

Technical Data Sheet

ReadyTube™ 12 MSRV (Modified Semi-Solid RAPPAPORT-VASSILIADIS) Medium acc. ISO 6579

Ordering number: 1.46622.0100

For the selective enrichment and presumptive detection of Salmonella from food and animal feed, animal faeces and environmental samples from primary production stage.

This culture medium complies with the specifications given by EN ISO 6579/Amd 1 and EN ISO/FDIS 6579-1.

Mode of Action

This medium is a semi-solid modification of Rappoport-Vassiliadis enrichment broth and is used as a motility enrichment in Petri dishes (de Smedt et al. 1986). It is a rapid and sensitive medium for the isolation of Salmonella spp. and can be seeded after directly after pre-enrichment.

Its efficiency is due to the ability of salmonellae to migrate into the semi-solid medium thus forming opaque halos of growth. The motility of other microorganisms is largely inhibited by the elective agents magnesium chloride, malachite green and novobiocin and the enhanced incubation temperature of 41.5 °C.

According to EN ISO 6579/Amd 1 and EN ISO FDIS 6579-1, MSRV medium contains 10 ml/l novobiocin whilst the original composition of MSRV medium contains 20 mg/l (de Smedt et al. 1986).

Studies have shown larger migration zones on MSRV medium with a lower concentration of novobiocin and the (negative) influence of novobiocin on bacterial motility (Veenman et al. 2007).

Because the detection principle is based on motility, this MSRV medium is not appropriate for the detection of non-motile Salmonellae.

EN ISO 6579/Amd 1 describes the usage of MSRV medium for the detection of Salmonellae in samples from the primary production stage. EN ISO FDIS 6579-1 gives the choice between using RVS broth or MSRV semi-solid medium for food, animal feed samples and for environmental samples from the food production area, it includes the usage of MSRV medium for samples from primary production stage.

Typical Composition

Specified by ISO 6579		ReadyTube™ 12 MSR/V	
Enzymatic Digest of Animal and Plant Tissue	4.6 g/l	Enzymatic Digest of animal and plant tissue	4.6 g/l
Acid Hydrolysate of Casein	4.6 g/l	Casein Hydrolysate	4.6 g/l
NaCl	7.3 g/l	NaCl	7.3 g/l
KH ₂ PO ₄	1.5 g/l	KH ₂ PO ₄	1.5 g/l
MgCl ₂ , anhydrous	10.9 g/l	MgCl ₂ , anhydrous	10.9 g/l
Malachite Green Oxalate	0.04 g/l	Malachite Green Oxalate	0.04 g/l
Novobiocin Sodium Salt	0.01 g/l	Novobiocin Sodium Salt	0.01 g/l
Agar	2.7 g/l	Agar	2.7 g/l
Water	1000 ml/l	Water	1000 ml/l
pH at 25°C	5.2 (5.1 - 5.4)	pH at 25°C	5.1 - 5.4

Application and Interpretation

Depend on the purpose for which the medium is used.

Allow the MSR/V medium to equilibrate at room temperature if it was stored at a lower temperature.

According to EN ISO 6579/Amd 1 and EN ISO FDIS 6579-1, inoculate MSR/V plates with 3 drops of the culture obtained in the pre-enrichment (Buffered Peptone Water). The 3 drops should total 0.1 ml and should be placed separately and equally spaced on the surface of the medium.

Minimize the transfer of particulate material from the pre-enrichment into the selective enrichment medium.

Incubate the inoculated MSR/V medium under aerobic conditions, e.g. acc. to EN ISO 6579 40.5-42.5 °C for 21-27 h. **Do not invert the plates.** Care should be taken that the maximum allowed temperature (42.5 °C) is not exceeded.

Positive MSR/V medium will show a grey-white, turbid zone extending out from the inoculated drop.

From the positive growth obtained on MSR/V medium, determine the furthest point of opaque growth from the inoculation points and dip a 1 µl-loop just inside the border of the opaque growth. Withdraw the loop ensuring that no large lumps of MSR/V medium are extracted. Inoculate the surface of a petri dish containing the first selective plating-out medium so that well-isolated colonies will be obtained. Proceed in the same way with the second selective plating medium, for details see EN ISO 6579/Amd 1 and EN ISO FDIS 6579-1.

According to EN ISO/FDIS 6579-1, for some products it may be necessary to incubate the selective enrichment medium for an additional 24 h, then follow the same plating-out procedure as described above.

For samples from the primary production stage, negative MSR/V plates have to be incubated for a further 21-27 h. Perform the selective plating procedure, if after 48 h incubation, these MSR/V plates become positive.

According to EN ISO/FDIS 6579-1, it is permissible to store the selective enrichment after incubation at 2-8 °C for a maximum of 72 h.

Storage and Shelf Life

The product can be used for sampling until the expiry date if stored upright, protected from light and properly sealed at +2 °C to +8 °C.

The testing procedures as described on the CoA can be started up to the expiry date printed on the label.

Disposal

Please mind the respective regulations for the disposal of used culture medium (e.g. autoclave for 20 min at 121 °C, disinfect, incinerate etc.).

Quality Control

Function	Control strains	Incubation	Method of control	Expected results
Productivity	<i>Salmonella</i> Typhimurium ATCC 14028	2x 21-27 h at 40.5-42.5 °C	Qualitative	Grey-white, turbid zone extending out from inoculated drop(s). After 24-48 h, the turbid zone(s) will be (almost) fully migrated over the plate. Possible extra: characteristic colonies after subculturing on XLD
	<i>Salmonella</i> Enteritidis ATCC 13076			
Selectivity	<i>Escherichia coli</i> ATCC 8739	2x 21-27 h at 40.5-42.5 °C	Qualitative	Possible growth at the place of the inoculated drop(s) without a turbid zone.
	<i>Escherichia coli</i> ATCC 25922			
	<i>Enterococcus faecalis</i> ATCC 19433			No growth
	<i>Enterococcus faecalis</i> ATCC 29212			

Please refer to the actual batch related Certificate of Analysis.

The performance test is in accordance with the current version of EN ISO 11133



Literature

De Smedt, J.M., Bolderdijk, R.F., Rappold, H. and Lautenschlaeger, D. (1986): Rapid *Salmonella* detection in foods by motility enrichment on a modified semi-solid Rappaport-Vassiliadis Medium. J. Food Prot. **49**: 510-514.

De Smedt, J.M. and Bolderdijk, R.F. (1987): Dynamics of *Salmonella* isolation with modified semi-solid Rappaport-Vassiliadis Medium. J. Food Prot. **50**: 658-661.

De Smedt, J.M. and Bolderdijk, R.F. (1990): Collaborative study of the international office of cocoa, chocolate and sugar confectionery on the use of motility enrichment for *salmonella* detection in cocoa and chocolate. J. Food Prot. **55**: 659-664.

ISO International Standardisation Organisation. Microbiology of food and animal feeding stuffs - Horizontal method for the detection of *Salmonella* spp. EN ISO 6579:2002.

ISO International Standardisation Organisation. Microbiology of food and animal feeding stuffs - Horizontal method for the detection of *Salmonella* spp. -- Amendment 1: Annex D: Detection of *Salmonella* spp. in animal faeces and in environmental samples from the primary production stage. EN ISO 6579:2002/Amd 1:2007.

ISO International Standardisation Organisation. Microbiology of the food chain - Horizontal method for the detection, enumeration and serotyping of *Salmonella* - Part 1: Horizontal method for the detection of *Salmonella* spp. EN ISO/FDIS 6579-1:2015.

ISO International Standardisation Organisation. Microbiology of food, animal feed and water - Preparation, production, storage and performance testing of culture media. EN ISO 11133:2014.

Mooijman, K.A. (2012): Culture media for the isolation of *Salmonella*. In: Handbook of Culture Media for Food and Water Microbiology. (Corry, J.E.L., Curtis, G.D.W. and Baird, R.M. eds). pp. 261-286. Royal Society of Chemistry, Cambridge, UK.

Veenman, C., Korver, H. and Mooijman, K.A. (2007): Improvements in the method for detection of *Salmonella* spp. In animal faeces. National Institute for Public Health and the Environment, Bilthoven, the Netherlands. RIVM report 330300 010. <http://www.rivm.nl/bibliotheek/rapporten/330300010.pdf>.

Ordering Information

Product	Cat. No.	Pack size	Other pack sizes available
ReadyTube™ 12 MSR/V Medium ISO 6579	1.46622.0100	100 x 12 ml	
MSRV Selective Supplement	1.09874.0010	10 x 1 vial	
MSRV Medium (Base) ISO 6579	1.09878.0500	500 g	
ReadyTube™ 9 BPW ISO 6579, 6887, 21528	1.46142.0020	20 x 9 ml	6 x 225 ml, 6 x 1000 ml,
GranuCult™ Buffered Peptone Water ISO 6579, 21528, 22964	1.07228.0500	500 g	5 kg, 25 kg
ReadyTube™ 10 RVS Broth ISO 6579	1.46694.0020	20 x 10ml	

Product	Cat. No.	Pack size	Other pack sizes available
GranuCult™ RVS Broth ISO 6579	1.07700.0500	500 g	
GranuCult™ MKTTn (Muller Kaufmann Tetrathionate Novobiocin) Broth Base	1.05878.0500	500 g	
Iodine resublimed	1.04761.0100	100 g	500 g
Potassium Iodide	1.05043.0250	250 g	500 g, 1 kg
ReadyPlate™ XLD Agar ISO 6579	1.46751.0020	20 x 90 mm	
GranuCult™ XLD Agar ISO 6579	1.05287.0500	500 g	
RAMBACH® Agar ready-to-use	1.46719.0020	20 x 90 mm	100 x 90 mm
RAMBACH® Agar	1.07500.0001	4 x 250ml	4 x 1000 ml 4 x 50 l
Triple Sugar Iron Agar	1.03915.0500	500 g	

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