

## Urea Agar Base (Christensen's Urea Agar Base) (NCM0180)

### Intended Use

Urea Agar Base is used with agar for the differentiation of microorganisms on the basis of urease production in a laboratory setting. Urea Agar Base is not intended for use in the diagnosis of disease or other conditions in humans.

### Description

Christensen devised a urea agar medium containing peptone and dextrose that had a reduced buffer content. The medium supported the vigorous growth of many Gram-negative, enteric bacilli and readily permitted observation of urease production. Urea Agar Base may be used as a screening medium (along with Triple Sugar Iron Agar) for the selection of *Salmonella* and *Shigella* cultures for serologic classification. Urea Agar Base is also used to detect production of urease by yeast. Urease production is an important differential test in microbiology and outlined in standard methods.

### Typical Formulation

Enzymatic Digest of Gelatin	1.0 g/L
Dextrose	1.0 g/L
Sodium Chloride	5.0 g/L
Monopotassium Phosphate	2.0 g/L
Urea	20.0 g/L
Phenol Red	0.012 g/L

Final pH: 6.8 ± 0.2 at 25°C

Formula may be adjusted and/or supplemented as required to meet performance specifications.

### Supplement

Agar No. 1 Bacteriological (NCM0236) 15.0 g/L

### Precaution

Refer to SDS

### Preparation

1. Suspend 29 g of the medium in 100 mL of purified water until dissolved completely. Filter sterilize.
2. Suspend 15 g of Agar No. 1 Bacteriological (NCM0236) in 900 mL of purified water.
3. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
4. Autoclave at 121°C for 15 minutes.
5. Cool sterilized agar to 45 - 50°C and aseptically add the sterile Urea Agar Base.
6. Mix thoroughly and dispense into sterile tubes. Place tubes in a slanted position.

### Quality Control Specifications

**Dehydrated Appearance:** Powder is homogeneous, free flowing, with soft clumps and off-white.

**Prepared Appearance:** Prepared medium is trace to slight haze, and light to medium yellowish-orange.

**Expected Cultural Response:** Cultural response on Urea Agar Base supplemented with agar, incubated at 33-38°C, and examined for growth at 4-6 hours and after 18 - 24 hours.

# Technical Specification Sheet



Microorganism	Approx. Inoculum (CFU)	Expected Results - Urease Reaction
<i>Escherichia coli</i> ATCC® 25922	Direct Inoculation	Negative
<i>Klebsiella pneumoniae</i> ATCC® 13883	Direct Inoculation	Weak positive
<i>Proteus mirabilis</i> ATCC® 29906	Direct Inoculation	Positive
<i>Proteus vulgaris</i> ATCC® 13315	Direct Inoculation	Positive
<i>Salmonella typhimurium</i> ATCC® 14028	Direct inoculation	Negative

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

## Test Procedure

1. Use a heavy inoculum from a pure 18 – 24 hour culture. Inoculate by streaking back and forth over the entire slant surface. Do not stab the butt because it serves as a color control.
2. Incubate tubes with loose caps at 33-38°C.
3. Observe reactions after 6 and 24 hours, and for the next 6 days. Longer periods of incubation may be necessary.

## Results

The production of urease is a positive reaction, indicated by an intense red or pink color on the slant. No color change of the medium is a negative reaction.

## Expiration

Refer to expiration date stamped on the container. The dehydrated medium should be discarded if not free flowing, or if appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

## Limitations of the Procedure

1. The alkaline reaction produced in this medium after prolonged incubation may not be caused by urease activity. False positive reactions may occur due to the utilization of peptones or other proteins that raise the pH due to protein hydrolysis and the release of excessive amino acid residues. To eliminate possible protein hydrolysis, perform a control test with the same test medium without urea. Do not autoclave medium because excessive heat may alter ingredients.
2. Do not heat or reheat the medium because urea decomposes very easily.
3. Due to nutritional variation, some strains may be encountered that grow poorly or fail to grow on this medium. Urea Agar Base detects rapid urease activity of only the urease-positive *Proteus* spp.

## Storage

Store dehydrated culture media at 2-8°C away from direct sunlight. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

## References

1. Christensen, W. B. 1946. Urea decomposition as a means of differentiating *Proteus* and paracolon cultures from each other and from *Salmonella* and *Shigella* types. J. Bacteriol. 52:461.
2. Ewing, W. H. 1946. An additional *Shigella paradysenteriae* serotype. J. Bacteriol. 51:433-445.
3. Ewing, W. H., and D. W. Bruner. 1947. Selection of *Salmonella* and *Shigella* cultures for serological classification. Am. J. Clin. Pathol. 17:1-12.
4. Baron, E. J., L. R. Peterson, and S. M. Finegold. 1994. Bailey & Scott's Diagnostic Microbiology, 9<sup>th</sup> ed. Mosby-Year Book, Inc., St. Louis, MO.
5. Vanderzant, C., and D. F. Splittstoesser (eds.). 2015. Compendium of methods for the microbiological examination of foods, 4<sup>th</sup> ed. American Public Health Association, Washington, D.C.



620 Leshar Place • Lansing, MI 48912  
800-234-5333 (USA/Canada) • 517-372-9200  
foodsafety@neogen.com • foodsafety.neogen.com

# Technical Specification Sheet



6. Andrews, W. H., G. A. June, P. S. Sherrod, T. S. Hammack, and R. M. Amaguana. FDA Bacteriological analytical manual, 8<sup>th</sup> ed. AOAC International, Gaithersburg, MD.
7. Marshall, R. T. (ed.). 2004. Standard methods for the examination of dairy products. 17<sup>th</sup> ed. American Public Health Association, Washington, D.C.
8. MacFaddin, J. F. 1985. Media for isolation-cultivation-identification-maintenance of medical bacteria. Williams & Wilkins, Baltimore, MD.

Effective Date: 5/24/2019

Revision: 1



620 Lesher Place • Lansing, MI 48912  
800-234-5333 (USA/Canada) • 517-372-9200  
foodsafety@neogen.com • foodsafety.neogen.com