Selenite Cystine Broth ISO

Cat. 1220

For the selective enrichment of Salmonella spp and some strains of Shigella in feces, urine (from clinical samples) and other materials of sanitary importance

Practical information

Aplications	Categories
Selective enrichment	Salmonella
Selective enrichment	Shigella

Industry: Clinical / Food

Regulations: ISO 19250 / BAM / ISO 6579

CE IVD

Principles and uses

Selenite Cystine Broth is used for the selective enrichment of Salmonella spp, and is a modified enriched medium by the addition of the amino acid cystine. This amino acid establishes a redox potential that seems to be very good for the enrichment and recovery of Salmonella and some strains of Shigella, present in limited numbers in feces, diverse foods and other products of sanitary concern.

Selenite Cystine Broth is used particularly to limit the loss of sensitivity that affects other enrichment media especially in food products with a high content of organic material, for example, foods containing egg or egg powder.

Selenite Cystine Broth is recommended for the detection of Salmonella in the non-acute stages of illness when the organisms occur in low numbers in the feces ,and for epidemiological studies to encourage the detection of low numbers of organisms from asymptomatic or convalescent patients.

Selenite Cystine Broth inhibits the early multiplication of bacteria such as Coliforms, but allows the Salmonellae to grow with ease. Peptone mixture is a source of nitrogen, vitamins and amino acids essential for growth. Lactose is the carbohydrate energy source; Sodium selenite inhibits Gram-positive bacteria and most enteric Gram-negative bacteria, except Salmonella. L-Cystine lowers the toxicity of Sodium selenite and adds an additional organic sulphur.

If the broth is to be used immediately, sterilization is unnecessary. Broth which has been tubed and steamed may be kept for months under refrigeration.

After a long storage period of the dehydrated medium, the colour of the prepared broth might change to reddish/red. The microbiological performance, however, is not affected.

Formula in g/L

Lactose	4	L-Cystine	0,01
Peptone mixture	5	Sodium phosphate	10
Sodium biselenite	4		

Preparation

Suspend 23 grams of the medium in one liter of distilled water. Mix well and heat gently until dissolved. Dispense and sterilize by exposing the medium to flowing steam for 5 minutes. Excessive heating is detrimental. Do not sterilize in autoclave.

Instructions for use

» For clinical diagnosis, the type of sample is feces.

- Suspend 1-2 g of sample in 10-15 ml of Selenite Cystine Broth and mix well until a homogeneous solution is obtained.
- Inoculate and incubate in aerobic conditions at 35±2 °C for 18-24 hours.
- Subculture on plates of MacConkey Agar (Cat. 1052), SS Agar (Cat. 1064), XLD Agar (Cat. 1080) or Chromogenic Salmonella Agar (Cat.1122).
- Incubate at 35±2 ºC for 18-24 h.

» For other uses not covered by the CE marking:

Microbiological analysis of food. Follow the usual methods.
- Inoculate the tubes of Selenite Cystine Broth.
- Subcultivate into differential solid media, such as SS Agar (Cat. 1064), MacConkey Agar (Cat. 1052), XLD Agar (Cat. 1080) and Chromogenic Salmonella Agar (Cat. 1122) and observe after 6-8 hours of incubation and again, after 12-24 hours.
- After 18 hours of incubation, the commensal microorganisms rapidly increase and begin to impede the isolation of Salmonellae, so it is necessary to subculture before the elapse of this critical time.

Detection of Salmonella Typhi and Salmonella Paratyphi according to Annex D of ISO 6579:
- Preenrichment in non-selective medium:
Inoculate the Buffered Peptone Water (Cat. 1402) with the sample or dilutions, and incubate at 34-38 ºC for 18±2 h.
- Enrichment in selective media:
Inoculate, with the culture obtained in the pre-enrichment stage, the Selenite Cystine Broth (Cat. 1220) the Rappaport Soy Broth (Vassiliadis)(Cat. 1174), and the MKKTN Broth (Cat. 1173).
The Rappaport Soy Broth is incubated at 41,5±1 ºC for 24±3 h, the Selenite Cystine Broth is incubated at 34-38 ºC for 24-48 h and the MKKTN Broth at 34-38 ºC for 24±3 hours
- Plating out on selective solid media:
From the selective enriched cultures, inoculate two selective isolation agar; XLD agar (Cat. 1274) and Bismuth Sulfite Agar (Cat. 1011)
Incubate the XLD plates inverted at 34-38 ºC for 24±3 hours and the Bismuth Sulfite plates at 34-38 ºC for 24h, and again, if necessary, for 48h.
- Confirmation:
Subculture colonies of presumptive Salmonella and confirm their identity by biochemicals and serological tests

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Beige	Clear to dark amber. Red after long storage time	7,0±0,2

Microbiological test

According to ISO 11133:
Incubation conditions: (37±1 ºC / 24±3 h).
Inoculation conditions: Productivity qualitative (<100 CFU) / Selectivity (10^4-10^6 CFU).

Microorganisms	Specification
Salmonella typhimurium ATCC 14028 +Escherichia coli ATCC 8739 +Pseudomonas aeruginosa ATCC 27853	>10 characteristic colonies on XLD Agafr or other medium of choice
Salmonella enteriditis ATCC 13076 +Escherichia coli ATCC 8739 +Pseudomonas aeruginosa ATCC 27853	>10 characteristic colonies on XLD Agar or other medium of choice
Enterococcus faecalis ATCC 19433	<10 colonies on TSA
Escherichia coli ATCC 8739	Partial inhibition, <=100 colonies on TSA

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Bibliography

Leifson E. (1936) Am. J. Hyg 24: 423-432
American Public Health Association (1976) Compendium of Methods for the Microbiological Examination of Foods. Fricker CR. (1987) J. Appl. Bact. 63: 99-1 16.