Our Selenite Dulcitol Broth is used for the selective enrichment of *Salmonella* species from a variety of samples including food.

Leifson devised the original selenite formulation and demonstrated the efficacy of the medium for isolating *Salmonella* from clinical specimens. Selenite Dulcitol Broth is a modification of Leifson’s recipe where dulcitol is added to the broth to improve the recovery of *Salmonella*. Raj reported that dulcitol greatly improved recovery of *Salmonella*, and resulted in much greater sensitivity when compared to other selenite-containing enrichment broths.

The presence of a fermentable carbohydrate, such as dulcitol, helps to elicit growth of *Salmonella* while other *Enterobacteriaceae* such as *Proteus* cannot utilize this carbohydrate. Proteose peptone and yeast extract provide the bacteria with amino acids, vitamins, and other vital growth factors. Phosphate is added to help maintain a stable pH, since reduction of the sodium selenite results in an alkaline shift in the pH of the broth. Sodium selenite is a selective agent that inhibits gram-positive organisms as well as most *Enterobacteriaceae*. The retarding effects of sodium selenite are temporary and therefore sub-culturing before 24 hours of incubation is essential for good recovery of *Salmonella*.

**Recommended Procedure**

(Depending on sample please consult appropriate references for a more detailed testing protocol)

1. Inoculate the Selenite Dulcitol Broth with the sample.
2. Incubate the tubes with loose caps for 12-18 hours at 35°C.
3. Subculture onto a selective and differential media such as SS or XLD agar to isolate potential *Salmonella* colonies.
4. Incubate plates for 24 hours at 35°C and examine plates for growth.

**Quality Control**

After checking the medium for correct pH, colour, depth, and sterility, the following organisms are used to determine the performance of the completed medium. The tubes are incubated at 35°C and sub-cultured onto MacConkey Agar after 18 hours. MacConkey plates are incubated at 35°C for 24 hours and then examined.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Salmonella typhimurium</em> ATCC 14028</td>
<td>Growth</td>
</tr>
<tr>
<td><em>Escherichia coli</em> ATCC 25922</td>
<td>Inhibition (partial)</td>
</tr>
</tbody>
</table>

**Interpretation of Results**

Selenite Dulcitol Broth is intended only for use as an enrichment step for isolating *Salmonella*. Growth is observed as a turbid, orange solution. The inhibitory effects of sodium selenite is markedly reduced after 24 hours of incubation, therefore sub-culturing onto a selective, differential medium is essential prior to 24 hours.

**Formula per Litre of Medium**

Proteose peptone ............................................. 4.0 g
Yeast extract .................................................. 1.5 g
Sodium phosphate (dibasic) ......................... 1.25 g
Potassium phosphate (Monobasic) ............. 1.25 g
Sodium Selenite ............................................... 5.0 g
Dulcitol .......................................................... 4.0 g

pH 6.9 ± 0.2
Ideally, Selenite Dulcitol Broth should be subcultured after 12-18 hours of incubation to prevent the overgrowth of *Salmonella* by other gram-negative bacteria. For more information of typical *Salmonella* colonies refer to an appropriate technical source depending on the type of selective, differential medium used.

Additional biochemical and/or serological tests should be performed on isolated colonies from pure culture to complete identification.

- *Do not use if excess red precipitate (reduced selenite) is observed at the bottom of the tube*

- *Sodium acid selenite is highly toxic and therefore tubes should be handled with care and attention*

**Storage and Shelf Life**

Our Selenite Dulcitol Broth should be stored in an upright position at 4°C to 8°C and protected from light. Under these conditions the medium has a shelf life of 6 weeks from the date of manufacture.

**References**


Original: December 1998
Reviewed / Revised: October 2014