



PRODUCT SPECIFICATION SHEET

MacConkey Agar w/o CV, with 0.5% Bile Salts (DM145)

Intended Use

MacConkey Agar w/o CV, with 0.5% Bile salts (DM145) is recommended for selective isolation and differentiation of lactose fermenting and lactose non-fermenting enteric bacteria in compliance with BP.

Product Summary and Explanation

MacConkey Agar is based on the bile salt-neutral red-lactose agar of MacConkey.⁽¹⁾ MacConkey Agar is the earliest selective and differential medium for cultivation of enteric microorganisms from a variety of clinical specimens.^(1, 2) Subsequently MacConkey Agar and Broth have been recommended for use in microbiological examination of foodstuffs⁽³⁾ and for direct plating / inoculation of water samples for coliform counts.⁽⁴⁾ These media are also accepted by the Standard Methods for the Examination of Milk and Dairy Products^(5, 6) and pharmaceutical preparations. The original MacConkey medium was used to differentiate strains of *Salmonella typhosa* from members of the coliform group. Modifications made in the original formula improved the growth of *Shigella* and *Salmonella* strains. MacConkey Agar is listed as one of the recommended media for the isolation of *E. coli* from non-sterile pharmaceutical products.⁽⁷⁾

MacConkey Agar w/o CV, with 0.5% Bile salts is a differential medium and less selective than MacConkey Agar. The lack of Crystal Violet permits growth of enterococci, staphylococci, and *Mycobacterium* spp. MacConkey Agar contains bile salts which attributes to the selective action to this medium, that inhibit gram-positive organisms and allow gram-negative organisms to grow. Gram-negative bacteria usually grow well on the medium and are differentiated by their ability to ferment lactose. Lactose fermenting strains grow as red or pink and may be surrounded by a zone of acid precipitated bile. The red colour is due to production of acid from lactose, absorption of neutral red and a subsequent colour change of the dye when the pH of medium falls below 6.8. Lactose non-fermenting strains, such as *Shigella* and *Salmonella* are colourless and transparent and typically do not alter appearance of the medium. When lactose non-fermenters grow in proximity to coliform colonies, the surrounding medium appears as cleared areas.

Principles of the Procedure

Peptic digest of animal tissue in MacConkey Agar w/o CV, w/ 0.5% Bile salts, serves as the main source of nitrogen and vitamins. Lactose serves as the carbon source by being the fermentable carbohydrate. Bile salts serve to make the medium selective by inhibiting accompanying gram-positive bacteria. Sodium chloride maintains the osmotic equilibrium. Neutral red is the pH indicator dye.

Formula / Liter

Ingredients	Gms / Liter
Peptic digest of animal tissue	20.00
Lactose	10.00
Bile salts	5.00
Sodium Chloride	5.00
Neutral red	0.075
Agar	12.00
Final pH: 7.4 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.

Directions

1. Suspend 52 grams of the medium in one liter of distilled water.
2. Heat if necessary, to dissolve the medium completely.
3. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
4. Mix well and pour into sterile petri plates.
5. DO NOT OVERHEAT.
6. The surface of the medium should be dry when inoculated.



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Quality Control Specifications

Dehydrated Appearance	Light yellow to pink homogeneous free flowing powder
Prepared Medium	Orange red coloured clear to slightly opalescent gel forms in Petri plates
Reaction of 5.2% Solution	pH : 7.4 ± 0.2 at 25°C
Gel Strength	Firm, comparable with 1.2% Agar gel

Expected Cultural Response: Cultural characteristics observed after an incubation 35-37°C for 18-24 hours.

Sr. No.	Organisms	Results to be achieved			
		Inoculum (CFU)	Growth	Recovery	Colour of colony
1.	<i>Escherichia coli ATCC 25922</i>	50-100	good-luxuriant	≥50 %	pink to red with bile precipitate
2.	<i>Enterobacter aerogenes ATCC 13048</i>	50-100	good-luxuriant	≥50 %	pink to red
3.	<i>Enterococcus faecalis ATCC 29212</i>	50-100	fair to good	30-40%	pale pink to red
4.	<i>Proteus vulgaris ATCC 13315</i>	50-100	good-luxuriant	≥50 %	Colourless
5.	<i>Salmonella Paratyphi A ATCC 9150</i>	50-100	good-luxuriant	≥50 %	Colourless
6.	<i>Shigella flexneri ATCC 12022</i>	50-100	fair to good	≥50%	Colourless
7.	<i>Salmonella Paratyphi B ATCC 8759</i>	50-100	good-luxuriant	≥50 %	Colourless
8.	<i>Salmonella Enteritidis ATCC 13076</i>	50-100	good-luxuriant	≥50 %	Colourless
9.	<i>Salmonella Typhi ATCC 6539</i>	50-100	good-luxuriant	≥50 %	Colourless
10.	<i>Staphylococcus aureus ATCC 25923</i>	50-100	fair to good	30-40%	pale pink to red

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Refer to appropriate references using MacConkey Agar w/o CV, w/ 0.5% Bile salts for the isolation and identification of enteric organisms.

Results

- Lactose-fermenting organisms grow as pink to red colonies with or without a zone of precipitated bile.
- Non-lactose fermenting organisms grow as colorless or clear colonies.
- Swarming by *Proteus* spp. is reduced.

Storage

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

- Although MacConkey Agar w/o CV, with 0.5% Bile salts is a selective medium, it is less inhibitory than MacConkey Agar, allowing gram-positive organisms to grow, biochemical and serological testing using pure cultures are recommended for complete identification.
- Consult appropriate texts for detailed information and recommended procedures.
- Incubation of MacConkey Agar w/o CV, with 0.5% Bile salts plates under increased CO₂ has been reported to reduce the growth and recovery of certain gram-negative bacilli.

Packaging

Product Name : MacConkey Agar w/o CV, with 0.5% Bile Salts.



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Product Code : DM145

Available Pack sizes : 100gm / 500gm

References

1. MacConkey, 1905, J. Hyg., 5:333.
2. MacConkey, 1900, The Lancet, ii:20.
3. Downes F. P. and Ito K. (Ed.), 2001, Compendium of Methods for the Microbiological Examination of Foods, 4th ed., APHA, Washington, D.C.
4. Greenberg A. E., Clesceri L. S. and Eaton A. D., (Eds.), 2005, Standard Methods for the Examination of Water and Wastewater, 21st ed., APHA, Washington, D.C.
5. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
6. The United States Pharmacopoeia XXI and the National Formulary, 16th ed., 1985, United States Pharmacopoeial Convention, Inc., Washington, D.C.
7. United States Pharmacopoeial Convention, Inc. 2008. The United States pharmacopoeia 31/ The national formulary 26, Supp. 1, 8-1-08, online. United States Pharmacopoeial Convention, Inc., Rockville, Md.

Further Information

For further information please contact your local MICROMASTER Representative.



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