

# Instructions for Use

## MACCONKEY BROTH

<a href="#">Cat. no. K194</a>	MacConkey Broth with Durham Tube, 13x100mm Tube, 5ml	20 tubes/box
<a href="#">Cat. no. K196</a>	MacConkey Broth, 16x125mm Tube, 10ml	20 tubes/box

## INTENDED USE

Hardy Diagnostics MacConkey Broth is recommended for cultivating gram-negative, lactose-fermenting bacilli from water and foods as a presumptive test for coliforms. MacConkey Broth can also be used for pre-enrichment of *E. coli* O157 for toxin testing.

## SUMMARY

MacConkey Broth is a modification of the original bile salt broth recommended by MacConkey, which contained 0.5% sodium taurocholate and litmus as an indicator.<sup>(1)</sup> MacConkey later suggested variations of this formulation using neutral red as an indicator instead of litmus.<sup>(2,3)</sup> Consequently, Childs and Allen demonstrated the inhibitory effect of neutral red and further revised the formula to include the less inhibitory bromcresol purple.<sup>(4)</sup> Bile salts in the growth medium replaced the original sodium taurocholate.

Gelatin peptone provides MacConkey Broth with nitrogen and vitamins to promote growth. Lactose is utilized by lactose-fermenting bacilli. Bile salts inhibit the growth of gram-positive microorganisms and bromcresol purple acts as the pH indicator.

## FORMULA

Ingredients per liter of water:\*

Gelatin Peptone	20.0gm
Lactose	10.0gm
Bile Salts	5.0gm
Bromcresol Purple	0.01gm

Final pH 7.3 +/- 0.3 at 25°C.

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

## STORAGE AND SHELF LIFE

Storage: Upon receipt store at 2-8°C. away from direct light. Media should not be used if there are any signs of deterioration, discoloration, contamination, or if the expiration date has passed. Product is light and temperature sensitive; protect from light, excessive heat, moisture, and freezing.

The expiration date on the product label applies to the product in its intact packaging when stored as directed. The product may be used and tested up to the expiration date on the product label and incubated for the recommended incubation times as stated below.

Refer to the document "[Storage](#)" for more information.

## PRECAUTIONS

For Cat. nos. K194 adn K196.

This product may contain components of animal origin. Certified knowledge of the origin and/or sanitary state of the animals does not guarantee the absence of transmissible pathogenic agents. Therefore, it is recommended that these products be treated as potentially infectious, and handle observing the usual Universal Precautions for blood. Do not ingest, inhale, or allow to come into contact with skin.

This product is for *in vitro* diagnostic use only. It is to be used only by adequately trained and qualified laboratory personnel. Observe approved biohazard precautions and aseptic techniques. All laboratory specimens should be considered infectious and handled according to "standard precautions." Refer to the document "[Guidelines for Isolation Precautions](#)" from the Centers for Disease Control and Prevention.

For additional information regarding specific precautions for the prevention of the transmission of all infectious agents from laboratory instruments and materials, and for recommendations for the management of exposure to infectious disease, refer to CLSI document M29: *Protection of Laboratory Workers from Occupationally Acquired Infections*.

Sterilize all biohazard waste before disposal.

Refer to the document "[Precautions When Using Media](#)" for more information.

## PROCEDURE

1. Inoculate tubes with the test specimen. Incubate tubes for 18-24 hours at 35 +/- 2°C. in an aerobic atmosphere with loose caps.
2. For toxin testing procedures, consult the manufacturer's technical insert.

## INTERPRETATION OF RESULTS

Lactose-fermenting microorganisms grow well in MacConkey Broth and produce acid, causing the medium to turn yellow. Non-fermenting organisms produce excellent growth but will not produce acid or gas.

## LIMITATIONS

It is recommended that biochemical, immunological, molecular, or mass spectrometry testing be performed on colonies from pure culture for complete identification of bacteria and/or fungi.

Refer to the document "[Limitations of Procedures and Warranty](#)" for more information.

## MATERIALS REQUIRED BUT NOT PROVIDED

Standard microbiological supplies and equipment such as loops, swabs, applicator sticks, other culture media, incinerators, and incubators, etc., as well as serological and biochemical reagents, are not provided.

## QUALITY CONTROL

Hardy Diagnostics tests each lot of commercially manufactured media using appropriate quality control microorganisms and quality specifications as outlined on the Certificate of Analysis (CofA) and the CLSI document

M22-A3 *Quality Assurance for Commercially Prepared Microbiological Culture Media*. The following microorganisms are routinely used for testing at Hardy Diagnostics:

Test Organisms	Inoculation Method*	Incubation			Results
		Time	Temperature	Atmosphere	
<b>MacConkey Broth (Cat. no. K194, K196<sup>c</sup>):</b>					
<i>Escherichia coli</i> <sup>a</sup> ATCC <sup>®</sup> 25922	A	18-24hr	35°C	Aerobic	Growth; media turns yellow, gas production
<i>Escherichia coli</i> <sup>b</sup> ATCC <sup>®</sup> 8739	J	18-24hr	42 - 44°C	Aerobic	Growth; media turns yellow, gas production
<i>Staphylococcus aureus</i> <sup>a,b</sup> ATCC <sup>®</sup> 6538	B	24-48hr	42 - 44°C	Aerobic	Partial to complete inhibition; no color change, no gas production

\* Refer to the document "[Inoculation Procedures for Media QC](#)" for more information.

<sup>a</sup> Recommended QC strains for User Quality Control according to the CLSI document M22 when applicable.

<sup>b</sup> Tested in accordance with USP <61> and <62>. <sup>(13,14)</sup>

<sup>c</sup> No gas detected.

## USER QUALITY CONTROL

End users of commercially prepared culture media should perform QC testing in accordance with applicable government regulatory agencies, and in compliance with accreditation requirements. Hardy Diagnostics recommends end users check for signs of contamination and deterioration and, if dictated by laboratory quality control procedures or regulation, perform quality control testing to demonstrate growth or a positive reaction and to demonstrate inhibition or a negative reaction, if applicable. Hardy Diagnostics quality control testing is documented on the certificate of analysis (CofA) available from Hardy Diagnostics [Certificate of Analysis](#) website. Also refer to the document "[Finished Product Quality Control Procedures](#)," and the CLSI document M22-A3 *Quality Assurance for Commercially Prepared Microbiological Culture Media* for more information on the appropriate QC procedures. See the references below.

## PHYSICAL APPEARANCE

Hardy Diagnostics MacConkey Broth should appear clear to slightly hazy, and reddish-purple in color. May have a slight precipitate.

## REFERENCES

1. MacConkey. 1901. *Zentralbl. Bakteriol.*; 29:740.
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4. Childs, Eileen and Allen, L.A. 1953. Improved methods for determining the most probable number of *Bacterium coli* and of *Streptococcus faecalis*. *J. Hyg.*; 51:468-477.
5. Anderson, N.L., et al. *Cumitech 3B; Quality Systems in the Clinical Microbiology Laboratory*, Coordinating ed., A.S. Weissfeld. American Society for Microbiology, Washington, D.C.
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8. Isenberg, H.D. *Clinical Microbiology Procedures Handbook*, Vol. I, II & III. American Society for Microbiology, Washington, D.C.
9. MacFaddin, J.F. 1985. *Media for Isolation, Cultivation, Identification, Maintenance of Bacteria*, Vol. I. Williams & Wilkins, Baltimore, MD.
10. *Quality Assurance for Commercially Prepared Microbiological Culture Media*, M22. Clinical and Laboratory Standards Institute (CLSI - formerly NCCLS), Wayne, PA.
11. American Public Health Association. *Standard Methods for the Examination of Dairy Products*, APHA, Washington, D.C.
12. Greenberg, A.E., et al. (ed.). 1992. *Standard Methods for the Examination of Water and Wastewater*, 18th ed. APHA, Washington, D.C.
13. The Official Compendia of Standards. USP General Chapter <61> Microbiological Examination of Nonsterile Products: Microbial Enumeration Tests. *USP-NF*. United States Pharmacopeial Convention Inc., Rockville, MD.
14. The Official Compendia of Standards. USP General Chapter <62> Microbiological Examination of Nonsterile Products: Tests for Specified Microorganisms. *USP-NF*. United States Pharmacopeial Convention Inc., Rockville, MD.

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1430 West McCoy Lane, Santa Maria, CA 93455, USA

Phone: (805) 346-2766 ext. 5658

Fax: (805) 346-2760

Website: [HardyDiagnostics.com](http://HardyDiagnostics.com)

Email: [TechnicalServices@HardyDiagnostics.com](mailto:TechnicalServices@HardyDiagnostics.com)

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