^{\circ} \mathrm{C}$ : $\quad \mathrm{pH} 6.9 \pm 0.2$

## Cultural Response

## Difco ${ }^{\text {TM }}$ SF Medium

Prepare the medium per label directions. Inoculate and incubate at $45-46^{\circ} \mathrm{C}$ for $18-48$ hours.

|  | INOCULUM |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| ORGANISM | ATCC $^{\text {ITM }}$ | CFU | RECOVERY | REACTION |  |
| Enterococcus faecalis | 19433 | $10^{5}-10^{6}$ | Good | Yellow (acid) |  |
| Enterococcus faecium | 27270 | $10^{5}-10^{6}$ | Good | Yellow (acid) |  |
| Escherichia coli | 25922 | $10^{5}-10^{6}$ | Inhibition | No change |  |
| Streptococcus bovis | 33317 | $10^{5}-10^{6}$ | None to <br> poor | No change |  |

## Directions for Preparation from Dehydrated Product

1. Dissolve 36 g of the powder in 1 L of purified water. For double strength medium, use $72 \mathrm{~g} / \mathrm{L}$ of purified water. Rehydrate with proportionally less water when liquid inocula will exceed 1 mL .
2. Autoclave at $121^{\circ} \mathrm{C}$ 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 $45-46^{\circ} \mathrm{C}$ 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

1. Hajna and Perry. 1943. Am J. Public Health. 33:550.
2. Wehr and Frank (ed.). 2004. Standard methods for the examination of dairy products, 17th ed. American Public Health Association, Washington, D.C.
3. Eaton, Rice and Baird (ed.). 2005. Standard methods for the examination of water and wastewater, 21st ed., online. American Public Health Association, Washington, D.C.
4. Downes and Ito (ed.). 2001. Compendium of methods for the microbiological examination of foods, 4th ed. American Public Health Association, Washington, D.C.

Availability
Difco ${ }^{\text {TM }}$ SF Medium
Cat. No. 231510 Dehydrated - 500 g

## BBL ${ }^{\text {m }}$ SF Broth

Cat. No. 221712 Prepared Tubes - Ctn. of 100

