

TECHNICAL DATA SHEET

Urea Broth Base (Urea Broth Medium)

Principle

The urea broth base is developed by the Rustigian and Stuart (1941) for the differentiation of *Proteus* species from *Salmonella* and *Shigella* species from clinical samples. They are differentiated on basis of urea utilization, gram negative enteric bacilli are unable to utilize urea in scanty of nutrients and highly buffered medium. Urea broth is composed of yeast extract, monobasic potassium phosphate, dibasic potassium phosphate and phenol red. Yeast extract provides carbon and nitrogen, vitamins and other growth factors required for the growth of organisms. Phosphates act as buffering agent. Many urinary tract infections causing organisms, produce urease enzyme, which catalyzes the splitting of urea in the presence of water to release two molecules of ammonia and carbon dioxide. The ammonia combines with the carbon dioxide and water to form ammonium carbonate, which turns the medium alkaline, and change the color of medium from light orange at pH 6.8 to magenta pink at pH 8.1 due to presence of phenol red. Rapid urease-positive organisms turn the entire medium pink within 24 hours.

Use: For identifying bacteria on the basis of urea utilization, for the differentiation of *Proteus* species from *Salmonella* and *Shigella* species

Contents*

Ingredients	Gram/Litre
Yeast Extract	0.100
Monobasic Potassium Phosphate	9.100
Dibasic Potassium Phosphate	9.500
Phenol Red	0.010
pH at 25°C	6.8 ±0.2

* Formula adjusted for optimum performance and parameters

Directions: Dissolve 18.70 grams in 950 ml distilled water, boil to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure at 121°C for 15 minutes. Allow to cool the medium and aseptically add 50ml of sterile 40% urea solution. Mix well and distribute in sterile test tubes and inoculate test sample aseptically.

Specimens types analyzed

Pharmaceutical samples, clinical and non-clinical samples etc.

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Precautions to be taken

These microbial media are intended for the in-vitro use only. All the handling, experiments, storage, and discarding should be performed with the help of skilled and knowledgeable technicians and as per the established guidelines. The material should be disposed only after proper sterilization by autoclaving. Please go through the MSDS of the media to avoid any accidents or in emergency.

Performance and Evaluation

The expected performance of the medium is liable to use as per the direction on the label when stored at optimum conditions and within expiry date.

Quality Control

Appearance	Light orange to pink colored free flowing, homogeneous powder
Reaction of 1.87% solution	6.8 $\pm$ 0.2 at 25 °C
pH	6.60- 7.00
Color and clarity of ready medium	Yellow orange colored, clear opalescent solution
Growth Promotion properties	Best at $\leq$ 100 CFU at 32-37 °C for 18-72 h
Indicative properties	Optimum at $\leq$ 100 CFU at 32-37 °C for 18-48 h
Negative control	Performed using sterile distilled water

Different Microbial Response: Cultural characteristics observed after incubation at 33-37°C for 18-24 hours.

Organism	ATCC	Inoculum	Growth	Urease test
<i>Proteus mirabilis</i>	12453	50-100	Good	Positive reaction
<i>Escherichia coli</i>	8739	50-100	Good	Negative reaction
<i>Klebsiella aerogenes</i>	13048	50-100	Good	Negative reaction
<i>Salmonella typhimurium</i>	14028	50-100	Good	Negative reaction

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Storage and Shelf Life: The product is highly hygroscopic; keep the container tightly closed at all times and store it properly as per the conditions mentioned on the label. The declared expiry is valid only when stored as per the conditions mentioned on the label. Note: Sterilize media immediately after reconstitution.

Disposal: To avoid the contamination or propagation of any hazardous microbes the used, unusable or modified preparation of this product must be disposed after autoclaving after completion of task.

Reference

1. Atlas, R. M. (2005). *Handbook of media for environmental microbiology*. CRC press.
2. *Difco Manual* (1998). 11th Edition. Difco Laboratories., Division of Becton Dickinson and Company, Sparks, Maryland, USA.
3. MacFaddin J. F, (1985), *Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria*, Vol. 1, Williams and Wilkins, Baltimore, Md.
4. Rustigian Robert, and Stuart C. A., (1941) *Decomposition of Urea by Proteus*. Proceedings of the Society for Experimental Biology and Medicine, Volume: 47 issues: 1, 108-112

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