

TRYPTIC SOY AGAR (7100)

Intended Use

Tryptic Soy Agar is used for the cultivation of a wide variety of microorganisms. Tryptic Soy Agar conforms to Harmonized USP/EP/JP Requirements.^{1,2,3}

Product Summary and Explanation

In 1955, Leavitt et al.⁴ discovered Tryptic Soy Agar (TSA) facilitated vigorous growth of aerobic and anaerobic microorganisms. TSA, a general purpose medium, is commonly referred to as Soybean-Casein Digest Agar USP 23. TSA is a nutritious base, and a variety of supplements can be added to enhance this medium. The addition of 5% sterile, defibrinated sheep, horse, or rabbit blood provides an excellent non-selective medium, used to determine hemolytic reactions of bacteria. TSA supplemented with lecithin and Tween 80[®] is widely used in environmental monitoring.⁵

TSA is recommended in multiple water & wastewater applications,⁶ and numerous standard methods for food testing.⁷ This medium also conforms to Harmonized United States Pharmacopoeia (USP), European Pharmacopoeia (EU), and Japanese Pharmacopoeia (JP).^{1,2,3} Clinically, TSA is used in the differentiation of Haemophilus species (the X and V factors are omitted from this medium), and widely used for blood cultures. TSA is commonly used as a maintenance medium for culture collections, and testing bacterial contaminants in cosmetics.⁸

Principles of the Procedure

Enzymatic Digest of Casein and Enzymatic Digest of Soybean Meal provide the nitrogen, vitamins and carbon in TSA. Sodium Chloride maintains osmotic balance in the medium. Agar is the solidifying agent.

Formula / Liter

Enzymatic Digest of Casein.....	15 g
Enzymatic Digest of Soybean Meal.....	5 g
Sodium Chloride	5 g
Agar	15 g

Final pH 7.3 ± 0.2 at 25°C

Formula may be adjusted and/or supplemented as required to meet performance specifications.

Precautions

1. For Laboratory Use.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions

1. Suspend 40 g of the medium in one liter of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
3. Autoclave at 121°C for 15 minutes.
4. Optional: Prepare 5 to 10% blood agar by adding appropriate volume of sterile defibrinated blood to melted sterile agar medium, cooled to 45 – 50°C.

Quality Control Specifications

Dehydrated Appearance: Powder is homogeneous, free flowing and light beige.

Prepared Appearance: Prepared medium without enrichment is trace to slight hazy and yellow beige in color. Prepared medium with 5% sheep blood is red and opaque.

Expected Cultural Response and USP/EP/JP Growth Promotion Testing: Cultural response on TSA tested at Harmonized USP/EP/JP specified temperatures and incubation times.^{1,2,3}

Microorganism	Approx. Inoculum (CFU)	Expected Results
		Growth
<i>Aspergillus niger</i> ATCC® 16404	10 - 100	Growth
<i>Bacillus subtilis</i> ® ATCC 6633	10 - 100	Growth
<i>Candida albicans</i> ® 10231	10 - 100	Growth
<i>Pseudomonas aeruginosa</i> ATCC® 9027	10 - 100	Growth
<i>Staphylococcus aureus</i> ATCC® 6538	10 - 100	Growth

Tryptic Soy Agar was prepared according to label directions with 5% sheep blood and inoculated. Cultures were incubated at 30 - 35°C under the appropriate atmosphere and examined for growth at 18 – 24 hours.

Microorganism	Approx. Inoculum (CFU)	Expected Results	
		Growth	Hemolysis
<i>Escherichia coli</i> ATCC® 25922	10 - 100	Good to excellent	Beta hemolysis
<i>Staphylococcus aureus</i> ATCC® 25923	10 - 100	Good to excellent	Beta hemolysis
<i>Streptococcus pneumoniae</i> ATCC® 6305	10 - 100	Fair to excellent	Alpha hemolysis
<i>Streptococcus pyogenes</i> ATCC® 19615	10 - 100	Fair to excellent	Beta hemolysis

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Refer to appropriate references for specific procedures using Tryptic Soy Agar.^{1,2,4-7}

Results

Refer to appropriate references for test results.

Storage

Store sealed bottle containing the dehydrated medium at 2 - 30°C. Once opened and recapped, place the container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

Expiration

Refer to expiration date stamped on the container. The dehydrated medium should be discarded if it is not free flowing, or if medium has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

Due to nutritional variation, some strains may be encountered that grow poorly or fail to grow on this medium.

Packaging

Tryptic Soy Agar	Code No.	7100A	500 g
		7100B	2 kg
		7100C	10 kg

References

1. **United States Pharmacopeial Convention.** 2007. The United States pharmacopeia, 31st ed., Amended Chapters 61, 62, 111. The United States Pharmacopeial Convention, Rockville, MD.
2. **Directorate for the Quality of Medicines of the Council of Europe (EDQM).** 2007. The European Pharmacopoeia, Amended Chapters 2.6.12, 2.6.13, 5.1.4, Council of Europe, 67075 Strasbourg Cedex, France.
3. **Japanese Pharmacopoeia.** 2007. Society of Japanese Pharmacopoeia. Amended Chapters 35.1, 35.2, 7. The Minister of Health, Labor, and Welfare.
4. **Leavitt, J. M., I. J. Naidorf and P. Shugaevsky.** 1955. The undetected anaerobe in endodontics: a sensitive medium for detection of both aerobes and anaerobes. The NY J. Dentist. **25**:377-382.
5. **Orth, D. S.** 1993. Handbook of cosmetic microbiology. Marcel Dekker, Inc., New York, NY.
6. **Greenberg, A. E., L. S. Clesceri, and A. D. Eaton (eds.).** 1995. Standard methods for the examination of water and wastewater, 19th ed. American Public Health Association, Washington, D.C.
7. **U.S. Food and Drug Administration.** Bacteriological analytical manual, 8th ed., AOAC International, Gaithersburg, MD.
8. **Curry, A. S., G. G. Joyce, and G. N. McEwen, Jr.** 1993. CTFA Microbiology guidelines. The Cosmetic, Toiletry, and Fragrance Association, Inc. Washington, D.C.

Technical Information

Contact Acumedia Manufacturers, Inc. for Technical Service or questions involving dehydrated culture media preparation or performance at (517)372-9200 or fax us at (517)372-2006.