

Urea Broth (i23180)

Used for the differentiation of organisms, especially the *Enterobacteriaceae*, on the basis of urease production.

Industry: Food / Water / Clinical

Principles & Uses

Urea Broth, developed by Rustigian and Stuart, is designed for the differentiation of *Proteus* species from *Salmonella* and *Shigella* in enteric infection diagnosis. The medium relies on urea utilization, and the resulting ammonia production during incubation leads to an alkaline shift, observed by a pink-red color change. This color change is a general feature of urease testing and is not specific to urea. To rule out false positives, a medium without urea serves as a negative control.

Urea, serving as a nitrogen source for urease-producing organisms, triggers ammonia production. Yeast extract provides essential B-group vitamins, potassium phosphates offer buffering capacity, and phenol red serves as the pH indicator. The medium reacts notably to the high ammonia outputs of *Proteus*, *Morganella*, and *Providencia* within the first 24 hours of incubation.

Composition (gr/L)

Yeast Extract 1 g, Urea 20 g, Dipotassium Phosphate 9.5 g, Monopotassium Phosphate 9.1 g, Phenol Red 0.012 g.

Final pH at 25°C 6.8 ± 0.2

Preparation from dehydrated Powder

The presence of urea in this medium renders it inherently lumpy. This condition will not adversely affect a properly stored medium. Dissolve 38.7 g of the powder in 1 L of purified water. Mix thoroughly to completely dissolve the powder.

Filter sterilizes. DO NOT BOIL OR AUTOCLAVE THE MEDIUM.

Quality Control

Dehydrated Appearance: Light orange to light pink, homogeneous, inherently lumpy.

Prepared Appearance: Orange-yellow, clear.

Reaction of 3.87% Solution at 25°C: pH 6.8 ± 0.2

Cultural Response

The medium was inoculated with fresh colonies of organisms listed below. Cultural characteristics observed after an incubation at 35-37°C for 18-48 hours.

Organism (ATCC*)	Urease Reaction
<i>Enterobacter aerogenes</i> (13048)	-
<i>Escherichia coli</i> (25922)	-
<i>Proteus mirabilis</i> (25933)	+

*ATCC is a registered trade mark of the American Type Culture Collection.



Escherichia coli (left). *Proteus mirabilis* (middle). Prepared Culture Media (right).

Storage

Keep the container at 15-30 °C. Store prepared medium at 2-8 °C.