



# BRAIN HEART INFUSION BROTH

- For in vitro use only -

Brain Heart Infusion (BHI) Broth is a general-purpose medium used for the isolation, cultivation, and maintenance of a variety of fastidious and non-fastidious microorganisms.

In 1919, Rosenow devised an excellent medium for culturing streptococci by using a dextrose broth supplemented with brain tissue. Rosenow's formulation was later modified by Hayden whom found the addition of crushed marble resulted in favorable growth of dental pathogens. Our current formulation contains infusion from brain and heart in place of brain tissue while disodium phosphate has replaced calcium carbonate.

BHI Broth is a highly nutritious base that meets the growth requirements of many types of microorganisms including bacteria, yeasts, and molds. Both our enriched BHI Broth (Cat# TB58) and our Fildes formulation (Cat# TB63) contain hemin (X Factor) and NAD (V Factor) that allows for the recovery of more fastidious organisms such as *Haemophilus* species. Fildes enrichment is a pepsin blood digest that liberates the X and V-factor required by *Haemophilus* species.

An anaerobic version of BHI Broth is also available that contains vitamin K and hemin; these constituents are necessary growth factors for some anaerobic organisms.

## Formulation per Litre of Medium

### TB60 Brain Heart Infusion Broth

Infusion from Brain Heart.....	6.0 g
Peptic Digest of Animal Tissue.....	6.0 g
Pancreatic Digest of Gelatin.....	14.5 g
Sodium Chloride.....	5.0 g
Dextrose.....	3.0 g
Disodium Phosphate.....	2.5 g

pH 7.4 ± 0.2

## Additional Ingredients per Liter:

### TB55 BHI with Hemin and NAD

Hemin.....	25 mg
NAD.....	15 mg

### TB58 BHI (Enriched - Anaerobic)

Vitamin K.....	1.0 mg
Hemin.....	5.0 mg

### TB63 BHI with Fildes Enrichment

Fildes Enrichment.....	50.0 mL
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## Recommended Procedure

### General Procedure

1. Allow medium to adjust to room temperature prior to inoculation.
2. Lightly inoculate the broth using the test sample or with the organism of interest.
3. For aerobic organisms, incubate aerobically at 35°C with loose caps. For fastidious organisms such as *Haemophilus* species incubate in a CO<sub>2</sub>-enriched atmosphere at 35°C with loose caps
4. Examine tubes after 24 hours and at 48 hours. Reincubate tubes an additional 24 hours if required.

### Anaerobic Procedure (TB58)

1. Prior to inoculation, pre-reduce the broth by placing the tubes in an anaerobic environment overnight at room temperature.
2. Lightly inoculate the broth using the test sample or with the organism of interest.
3. Incubate tubes anaerobically at 35°C with loose caps.
4. Examine tubes after 48 hours.

## Interpretation of Results

After the incubation period examine tubes for turbidity which is an indication of growth. If desired the broth can then be sub-cultured onto an appropriate solid medium for observance of colony morphology and so that further tests can be performed on isolated colonies.

- *If BHI broth is used to culture yeasts or fungi a prolonged incubation period may be required to obtain good growth*
- *Since nutritional requirements of organisms vary, some strains may be encountered that fail to grow or grow poorly in this medium*

## Quality Control

After checking for correct pH, color, depth, and sterility, the following organisms are used to determine the growth performance of the completed medium.

Organism	Expected Result
<b>BHI Broth</b>	
<i>Escherichia coli</i> ATCC 25922	Growth
<i>Staphylococcus aureus</i> ATCC 25923	Growth
<b>BHI (Enriched – Anaerobic)</b>	
<i>Bacteroides fragilis</i> ATCC 25285	Growth
<i>Clostridium perfringens</i> ATCC 13124	Growth
<b>BHI (with Fildes or Hemin &amp; NAD)</b>	
<i>Haemophilus influenzae</i> ATCC 10211	Growth
<i>Haemophilus parainfluenzae</i> ATCC 7901	Growth

## Storage and Shelf Life

Our various BHI Broth formulations should be stored in an upright position at 4 to 8°C. Under these conditions the media have the following shelf life:

- TB55 – BHI with Hemin and NAD – 16 weeks
- TB58 – BHI (Enriched) – 26 weeks
- TB60 – BHI Broth – 26 weeks
- TB63 – BHI with Fildes – 16 weeks

## Ordering Information

Cat#	Description	Format
TB55-05	BHI Broth Hemin & NAD 5-mL [16x100-mm s/c Tube]	10/pkg
TB58-05	BHI Broth Enriched 5-mL [16x100-mm s/c Tube]	10/pkg
TB58-10	BHI Broth Enriched 10-mL [16x125-mm s/c Tube]	10/pkg
TB60-0.5	BHI Broth 0.5-mL [13x100-mm s/c Tube]	10/pkg
TB60-02	BHI Broth 2-mL [13x100-mm s/c Tube]	10/pkg
TB60-05	BHI Broth 5-mL [13x100-mm s/c Tube]	10/pkg
TB60-10	BHI Broth 10-mL [16x125-mm s/c Tube]	10/pkg
TB63-10	BHI Broth w Fildes 10-mL [16x125-mm s/c Tube]	10/pkg

## References

1. Rosenow EC. Studies on elective localization. J Dent Research 1919; 1:205-49.
2. Hayden RL. Elective localization in the eye of bacteria from infected teeth. Arch Int Med 1923; 32:828-49.
3. Fildes P. Br J Exp Pathol 1920; 1:129.
4. Fildes P. Br J Exp Pathol 1921; 2:16.
5. MacFaddin JF. Media for isolation-cultivation-maintenance of medical bacteria, Vol I. Baltimore: Williams & Wilkins, 1985.

6. Isenberg HD, Ed. Clinical microbiology procedures handbook. Washington, DC: ASM, 1992.
7. NCCLS. Quality assurance for commercially prepared microbiological culture media. 2<sup>nd</sup> ed. NCCLS document M22-A2. Wayne, PA: NCCLS, 1996.
8. Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover RH. Manual of clinical microbiology. 7<sup>th</sup> ed. Washington: ASM, 1999.

Original: October 2003

Revised / Reviewed: October 2014