
**Microbiology of the food chain —
Preparation of test samples, initial
suspension and decimal dilutions for
microbiological examination —**

**Part 2:
Specific rules for the preparation of
meat and meat products**

*Microbiologie de la chaîne alimentaire — Préparation des
échantillons, de la suspension mère et des dilutions décimales en vue
de l'examen microbiologique —*

*Partie 2: Règles spécifiques pour la préparation des viandes et
produits carnés*



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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 9, *Microbiology*.

This second edition cancels and replaces the first edition (ISO 6887-2:2003), which has been technically revised.

A list of parts in the ISO 6887 series can be found on the ISO website.

Microbiology of the food chain — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination —

Part 2:

Specific rules for the preparation of meat and meat products

WARNING — The use of this document may involve hazardous materials, operations and equipment. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before use.

1 Scope

This document specifies rules for the preparation of meat and meat product samples and their suspension for microbiological examination when the samples require different preparation from the methods described in ISO 6887-1. ISO 6887-1 defines the general rules for the preparation of the initial suspension and dilutions for microbiological examination.

This document excludes preparation of samples for both enumeration and detection test methods where preparation details are specified in the relevant International Standards.

This document is applicable to the following fresh, raw and processed meats, poultry and game and their products:

- refrigerated or frozen;
- cured or fermented;
- minced or comminuted;
- meat preparations;
- mechanically separated meat;
- cooked meats;
- dried and smoked meats at various degrees of dehydration;
- concentrated meat extracts;
- excision and swab samples from carcasses.

This document excludes the sampling of carcasses (see ISO 17604) and preparation of samples from the primary production stage (see ISO 6887-6).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6887-1, *Microbiology of the food chain — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 1: General rules for the preparation of the initial suspension and decimal dilutions*

ISO 7218, *Microbiology of food and animal feeding stuffs — General requirements and guidance for microbiological examinations*

ISO 17604, *Microbiology of the food chain — Carcass sampling for microbiological analysis*

ISO 18593, *Microbiology of food and animal feeding stuffs — Horizontal methods for sampling techniques from surfaces using contact plates and swabs*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6887-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1
block
large piece
meat cut
sample whose composition and dimensions (surface and thickness, but thickness in particular) allow a sample to be taken at depth under satisfactory sterile conditions

3.2
shaving
sample from frozen meat resulting from a cut surface sample

3.3
fragment
sample taken at depth inside the test piece by electric drill or a hand-drill

3.4
slice
cut of meat with approximately parallel sides up to several centimetres thick

3.5
trimming
meat scrap that has been cut from carcasses or larger pieces of meat

4 Principle

The general principles for sample preparation and subsequent steps are detailed in ISO 6887-1 while ISO 6887-2 describes specific sample preparation for meat and meat products.

5 Diluents

Diluents for general use and special purposes are described in ISO 6887-1 and there are no additional specific requirements for meat and meat products.

6 Apparatus

Usual microbiological laboratory equipment for general use (ISO 6887-1 and ISO 7218) and, in particular, the following.

6.1 Equipment for cauterization of meat surfaces, e.g. portable gas blowtorch.

6.2 Template for surface sampling, metallic or plastic frame of appropriate dimensions enabling the delineation of the surface to be sampled, sterilized by autoclaving or immersion in 70 % (volume fraction) alcohol and flaming.

An example of a template or frame is shown in [Annex A](#), but other suitable tools are available. As some spores might survive flaming, a pre-sterilized metal template is recommended when testing for sporulated microorganisms.

7 Sampling and sample types

7.1 General

Carry out sampling in accordance with the specific standard appropriate to the product concerned or see ISO/TS 17728. If a specific standard is not available, it is recommended that agreement be reached on this subject by the parties concerned.

7.2 General types of samples sent to the laboratory

Methods for handling the general types of samples that may be submitted for testing, such as frozen, hard and dry, liquid and non-viscous products, and multi-component products are detailed in ISO 6887-1 as these are applicable to many types of food and feed.

7.3 Specific types of samples sent to the laboratory

Meat and meat-based products may include any of the following types:

- units of meat or meat-based products, prepared or processed and of different dimensions;
- cuts of meat taken from larger units of meat;
- primal cuts of meat taken from carcasses;
- shavings or fragments taken from frozen blocks;
- offal from various species;
- oriental delicacies such as chicken and duck feet.

Tissues, swabs or other types of samples collected using non-destructive methods (see ISO 17604) may also be sent to the laboratory.

The physical state of the samples received may vary according to the following factors:

- a) temperature, for products that are
 - non-frozen, or

- frozen or deep-frozen (see ISO 7218);
- b) water activity (a_w), for products that are
 - untreated, or
 - intermediate moisture meat products in which microbial growth is inhibited as a result of the reduced water activity (a_w).

8 Preparation of samples

8.1 General

All preparations and manipulations shall be carried out using aseptic techniques with sterile equipment (ISO 7218).

8.2 Purpose of testing

General details are given in ISO 7218.

The purpose of microbiological testing of meats includes detection and/or enumeration of

- microbial flora from samples taken at depth,
- surface microbial flora, or
- microbial flora from the entire sample (surface and depth).

Preparation of samples shall take into account the aim of the testing and the nature of the sample.

8.3 General case for acidic products

The general case for preparation of acidic products (pH between 3,5 and 4,5) is given in ISO 6887-1 and there are no additional specific requirements for meat and meat products.

8.4 High-fat products (over 20 % of total mass as fat)

The general case for preparation of high-fat products is given in ISO 6887-1 and there are no additional specific requirements for meat and meat products.

9 Specific procedures

9.1 Initial preparation of the different types of samples

This applies only to samples for the detection or enumeration of the total microbial flora from both the surface and depth. Use sufficient material from the laboratory sample to give a representative test portion as specified in the test method.

9.1.1 Laboratory sample with a mass equal to or less than 50 g

Use the whole laboratory sample for preparation of the initial suspension if the sample mass is equal to or less than 50 g.

9.1.2 Blocks, large pieces, meat cuts

For meat cuts, take the test portion at depth and/or a surface sample and prepare the initial suspension.

9.1.3 Slices or pieces of meat or cooked meat

Take strips from the centre of the slices or pieces to prepare the initial suspension.

9.1.4 Fragments, shavings and trimmings

Homogenize these thoroughly before removing the test portion for preparation of the initial suspension.

9.1.5 Meat products in “skins” (sausages)

If the skin is not intended for consumption, disinfect the cooked or raw sausages at the point of incision by wiping the surface with 70 % (volume fraction) alcohol or by cauterizing using a blowtorch (6.1); pull to remove the skin with sterile forceps or tongs. Slice the sausages and cut into small pieces before homogenizing.

Do not remove edible skins from raw sausages, but slice and homogenize including the skin.

9.1.6 Cooked meats

For packaged cooked meats, open the packaging in accordance with 9.2 and prepare test portions as for raw products.

9.1.7 Chicken and duck feet

Cut several units of chicken or duck feet (including all parts) with a pair of sterile scissors along the joints into smaller pieces. Mix and weigh out the test portion in a tared sterile plastic bag. Add nine times this mass of an appropriate diluent (ISO 6887-1) and massage by hand for 1 min to 2 min to make the 1 in 10 initial suspension.

9.2 Procedure for pre-packed products

For general instructions on sample preparation of packaged products, see ISO 6887-1.

9.3 Procedure for non-frozen products

9.3.1 Sample preparation from depth within the test material

Such test portions are used to examine only the deep tissue and sampling is carried out after cauterization of the surface. Use scalpels and forceps to remove an appropriate area of skin from cuts of meat presented with skin on.

If packaged, remove the sample aseptically and place on a sterile tray. Remove a surface layer 2 mm to 5 mm thick from the upper surface to expose an area of approximately 5 cm by 5 cm with a sterile scalpel or knife. Cauterize this exposed surface using a blowtorch (6.1) until charring occurs. Using a fresh sterile knife or scalpel, remove a layer about 4 cm by 4 cm and 1 cm deep from below the charred area. Using sterile forceps and scalpel, remove the required test portion from the exposed area and place it in a tared sterile container or plastic bag.

Weigh the test portion and add nine times this mass of an appropriate diluent (ISO 6887-1) to make the 1 in 10 initial suspension.

9.3.2 Sample preparation from the surface of meat (excision/destructive method)

Samples are taken without cauterization of the exposed surface.

If packaged, it may be necessary to remove the meat aseptically and place it on a sterile tray with the test surface uppermost. Use a sterilized or disinfected template (6.2) and apply to the designated area (see Annex A).

Using a sterile scalpel, cut along the inside edges of the template. Then, using sterile forceps to lift the test portion, cut across the whole area to a depth of 2 mm to 3 mm and place the pieces in a tared sterile container or plastic bag.

Weigh the test portion and add nine times this mass of an appropriate diluent (ISO 6887-1) to make the 1 in 10 initial suspension.

For such surface samples, the initial dilution should be recorded. For example, from a sample from a 25 cm² surface diluted in a total volume of 100 ml of diluent, 1 ml of this initial suspension represents 0,25 cm².

9.3.3 Sample preparation from individual slices

Samples are taken without cauterization of the exposed surface.

If packaged, it may be necessary to remove the meat aseptically and place it on a sterile tray with the test surface uppermost.

Using a sterile scalpel and forceps, cut a strip 1 cm wide along the centre of the greatest length. Cut the strip into small pieces and place them into a tared sterile container or plastic bag.

Weigh the test portion and add nine times this mass of an appropriate diluent (ISO 6887-1) to make the 1 in 10 initial suspension.

9.3.4 Sample preparation of carcass samples

Procedures for sampling carcasses from freshly slaughtered animals are given in ISO 17604.

9.4 Sample preparation for frozen products

Procedures for handling small samples of all types by defrosting before sampling and those for sampling larger blocks of meat and meat products without preliminary defrosting are given in ISO 6887-1.

9.5 Sample preparation for dried and partially dehydrated meats and meat extracts

Procedures for dried and partially dehydrated products are given in ISO 6887-4.

9.6 Sample preparation of surface samples (swabs and other devices)

For non-destructive carcass sampling using swabs or other devices, refer to ISO 17604.

For general preparation and calculation instructions for swabs and other devices, refer to ISO 18593.

10 Further dilutions

Prepare further dilutions in accordance with ISO 6887-1.

Annex A (informative)

Template for the delineation of a surface sample area

The device may be made from materials as follows:

- frame: stainless-steel sheet with a thickness of 3/10 mm;
- handle: stainless-steel cylindrical stem with a diameter of 4 mm.

An example of a suitable template is shown in [Figure A.1](#).

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