

TECHNICAL SHEET

Microlab Salmonella

PRINCIPLE AND SCOPE OF THE TEST

Microlab Salmonella is a qualitative test for the detection of *Salmonella enterica* serogroups A-E in food and environmental samples.

The method consists of two stages: an enrichment phase and a detection phase. During the enrichment phase, the sample is incubated in a specific culture medium for 24 hours at 37°C, allowing the bacteria to multiply to detectable levels. Subsequently, these bacteria are detected using a lateral flow immunochromatographic assay (LFIA) based on a specific antigen-antibody reaction.

Microlab can be presented in two different formats: the Microlab device and the Microlab Basic:

- Microlab Salmonella: This presentation integrates all phases into a ready-to-use device, eliminating the transfer of the enriched medium between containers and therefore the risk of cross-contamination. This format can be used in the food industry itself or in a laboratory and requires no qualified personnel or specific microbiology equipment.
- Microlab Basic Salmonella: In this format, the culture medium for enrichment and the immunochromatographic test are presented separately and require prior preparation.

VALIDATION

Microlab Salmonella has been approved by the AOAC Research Institute under the Performance Tested Methods program (license number PTM 052401). Validation was performed according to AOAC guidelines. The food matrices included in the AOAC validation are listed in Table 1.

Table 1. Matrices validated with the Microlab Salmonella method.

Category	Matrix analyzed
Meat and meat products ready to cook (excluding poultry)	Ground beef
Ready-to-cook poultry products	Raw turkey (thermal processed, marinated)
Eggs and egg products	Pasteurized liquid egg
Ready-to-eat meat products (excluding poultry)	Deli ham
Milk and treated products thermally	Fresh cheese

A different strain of *Salmonella* was used for each validated matrix, and the results were compared with the ISO 6579-1:2020 reference method . All presumptive positive results were confirmed according to ISO standards. The tests performed on food matrices were:

- 5 negative controls (not inoculated).
- 5 positive controls (100% positive with reference method, POD=1).
- 20 samples with an inoculation level such that it resulted in 25-75% positives for the reference method (POD=0.25-0.75).

On the other hand, AOAC validation requires, in addition to matrix testing, the following studies:

- **Inclusivity:** The analysis of 100 different strains of *Salmonella* was carried out in order to verify the ability of the method to reliably detect the different serogroups of the target microorganism.
- **Exclusivity:** Thirty strains of bacteria phylogenetically related to *Salmonella* were analyzed to confirm the absence of cross-reactivity and ensure the specificity of the assay.
- **Sturdiness:** Controlled variations were introduced into the assay protocol (incubation temperature, enrichment time, and detection time) to evaluate the ability of the Microlab system to maintain adequate performance under modified conditions.

- **Batch-to-batch consistency:** The functionality of three different batches of Microlab kits was verified, ensuring the reproducibility and uniformity of results between productions.
- **Stability:** Tests were carried out with kits at different points in their life cycle period, with the aim of ensuring the correct functioning of the test throughout its useful life.

VERIFICATION

Due to the large number of different food and environmental samples, in addition to the matrices included in the AOAC certification, performance verification studies of the Microlab Salmonella method have been conducted with new matrices. The verified matrices are described in Table 2.

Number of tests per food matrix:

- 1 negative control (uninoculated).
- 1 sample with an inoculation level 10 times higher than the detection limit.
- 3 samples with an inoculation level between 2 and 5 times higher than the detection limit.

Table 2. Matrices verified with the Microlab Salmonella method.

Category	Matrix analyzed
Meat and meat products ready to cook (excluding poultry)	Fresh meat, minced meat, burger meat, carpaccio
Ready-to-eat meat products (excluding poultry)	Vienna sausage, fuet, mortadella, cooked ham, smoked bacon, cured ham, pâté
Ready-to-cook poultry products	Fresh meat, minced meat, burger meat, raw chicken breast
Ready-to-eat poultry products	Cooked turkey, Cooked chicken
Raw milk and raw milk products	Raw cow's milk
Milk and heat-treated products	UHT and pasteurized milk, pasteurized milk cheese, cheddar cheese, feta cheese, mozzarella, yogurt, cream ice cream, powdered milk
Eggs and egg products	Egg in shell, powdered egg
Fruits and vegetables	Gazpacho, salmorejo, strawberry, onion
Raw fish and seafood, ready to cook	Raw prawns, raw tuna
Fishmonger products ready to eat or reheat	Smoked salmon, cooked prawns, mussel mousse
Dried vegetable products	Quinoa
Pet food and animal feed products	Dry food
Environmental samples	Wash water, polycarbonate, stainless steel

LITERATURE

1. Appendix J, AOAC INTERNATIONAL Methods Committee Guidelines for Validation of Microbiological Methods for Food and Environmental Surfaces (2023) in Official Methods of Analysis of AOAC INTERNATIONAL, 22nd Edition(New York, AOAC Publications, 4 Jan. 2023), <https://doi.org/10.1093/9780197610145.005.010> (accessed January 11, 2024).