



PRODUCT SPECIFICATION SHEET

MacConkey Agar Base (DM1096)

Intended Use

MacConkey Agar Base (DM1096) is recommended for studying carbohydrate fermentation reactions of coliforms by adding carbohydrates either individually or in combination.

Product Summary and Explanation

MacConkey Agar is based on the bile salt-neutral red-lactose agar of MacConkey.⁽¹⁾ The original MacConkey medium contains protein, bile salts, sodium chloride and two dyes and was used to differentiate strains of *Salmonella typhosa* from members of the coliform group. The formula improvements gave improved differential reactions between these enteric pathogens and the coliform group. MacConkey Agar is the earliest selective and differential medium for cultivation of enteric microorganisms from a variety of clinical specimens.^(1, 2) *Klebsiella* species are often associated with coliforms in water supply distribution systems and are present as a major component in industrial wastes of paper mill, textile and other industries. MacConkey Agar Base is used for studying carbohydrate fermentation reactions of coliforms by adding carbohydrates either individually or in combination.⁽³⁾

Principles of the Procedure

MacConkey Agar Base contains peptic digest of animal tissue and proteose peptone which provides nitrogen and other growth nutrients. This medium does not contain carbohydrates. However for studying fermentation reaction, carbohydrate of interest has to be added while preparing medium. The selective action of this medium is attributed to bile salts and crystal violet, which are inhibitory to most of the species of gram-positive bacteria. Gram-negative bacteria usually grow well on the medium and are differentiated by their ability to ferment carbohydrates. Carbohydrate 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 carbohydrate, absorption of neutral red and subsequent colour change of the dye when the pH of the medium falls below 6.8. Sodium chloride helps to maintain osmotic balance.

Formula / Liter

| Ingredients | Gms / Liter |
|--|-------------|
| Peptic digest of animal tissue | 17.00 |
| Proteose peptone | 3.00 |
| Bile salts | 1.50 |
| Sodium chloride | 5.00 |
| Crystal violet | 0.001 |
| Neutral red | 0.03 |
| Agar | 13.50 |
| Final pH: 7.1 ± 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.
3. If MacConkey Agar Base is to be used within 12 hours, omit autoclaving and gently boil medium for 5 minutes. Add 1% carbohydrate before or after autoclaving, depending upon heat lability.

Directions

1. Suspend 40 grams of the medium in one liter of distilled water.
2. Add desired amount of carbohydrate either individually or in combination.
3. Heat to boiling, to dissolve the medium completely.
4. Autoclave at 121°C, 15 psi pressure, for 15 minutes / validated cycle.
5. Avoid overheating.
6. Cool to 45-50°C and pour into sterile Petri plates.
7. 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 | Red with purplish tinge clear to slightly opalescent gel forms in Petri plates |
| Reaction of 4.0% Solution | pH : 7.1 ± 0.2 at 25°C |
| Gel Strength | Firm, comparable with 1.35% Agar gel |

Expected Cultural Response: Cultural characteristics observed with added 1% lactose, after an incubation at 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</i> ATCC 25922 | 50-100 | good-luxuriant | ≥50% | pink to red with bile precipitate |
| 2. | <i>Enterobacter aerogenes</i> ATCC 13048 | ≥10 ³ | good-luxuriant | ≥50% | pink to red |
| 3. | <i>Enterococcus faecalis</i> ATCC 29212 | 50 - 100 | fair to good | 30-40% | pale pink to red |
| 4. | <i>Proteus vulgaris</i> ATCC 13315 | 50-100 | good-luxuriant | ≥50% | colourless |
| 5. | <i>Salmonella Paratyphi A</i> ATCC 9150 | 50-100 | good-luxuriant | ≥50% | colourless |
| 6. | <i>Shigella dysenteriae</i> ATCC 13313 | 50-100 | fair to good | 30-40% | colourless |
| 7. | <i>Salmonella Paratyphi B</i> ATCC 8759 | 50-100 | good-luxuriant | ≥50% | colourless |
| 8. | <i>Salmonella Enteritidis</i> ATCC 13076 | 50-100 | good-luxuriant | ≥50% | colourless |
| 9. | <i>Salmonella Typhi</i> ATCC 6539 | 50-100 | good-luxuriant | ≥50% | colourless |
| 10. | <i>Staphylococcus aureus</i> ATCC 25923 | ≥10 ³ | inhibited | 0% | -- |

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

Test Procedure

Refer to appropriate references and standard test procedures.

Results

1. Carbohydrate fermenting strains grow as red or pink and may be surrounded by a zone of acid precipitated bile.
2. Non-fermenting strains grow as colourless and without a zone of acid precipitated bile.

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

1. Although, MacConkey media are selective primarily for gram-negative enteric bacilli, for complete identification, biochemical and, if indicated, serological testing using pure cultures are recommended. Consult appropriate texts for detailed information and recommended procedures.
2. Incubation of MacConkey Agar plates under increased CO₂ has been reported to reduce the growth and recovery of a number of strains of gram-negative bacilli.

Packaging

Product Name : MacConkey Agar Base

Product Code : DM1096

Available Pack sizes : 500gm



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References

1. MacConkey, 1900, The Lancet, ii:20.
2. MacConkey, 1905, J. Hyg., 5:333.
3. Holt, Harris and Teague, 1916, J. Infect. Dis., 18:596.

Further Information

For further information please contact your local MICROMASTER Representative.



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