



Reference : 03-037

Scharlau Microbiology - Technical data sheet

Product :
OXIDATION-FERMENTATION FLUID MEDIUM BASE
(O/F MEDIUM)

Also known as

O/F Enteric Medium; O/F Basal Medium according to Hugh & Leifson

Specification

Fluid medium used for determining the oxidative and/or fermentative metabolism of Gram negative bacilli (Enterobacteriaceae).

Formula * in g/L

Casein peptone.....	2.00
Sodium chloride.....	5.00
Dipotassium phosphate.....	0.30
Bromothymol Blue.....	0.08
Agar.....	3.00

Final pH 6,8 ± 0,2 at 25 °C

* Adjusted and /or supplemented as required to meet performance criteria

Directions

Suspend 10.38 g of powder in 1 L of distilled water and bring to the boil. Add sugar in the desired concentration and distribute in fermentation tubes. Add to half of them vaseline seals or vaspar®. Sterilize for 15 minutes at 121°C.

Note: the usual sugar concentration is 10 g/l.

Description

Using this medium Hugh and Leifson were able to differentiate Gram negative bacteria into three categories: fermentative, oxidative and inactive. The organism to be studied is inoculated in two long narrow tubes by deep stab inoculation. One tube is covered with oil or a Vaseline® layer to induce an anaerobic environment that forces the strain to carry out fermentation.

Fermentative organisms produce a large amount of acid in both the tubes, and this is indicated by the yellow colouration of the Bromothymol Blue indicator. Bacteria that utilise an oxidative metabolic pathway carry out this reaction only in the tube without the oil/Vaseline. Inactive strains do not use sugars and therefore do not induce any change in either tube.

In some instances a slight blue colouration, probably due to alkalinization by peptone degradation, can occur.

Some authors have proposed the usage of just one tube for this assay, but the medium must be modified by solidifying (with 1,5% agar) and the addition of yeast extract and/or cystine. In these tubes the stab must be, at least, 8 cm deep.

Hugh and Leifson recommend simultaneous assay with glucose, lactose and sucrose of 1% concentration, adding the sugars, sterilised by filtration, to the medium.

Note: The current formulation has been adapted to the ISO standard described in the Bibliography.



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Quality control

Incubation temperature: 35°C ±2,0

Incubation time: 18-24 h

Inoculum: Pure cultures using and inoculating needle (C.H.: Dextrose 10 g/l) + vaselin, according to ISO 11133:2014/Amd 1:2018 & Adm 2:2020

Microorganism

Growth

Remarks

Pseudomonas aeruginosa ATCC® 27853 Good O / F: + / -

Escherichia coli ATCC® 25922 Good O / F: + / + Yellow medium

Salmonella typhimurium ATCC® 14028 Good O / F: + / + Yellow medium

Salmonella enteritidis ATCC® 13076 Good O / F: + / + Yellow medium

Pseudomonas fluorescens ATCC® 13525 Good O / F: + / -



Left: *Escherichia coli* ATCC 25922
Right: *Salmonella typhimurium* ATCC 14028



Pseudomonas aeruginosa ATCC 27853

References

- ATLAS, R.M., L.C. PARKS (1993) Handbook of Microbiological Media. CRC Press, Inc. London.
- COWAN, S.T. (1974) Cowan and Steel's manual for the identification of medical bacteria. 2nd ed. Cambridge University Press. UK.
- DOWNES, F.P. & K. ITO (2001) Compendium of Methods for the Microbiological Examination of Foods. 4th ed. APHA. Washington. DC. USA.
- FORBES, B.A., D.F SAHM & A.S. WEISSFELD (Eds.) (1998) Bailey & Scott's Diagnostic Microbiology. 10th ed. Mosby. St Louis. MO. USA.
- HORWITZ, W. (2000) Official Methods of Analysis of the AOAC International 17th ed. Gaithersburg. MD. USA.
- HUGH, R. & E. LEIFSON (1953) The taxonomic significance of fermentative vs. Oxidative metabolism of carbohydrates by various Gram negative bacteria. J. Bact 66:24.
- ISENBERG, H.D. (1992) Clinical Microbiology Procedures Handbook. ASM Press. Washington. DC. USA.
- ISENBERG, H.D. (1998) Essential Procedures for Clinical Microbiology. ASM Press. Washington. DC. USA.
- ISO 11133:2014/ Adm 1:2018/ Adm 2:2020/ Microbiology of food, animal feed and water. Preparation, production, storage and performance testing of culture media.
- ISO 21528-1:2017 Standard. Microbiology of food chain - Horizontal methods for the detection and enumeration of Enterobacteriaceae - Part 1: Detection of Enterobacteriaceae.
- ISO. Norma 21528-2 (2017) Microbiology of the food chain – Horizontal methods for the detection and enumeration of Enterobacteriaceae. – Part 2: Colony-count method.
- MURRAY, P.R., E.J. BARON, J.H. JORGENSEN, M.A. PFALLER & R.H. YOLKEN (Eds.) (2003) Manual of Clinical Microbiology. 8th ed. ASM Press. Washington. DC. USA.
- MacFADDIN, J.F. (1985) Media for Isolation-cultivation-identification-maintenance of Medical Bacteria. Vol. I. Williams & Wilkins. Baltimore. MD. USA.
- US FDA (Food and Drug Administrations) (1998) Bacteriological Analytical Manual. 8th ed. AOAC International. Gaithersburg. MD. USA.
- WINN, W., S. ALLEN, W. JANDA, E. KONEMAN, G. PROCOP, G. WOODS & P. SCHRECKENBERER (2006) Koneman's Color Atlas and Textbook of Diagnostic Microbiology. 6th ed. Lippincott, Williams & Wilkins. Philadelphia. PA. USA.

Storage

For laboratory use only. Keep tightly closed, away from bright light, in a cool dry place (+4 °C to 30 °C).



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