

## Lauryl Sulfate Broth - Instructions for Use

### *Intended Use*

BACGro™ Lauryl Sulfate Broth is used in the detection of coliforms and *E. coli* in water, wastewater, and food. Lauryl Sulfate Broth is not intended for use in diagnosis, treatment, or prevention of disease in humans.

### *Product Summary*

Coliform presence in drinking water can be an indicator of contamination by other disease-causing bacteria. Coliforms are Gram-negative non-spore forming bacilli that ferment lactose and may be either aerobic or facultative anaerobes<sup>1</sup>. At 35° C, coliforms will produce acid and gas from lactose after incubation periods of 24-48 hours.

Lauryl Sulfate Broth was first described by Mallmann and Darby<sup>2</sup>, and is cited in many references for use in the detection of coliforms and coliform MPN testing. It is listed in the Official Methods of Analysis of AOAC International<sup>3</sup>, as well as American Public Health Association procedures<sup>4</sup>.

The inclusion of sodium lauryl sulfate inhibits Gram-positive bacteria, serving as the selective agent for coliforms. The inclusion of peptone provides the nitrogen, amino acid, vitamin, and mineral sources. Lactose acts as the fermentation agent for coliforms, resulting in production of acid and gas if coliforms are present. Potassium phosphates supply the buffering capacity and sodium chloride is included for the maintenance of osmotic balance. The inclusion of MUG allows for differentiation of *E. coli* from other coliforms, due to *E. coli*'s  $\beta$ -glucuronidase activity. MUG is broken down by this enzyme into a fluorescent end product (4-methylumbelliferone) which can be detected by excitation with a UV light at 365nm.

### ***Formulation\* (per Liter)***

Casein Peptone	20.0 g
Lactose	5.0 g
Sodium Chloride	5.0 g
Monopotassium Phosphate	2.75 g
Dipotassium Phosphate	2.75 g
<u>Sodium Lauryl Sulfate</u>	<u>0.1 g</u>
Total	35.6 g/L

(Media containing MUG at 0.05g/L is also available)

\*Formula may be supplemented and/or adjusted as required to meet performance criteria

### ***Directions***

1. Dissolve 35.6 g of Lauryl Sulfate Broth powder (or 35.7g/L of Lauryl Sulfate Broth with MUG) in 1L purified water
2. Stir to completely dissolve.
3. Distribute into test tube tubes containing inverted fermentation Durham tubes.
4. Autoclave at 121 degrees Celsius for 15 minutes.
5. Cool prior to use.

### ***Precautions***

This product is for laboratory use only and should only be used by qualified, trained laboratory personnel. Personnel should always use proper aseptic technique and observe all biohazardous precautions. All microbiological cultures should be presumed to be infectious.

Avoid ingestion, inhalation, or contact with skin and mucous membranes. If contact occurs, flush the area with clean water.

IRRITANT. Can irritate eyes, skin, and respiratory tract.

### ***Quality Control Specifications***

Gold Standard Diagnostics tests each lot of manufactured BACGro™ culture media utilizing appropriate control organisms and specifications as documented on the Certificate of Analysis. End users should perform quality control testing in accordance with government regulatory requirements and accreditation guidelines. The following specifications are routinely used for testing:

Appearance (dehydrated): Light beige, homogenous, free flowing powder, free of debris

Appearance (prepared): Pale yellow to amber, can be clear or hazy.

pH (prepared): 6.6 – 7.0 at 25°C

#### Organism Performance:

Strain ID	Incubation			Result
	Time	Temp.	Environment	
<i>Escherichia coli</i> * (ATCC® 8739)	24 – 48 hr.	30°C & 37°C	Aerobic	Growth, Gas produced
<i>Escherichia coli</i> * (ATCC® 25922)	24 – 48 hr.	30°C & 37°C	Aerobic	Growth, Gas produced
<i>Citrobacter freundii</i> (ATCC® 43864)	24 – 48 hr.	30°C	Aerobic	Growth, Gas produced
<i>Enterococcus faecalis</i> (ATCC® 19433)	24 – 48 hr.	30°C & 37°C	Aerobic	Growth inhibited
<i>Enterococcus faecalis</i> (ATCC® 29212)	24 – 48 hr.	30°C & 37°C	Aerobic	Growth inhibited

\**E. coli* strains expressing  $\beta$ -glucuronidase activity will also produce fluorescence in media containing MUG. Not all strains of *E. coli* are  $\beta$ -glucuronidase positive- notably strains of *E. coli* O157:H7 will not produce fluorescence.

### ***Limitations of the Procedure***

This product is not labeled for use as a medical device, and is not intended to diagnose, treat, or prevent disease.

Due to variation in nutritional requirements, some strains may be encountered that grow poorly in this medium.

The quality control specifications are performed at a 1x concentration. Due to the presence of sodium lauryl sulfate, a precipitate may form when used at greater than 1x concentration. Use at a 2x concentration is not recommended.

### ***Storage and Expiration***

BACGro™ Lauryl Sulfate Broth should be stored at 2 – 30 degrees Celsius. Because of the hygroscopic nature of dehydrated culture media, it should be stored in a dry place and the lid should remain tightly sealed. Media should be discarded if it is not free flowing or shows discoloration.

The expiration date printed on the label is applicable to media stored as directed.

## ***Catalog Numbers***

DCM2401 – Lauryl Sulfate Broth, 500g

DCM2405 – Lauryl Sulfate Broth, 5kg

DCM2410 – Lauryl Sulfate Broth, 10kg

DCM2501 – Lauryl Sulfate Broth with MUG, 500g

DCM2510 – Lauryl Sulfate Broth with MUG, 10kg

<sup>1</sup> Martin, N. H., Trmčić, A., Hsieh, T., Boor, K. J., & Wiedmann, M. (2016). The Evolving Role of Coliforms As Indicators of Unhygienic Processing Conditions in Dairy Foods. *Frontiers in Microbiology*, 7. doi:10.3389/fmicb.2016.01549

<sup>2</sup> Mallmann and Darby. (1941). *American Journal of Public Health* 31:127.

<sup>3</sup> Horwitz (ed.). (2000) *Official Methods of Analysis of AOAC International*. 17<sup>th</sup> edition. AOAC International. Gaithersburg, MD.

<sup>4</sup> Downes and Ito. (2001). *Compendium of Methods for the Microbiological Examination of Foods*. 4<sup>th</sup> edition. American Public Health Association. Washington, DC.