

# YM Agar • YM Broth

## Intended Use

YM Agar and YM Broth are used for cultivating yeasts, molds and other aciduric microorganisms.

## Summary and Explanation

YM Agar and YM Broth (Yeast Mold Agar and Broth) are prepared according to the formulae published by Wickerham.<sup>1-3</sup> Wickerham suggested that YM Broth acidified to pH 3.0-4.0 be used as an enrichment medium for yeasts from populations also containing bacteria and molds.

Media selectivity may be enhanced through acidification or through addition of selective agents. YM Broth may be acidified prior to sterilization. YM Agar should be sterilized without pH adjustment and sterile acid added to the sterile molten medium cooled to 45-50°C. Acidified YM Agar should not be heated. Antibiotics may be aseptically added to the sterile media. Other fungistatic materials, such as sodium propionate and diphenyl may be added to YM Agar to eliminate molds and permit the enumeration of yeasts in mixed populations.

## Principles of the Procedure

Yeast extract is a source of trace elements, vitamins and amino acids. Malt extract is a source of carbon, protein and nutri-

ents. Peptone is an additional source of carbon and provides nitrogen and amino acids. Dextrose provides carbon. Agar is the solidifying agent.

## Formulae

### Difco™ YM Agar

Approximate Formula\* Per Liter

Yeast Extract .....	3.0	g
Malt Extract .....	3.0	g
Peptone .....	5.0	g
Dextrose .....	10.0	g
Agar .....	20.0	g

### Difco™ YM Broth

Consists of the same ingredients without the agar.

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

## Directions for Preparation from Dehydrated Product

1. Suspend the powder in 1 L of purified water:  
Difco™ YM Agar – 41 g;  
Difco™ YM Broth – 21 g.  
Mix thoroughly.
2. Heat the agar medium with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Autoclave the agar and broth media at 121°C for 15 minutes.

## User Quality Control

### Identity Specifications

#### Difco™ YM Agar

Dehydrated Appearance: Beige, free-flowing, homogeneous.

Solution: 4.1% solution, soluble in purified water upon boiling. Solution is light to medium amber, very slightly opalescent.

Prepared Appearance: Light to medium amber, slightly opalescent.

Reaction of 4.1% Solution at 25°C: pH 6.2 ± 0.2

#### Difco™ YM Broth

Dehydrated Appearance: Light beige, free-flowing, homogeneous.

Solution: 2.1% solution, soluble in purified water. Solution is light to medium amber, clear to very slightly opalescent.

Prepared Appearance: Light to medium amber, clear to very slightly opalescent. At pH adjusted to 3.0-4.0, medium becomes slightly opalescent.

Reaction of 2.1% Solution at 25°C: pH 6.2 ± 0.2

### Cultural Response

#### Difco™ YM Agar or YM Broth

Prepare two sets of agar plates or broth tubes (one set pH 6.2, one set adjusted to pH 3.0-4.0) per label directions. Inoculate and incubate at 30 ± 2°C for 18-72 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY pH 3.0-4.0	RECOVERY pH 6.2
<i>Aspergillus niger</i>	16404	10 <sup>2</sup> -10 <sup>3</sup>	Good	Good
<i>Candida albicans</i>	10231	10 <sup>2</sup> -10 <sup>3</sup>	Good	Good
<i>Escherichia coli</i>	25922	10 <sup>2</sup> -3×10 <sup>2</sup>	Marked to complete inhibition	Good
<i>Lactobacillus rhamnosus</i>	7469	10 <sup>2</sup> -3×10 <sup>2</sup>	Poor to fair	Good
<i>Saccharomyces cerevisiae</i>	9763	10 <sup>2</sup> -10 <sup>3</sup>	Good	Good

- To increase selectivity, acidify the medium to pH 3.0 to 4.0 (by adding sterile 10% HCl, tartaric acid or 10% citric acid) or add antibiotics (penicillin 20 units per mL final concentration or streptomycin 40 µg per mL final concentration) using aseptic technique. Acidified agar medium should not be reheated.
- Test samples of the finished product for performance using stable, typical control cultures.

## Procedure

Inoculate YM Agar plates or YM Broth tubes with sample to evaluate for the presence of yeasts, molds, or aciduric microorganisms. Incubate at 30 ± 2°C for 18-72 hours.

To favor isolation of fermentative species, add a layer of sterile paraffin oil 1 cm deep on the surface of the inoculated broth. Incubate the culture until growth appears and then streak onto YM Agar to obtain isolated yeast colonies. To isolate fermentative and oxidative strains, place acidified inoculated YM Broth on a rotary shaker for 1 or 2 days. This favors yeast recovery while preventing the sporulation of molds.

## Expected Results

Examine the plates or tubes for growth. Record YM Agar results as colony-forming units (CFU) per volume of sample. Record YM Broth results as growth or no growth.

## References

- Wickerham. 1939. J. Tropical Med. Hyg. 42:176.
- U. S. Department of Agriculture. 1951. Tech. Bull. No. 1029.
- Jong and Edwards. 1991. American Type Culture Collection catalog of filamentous fungi, 18th ed. American Type Culture Collection, Rockville, Md.

## Availability

### Difco™ YM Agar

**AOAC** **COMP**  
Cat. No. 271210 Dehydrated – 500 g

### Difco™ YM Broth

Cat. No. 271120 Dehydrated – 500 g  
271110 Dehydrated – 10 kg