

### Also known as

Casein Soybean Digest Agar

### Specification

General purpose medium containing animal and plant peptone, according to Pharmacopoeial Harmonized Methods and ISO standards.

### Formula \* in g/L

|                       |      |
|-----------------------|------|
| Casein peptone .....  | 15.0 |
| Soy peptone .....     | 5.0  |
| Sodium chloride ..... | 5.0  |
| Agar .....            | 15.0 |

Final pH 7.3 ± 0.2 at 25 °C

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

### Directions

Mix 40 g of powder in 1 L of distilled water. Let it soak and bring to the boil to dissolve the agar. Sterilize in the autoclave at 121°C for 15 minutes.

### Description

TSA is a widely used medium containing two peptones which support the growth of a wide variety of organisms, even that of very fastidious ones such as *Neisseria*, *Listeria*, *Brucella*, etc. It is frequently used for routine diagnostic purposes due to its reliability and its easily reproducible results.

The following list includes some of its most common applications:

- . The medium provides, with added blood, perfectly defined haemolysis zones, while preventing the lysis of erythrocytes due to its sodium chloride content.
- . It can be used for the preparation of an exceptionally nutrient 'chocolate' agar, thanks to the richness of its peptones. In a reducing environment or with a CO<sub>2</sub> enriched atmosphere, it provides an excellent medium for the isolation of *Brucella* and *Neisseria*. It may be made selective by using additives.
- . Most streptococci grow in this medium though clear differences can be observed from one species to another.
- . Several tests for the differentiation and identification of staphylococci can be performed on this medium, provided suitable additives are used.
- . Yeast, particularly *Candida* species, can grow in this medium forming very characteristic colonies.
- . Chromogenic pseudomonads frequently produce pigmentation on TSA and are therefore easily recognized.
- . A vast bibliography documents its applications in the food industry.
- . It has been frequently used in the Health industry to produce antigens, toxins, etc...
- . Its simple and inhibitor-free composition makes it suitable for the detection of antimicrobial agents in food and other products.
- . A balanced and high nutrient value together with a lack of fermentable carbohydrates make this medium ideal for maintaining bacterial strains.
- . If it is desired to use as an alternative medium in confirming the presumptive *Legionella* colonies isolated on the BCYE medium, the pH of the TSA must be adjusted so that after sterilization it is 6.8 ± 0.2 at 25 °C.

### Quality control

**Incubation temperature:** 30-35 °C

**Incubation time:** 24-48 h - 5 days

**Inoculum:** Practical range 50-100 CFU (productivity), according to Ph. Eur. and ISO 11133:2014/Amd 1:2018 . Spiral Plate Method

### Microorganism

*Bacillus subtilis* ATCC® 6633  
*Staphylococcus aureus* ATCC® 6538  
*Escherichia coli* ATCC® 8739  
*Candida albicans* ATCC® 10231  
*Pseudomonas aeruginosa* ATCC® 9027  
*Aspergillus brasiliensis* ATCC® 16404  
*Listeria monocytogenes* ATCC® 13932

### Growth

Productivity > 0.70  
Productivity > 0.70  
Productivity > 0.70  
Productivity > 0.70  
Productivity > 0.70  
Productivity > 0.70  
Productivity > 0.70

### Remarks

-  
-  
-  
48 h / 5 d  
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3-5 d (Black sporulation)  
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### References

- ATLAS, R.M. & L.C. PARKS (1993) Handbook of Microbiological Media. CRC Press, Inc. London.
- COLIPA (1997) Guidelines on Microbial Quality Management (MQM). Brussels.
- DOWNES, F.P. & K. ITO (2001) Compendium of Methods for the Microbiological Examination of Food, 4th ed, ASM, Washington D.C.
- EUROPEAN PHARMACOPOEIA 8.0 (2014) 8th ed. § 2.6.13. Microbiological examination of non-sterile products: Test for specified microorganisms. Harmonised Method. EDQM. Council of Europe. Strasbourg.
- FDA (Food and Drug Administrations) (1998) Bacteriological Analytical Manual. 8th ed. Revision A. AOAC International. Gaithersburg. MD.
- HORWITZ, W. (2000) Official Methods of Analysis of AOAC INTERNATIONAL, 17th ed. Gaithersburg, MD. USA.
- ISO 9308-1 Standard (2000) Water Quality. Detection and enumeration of E. coli and coliform bacteria. Membrane filtration method.
- ISO 11731 Standard (2017) Water Quality. - Enumeration of Legionella.
- ISO 11133:2014. Microbiology of food, animal feed and water. Preparation, production, storage and performance testing of culture media.
- ISO 18415 Standard (2017) Cosmetics - Microbiology - Detection of specified and non-specified microorganisms.
- ISO 21149 Standard (2017) Cosmetics - Microbiology - Enumeration and detection of aerobic mesophilic bacteria.
- ISO 21150 Standard (2015) Cosmetics - Microbiology - Detection of Escherichia coli.
- ISO 22717 Standard (2015) Cosmetics - Microbiology - Detection of Pseudomonas aeruginosa.
- ISO 22718 Standard (2015) . Cosmetics - Microbiology - Detection of Staphylococcus aureus.
- ISO 22964 (2017) Microbiology of the food chain.- Horizontal method for the detection of *Cronobacter spp*
- PASCUAL ANDERSON, M<sup>a</sup>R<sup>a</sup> (1992) Microbiología Alimentaria. Díaz de Santos S.A., Madrid.
- USP 33 - NF 28 (2011) <62> Microbiological examination of non-sterile products: Test for specified microorganisms. Harmonised Method. USP Corp. Inc. Rockville. MD. USA.

### Storage

Keep tightly closed, away from light, in a dry place (4-30 °C).