

MRS Broth Without Glucose

De Man, Rogosa & Sharpe Broth (Modified — Glucose Omitted) | Catalogue No. AS-1448

1. Product Overview

MRS Broth Without Glucose (AS-1448) is a modified version of de Man, Rogosa and Sharpe (MRS) Broth in which the standard glucose (dextrose) component has been omitted. The medium retains the full nutrient-rich MRS base required to support lactic acid bacteria (LAB), while allowing the laboratory to introduce a selected carbohydrate source independently. This makes it particularly suited to carbohydrate-utilisation studies, fermentation research, and comparative growth or strain-screening work where the identity and concentration of the fermentable sugar must be controlled by the experimenter rather than fixed by the base medium.

2. Mode of Action

Peptone, beef extract, and yeast extract supply the nitrogen, peptides, and B-vitamin complex required for lactic acid bacteria growth. Polysorbate 80 (Tween 80) supplies fatty acids and aids nutrient uptake. Magnesium and manganese sulfate act as essential growth co-factors. Sodium acetate and triammonium citrate provide selectivity, inhibiting many competing organisms (particularly streptococci and moulds) while supporting LAB growth. With glucose omitted, the base medium alone provides minimal fermentable carbohydrate; growth of most LAB will be limited until a carbohydrate source is added by the user.

3. Product Specifications

Synonyms	MRS Broth, Glucose-Free; Modified Lactobacillus Broth (without dextrose)
Format	Dehydrated microbiological broth medium (no agar)
Modification	Glucose/dextrose omitted from the standard MRS formulation — added separately by the user
Final pH (25°C, base medium)	6.2 ± 0.2
Sterilisation	Autoclave at 121°C for 15 minutes
Appearance (powder)	Beige to light yellow, homogeneous powder
Appearance (prepared)	Clear to slightly opalescent, light amber solution
Storage (powder)	2–25°C, dry, tightly sealed, protected from moisture and direct light
Storage (prepared broth)	2–8°C; use within the period validated for the intended application
Application	Lactic acid bacteria cultivation, fermentation studies, carbohydrate-utilisation and strain-screening research

4. Formula — per litre (base medium, without carbohydrate)

Ingredient	g/L	Role
Peptone (from casein)	10.0	Primary nitrogen source — amino acids and peptides
Beef extract	8.0	Nitrogenous and carbonaceous growth factors
Yeast extract	4.0	B-vitamin complex and trace nutrients
Polysorbate 80 (Tween 80)	1.0	Surfactant; supplies fatty acids, aids nutrient uptake
Sodium acetate	5.0	Selective agent — inhibits streptococci, moulds, and other competing flora
Triammonium citrate	2.0	Selective agent — inhibits Gram-negative organisms
Dipotassium hydrogen phosphate (K_2HPO_4)	2.0	pH buffer component
Magnesium sulfate	0.2	Growth co-factor
Manganese sulfate	0.05	Growth co-factor

Total (base medium): 32.25 g/L | Final pH 6.2 ± 0.2 at 25°C

Note: The standard MRS formulation includes D(+)-glucose at 20.0 g/L, which is intentionally omitted from AS-1448. Add the required carbohydrate (glucose, lactose, fructose, sucrose, maltose, or another validated substrate) separately, at the concentration specified by the laboratory method or experimental design. Final pH may shift slightly depending on the carbohydrate added.

5. Preparation Protocol

- Suspend 32.25 g of dehydrated MRS Broth Without Glucose per litre of purified or distilled water.
- Add the selected carbohydrate source separately, at the concentration required by the intended application (typically 10–20 g/L for most LAB fermentation work).
- Heat with frequent agitation until completely dissolved.
- Sterilise by autoclaving at 121°C for 15 minutes.
- Cool to room temperature or as required before use. Dispense aseptically.

6. Quality Control — Organisms & Expected Results

Organism (ATCC)	Condition	Expected Result
Lactobacillus plantarum ATCC 8014	With 20 g/L glucose added	Good growth; turbid culture within 24–48h at 35–37°C
Lactobacillus acidophilus ATCC 4356	With 20 g/L glucose added	Good growth; turbid culture within 24–48h at 35–37°C
Lactobacillus plantarum ATCC 8014	Base medium, no carbohydrate added	Reduced or minimal growth — confirms absence of fermentable carbohydrate in base

Testing the base medium both with and without added carbohydrate is recommended to confirm both growth-support capability and the intended absence of background glucose.

7. Applications

- Carbohydrate utilisation studies — compare LAB growth on different sugars without background glucose interference
- Fermentation research — controlled addition of selected fermentable carbohydrate substrates
- Lactobacillus cultivation — growth of Lactobacillus species after supplementation with the desired carbohydrate
- Probiotic R&D — screening of strain-specific carbohydrate preferences and growth responses
- Food and dairy microbiology — research involving LAB metabolism in dairy, fermented foods, and functional ingredients

8. Storage & Shelf Life

Dehydrated powder

24 months from date of manufacture when stored at 2–25°C, dry, protected from moisture and direct light

Prepared broth

Use promptly; store at 2–8°C only if short-term storage before use is required

9. Literature & References

1. de Man JC, Rogosa M, Sharpe ME. A medium for the cultivation of lactobacilli. Journal of Applied Bacteriology. 1960;23(1):130–135. [Original formulation]
2. ISO 7218:2007. Microbiology of food and animal feeding stuffs — General requirements and guidance for microbiological examinations. Geneva: ISO.
3. ISO 11133:2014. Microbiology of food, animal feed and water — Preparation, production, storage and performance testing of culture media. Geneva: ISO.

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