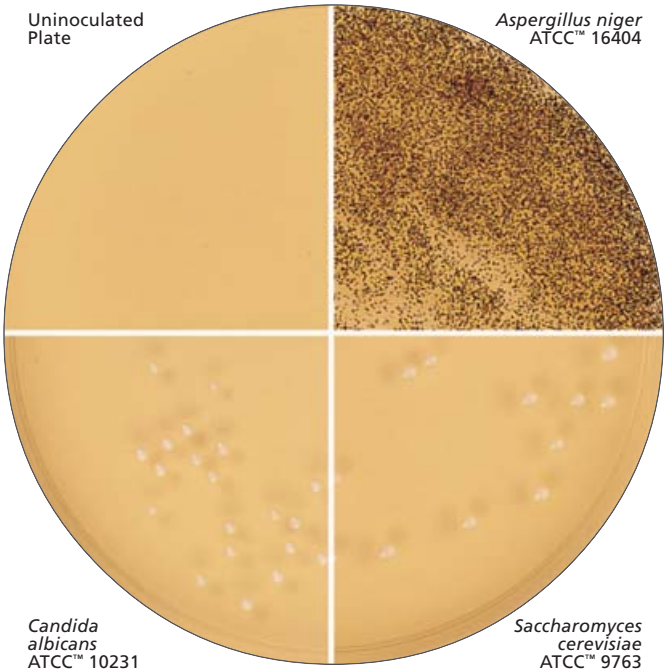

3. Autoclave at 121°C for 15 minutes. Avoid overheating (and consequent hydrolysis and darkening of the agar with failure to solidify). Note: To lower the pH, add sterile 1:10 lactic acid, USP. DO NOT REHEAT THE MEDIUM.
4. Test samples of the finished product for performance using stable, typical control cultures.

Procedure

See appropriate references for specific procedures.

Expected Results

Refer to appropriate references and procedures for results.

Limitation of the Procedure

Do not heat the medium after addition of acid, as this will hydrolyze the agar and reduce its solidifying properties.

References

1. Reddish. 1919. Abstr. Bacteriol. 3:6.
2. Thom and Church. 1926. The aspergilli. Williams & Wilkins, Baltimore, Md.
3. Fulmer and Grimes. 1923. J. Bacteriol. 8:585.
4. Horwitz (ed.). 2000. Official methods of analysis of AOAC International, 17th ed., vol. I. AOAC International, Gaithersburg, Md.

Availability

Difco™ Malt Agar

AOAC BAM

Cat. No.	224200	Dehydrated – 500 g
	224100	Dehydrated – 10 kg

BBL™ Malt Agar

AOAC BAM

Cat. No.	211401	Dehydrated – 500 g

Bacto™ Malt Extract

Intended Use

Bacto Malt Extract is used for preparing microbiological culture media for the propagation of yeasts and molds.

Summary and Explanation

Bacto Malt Extract is used in the culture of yeasts and molds. This product is very high in carbohydrate content[1] and is suitable for the growth of yeasts and molds because of the high concentration of reduced sugars, especially the maltoses. Malt extract in the agar form is recommended for the detection and isolation of yeasts and molds from dairy products and food. It is also a medium for stock culture maintenance.

Media formulations containing **Bacto** Malt Extract are specified in various standard methods manuals.[2-5]

Principles of the Procedure

Bacto Malt Extract is the water-soluble portion of malted barley. The extraction process breaks down the polysaccharides into simple sugars. After the malting process is complete, the extract is prepared from the malted barley by cracking the grain in a mill and then extracting the grain with a warm liquor. The resulting "wort" is filtered and evaporated or dried under vacuum.[6,7]

User Quality Control

Identity Specifications

Bacto™ Malt Extract

Dehydrated Appearance:	Medium tan, free-flowing, homogeneous.
Solution:	2.0% solution, soluble in purified water. Solution is medium amber, slightly opalescent to opalescent, with a precipitate.
Reaction of 2.0% Solution at 25°C:	pH 4.5-5.5

Cultural Response

Bacto™ Malt Extract

Prepare a sterile 2% solution of **Bacto** Malt Extract. Inoculate and incubate tubes at 30 ± 2°C for up to 3 days.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
Aspergillus niger	16404	30-300	Good
Candida albicans	10231	30-300	Good
Saccharomyces carlsbergensis	9080	30-300	Good

Typical Analysis

Refer to Product Tables in the Reference Guide section of this manual.

Directions for Preparation from Dehydrated Product

Refer to the final concentration of **Bacto** Malt Extract in the formula of the medium being prepared. Add product as required.

Procedure

See appropriate references for specific procedures using **Bacto** Malt Extract.

Expected Results

Refer to appropriate references and procedures for results.

References

1. Cote. 1999. *In* Flickinger and Drew (ed.), Encyclopedia of bioprocess technology: fermentation, biocatalysis, and bioseparation. John Wiley & Sons, Inc., New York, N.Y.
2. Horowitz (ed.). 2000. Official methods of analysis of AOAC International, 17th ed. AOAC International, Gaithersburg, Md.
3. U.S. Food and Drug Administration. 1995. Bacteriological analytical manual, 8th ed. AOAC International, Washington, D.C.
4. Downes and Ito (ed.). 2001. Compendium of methods for the microbiological examination of foods, 4th ed. American Public Health Association, Washington, D.C.
5. Clesceri, Greenberg and Eaton (ed.). 1998. Standard methods for the examination of water and wastewater, 20th ed. American Public Health Association, Washington, D.C.
6. Bridson and Brecker. 1970. *In* Norris and Ribbons (ed.), Methods in microbiology, vol. 3A. Academic Press, New York, N.Y.
7. How malt is made. Briess Malting Company. 2 Dec. 2002. <http://www.briessmalting.com/hb/hbhow.htm>.

Availability

Bacto™ Malt Extract

AOAC BAM COMPF SMWW

Cat. No.	218630	Dehydrated – 500 g
	218610	Dehydrated – 10 kg

Malt Extract Agar • Malt Extract Broth

Intended Use

Malt Extract Agar is used for isolating, cultivating and enumerating yeasts and molds.

Malt Extract Broth is used for cultivating yeasts and molds.

Summary and Explanation

The use of malt and malt extracts for the propagation of yeasts and molds is quite common. Reddish[1] described a culture medium prepared from malt extract that was a satisfactory substitute for wort. Thom and Church,[2] following the formula of Reddish, used malt extract as a base from which they prepared the complete media. Malt Extract Broth is recommended for the examination of yeasts and molds in the U.S. Food and Drug Administration's *Bacteriological Analytical Manual*.[3]

User Quality Control

Identity Specifications

Difco™ Malt Extract Agar

Dehydrated Appearance:	Off-white, free-flowing, homogeneous.
Solution:	3.36% solution, soluble in purified water upon boiling. Solution is very light amber, slightly opalescent.
Prepared Appearance:	Very light amber, slightly opalescent.
Reaction of 3.36% Solution at 25°C:	pH 4.7 ± 0.2

Difco™ Malt Extract Broth

Dehydrated Appearance:	Light beige to beige, free-flowing, homogeneous.
Solution:	1.5% solution, soluble in purified water. Solution is light amber, clear.
Prepared Appearance:	Very light to light amber, clear.
Reaction of 1.5% Solution at 25°C:	pH 4.7 ± 0.2

Cultural Response

Difco™ Malt Extract Agar or Malt Extract Broth

Prepare the medium per label directions. Inoculate and incubate at 30 ± 2°C for 18-48 hours (agar) or 18-72 hours (broth).

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
Aspergillus niger	16404	10^2-10^3	Good
Candida albicans	10231	10^2-10^3	Good
Saccharomyces cerevisiae	9763	10^2-10^3	Good

Principles of the Procedure

Malt Extract Agar contains maltose as an energy source. Dextrin, a polysaccharide derived from high quality starch, and glycerol are included as carbon sources. Peptone is provided as a nitrogen source. Agar is the solidifying agent.

Malt Extract Broth contains malt extract which provides the carbon, protein, and nutrient sources required for growth of microorganisms. Maltose is added as an energy source. Dextrose is included as a source of fermentable carbohydrate. Yeast extract provides the vitamins and cofactors required for growth and additional sources of nitrogen and carbon.

The acidic pH of Malt Extract Agar and Broth allows for the optimal growth of molds and yeasts while restricting bacterial growth.

Formulae

Difco™ Malt Extract Agar

Approximate Formula* Per Liter

Maltose, Technical	12.75	g
Dextrin	2.75	g
Glycerol	2.35	g
Peptone	0.78	g
Agar	15.0	g

Difco™ Malt Extract Broth

Approximate Formula* Per Liter

Malt Extract	6.0	g
Maltose, Technical	1.8	g
Dextrose	6.0	g
Yeast Extract	1.2	g

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