



# Technical Data

## HiEncap™ MacConkey Agar w/0.15% Bile salts, CV and NaCl

EC081CCL

HiEncap™ MacConkey Agar w/ 0.15% Bile salts, CV and NaCl is recommended for the selective isolation and differentiation of coliform organisms and other enteric pathogens.

### Composition\*\*

Ingredients	Gms / Litre
Pancreatic digest of gelatin	17.000
Casein enzymic hydrolysate	1.500
Peptic digest of animal tissue	1.500
Lactose	10.000
Bile salts	1.500
Sodium chloride	5.000
Neutral Red	0.030
Crystal violet	0.004
Agar	15.000
Final pH ( at 25°C)	7.1±0.2

\*\*Formula adjusted, standardized to suit performance parameters

### Directions

Each capsule contains 12.88 grams of media. Suspend 1 capsule in 250ml (4 capsules in 1000 ml) distilled or purified water. Heat to boiling to dissolve the agar completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Avoid overheating. Cool to 45 - 50°C and pour into sterile Petri plates. The surface of the medium should be dry when inoculated.

### Principle And Interpretation

MacConkey agars are slightly selective and differential plating media mainly used for the detection and isolation of gram-negative organisms from clinical (1), dairy (2), food (3,4), water (5), pharmaceutical (6, 14) and industrial sources (7). It is also recommended for the selection and recovery of the *Enterobacteriaceae* and related enteric gram-negative bacilli. USP recommends this medium for use in the performance of Microbial Limit Tests (6).

These agar media are selective since the concentration of bile salts, which inhibit gram-positive microorganisms, is low in comparison with other enteric plating media. The medium M081, which corresponds with, that recommended by APHA can be used for the direct plating of water samples for coliform bacilli, for the examination of food samples for food poisoning organisms (3) and for the isolation of *Salmonella* and *Shigella* species in cheese (2). Other than that this medium is also used for count of coli-aerogenes bacteria in cattle and sheep faeces (8), the count of coli-aerogenes and non-lactose fermenters in poultry carcasses (9), bacterial counts on irradiated canned minced chicken (10) and the recognition of coli-aerogenes bacteria during investigations on the genus *Aeromonas* (11).

MacConkey Agar is the earliest selective and differential medium for cultivation of enteric microorganisms from a variety of clinical specimens (13, 12). The original medium contains protein, bile salts, sodium chloride and two dyes. The selective action of this medium is attributed to crystal violet and bile salts, which are inhibitory to most species of gram-positive bacteria. 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 colonies 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, transparent and typically do not alter appearance of the medium.

Peptones are sources of nitrogen and other nutrients. Lactose is a fermentable carbohydrate, bile salts and crystal violet are selective agents that inhibit growth of gram-positive organisms. Neutral red is the pH indicator dye.

## Quality Control

### Appearance

Gelatin capsule containing light yellow to pink coloured granulated media.

### Gelling

Firm comparable with 1.5% Agar gel.

### Colour and Clarity of prepared medium

Red with purplish tinge coloured clear to slightly opalescent gel forms in Petri plates.

### Quantity

Each capsule contains 12.88 grams of medium sufficient for 250 ml media

### Reaction

Reaction of 4.95% w/v aqueous solution at 25°C. pH : 7.1±0.2

### pH

6.90-7.30

### Cultural Response

Cultural response was observed after an incubation at 30-35°C for 18-72 hours. Recovery rate is considered as 100% for bacteria growth on Soybean Casein Digest Agar.

### Cultural Response

Organism	Growth	Inoculum (CFU)	Recovery	Colour of colony	Incubation temperature	Incubation period
<b>Cultural Response</b>						
<i>Salmonella Typhi</i> ATCC 6539	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Salmonella Enteritidis</i> ATCC 13076	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Salmonella Paratyphi A</i> ATCC 9150	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Salmonella Paratyphi B</i> ATCC 8759	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Salmonella Abony</i> NCTC 6017	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Proteus vulgaris</i> ATCC 13315	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Staphylococcus epidermidis</i> ATCC 12228	inhibited	≥10 <sup>3</sup>	0%		30 -35 °C	≥24 hrs
<i>Salmonella Typhimurium</i> ATCC 14028	luxuriant	50 -100	≥50 %	colourless	30 -35 °C	25 -100
<i>Corynebacterium diphtheriae type gravis</i>	inhibited	≥10 <sup>3</sup>	0%		30 -35 °C	≥24 hrs
<i>Escherichia coli</i> ATCC 8739	luxuriant	50 -100	≥50 %	pink-red with bile precipitate	30 -35 °C	25 -100
<i>Enterobacter aerogenes</i> ATCC 13048	luxuriant	50 -100	≥50 %	pink to red	30 -35 °C	25 -100
<i>Staphylococcus aureus</i> ATCC 6538	inhibited	≥10 <sup>3</sup>	0%		30 -35 °C	≥24 hrs
<i>Staphylococcus aureus</i> ATCC 25923	inhibited	≥10 <sup>3</sup>	0%		30 -35 °C	≥24 hrs
<i>Shigella flexneri</i> ATCC 12022	fair to good	50 -100	30 -40 %	colourless	30 -35 °C	15 -40
<i>Escherichia coli</i> ATCC 25922	luxuriant	50 -100	≥50 %	pink to red with bile precipitate	30 -35 °C	25 -100
<i>Escherichia coli</i> NCTC 9002	luxuriant	50 -100	≥50 %	pink to red with bile precipitate	30 -35 °C	25 -100
<i>Enterococcus faecalis</i> ATCC 29212	fair to good	50 -100	30 -40 %	colourless to pale pink	30 -35 °C	15 -40

## Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

## Reference

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