

BARNEY MILLER MEDIUM (7685)

Intended Use

Barney Miller Medium is used for the detection of beer spoilage microorganisms.

Product Summary and Explanation

Barney Miller Medium was developed by Barney, Kot, and Chicoye¹ at Miller Brewing Company to detect beer spoilage bacteria. *Lactobacillus* spp. and *Pediococcus* spp., often referred to as lactic acid bacteria, usually cause spoilage during brewing and beer processing.² Beer is not a favorable growth medium, however lactic acid bacteria appear to thrive during oxygen-deprived stages of fermentation and maturation.² Lactic acid bacteria are capable of growth throughout fermentation because they are resistant to ethanol, do not require oxygen, and flourish at a low pH.² Lactic acid bacteria can cause turbidity, acidity, and disrupt the flavor of beer during processing.²

Principles of the Procedure

Tomato Juice Broth, Dipeptone, and Beef Extract provide nitrogen, vitamins, carbon, and minerals in Barney Miller Medium. Maltose and Dextrose are the fermentable carbohydrates. Potassium Acetate and L-Malic Acid are used as selective agents. L-Cysteine HCl is a reducing agent and growth stimulant in Barney Miller Medium. Tween 80 is a surfactant; Agar is the solidification agent.

Formula / Liter

Tomato Juice Broth.....	15 g
Maltose	15 g
Dextrose.....	10 g
Dipeptone.....	5 g
Potassium Acetate	3 g
Beef Extract	2 g
L-Malic Acid	0.5 g
Tween 80	0.5 g
L-Cysteine HCl.....	0.2 g
Agar	15 g

Final pH: 5.6 ± 0.1 at 25°C

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

Precaution

1. For Laboratory Use.
2. **HARMFUL.** Harmful if swallowed or inhaled. May cause irritation to skin, eyes, and respiratory system.

Directions

1. Suspend 66.2 g of the medium in 750 mL of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
3. While medium is hot, add and mix 250 mL of beer without degassing.
4. Autoclave at 121°C for 15 minutes.
5. If necessary, aseptically adjust pH to 5.6 – 5.7 with a sterilized solution of 1N HCl or 1N KOH.

Quality Control Specifications

Dehydrated Appearance: Powder is homogeneous, free flowing, may have lumps, and medium to dark tan.

Prepared Appearance: Prepared medium is trace to slightly hazy and light to medium amber, with no precipitate.

Expected Cultural Response: Cultural response on Barney Miller Medium at 30 ± 2°C in CO₂ after 3 days of incubation.

Microorganism	Response
<i>Lactobacillus brevis</i> ATCC® 14869	growth
<i>Lactobacillus delbrueckii</i> ATCC® 9649	growth
<i>Pedicoccus acidilactici</i> ATCC® 33314	growth

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

Test Procedure³

1. Dilute samples with sterile saline or sterile water to achieve approximately 100 colonies per plate.
2. Spread 0.1 mL of sample over the surface of the medium using a sterile bent glass rod or other nonabsorbing substance,⁴ or use a pour plate procedure.⁵
3. Incubate plates anaerobically at 28°C.

Note: Three replicates of each inoculum are recommended, along with suitable blanks or controls of the dilution solution.

Results

Perform plate counts within 48 hours and up to 7 days of incubation for the examination of lactic acid bacteria.

Storage

Store sealed bottle containing the dehydrated medium at 2 - 30°C. Once opened and recapped, place 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 not free flowing, or if appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

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

Packaging

Barney Miller Medium	Code No.	7685A	500 g
		7685B	2 kg
		7685C	10 kg

References

1. **Barney, M. C., E. J. Kot, and E. Chicoye.** 1990. Culture medium for detection of beer spoilage microorganisms. U. S. patent 4,906,573.
2. **Goldammer, T.** 2000. The Brewer's Handbook, The complete book to brewing beer. Beer spoilage organisms, 19:1-14. KVP Publishers, Clifton, VA.
3. **American Society of Brewing Chemists.** 1992. Methods of Analysis of the American Society of Brewing Chemists, 8th ed. Microbiological Controls. 5: 5-6. St. Paul, MN.
4. **Lee, S. Y., N. O. Jangaard, J. H. Coors, W. P. Hsu, C. M. Fuchs, and M. W. Brenner.** 1975. Proc. Am. Soc. Brew. Chem. 33:18.
5. **American Society of Brewing Chemists.** 1975. Report of Subcommittee on Microbiological Controls. Proc. Am. Soc. Brew. Chem. 33:75.

Technical Information

Contact Acumedia Manufacturers, Inc. for Technical Service or questions involving dehydrated culture media preparation or performance at (410)780-5120 or fax us at (410)780-5470.