70195 Vogel-Johnson Agar NutriSelect® Plus

Vogel and Johnson enhanced the fermentation reaction by increasing the mannitol concentration to 1% (w/v), clearly indicated by the development of yellow zones surrounding the colonies. *S. aureus* is able to reduce tellurite to metallic tellurium resulting in growth of black colonies. Used for the detection of coagulase-positive and mannitol-utilizing *Staphylococci*, recommended by USP.

Composition:

Ingredients	Grams/Litre
Peptone from Casein,	10.0
Yeast extract	5.0
D-Mannitol	10.0
Dipotassium hydrogenphosphate	5.0
Lithium chloride	5.0
L-Glycine	10.0
Phenol red	0.025
Agar	16.0

Final pH 7.1 +/- 0.2 at 25°C

Store dehydrated powder between 10-30°C in a tightly closed container and the prepared medium at 20-30°C.Protect from moisture and light by keeping container in a low humidity environment.Use before expiry date on the label.

Appearance(color):	Faintly red to light red to pink, free flowing powder
Gelling:	Firm, comparable with 1.6% Agar gel.
Color and Clarity:	Red coloured clear to slightly opalescent gel forms in Petri plates.

Directions:
Suspend 61.0 g in 1 litre of distilled water and bring gently to the boil to dissolve completely. Sterilize by autoclaving at 121°C for 15 minutes. Cool to 50°C and add 20 ml of sterile 1% potassium tellurite (Cat. No. 17774). Do not heat the complete medium.

Principle and Interpretation:
Staphylococcus aureus, a gram-positive, spherical bacterium, is a common colonizer of the human skin and mucosa. It causes skin and wound infections, urinary tract infections, pneumonia and bacteremia. It is also commonly implicated in food poisoning. It is also found as a common contaminant in pharmaceutical and cosmetics products (6). Vogel-Johnson Agar is prepared according to the formula devised by Vogel and Johnson (4) and is recommended for the microbial limit test in USP (1). Originally it was developed by Zebovitz (3), as a Tellurite Glycine Agar, a selective medium for the detection of coagulase-positive staphylococci. Later, Vogel-Johnson modified the medium in 1960 by increasing mannitol and adding phenol red as a pH indicator (8). Vogel Johnson Agar selects and differentiates coagulase-positive staphylococci that ferment mannitol and reduce tellurite. (6). V.J. Agar is specified in the standard methods for examination of cosmetics (5,6), pharmaceutical articles and nutritional supplements (1).
Tryptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract is a source of vitamins, particularly of the B-group. Dipotassium hydrogen phosphate provides buffering to the medium. During the first 24 hours, contaminating organisms are almost inhibited by tellurite, lithium chloride and high glycine content. The effect of inhibitors on *S.aureus* is reduced because of the

presence of mannitol and glycine. Coagulase-positive staphylococci reduce potassium tellurite to metallic free tellurium and thus produce black colonies surrounded by yellow zones. This yellow color is due to phenol red indicator that turns yellow in acidic condition due to mannitol fermentation. If mannitol is not fermented, yellow zones are not formed. Also, the color of the medium around the colonies may even be a deeper red than normal due to utilization of the peptones in the medium. Prolonged incubation may result in growth of black coagulase-negative colonies.

Cultural characteristics observed with added 1% Potassium Tellurite solution (17774), after an incubation for 24-48 hours at 35-37°C

Organisms (ATCC/WDCM)	Inoculum (CFU)	Growth	Recovery	Color of colony	Mannitol fermentation
Escherichia coli (25922/00013)	≥10^4	-	0%	-	-
Proteus mirabilis (25933)	50-100	poor	10-20%	black	negative
Staphylococcus aureus subsp. Aureus (25923/ 00034)	50-100	+++	≥50%	black with yellow halo	positive
Staphylococcus epidermidis (12228/ 00036)	50-100	+/++	30-40%	translucent to blackish	negative
Escherichia coli (NCTC 9002)	≥10^4	-	0%	-	-
Escherichia coli (8739/ 00012)	≥10^4	-	0%	-	-
Staphylococcus aureus subsp. Aureus (6538/ 00032)	50-100	+++	≥50%	black with yellow halo	positive

References:

1. United States Pharmacopeia, 2019. United States Pharmacopeial Convention, Inc., Rockville, Md
2. MacFaddin J. F., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria, Vol. 1, Williams & Wilkins, Baltimore, Md.
3. Zebovitz E., Evans J. B. and Niven C. F., 1955, J. Bacteriol., 70:686.
4. Vogel R. A. and Johnson M. J., 1960, Public Health Lab. 18:131.
5. Curry A. S., Graf J. G. and McEwen G. M., (Eds.), 1993, CTFA Microbiology Guidelines, The Cosmetic, Toiletry and Fragrance Association, Washington, D.C.
6. FDA Bacteriological Analytical Manual, 2016, AOAC, Washington, D.C

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.