Technical Data Sheet

GranuCult® prime
Selenite Cystine (SC) broth acc. FDA-BAM
(contains Sodium selenite)

Ordering number: 1.00212.0500

For the selective enrichment of *Salmonella* from food and animal feed and other materials, especially when the detection of *Salmonella* enterica subspecies *enterica* serovars Typhi and Paratyphi is of specific concern.

This culture medium complies with the specifications given by FDA-BAM Medium M134 (Medium 1: Modification of Leifson's formulation for selenite broth), AOAC Official Method 967.25, GB 4789.4 and APHA. The typical composition of this culture medium complies with the specifications given by EN ISO 6579-1.

Mode of Action

Peptones including the enzymatic digest of casein provide nitrogen, vitamins, amino acids and Lactose provides the carbon sources. Disodium phosphate acts as a buffer to maintain the pH.

Selenite inhibits the growth of coliform bacteria and enterococci in the first 6 – 12 hours of incubation, its inhibitory effect then gradually declines.

L-Cystine is considered to enhance the growth of *Salmonella* by reduction of toxicity. According to the modification described by North and Bartram (1953), L-Cystine is added to the original formulation of Leifson (1936).

Typical Composition

There is no composition specified by APHA for Selenite Cystine broth.

Specified by FDA-BAM M134 (Medium 1), AOAC 967.25		Specified by GB 4789.4		Specified by EN ISO 6579-1		GranuCult® prime Selenite Cystine (SC) broth acc. FDA-BAM	
Tryptone or Polypeptone	5.0 g/l	Peptone	5.0 g/l	Peptone	5.0 g/l	Peptone (includes enzymatic digest of casein)*	5.0 g/l
L-Cystine	0.01 g/l	L-Cystine	0.01 g/l	L-Cystine	0.01 g/l	L(-)Cystine	0.01 g/l
Lactose	4.0 g/l	Lactose	4.0 g/l	Lactose	4.0 g/l	Lactose	4.0 g/l
Na_2HPO_4	10.0 g/l	Na_2HPO_4	10.0 g/l	Na_2HPO_4 x 12 H_2O	10.0 g/l	Na_2HPO_4 x 12 H_2O	10.0 g/l
Sodium acid selenite	4.0 g/l	Sodium hydrogen selenite	4.0 g/l	Sodium hydrogen selenite	4.0 g/l	Sodium hydrogen selenite**	4.0 g/l
Water	1000 ml	Water	1000 ml	Water	1000 ml	Water	n/a
pH at 25 °C	7.0 ± 0.2	pH at 25 °C	7.0 ± 0.2	pH at 25 °C	7.0 ± 0.2	pH at 25 °C	7.0 ± 0.2

* Enzymatic digest of casein is equivalent to the term tryptone.
**Sodium hydrogen selenite is equivalent to the term sodium acid selenite.

Preparation

Dissolve 23.0 g in 1 liter of purified water at room temperature, if necessary, warm shortly (max. 60 °C). Filter-sterilize if a storage is planned. Dispense into suitable containers. Do not autoclave!

Acc. to EN ISO 6579-1, dispense the prepared medium to achieve a depth of at least 5 cm.

The dehydrated medium is a granulate with brown color.

The prepared medium is clear and yellowish. The pH value at 25 °C is in the range of 6.8 - 7.2.

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

Before inoculation, allow the prepared medium to equilibrate at room temperature if it was stored at a lower temperature.

Experimental Procedure and Evaluation

Depend on the purpose for which the medium is used.

Transfer 1 ml of the culture obtained in the pre-enrichment (e. g. Buffered Peptone Water) to a tube containing 10 ml of SC broth. Minimize the transfer of particulate material from the pre-enrichment into the selective enrichment medium.

Incubate the inoculated broth under aerobic conditions e.g.
- acc. to EN ISO 6579-1 between 34 °C and 38 °C for (24 ± 3 h) and (48 ± 3 h);
- acc. to FDA-BAM Chapter No. 5 at (35 ± 2 °C) for (24 ± 2 h);
- acc. to APHA at (35 ± 1 °C) for (24 ± 2 h);
- acc. to GB 4789.4 at (36 ± 1 °C) for (18 to 24).

From the culture obtained in SC broth, selective solid media are inoculated after gently shaking, see details given by the appropriate standard.

If the detection of *Salmonella enterica* subspecies *enterica* serovars Typhi and Paratyphi is of specific concern, mostly Bismuth Sulfite (BS) agar, XLD agar and another solid selective medium complementary to XLD agar are inoculated from the culture obtained in SC broth.

Storage

Store at +2 °C to +8 °C, dry and tightly closed. Do not use clumped or discolored medium. Protect from UV light (including sun light). For *in vitro* use only.

Acc. to EN ISO 6579-1, self-prepared poured tubes can be stored in the dark and protected against evaporation at (5 ± 3 °C). The medium may be used until a red precipitate occurs.

Microbiological Performance

Test strain	Inoculum	Method of control	Criteria
Salmonella Typhimurium ATCC® 14028 [WDCM 00031] + *Escherichia coli* ATCC® 25922 [WDCM 00013]	≤ 100 CFU ≥ 1 x 10^4 CFU	Qualitative	*Salmonella*: > 10 colonies with black center on XLD agar *E. coli*: inhibited growth
Salmonella Typhimurium ATCC® 13076 [WDCM 00030] + *Escherichia coli* ATCC® 8739 [WDCM 00012]	≤ 100 CFU ≥ 1 x 10^4 CFU		

Incubation: (24 ± 3 h) at (37 ± 1) °C, aerobic.
Confirmation on XLD agar.

Please refer to the actual batch related Certificate of Analysis.

Literature

AOAC (2005): Official Method 467.25 *Salmonella* in Foods. Preparation of Culture Media and Reagents. AOAC International, Rockville, MD, USA.

APHA (2018): Part 9260: Detection of pathogenic bacteria. Standard Methods for the Examination of Water. 23rd ed. American Public Health Association, American Water Works Association, Water Environment Federation, Washington, D.C.

APHA (2015): Chapter No. 36 *Salmonella*. and Chapter No. 67 Microbiological media, reagents and stains. Compendium of Methods for the Microbiological Examination of Foods. 5th ed. American Public Health Association, Washington, D.C.

APHA (1978): Chapter No. 5 Pathogens in Milk and Milk Products. Standard Methods for the Examination of Dairy Products. 17th ed. American Public Health Association, Washington, D.C.

ISO International Standardisation Organisation. Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of *Salmonella* — Part 1: Detection of *Salmonella* spp. + Amendment 1 Broader range of incubation temperatures, amendment to the status of Annex D, and correction of the composition of MSRV and SC. EN ISO 6579-1:2027/ Amd1:2020.

FDA-BAM (2017): Chapter No. 5: *Salmonella*. Food and Drug Administration - Bacteriological Analytical Manual.

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National Health and Family Planning Commission of the People's Republic of China. China Food and Drug Administration. National Standard of the People's Republic of China. National food safety standard — Food microbiological examination: Examination of *Salmonella*. GB 4789.4-2016.

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Corry, J.E.L., Curtis, G.D.W. and Baird, R.M. (2012): Selenite cystine broth. In: Handbook of Culture Media for Food and Water Microbiology, pp. 924-926. Royal Society of Chemistry, Cambridge, UK.

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Leifson, E. (1936): New selenite enrichment media for the isolation of typhoid and paratyphoid (*Salmonella*) bacilli. Am. J. Hyg. **24**: 423-432.

Mooijman, K.A. (2012): Culture media for the isolation of *Salmonella*. In: Handbook of Culture Media for Food and Water Microbiology. (Corry, J.E.L., Curtis, G.D.W. and Baird, R.M. eds), pp. 261-286. Royal Society of Chemistry, Cambridge, UK.

North, W.R. and Bartram, M.T. (1953): The efficiency of selenite broth of different compositions in the isolation of *Salmonella*. Appl. Microbiol. **1**: 130-134.

Robertson, D.S. (1970): Selenium, a possible teratogen. Lancet **7645**: 518-519.

Ordering Information

Product	Cat. No.	Pack size
GranuCult® prime Selenite Cystine (SC) broth acc. FDA-BAM	1.00212.0500	500 g