



**International
Standard**

ISO 5553

**Meat and meat products —
Detection of condensed phosphates**

*Viandes et produits à base de viande — Recherche des phosphates
condensés*

**Second edition
2024-02**

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Foreword

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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 document 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).

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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 6, *Meat, poultry, fish, eggs and their products*.

This second edition cancels and replaces the first edition (ISO 5553:1980), which has been technically revised.

The main changes are as follows:

- term “polyphosphates” has been revised to “condensed phosphates”;
- clauses have been reordered;
- [Clause 5](#) “Sampling” has been updated;
- [Clause 7](#) “Reagents and Apparatus” has been updated;
- the amount of extracting solution has been revised and the temperature conditions of the extracting solution has been deleted ([8.2.1](#));
- “Limit of detection” has been added ([8.5](#));
- “Repeatability and reproducibility” has been added ([8.6](#));
- [Clause 9](#) “Interpretation” has been modified and the R_F values of the phosphates in the reference mixture have been revised;
- [Annex A](#) and [Annex B](#) have been added;
- “Bibliography” has been added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Meat and meat products — Detection of condensed phosphates

1 Scope

This document specifies a method for the detection of linear condensed phosphates in meat and meat products by thin layer chromatographic separation.

This document only applies to the detection of added condensed phosphates that are still present in the sample at the time of investigation, because condensed phosphates are gradually hydrolyzed by enzymes present in meat or meat products and during heat treatment of meat or meat products.

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 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Principle

Extraction of the meat or meat products with trichloroacetic acid. Clearing of the serum obtained with ethanol/diethyl ether mixture. Separation of the phosphates by thin layer chromatography and detection of condensed phosphates by spraying with reagents for colour development.

5 Sampling

Sampling is not part of the method specified in this document. A recommended sampling method is given in CAC/GL 50-2004.

It is important that the laboratory-received sample is truly representative and has not been damaged or changed during transport or storage.

Start from a representative sample of at least 200 g. Store the sample in such a way that deterioration and change in composition are prevented.

6 Preparation of the test sample

Homogenize the sample by using the appropriate equipment (7.2.5). If using a mechanical meat grinder with plate, run the sample through the machine at least twice. Keep it in a completely filled, air-tight, closed

container and store it, if necessary, in a refrigerator. Analyse the sample as soon as possible, but in any case, within 5 h. If the serum cannot be prepared immediately, store the sample at -20 °C for 2 months.

7 Reagents and apparatus

7.1 Reagents

All reagents shall be of recognized analytical quality. Water of at least grade 3 in accordance with ISO 3696 shall be used.

Warning — All appropriate safety precautions shall be observed when carrying out the procedures specified in this document.

7.1.1 Isopropyl alcohol.

7.1.2 Hydrochloric acid.

7.1.3 Perchloric acid

7.1.4 Ammonium molybdate tetrahydrate $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}\cdot 4\text{H}_2\text{O}]$.

7.1.5 Ammonium hydroxide.

7.1.6 Sodium metabisulphite ($\text{Na}_2\text{S}_2\text{O}_5$).

7.1.7 Sodium sulphite (Na_2SO_3).

7.1.8 1-amino-2-naphthol-4-sulphonic acid.

7.1.9 Sodium acetate.

7.1.10 Trichloroacetic acid.

7.1.11 Diethyl ether.

7.1.12 Ethanol, 95 % (V/V).

7.1.13 Cellulose powder, for thin layer chromatography.

7.1.14 Soluble starch.

7.1.15 Reference mixture.

Dissolve in 100 ml of water.

— 50 mg of sodium dihydrogen phosphate (NaH_2PO_4),

— 50 mg of tetrasodium diphosphate ($\text{Na}_4\text{P}_2\text{O}_7$),

— 50 mg of pentasodium triphosphate ($\text{Na}_5\text{P}_3\text{O}_{10}$), and

— 50 mg of sodium hexametaphosphate ($\text{Na}_6\text{P}_6\text{O}_{18}$).

The reference mixture is stable at 4 °C for at least 4 weeks.