SLOVENSKI STANDARD
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Meso in mesni proizvodi - Merjenje pH - Referenļna metoda

Meat and meat products -- Measurement of pH -- Reference method

Viande et produits à base de viande -- Mesurage du pH -- Méthode de référence

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Meat and meat products — Measurement of pH — Reference method

Viande et produits à base de viande — Mesurage du pH — Méthode de référence

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 2917 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 6, *Meat and meat products*.

This second edition cancels and replaces the first edition (ISO 2917:1974), which has been technically revised.

Meat and meat products — Measurement of pH — Reference method

1 Scope

This International Standard specifies the reference method for measuring the pH of all kinds of meat and meat products, including poultry.

The method is applicable to products which may be homogenized and also to non-destructive measurements on carcass meat, quarters and muscles.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, this publication do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative documents referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

3 Term and definition

For the purposes of this International Standard, the following term and definition apply.

3.1
pH of meat and meat products
result of measurements performed in accordance with the procedure specified in this International Standard

4 Principle

The potential difference is measured between a glass electrode and a reference electrode, which are placed in a sample or a sample extract of the meat or meat product.

5 Reagents

Use only reagents of recognized analytical grade, unless otherwise specified.

5.1 Water, complying with at least grade 3 in accordance with ISO 3696.

The water used for preparing the buffer solutions should in addition be freshly boiled or scrubbed with carbon-dioxide-free nitrogen to remove carbon dioxide.

5.2 Buffer solutions, for calibrating the pH-meter.

The following buffer solutions may be used:

a) commercially available ready-to-use buffer solutions with a guaranteed pH value, accurate to at least 0,01 pH units;

b) buffer solutions prepared from commercially available dry mixtures;

c) self-prepared buffer solutions as described in 5.2.1 to 5.2.3.

5.2.1 Buffer solution, pH = 4,00 at 20 °C.

Dry potassium hydrogen phthalate at 110 °C to 130 °C until constant mass. Cool to ambient temperature in a desiccator.

Dissolve 10,21 g of the dried potassium hydrogen phthalate in about 800 ml of water in a 1 000 ml one-mark volumetric flask. Dilute to the mark with water and mix.

The pH of this solution is 4,00 at 0 °C and at 10 °C, and 4,01 at 30 °C.

5.2.2 Buffer solution, pH = 6,88 at 20 °C.

Dry potassium dihydrogen phosphate (KH_2PO_4, anhydrous) and disodium hydrogen phosphate (Na_2HPO_4, anhydrous) at 110 °C to 130 °C until constant mass. Cool to ambient temperature in a desiccator.

Dissolve 3,40 g of the dried KH_2PO_4 and 3,55 g of the dried Na_2HPO_4 in about 800 ml of water in a 1 000 ml one-mark volumetric flask. Dilute to the mark with water and mix.

The pH of this solution is 6,98 at 0 °C, 6,92 at 10 °C, and 6,85 at 30 °C.

The solution can be stored in a refrigerator for up to 3 months.

5.2.3 Buffer solution, pH = 5,45 at 20 °C.

Dissolve 7,01 g of citric acid monohydrate ($C_6H_8O_7 \cdot H_2O$) in about 500 ml of water in a 1 000 ml one-mark volumetric flask. Add 375 ml of sodium hydroxide solution (5.3), dilute to the mark with water and mix.

5.3 Sodium hydroxide solution, c(NaOH) = 1,0 mol/l.

Dissolve 40 g of sodium hydroxide in water and dilute to 1 000 ml.

5.4 Potassium chloride solution, c(KCl) = 0,1 mol/l.

Dissolve 7,5 g of potassium chloride in water in a 1 000 ml one-mark volumetric flask. Dilute to the mark with water and mix.

If muscle meat in prerigor condition is to be measured, glycolysis is stopped by adding 925 mg iodoacetic acid per litre of solution. Adjust the pH of the solution with sodium hydroxide solution (5.3) to 7,0.

5.5 Cleaning liquids.

5.5.1 Diethyl ether, saturated with water.

5.5.2 Ethanol (C_2H_5OH), 95 % volume fraction.

6 Apparatus

Usual laboratory apparatus and, in particular, the following.

6.1 Mechanical or **electrical equipment,** capable of homogenizing the laboratory sample.

This includes a high-speed rotational cutter, or a mincer fitted with a plate with apertures not exceeding 4,0 mm in diameter.

6.2 pH-meter, with digital or analog display, accurate to the nearest 0,01 pH unit.

If a temperature-correction system is not provided, the scale shall apply to measurements at 20 °C. The device shall be sufficiently protected from induction currents, due to external electric charges or currents, during the measurements.

6.3 Combined electrode, in which the glass indicator electrode and the Ag/AgCl or $Hg/HgCl_2$ reference electrode are joined in one shaft.

The glass electrode may be spherical, conical, cylindrical or needle-shaped.

NOTE A separate glass and reference electrode with an easily restorable liquid junction may also be used, in order to cope with problems caused by greasy samples.

6.4 Shaft homogenizer, capable of operating at a rotational frequency of 20 000 min^{-1}.

6.5 Magnetic stirrer.

7 Sampling

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 3100-1 [1].

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

Proceed from a representative sample of at least 200 g.

8 Preparation of test sample

8.1 Non-destructive measurements

Select a representative point of the sample for measurement of the pH. Proceed in accordance with clause 9.

8.2 Destructive measurements

Homogenize the laboratory sample with the appropriate equipment (6.1). Take care that the temperature of the sample material does not rise above 25 °C. If a mincer is used, pass the sample at least twice through the equipment.

Fill a suitable airtight container with the prepared sample. Close the container and store in such a way that deterioration and change in composition are prevented. Analyse the sample as soon as practicable, but always within 24 h after homogenization.