Dextrose Agar • Dextrose Broth

Intended Use

Dextrose Agar is used for cultivating a wide variety of microorganisms with or without added blood.

Dextrose Broth is used for cultivating fastidious microorganisms and for detecting gas from enteric bacilli.

Summary and Explanation

In 1932, Norton[1] recommended a basal medium containing 0.5-1% dextrose with approximately 5% defibrinated blood for the isolation of many fastidious bacteria, including *Haemophilus* and *Neisseria*. Dextrose is an energy source used by many organisms. The high concentration of this ingredient makes Dextrose Agar a suitable medium for the production of early, abundant organism growth and shortening the lag periods of older cultures. Because of the increased dextrose content, Dextrose Agar is not suitable for observation of hemolysis when supplemented with 5% sheep, rabbit or horse blood.

Dextrose Broth is a highly nutritious broth suitable for the isolation of fastidious organisms and specimens containing a low inoculum. The addition of 0.1-0.2% agar to Dextrose Broth facilitates anaerobic growth and aids in dispersion of reducing substances and CO_2 formed in the environment.[2] The low agar concentration provides suitable conditions for both aerobic growth in the clear upper zone and for microaerophilic and anaerobic growth in the lower, flocculent agar zones.

User Quality Control

Identity Specifications

Difco™ Dextrose Agar

Dehydrated Appearance:	Medium beige, homogeneous, free-flowing.
Solution:	4.3% solution, soluble in purified water upon boiling. Solution is medium amber, very slightly to slightly opalescent.
Prepared Appearance:	Plain – Light to medium amber, slightly opalescent without significant precipitate.
	With blood – Cherry-red, opaque.
Reaction of 4.3% Solution at 25°C:	pH 7.3 ± 0.2

Difco™ Dextrose Broth

Dehydrated Appearance:	Light tan, homogeneous, free-flowing.
Solution:	2.3% solution, soluble in purified water. Solution is light amber, clear.
Prepared Appearance:	Light to medium amber, clear.
Reaction of 2.3% Solution at 25°C:	pH 7.2 ± 0.2

Cultural Response

Difco™ Dextrose Agar

Prepare the medium per label directions without (plain) and with sterile 5% defibrinated sheep blood (SB). Inoculate and incubate at 35 ± 2°C under appropriate atmospheric conditions for 18-48 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY PLAIN	RECOVERY WITH SB
Escherichia coli	25922	10^2-10^3	Good	Good
Neisseria meningitidis	13090	10^2-10^3	Poor	Good
Staphylococcus aureus	25923	10^2-10^3	Good	Good
Streptococcus pneumoniae	6305	10^2-10^3	Fair	Good
Streptococcus pyogenes	19615	10^2-10^3	Good	Good

Difco™ Dextrose Broth

Prepare the medium per label directions with one set of tubes containing fermentation vials and a second set of tubes (without fermentation vials) containing medium supplemented with 0.1% agar. Inoculate and incubate at 35 ± 2°C. Read growth and gas production at 18-48 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY	GAS	RECOVERY W/0.1% AGAR
Escherichia coli	25922	10^2-10^3	Good	+	Good
Neisseria meningitidis	13090	10^2-10^3	Good	–	Good
Staphylococcus aureus	25923	10^2-10^3	Good	–	Good
Streptococcus pneumoniae	6305	10^2-10^3	Good	–	Good
Streptococcus pyogenes	19615	10^2-10^3	Good	–	Good

Dextrose Agar and Dextrose Broth are specified in the *Compendium of Methods for the Microbiological Examination of Foods*.[3]

Principles of the Procedure

Beef extract and peptones provide nitrogen, amino acids and vitamins. Dextrose is a carbon source, and the increased concentration is a distinguishing characteristic of this medium from other formulations used as blood agar bases. Agar is the solidifying agent.

Supplementation with 5% blood provides additional growth factors for fastidious microorganisms.

Formulae

Difco™ Dextrose Agar

Approximate Formula* Per Liter		
Pancreatic Digest of Casein	5.0	g
Proteose Peptone No. 3	2.0	g
Pancreatic Digest of Gelatin	3.0	g
Beef Extract	3.0	g
Dextrose	10.0	g
Sodium Chloride	5.0	g
Agar	15.0	g

Difco™ Dextrose Broth

Approximate Formula* Per Liter		
Pancreatic Digest of Casein	5.0	g
Proteose Peptone No. 3	2.0	g
Pancreatic Digest of Gelatin	3.0	g
Beef Extract	3.0	g
Dextrose	5.0	g
Sodium Chloride	5.0	g

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

Directions for Preparation from Dehydrated Product

Difco™ Dextrose Agar

1. Suspend 43 g of the powder in 1 L of purified water. Mix thoroughly.
2. Heat with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Autoclave at 121°C for 15 minutes.
4. Test samples of the finished product for performance using stable, typical control cultures.

OPTIONAL: To prepare blood agar, aseptically add 5% sterile defibrinated blood to the medium at 45-50°C. Mix well and dispense as desired.

Difco™ Dextrose Broth

1. Dissolve 23 g of the powder in 1 L of purified water.
2. Autoclave at 121°C for 15 minutes.
3. Test samples of the finished product for performance using stable, typical control cultures.

OPTIONAL: To prepare medium with agar, add 1-2 g of agar per liter of medium.

Procedure

For a complete discussion on microorganism isolation and identification, refer to appropriate references.

Expected Results

Refer to appropriate references and procedures for results.

References

1. Norton. 1932. J. Lab. Clin. Med. *17*:558.
2. MacFaddin. 1985. Media for isolation-cultivation-identification-maintenance of medical bacteria, vol. 1. Williams & Wilkins, Baltimore, Md.
3. Downes and Ito (ed.). 2001. Compendium of methods for the microbiological examination of foods, 4th ed. American Public Health Association, Washington, D.C.

Availability

Difco™ Dextrose Agar

COMPF

Cat. No. 267100 Dehydrated – 500 g

Difco™ Dextrose Broth

COMPF

Cat. No. 263100 Dehydrated – 500 g