

TECHNICAL DATA SHEET

M 17 AGAR

ENUMERATION OF LACTOCOCCI AND *STREPTOCOCCUS THERMOPHILUS*

1 INTENDED USE

M17 Agar is used for the enumeration of lactococci (especially *Lactococcus lactis*) in dairy products. It is also used to study the sensitivity of these species to bacteriophages. It is well adapted to the enumeration of *Streptococcus thermophilus* in natural or flavored yogurts, textured or not, and in yogurts containing morsels of fruit.

The typical composition corresponds to that defined in the standards FIL-IDF 149A and ISO 7889.

2 HISTORY

Terzhagi and Sandine showed that the incorporation of sodium β -glycerophosphate in M 16 medium increased the buffering capacity of the medium. The new medium, named M 17, led to an increase in the development of lactic streptococci, which are bacteria producing large quantities of acid via the homofermentative metabolism of lactose.

3 PRINCIPLES

Casein, meat and soybean peptones contain the carbon and nitrogen sources required to cultivate lactococci.

Yeast extract is a source of B vitamins

Ascorbic acid stimulates growth.

Lactose is fermented to lactic acid, which is buffered by glycerophosphate, in order to stabilize the pH of the media.

4 TYPICAL COMPOSITION

The composition can be adjusted in order to obtain optimal performance.

For 1 liter of media :

- Tryptone	2,50 g
- Peptic digest of meat.....	2,50 g
- Papaic digest of soybean meal	5,00 g
- Yeast extract	2,50 g
- Meat extract.....	5,00 g
- Lactose.....	5,00 g
- Sodium glycerophosphate.....	19,00 g
- Magnesium sulfate	0,25 g
- Ascorbic acid	0,50 g
- Bacteriological agar	15,00 g

pH of the ready-to-use media at 25 °C : 7,1 \pm 0,2.

5 PREPARATION

- Dissolve 57,2 g of dehydrated media (BK088) in 1 liter of distilled or demineralized water.
- Slowly bring to boiling, stirring with constant agitation until complete dissolution.
- Dispense into tubes or vials.
- Sterilize in an autoclave at 115 °C for 20 minutes.
- Cool and maintain the media in a molten state at 44-47 °C

✓ **Reconstitution :**
57,2 g/L

✓ **Sterilization :**
20 min at 115 °C

NOTES

- For the specific culture of *Streptococcus thermophilus*, it is recommended to adjust the pH of the media to pH 6.8.
- If the media has been prepared in advance, melt the media for the least amount of time necessary to achieve total liquefaction.

6 INSTRUCTIONS FOR USE

- Transfer 1 mL of the product to analyze and its serial dilutions to sterile Petri plates.
- Pour roughly 15 mL of molten media into each plate.
- Homogenize by swirling and let solidify on a cold, flat surface.
- Incubate at 37 ± 1 °C for 48 hours for the enumeration of *Streptococcus thermophilus*.
- Incubate at 30 ± 1 °C for 48 hours for mesophilic lactococci.

✓ **Incubation :**
1 mL in pour plates

✓ **Incubation :**
48 h at 30 or 37 °C

NOTE :

If the dough contains multiple species, differentiate them by incubation at :

- 45 ± 1 °C for 48 hours for the enumeration of *Streptococcus thermophilus* (agar pH adjusted to 6.8).
- 20 ± 1 °C for 5 days for lactococci enumeration (agar not adjusted in pH).

7 RESULTS

Streptococcus thermophilus and mesophilic lactococci give rise to colonies that reach 1 to 2 mm in diameter, depending on the number of colonies overall on the plate.

8 QUALITY CONTROL

Dehydrated media : beige powder, free-flowing and homogeneous.

Prepared media : amber agar.

Typical culture response after 48 hours of incubation at 37 °C

Microorganisms		Growth (Productivity Ratio : P_R)
<i>Streptococcus thermophilus</i>	ATCC® 14485	$P_R \geq 70$ %
<i>Lactococcus lactis</i> subsp. <i>lactis</i>	ATCC 11454	$P_R \geq 70$ %

9 STORAGE / SHELF LIFE

Dehydrated media : 2-20 °C. Storage at 2-8°C is recommended and will limit the clumping of the media. The expiration date is indicated on the label.

Prepared media in vials (*) : 180 days at 2-8 °C.

(*) Benchmark value determined under standard preparation conditions, following manufacturer's instructions.

10 PACKAGING

Dehydrated media :

500 g bottle BK088HA

11 BIBLIOGRAPHY

Terzaghi, B.E., and Sandine, W.E. 1975. Improved medium for lactic streptococci and their bacteriophages. Appl. Microbiol., 29: 807-813.

Journal Officiel du 4 janvier 1978. Méthode officielle d'analyse pour le dénombrement de la flore spécifique du yaourt ou yoghourt. (arrêté du 25 Novembre 1977).

FIL-IDF 149A. Juillet 1997. Levains lactiques de cultures de bactéries lactiques. Norme de composition.

ISO 7889 / IDF 117. Février 2003. Yaourt. Dénombrement des micro-organismes caractéristiques. Technique de comptage des colonies à 37°C.

12 ADDITIONAL INFORMATION

The information provided on the labels take precedence over the formulations or instructions described in this document and are susceptible to modification at any time, without warning.

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