

Milk Agar

Intended Use

Milk Agar is recommended by the British Standards Institute¹ for the enumeration of microorganisms in liquid milk, ice cream, dried milk and whey.

Summary and Explanation

Liquid milk is a highly perishable foodstuff with a shelf life of only 5-10 days after pasteurization. Contamination of raw milk may arise from either the soiled or diseased udder or inadequately cleaned milking or storage equipment. Bovine mastitis or udder inflammation may cause contamination with *Staphylococcus aureus*, *Streptococcus agalactiae*, *Escherichia coli* or, more rarely, *Yersinia enterocolitica* and *Leptospira* species. Excretion of these organisms can increase the bulk milk count by 10⁵ organisms/mL.

User Quality Control

Identity Specifications

Difco™ Milk Agar

Dehydrated Appearance: Beige, free-flowing, homogeneous.

Solution: 2.2% solution, soluble in purified water upon boiling. Solution is light amber, clear to slightly opalescent, no significant precipitate.

Prepared Appearance: Light amber, opalescent, no significant precipitate.

Reaction of 2.2% Solution at 25°C: pH 6.9 ± 0.1

Cultural Response

Difco™ Milk Agar

Prepare the medium per label directions. Inoculate using the pour plate technique and incubate at 30 ± 2°C for up to 72 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
<i>Lactobacillus rhamnosus</i>	9595	30-300	Good
<i>Lactococcus lactis</i>	19435	30-300	Good
<i>Staphylococcus aureus</i>	25923	30-300	Good
<i>Streptococcus thermophilus</i>	19258	30-300	Good

Poor cleaning of the milking equipment may cause contamination with micrococci, streptococci, coliforms or heat resistant *Bacillus* strains, giving an increase of the bulk milk count of >5 × 10⁴ organisms/mL. Spoilage of pasteurized or raw milk by proteolytic psychrotrophic bacteria can occur on prolonged storage below 7°C.

Milk Agar conforms to the EEC Commission for the examination of ice cream.² Milk Agar is recommended for performing plate count tests on milks, rinse waters and dairy products.³

Principles of Procedure

Peptone and yeast extract provide essential nutrients while skim milk powder is a source of casein. Dextrose is the carbon energy source. Agar is the solidifying agent.

Proteolytic bacteria will be surrounded by a clear zone from the conversion of casein into soluble nitrogenous compounds.¹

Formula

Difco™ Milk Agar

Approximate Formula* Per Liter

Tryptone	5.0	g
Yeast Extract	2.5	g
Dextrose	1.0	g
Skim Milk Powder (antibiotic free)	1.0	g
Agar	12.5	g

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

Directions for Preparation from Dehydrated Product

1. Suspend 22 g of the powder in 1 L of purified water. Mix thoroughly.
2. Heat with frequent agitation and boil for 1 minute to completely dissolve the powder.
3. Autoclave at 121°C for 15 minutes.
4. Test samples of the finished product for performance using stable, typical control cultures.

Procedure

Total counts may be carried out using either pour plates or surface counting techniques.

1. Prepare milk dilutions of 1/10, 1/100, 1/1,000 in 1/4-strength Ringer's solution. Use this inoculum within 15 minutes.
2. Pour Plates: Pipette 1 mL of each dilution into Petri dishes. Add 10-12 mL of molten Milk Agar, cooled to 45°C, and mix thoroughly.
Spread Plates: Spread 1 mL of milk dilution over the surface of the solidified medium in a Petri dish.
3. Incubate at 30 ± 2°C for 72 hours.

Expected Results

Select plates containing 10-300 colonies. Results are expressed as colonies per mL of product tested.

Proteolytic psychrotrophic colonies may be enhanced by flooding the plates with a solution of 1% hydrochloric acid or 10% acetic acid. Pour off the excess acid solution and count the colonies surrounded by clear zones.

References

1. Methods of microbiological examination for dairy purposes. Diluents, media and apparatus and their preparation and sterilisation. BS4285, Sec. 1.2.
2. Klose. 1968. Susswaren. 14:778.
3. Ministry of Health. 1937. Bacteriological tests for graded milk. Memo 139/Foods. H.M.S.O., London, England.

Availability

Difco™ Milk Agar

Cat. No. 218591 Dehydrated – 500 g