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Water quality — Detection of *Salmonella* species

Qualité de l'eau — Recherche de Salmonella



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6340 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 4, *Microbiological methods*.

Annexes A and B of this International Standard are for information only.

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Introduction

Salmonella species are bacteria which are widely distributed all over the world. They are usually classified as pathogens, although their virulence and pathogenesis vary widely. The natural hosts of *Salmonella* species include humans, agricultural and domestic livestock and wild animals including birds. Humans and animals may excrete these bacteria while carrying them asymptotically, as well as during disease. It is therefore impossible to eliminate them from the environment. Due to the severe diseases which can follow the infection of humans, the transmission of *Salmonella* species via different vehicles has to be minimized.

Since water is one of the vehicles, the presence or absence of *Salmonella* species should be monitored in water. *Salmonella* species may be present in all types of domestic and agricultural sewage, fresh waters, including ground and drinking waters, and also sea water.

The detection of *Salmonella* in water usually requires a concentration step. Since cells of *Salmonella* species may be injured in the aqueous environment, their detection in water usually requires a pre-enrichment step. The procedure described in this International Standard consists of regular enrichment(s), selection and confirmation steps.

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Water quality — Detection of *Salmonella* species

WARNING — In order to safeguard the health of laboratory personnel, it is essential that tests for detecting *Salmonella* species are undertaken in properly equipped laboratories, under the control of skilled microbiologists only, and that great care is taken in the disposal of all incubated materials.

1 Scope

This International Standard specifies a method for the detection of *Salmonella* species in water samples for monitoring purposes. In special epidemiological situations, other media may also be required.

The method can be applied to all kinds of water, except raw sewage.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

ISO 5667-1:1980, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes*.

ISO 5667-2:1991, *Water quality — Sampling — Part 2: Guidance on sampling techniques*.

ISO 5667-3:1994, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples*.

ISO 6579:1993, *Microbiology — General guidance on methods for the detection of Salmonella*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 *Salmonella* species: Gram-negative, oxidase-negative, facultatively anaerobic, non-sporeforming, rod-shaped bacteria which generally form colonies of 2 mm to 4 mm in diameter on solid selective media. They form typical colonies on solid selective media and display the biochemical and serological characteristics described when tests are carried out in accordance with this International Standard.

3.2 detection of *Salmonella* organisms: Determination of the presence of these bacteria in a particular volume, when tests are carried out in accordance with this International Standard.

4 Principle

The detection of *Salmonella* species requires four successive stages.

4.1 Pre-enrichment

Pre-enrichment is necessary to enable injured cells to grow. If necessary, samples can be concentrated using membrane filtration. The membrane filter with cells, or a known volume of sample or its dilution, is transferred to non-selective broth (buffered peptone water) for incubation at the optimal temperature for mesophilic bacteria.