

## BAT Broth

Cat. 2053

For the detection of Alicyclobacillus spp. in fruit juices.

### Practical information

Applications	Categories
Enrichment	Alicyclobacillus
Detection	Alicyclobacillus

### Principles and uses

BAT Broth is a medium for the detection of Alicyclobacillus spp. in fruit juices.

Alicyclobacillus is a genus of Gram-positive, rod-shaped, spore-forming, bacteria. The bacteria are able to grow in acidic conditions, while the spores are able to survive typical pasteurization procedures. Alicyclobacillus are strictly aerobic, acidophilic, thermophilic, soil-dwelling organisms, with an optimum growth at temperatures between 42-60 °C at a pH of 3,5-4,5 (growth range pH 2,2-5,8). Their spores survive for long periods in fruit concentrates and similar environments.

Spoilage of shelf-stable fruit juice products by Alicyclobacillus bacteria can be very costly. It is therefore important that concentrates and other raw materials are screened for spores of these taint producers to reduce the risk of spoilage of processed products.

Its presence in packaged products can cause flavor alterations. They do not produce gas or cause any change in the appearance of the beverage container, and therefore the spoilage is discovered only when the consumer opens and begins to consume the product. Fortunately, Alicyclobacillus are not pathogenic bacteria.

D (+) Glucose is the fermentable carbohydrate providing carbon and energy. Yeast extract is source of vitamins, particularly the B-group. Monopotassium phosphate acts as a buffer system. The medium is especially characterized by the presence of many trace elements which supply all of the specific requirements for these bacteria. pH value and the high incubation temperature inhibit the contaminating flora.

### Formula in g/L

Ammonium sulfate	0,2	Boric acid	0,0001
Calcium chloride	0,25	Cobalt chloride	0,00018
Copper sulfate	0,00016	D(+) Glucose	5
Magnesium sulfate	0,5	Manganase sulfate	0,00015
Monopotassium phosphate	3	Sodium molybdate	0,0003
Yeast extract	2	Zinc sulfate	0,00018

### Preparation

Suspend 11 grams of the medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 °C for 15 minutes. Cool to 45-50 °C and adjust the pH to 4,0±0,2 by adding H<sub>2</sub>SO<sub>4</sub> 1N (if necessary). Avoid reheating the medium after pH adjustment.

### Instructions for use

- Inoculate and incubate at 45±2 °C during 3 to 5 days.

### Quality control

Solubility	Appearance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25°C)
w/o rests	Fine powder	Beige	Beige slightly opalescent	4,0±0,2

## Microbiological test

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Incubation conditions: (45±2 °C / 3-5 days)

### Microorganisms

Bacillus cereus ATCC 11778  
Escherichia coli ATCC 25922  
Alicyclobacillus acidocaldarius ATCC 27009  
Alicyclobacillus acidoterrestris ATCC 49025

### Specification

Inhibited growth  
Inhibited growth  
Good growth  
Good growth

## Storage

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Temp. Min.:2 °C  
Temp. Max.:25 °C

## Bibliography

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BAUMGART, J. and MENJE, S.: The Impact of Alicyclobacillus acidoterrestris on the Quality of Juices and Soft Drinks. Fruit Processing 7; 251- 254 (2000)

IFU Working Group Microbiology: First Standard IFU-Method on the Detection of Alicyclobacillus in Fruit Juices. (April 2003)

Jensen Nancy, Evaluation of detection methods for alicyclobacilli in fruit juice concentrates in Australia. Food Science, Australia

Akira Yokota, Tateo Fujii, Keiichi Goto, Alicyclobacillus: Thermophilic Acidophilic Bacilli. Springer (2008)

Chang SS, Kang DH. Alicyclobacillus spp. in the fruit juice industry: history, characteristics, and current isolation/detection procedures. Department of Food Science and Human Nutrition, Washington State University, Pullman, Washington 99164-6376, USA.