

## CM 20801 - HEMMES MEDIUM

### INTENDED USE

For biochemical differentiation of Salmonella and Shigella on the basis of dextrose, lactose, sucrose fermentation, motility, H<sub>2</sub>S, indole and urease production.

### PRODUCT SUMMARY AND EXPLANATION

Salmonella and Shigella are gram-negative, facultatively anaerobic, non-sporulating, non-motile rods in the family Enterobacteriaceae. They are widely distributed in animals affecting mainly the stomach and the intestines. Arizona group was originally named Salmonella Arizonae. It has been found mainly in reptiles and birds and occasionally in human patients with diarrhea or septicemia. These organisms are difficult to differentiate biochemically from Escherichia coli. Hemmes Medium is used for screening and differentiating Salmonella and Shigella. The differentiation is based on seven reactions namely-dextrose, lactose, and sucrose fermentation, hydrogen sulphide production, urease detection, indole production and motility testing. Thus it is also named as Hemmes-7 Medium Base. It is prepared according to the formulation of Hemmes.

Salmonella and Shigella show a red slant and a yellow butt from dextrose fermentation. Motility and gas formation are detectable because of the appropriate agar concentration. Indole formation is also detectable due to the presence of tryptone. Urease activity is detected by the formation of cerise colour.

### COMPOSITION

| Ingredients         | Gms / Ltr |
|---------------------|-----------|
| Tryptone            | 10.000    |
| Yeast extract       | 3.000     |
| Dextrose (Glucose)  | 0.300     |
| Lactose             | 10.000    |
| Sucrose             | 10.000    |
| Sodium chloride     | 4.000     |
| Ferrous sulphate    | 0.040     |
| Sodium thiosulphate | 0.100     |
| Phenol red          | 0.015     |
| Agar                | 5.500     |

### PRINCIPLE

Tryptone and yeast extract in the medium are sources of carbon, nitrogen, vitamins and minerals. Ferrous sulphate, Sodium thiosulphate and sodium chloride provide the essential ions. Dextrose, lactose, and sucrose are included in the medium for fermentation studies.

### INSTRUCTION FOR USE

Dissolve 42.95 grams in 950 ml purified / distilled water.

Heat to boiling to dissolve the medium completely.

Dispense 95 ml amounts into flasks and sterilize by autoclaving at 15 psi pressure (121°C) for 15 minutes.

Cool to about 50-55°C and aseptically add 5 ml of sterile 40% Urea Solution per 95 ml basal medium.

Mix well and dispense into sterile test tubes.

Allow the tubed medium to cool and solidify in the slanted position to give a butt of at least 3 cm and slant of 2 cm.



## QUALITY CONTROL SPECIFICATIONS

Appearance of Powder : Light yellow to pink homogeneous free flowing powder.  
Appearance of prepared medium : Red coloured, clear to slightly opalescent gel forms in tubes as slants.  
pH (at 25°C) : 7.2±0.2

## INTERPRETATION

Cultural characteristics observed with added 40% Urea solution, after an incubation.

| Microorganism                       | ATCC  | Inoculum (CFU/ml) | Growth    | H <sub>2</sub> S                           | Indole                                                     | Motility                                                                                       | Urease                                    | Incubation Temperature | Incubation Period |
|-------------------------------------|-------|-------------------|-----------|--------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------|-------------------|
| Escherichia coli                    | 25922 | 50-100            | luxuriant | Negative reaction, no blackening of medium | Positive reaction, red ring at the interface of the medium | Positive, growth away from stabline causing turbidity                                          | Negative reaction, yellow slant           | 35 - 37°C              | 18-24 Hours       |
| Proteus mirabilis                   | 25933 | 50-100            | luxuriant | Positive reaction, blackening of medium    | Negative reaction, no colour development / cloudy ring     | Variable, motility is temp. dependent. It is more pronounced at 20°C and almost absent at 35°C | Positive reaction, pink colour throughout | 35 - 37°C              | 18-24 Hours       |
| Salmonella Typhimurium              | 14028 | 50-100            | luxuriant | Positive reaction, blackening of medium    | Negative reaction, no colour development / cloudy ring     | Positive, growth away from stabline causing turbidity                                          | Negative reaction, yellow slant           | 35 - 37°C              | 18-24 Hours       |
| Staphylococcus aureus subsp. aureus | 25923 | 50-100            | luxuriant | Negative reaction, no blackening of medium | Negative reaction, no colour development / cloudy ring     | Negative, growth along the stabline, surrounding medium remains clear                          | Negative reaction, yellow slant           | 35 - 37°C              | 18-24 Hours       |

## PACKAGING:

In pack size of 500 gm bottles.

## STORAGE

Dehydrated powder, hygroscopic in nature, store in a dry place, in tightly-sealed containers between 25-30°C and protect from direct sunlight. Under optimal conditions, the medium has a shelf life of 4 years. When the container is opened for the first time, note the time and date on the label space provided on the container. After the desired amount of medium has been taken out replace the cap tightly to protect from hydration.

Product Deterioration: Do not use if they show evidence of microbial contamination, discoloration, drying or any other signs of deterioration.

## DISPOSAL

After use, prepared plates, specimen/sample containers and other contaminated materials must be sterilized before discarding.

## REFERENCES



1. Giannella R. A., 1996, Salmonella in: Barons Medical Microbiology (Baron S. et al, Eds.), 4th Ed., Univ. of Texas, Medical Branch.
2. Hemmes J. H., St. Inst. Publ. Hlth., Curacao, Netherlands, Antilles.
3. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
4. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
5. Ryan K. J., Ray C. G., (Eds.), 2004, Sherris Medical Microbiology, 4th Ed., McGraw Hill.

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|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <br>Good Manufacturing<br>Practices Certified | <br>For In Vitro Diagnostic Use                                                                               | <br>Quantity            | <br>Lot / Batch Number | <br>Catalogue Number                 | <br>Manufacturer |
| <br>Temperature Unit                          | <br>Authorized Representative<br><small>MedNet GmbH<br/>Barkstrasse 10,<br/>48163 Maastricht, Germany</small> | <br>European Conformity | <br>QR<br>Code         | <br>Consults Instructions<br>for Use | <br>Best Before  |

NOTE: Please consult the Material Safety Data Sheet for information regarding hazards and safe handling Practices.

\*For LabUse Only

