Bacto™ Yeast Extract • Yeast Extract, UF Yeast Extract, LD • Bacto™ Yeast Extract, Technical Yeast Extract

Intended Use

Bacto Yeast Extract, Yeast Extract, UF (ultra-filtered), Yeast Extract, LD, **Bacto** Yeast Extract, Technical and Yeast Extract are used in preparing microbiological culture media.

Summary and Explanation

Bacto Yeast Extract, Yeast Extract, UF, Yeast Extract, LD, **Bacto** Yeast Extract, Technical and Yeast Extract are concentrates of the water-soluble portion of *Saccharomyces cerevisiae* cells that have been autolyzed. The autolysis is carefully controlled to preserve the naturally occurring B-complex vitamins. Yeast extract is considered a non-animal product and is used extensively for many non-animal formulations for bacterial, fungal, mammalian and insect cell culture.

Bacto Yeast Extract has been considered one of the most complete and versatile of the fermentation bionutrients available. It has been a valuable ingredient for the microbiological assay of vitamins. Yeast extract is also of value in the assay of antibiotics. B factor, a growth substance necessary for the production of rifampin in a *Nocardia* sp., can be isolated from yeast extract.[1]

Yeast Extract, UF is ultra-filtered and specifically designed for tissue culture applications. With its low endotoxin level and high content of naturally occurring B vitamins, it is an ideal substitute for fetal bovine serum. It has an endotoxin level of less than or equal to 500 EU/g.

Yeast Extract, LD was created to eliminate the problem of dust inhalation when handling large quantities of yeast extract. Yeast Extract, Yeast Extract, UF and Yeast Extract, LD are processed from the same culture of *Saccharomyces*.

Bacto Yeast Extract, Technical and Yeast Extract were developed to provide products priced for the biotechnology/pharmaceutical market with acceptable clarity and growth promoting characteristics.

Media formulations containing yeast extract are specified in standard methods for various applications.[2-8]

Principles of the Procedure

Bacto Yeast Extract, Yeast Extract, UF, Yeast Extract, LD, **Bacto** Yeast Extract, Technical and Yeast Extract are prepared by growing baker's yeast, *Saccharomyces* sp., in a carbohydrate-rich plant medium. The yeast is harvested, washed and resuspended in water, where it undergoes autolysis, or self-digestion. Yeast extract is the total soluble portion of this autolytic action. The autolytic activity is stopped by a heating step. The resulting

User Quality Control

NOTE: Differences in the Identity Specifications and Cultural Response testing for media offered as both **Difco**™ and **BBL**™ brands may reflect differences in the development and testing of media for industrial and clinical applications, per the referenced publications.

Identity Specifications

Bacto™ Yeast Extract

Dehydrated Appearance:	Light beige, free-flowing, homogeneous.
Solution:	1.0% and 2.0% solutions, soluble in purified water. 1.0% solution is light to medium amber, clear, may have a very slight precipitate. 2.0% solution is medium amber, clear, may have a very slight precipitate.
Reaction of 1.0% Solution at 25°C:	pH 6.4-6.8

Difco™ Yeast Extract, UF

Dehydrated Appearance:	Light to medium, yellow to tan, fine, homogeneous, may contain up to a small amount of minute light to dark tan particles.
Solution:	2.0% solution, soluble in purified water. Solution is light to dark, yellow to tan, clear to slightly hazy.
Reaction of 2.0% Solution at 25°C:	pH 6.8-7.2

Difco™ Yeast Extract, LD

Dehydrated Appearance:	Light to medium, yellow to tan, fine, homogeneous, may contain up to a small amount of minute light to dark tan particles.
Solution:	2.0% solution, soluble in purified water. Solution is light to dark, yellow to tan, clear to slightly hazy.
Reaction of 2.0% Solution at 25°C:	pH 6.8-7.2

Bacto™ Yeast Extract, Technical

Dehydrated Appearance:	Light to medium beige, free-flowing, homogeneous.
Solution:	1.0% solution, soluble in purified water. Solution is light to medium amber, clear to very slightly opalescent.

Cultural Response

Bacto™ Yeast Extract

Prepare a solution containing 1% **Bacto** Yeast Extract and 0.5% sodium chloride. Adjust the pH to 7.2 ± 0.2 using dilute NaOH. Dispense into tubes and autoclave. Inoculate and incubate at 35 ± 2°C for 18-48 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
Neisseria meningitidis	13090	30-300	Fair to good
Staphylococcus aureus	25923	30-300	Good
Streptococcus pneumoniae	6305	30-300	Good

Bacto™ Yeast Extract, Technical

Prepare a solution containing 2% **Bacto** Yeast Extract, Technical and 0.5% sodium chloride. Adjust the pH to 7.2-7.4 using dilute NaOH. Dispense into tubes and autoclave. Inoculate and incubate at 35 ± 2°C for 18-48 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
Escherichia coli	25922	30-300	Good
Streptococcus pyogenes	19615	30-300	Good

Identity Specifications

BBL™ Yeast Extract

Dehydrated Appearance:	Light to medium, yellow to tan, fine, homogeneous, may contain up to a small amount of minute light to dark, tan particles.
Solution:	2.0% solution, soluble in purified water. Solution is light to dark, yellow to tan, clear to slightly hazy.
Reaction of 2.0% Solution at 25°C:	pH 5.4-7.2

Cultural Response

BBL™ Yeast Extract

Prepare a sterile solution containing 10.0 g of Yeast Extract, 2.5 g of sodium chloride and 6.5 g of agar in 500 mL of purified water. Adjust the final pH to 7.2-7.5. Inoculate and incubate plates at 35 ± 2°C for 3 days (incubate streptococci with 3-5% CO_2; incubate *C. sporogenes* anaerobically).

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
Candida albicans	10231	10^3-10^4	Good
Clostridium sporogenes	11437	10^3-10^4	Good
Escherichia coli	25922	10^3-10^4	Good
Micrococcus luteus	9341	10^3-10^4	Good
Streptococcus pneumoniae	6305	10^3-10^4	Good
Streptococcus pyogenes	49117	10^4-10^5	Good

yeast extract is then filtered to produce a clear product and subsequently made into a powder by a spray-drying process.

Bacto Yeast Extract, Yeast Extract, UF, Yeast Extract, LD, **Bacto** Yeast Extract, Technical and Yeast Extract provide vitamins, nitrogen, amino acids and carbon in microbiological culture media.

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** Yeast Extract, Yeast Extract, UF, Yeast Extract, LD, **Bacto** Yeast Extract, Technical and Yeast Extract in the formula of the medium being prepared. Add appropriate product as required.

Procedure

See appropriate references for specific procedures using **Bacto** Yeast Extract, Yeast Extract, UF, Yeast Extract, LD, **Bacto** Yeast Extract, Technical and Yeast Extract.

Expected Results

Refer to appropriate references and procedures for results.

References

1. Kawaguchi, Asahi, Satoh, Uozumi and Beppu. 1984. J. Antibiot. *37*:1587.
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, Gaithersburg, Md.
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. U.S. Environmental Protection Agency (USEPA). 2000. Improved enumeration methods for the recreational water quality indicators: Enterococci and *Escherichia coli*. EPA-821/R-97/004. Office of Water, Washington, D.C.
6. Marshall (ed.). 1993. Standard methods for the examination of dairy products, 16th ed. American Public Health Association, Washington, D.C.
7. Clesceri, Greenberg and Eaton (ed.). 1998. Standard methods for the examination of water and wastewater, 20th ed. American Public Health Association, Washington, D.C.
8. U.S. Department of Agriculture. 1998. Microbiology laboratory guidebook, 3rd ed. Food Safety and Inspection Service, USDA, Washington, D.C.

Availability

Bacto™ Yeast Extract

AOAC BAM COMPF EPA SMD SMWW USDA

Cat. No.	212750	Dehydrated – 500 g
	212720	Dehydrated – 2 kg
	212730	Dehydrated – 10 kg

Difco™ Yeast Extract, UF

Cat. No.	210929	Dehydrated – 500 g
	210934	Dehydrated – 10 kg

Difco™ Yeast Extract, LD

Cat. No.	210933	Dehydrated – 500 g
	210941	Dehydrated – 10 kg

Bacto™ Yeast Extract, Technical

Cat. No.	288620	Dehydrated – 500 g
	288610	Dehydrated – 10 kg

BBL™ Yeast Extract

Cat. No.	211929	Dehydrated – 454 g
	211930	Dehydrated – 5 lb (2.3 kg)
	211931	Dehydrated – 25 lb (11.3 kg)