

Urea agar Base acc. to CHRISTENSEN

Medium proposed by CHRISTENSEN (1946) for the differentiation of urea-degrading microorganisms.

This culture medium complies with the recommendations of the International Organization for Standardization ISO (1993) and the DIN Norm 10160.

Mode of Action

Urea is hydrolysed to carbon dioxide and ammonia by the enzyme urease. The ammonia formed then causes the medium to become alkaline; this reaction is detected by the indicator phenol red which changes its colour from yellow to purple (see also JEFFRIES, 1964).

Typical Composition (g/litre)

Peptone from meat 1.0; D(+)-glucose 1.0; sodium chloride 5.0; potassium dihydrogen phosphate 2.0; phenol red 0.012; agar-agar 12.0.

Also to be added:

Urea 20.0 g/litre.

Preparation

Suspend 21 g/litre, autoclave (15 min at 121 °C). Prior to use, liquefy the medium, cool to 45-55 °C and add 50 ml of a filter-sterilized 40 % urea solution. Prepare slant-agar tubes.

pH: 6.8 ± 0.2 at 25 °C.

The prepared medium is clear and red.

Experimental Procedure and Evaluation

Inoculate the medium massively by spreading the pure culture under investigation on the surface of the agar.

Incubation: 5-48 hours at 35 °C.

Culture medium	Microorganism
Red	Urea-positive: Proteus, Klebsiella, some species of Enterobacter and Citrobacter and others
Yellow	Urea-negative: Shigella, Salmonella, Escherichia, Citrobacter, Enterobacter, Serratia, Providencia and others

Literature

Bundesgesundheitsamt: Amtliche Sammlung von Untersuchungsverfahren nach § 35 LMBG – Beuth Verlag Berlin, Köln

CHRISTENSEN, W.B.: Urea decomposition as means of differentiating Proteus and Paracolon cultures from each other and from Salmonella and Shigella types. – *J. Bact.*, **52**, 461-466 (1946).

COOK, G.T.: Urease and other biochemical reactions of the Proteus group. – *J.Path. Bact.*, **60**; 171-181 (1948).

Deutsches Institut für Normung (DIN): Untersuchung von Fleisch und Fleischerzeugnissen – Nachweis von Salmonellen (Referenzverfahren) – **DIN10160**.

International Organization for Standardization (ISO): Detection of salmonellae (Reference method) – **International Standard 6579** (1993).

JEFFRIES, C.D.: Urease activity of intact and disrupted bacteria. – *Arch.Path.*, **77**; 544-547 (1964).

STUART, C.A., VAN STRATUM, E., a. RUSTIGIAN, R.: Further studies on urease production by Proteus and related organisms. – *J. Bact.*, **49**; 437-444 (1945).

THAL, E., a. CHEN, T.H.: Two simple tests for the differentiation of plague and pseudotuberculosis bacilli. – *J. Bact.*, **69**; 103-104 (1955).

Ordering Information

Product	Merck Cat. No.	Pack size
Urea agar Base acc. to CHRISTENSEN	1.08492.0500	500 g
Urea	1.08487.0500	500 g

Quality control

Test strains	Growth	Clour change to
Escherichia coli ATCC 25922	good / very good	yellow
Shigella flexneri ATCC 12022	good / very good	yellow
Salmonella typhimurium ATCC 14028	good / very good	yellow
Klebsiella pneumoniae ATCC 13883	good / very good	red
Proteus vulgaris ATCC 13315	good / very good	red
Proteus mirabilis ATCC 14153	good / very good	red
Morganella morganii ATCC 25830	good / very good	red