

Buffered Listeria Enrichment Broth Base

(See *Listeria Enrichment Broth*)

Buffered Peptone Water • Buffered Peptone Water II

Intended Use

Buffered Peptone Water and Buffered Peptone Water II are used for preenriching injured *Salmonella* species from food specimens to increase recovery.

Summary and Explanation

Edel and Kampelmacher¹ noted that food preservation techniques involving heat, desiccation, preservatives, high osmotic pressure or pH changes cause sublethal injury to salmonellae. Preenrichment in a nonselective medium allows for repair of cell damage and facilitates the recovery of salmonellae. Lactose Broth is frequently used for this purpose but it may be detrimental to recovering salmonellae.² Buffered Peptone Water maintains a high pH over the preenrichment period and results in repair of injured cells that may be sensitive to low pH.³ This is particularly important for vegetable specimens which have a low buffering capacity. These media can be used for testing dry poultry feed.⁴ Test methods have been published for a variety of food samples.⁵

Buffered Peptone Water II provides improved enrichment through tighter specifications applied to the peptone component.

Principles of the Procedure

These preenrichment media contain peptone as a source of carbon, nitrogen, vitamins and minerals. Sodium chloride maintains the osmotic balance. Phosphates buffer the medium.

Formulae

Difco™ or BBL™ Buffered Peptone Water

Approximate Formula* Per Liter		
Peptone	10.0	g
Sodium Chloride	5.0	g
Disodium Phosphate	3.5	g
Monopotassium Phosphate	1.5	g

Difco™ Buffered Peptone Water II

Approximate Formula* Per Liter		
Peptone (Enzymatic Digest of Animal Tissue)	10.0	g
Sodium Chloride	5.0	g
Disodium Phosphate	3.5	g
Monopotassium Phosphate	1.5	g

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

Directions for Preparation from Dehydrated Product

1. Dissolve the powder in 1 L of purified water:
Difco™ or BBL™ Buffered Peptone Water – 20 g;
Difco™ Buffered Peptone Water II – 20 g.
 Mix thoroughly.
2. Autoclave at 121°C for 15 minutes.
3. Test samples of the finished product for performance using stable, typical control cultures.

Procedure

Test specimens according to recommended guidelines.

User Quality Control

Identity Specifications

Difco™ or BBL™ Buffered Peptone Water

Dehydrated Appearance: Cream-white to light tan, free-flowing, homogeneous, free of extraneous material.

Solution: 2.0% solution, soluble in purified water. Solution is light yellow to tan or amber, clear to slightly hazy.

Prepared Appearance: Light yellow to tan or amber, clear to slightly hazy.

Reaction of 2.0% Solution at 25°C: pH 7.2 ± 0.2

Difco™ Buffered Peptone Water II

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

Solution: 2% solution, soluble in purified water. Solution is light amber, clear.

Prepared Appearance: Light amber, clear.

Reaction of 2.0% Solution at 25°C: pH 7.2 ± 0.2

Cultural Response

Difco™ Buffered Peptone Water, BBL™ Buffered Peptone Water or Difco™ Buffered Peptone Water II

Prepare the medium per label directions. Inoculate and incubate at 35 ± 2°C for 18-24 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
<i>Salmonella choleraesuis</i> subsp. <i>choleraesuis</i> serotype Enteriditis	13076	30-100	Good
<i>Salmonella choleraesuis</i> subsp. <i>choleraesuis</i> serotype Typhi	19430	30-100	Good
<i>Salmonella choleraesuis</i> subsp. <i>choleraesuis</i> serotype Typhimurium	14028	30-100	Good

Expected Results

Growth is indicated by turbidity.

Limitation of the Procedure

The types and numbers of competing flora in the test sample can affect recovery and may overgrow salmonellae.

References

1. Edel and Kampelmacher. 1973. Bull. W.H.O. 48:167.
2. Angelotti. 1963. Microbiological quality of foods. Academic Press, New York, N.Y.
3. Sadowski. 1977. J. Food Technol. 12:85.
4. Juven, Cox, Bailey, Thomson, Charles and Schutze. 1984. J. Food Prot. 47:299.
5. Andrews, Flowers, Silliker and Bailey. 2001. In Downes and Ito (ed.), Compendium of methods for the microbiological examination of foods, 4th ed. American Public Health Association, Washington, D.C.

Availability

Difco™ Buffered Peptone Water

ISO		
Cat. No.	218105	Dehydrated – 500 g
	218103	Dehydrated – 2 kg
	218104	Dehydrated – 10 kg

BBL™ Buffered Peptone Water

ISO		
Cat. No.	212367	Dehydrated – 500 g
	212345	Dehydrated – 5 lb (2.3 kg)

Difco™ Buffered Peptone Water II

Cat. No.	218403	Dehydrated – 500 g
	218401	Dehydrated – 2 kg
	218402	Dehydrated – 10 kg

Bushnell-Haas Broth

Intended Use

Bushnell-Haas Broth is used for studying microbial utilization of hydrocarbons.

Summary and Explanation

Bushnell-Haas Broth (Bushnell-Haas marine salts broth), prepared according to the formula described by Bushnell and Haas¹, is used to evaluate the ability of microorganisms to decompose hydrocarbons. It is formulated without a

carbon source which allows for the addition of alternative hydrocarbons such as kerosene, light and heavy mineral oils, paraffin wax and gasoline.

Bushnell-Haas Broth was recommended for the microbiological examination of fuels by the Society for Industrial Microbiology (SIM) Committee on Microbiological Deterioration of Fuels.² The medium was used to enumerate total heterotrophs and hydrocarbon degradation by microorganisms during bioremediation of Prince William Sound following the Exxon Valdez oil spill.^{3,4}

User Quality Control

Identity Specifications

Difco™ Bushnell-Haas Broth

Dehydrated Appearance:	Beige with pink tint, free-flowing, homogeneous.
Solution:	0.327% solution, partially soluble in purified water, white precipitate remains. Solution, after autoclaving, is colorless to very light amber, clear supernatant over yellow-orange precipitate.
Prepared Appearance:	Colorless to very light amber, clear supernatant over yellow-orange precipitate.
Reaction of 0.327% Solution at 25°C:	pH 7.0 ± 0.2

Cultural Response

Difco™ Bushnell-Haas Broth

Prepare the medium per label directions. Inoculate in duplicate with the test organisms. Add sterile mineral oil (the hydrocarbon source) to one set. Incubate at 25-30°C for up to 1 week.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY WITHOUT HYDROCARBON	RECOVERY WITH HYDROCARBON
<i>Pseudomonas aeruginosa</i>	9027	10 ² -10 ³	None to poor	Good
<i>Pseudomonas aeruginosa</i>	10145	10 ² -10 ³	None to poor	Good
<i>Pseudomonas aeruginosa</i>	14207	10 ² -10 ³	None to poor	Good
<i>Pseudomonas aeruginosa</i>	27853	10 ² -10 ³	None to poor	Good

Principles of the Procedure

Magnesium sulfate, calcium chloride and ferric chloride provide trace elements necessary for bacterial growth. Potassium nitrate is a nitrogen source, while monopotassium phosphate and diammonium hydrogen phosphate provide buffering capability.

Formula

Difco™ Bushnell-Haas Broth

Approximate Formula* Per Liter	
Magnesium Sulfate	0.2 g
Calcium Chloride	0.02 g
Monopotassium Phosphate	1.0 g
Diammonium Hydrogen Phosphate	1.0 g
Potassium Nitrate	1.0 g
Ferric Chloride	0.05 g

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

Directions for Preparation from Dehydrated Product

1. Suspend 3.27 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.

NOTE: A precipitate, white prior to autoclaving becoming yellow to orange after autoclaving, is normal.