SLOVENSKI STANDARD
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Meso in mesni proizvodi - Merjenje pH (referenļna metoda)

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

Viandes et produits à base de viande -- Mesurage du pH (Méthode de référence)

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INTERNATIONAL STANDARD 2917

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Meat and meat products — Measurement of pH (Reference method)

Viandes 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 institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2917 was drawn up by Technical Committee ISO/TC 34, *Agricultural food products,* and circulated to the Member Bodies in August 1972.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	Romania
Belgium	Hungary	South Africa, Rep. of
Brazil	India	Spain
Chile	Iran	Thailand
Czechoslovakia	Ireland	Turkey
Denmark	Israel	United Kingdom
Egypt, Arab Rep. of	Netherlands	
France	Poland	

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

The Member Body of the following country expressed disapproval of the document on technical grounds :

New Zealand

Printed in Switzerland

Meat and meat products — Measurement of pH (Reference method)

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a reference method for measuring the pH of meat and meat products.

Two procedures are given : clause 8 describes the procedure for products which can be homogenized, and clause 9 the procedure for products which cannot be homogenized, for the purposes of the investigation.

2 REFERENCE

ISO 3100, *Meat and meat products — Sampling.* [1)]

3 DEFINITION

pH of meat and meat products : The result of measurements performed according to the procedure described.

NOTE — Owing to the relatively high electrolyte content of the aqueous phase of many meat products and to the fact that the pH meter, on the other hand, is calibrated with buffers of a low electrolyte content, the value measured cannot, in general, be identified with the theoretical pH value.

4 PRINCIPLE

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

5 CLEANING LIQUIDS

5.1 Ethanol, 95 % (*V/V*).

5.2 Diethyl ether, saturated with water.

5.3 Distilled water, or water of equal purity.

6 APPARATUS

6.1 pH meter, graduated in units of 0,1 pH or less, allowing readings accurate within 0,05 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.

6.2 Glass electrode. Glass electrodes of various geometrical shapes may be used; for example spherical, conical, cylindrical or needle-shaped.

Store the glass electrode with its membrane immersed in water.

6.3 Reference electrode, for example calomel electrode or silver chloride electrode containing saturated potassium chloride solution.

Unless otherwise specified, store the electrode in a saturated potassium chloride solution.

NOTE — The reference and glass electrodes may also be assembled into a system of combined electrodes. Unless otherwise specified, store the electrodes in distilled water.

6.4 Mechanical meat mincer, laboratory size, fitted with a perforated plate with holes not greater than 4 mm in diameter.

1) At present at the stage of draft.

7 SAMPLE

7.1 Proceed from a representative sample of at least 200 g. See ISO 3100.

7.2 Determine the pH immediately or store the sample in such a way that pH changes will be restricted to a minimum.

8 PROCEDURE FOR PRODUCTS WHICH CAN BE HOMOGENIZED

8.1 Preparation of the test sample

Except in cases of non-destructive investigation, homogenize the laboratory sample by passing it twice through the meat mincer (6.4) and by subsequent mixing (see 8.6).

8.2 Test portion

Take from the test sample a quantity that is sufficient to immerse or to embed the electrodes.

8.3 Calibration of pH meter

Calibrate the pH meter using a buffer solution of exactly known pH, as near as possible to the pH of the solution to be determined (see clause 10), at the temperature of measurement.

If the pH meter does not include a temperature correction system, the temperature of the buffer solution shall be within the range 20 ± 2 °C.

8.4 Measurement

8.4.1 Introduce the electrodes into the test portion and set the temperature correction system of the pH meter to the temperature of the test portion. If there is no temperature correction system, the temperature of the test portion shall be within the range 20 ± 2 °C.

8.4.2 Make the measurement using the procedure appropriate to the pH meter used. Read the pH directly from the scale on the instrument, to the nearest 0,05 pH unit, when a constant value has been reached.

8.4.3 Carry out three measurements on the same test sample.

8.5 Cleaning of the electrodes

Clean the electrodes by wiping them with pieces of cotton wool wetted with diethyl ether (5.2) and ethanol (5.1) successively. Finally, wash them with water (5.3) and store them as described in 6.2 and 6.3.

8.6 Note on procedure

Samples of very dry products may, in addition to the normal treatment (see 8.1), be homogenized with an equal mass of water in a laboratory mixer, prior to measurement of the pH.

8.7 Expression of results

8.7.1 *Calculation*

Take as the result the arithmetic mean of the three values, provided that the requirement concerning repeatability (see 8.7.2) is satisfied. Report the result to the nearest 0,1 pH unit.

8.7.2 *Repeatability*

The difference between the extreme values resulting from the three measurements shall not exceed 0,15 pH unit.

9 PROCEDURE FOR UNHOMOGENIZED PRODUCTS

9.1 Test portion

Take a part of the laboratory sample sufficient to allow measurement of the pH at several points.

9.2 Calibration of pH meter

See 8.3.

9.3 Measurement

9.3.1 If the test portion has a firm consistency, make a hole in it for each measuring point, so that the glass electrode may be introduced into it without breakage.

9.3.2 See 8.4.1 and 8.4.2.

9.3.3 Repeat the measurement at the same point.

9.3.4 If it is considered useful to know the differences between the pH measured at several points of the test portion, repeat the measurements at different points. The number of measuring points shall be a function of the nature and size of the sample.

9.4 Cleaning of the electrodes

See 8.5.

9.5 Expression of results

9.5.1 *Calculation*

Take as the result the arithmetic mean of the two values obtained at the same point, provided that the requirement concerning repeatability (see 9.5.2) is satisfied. Report the average pH for each point to the nearest 0,1 pH unit.

9.5.2 *Repeatability*

The difference between the two values obtained at the same point shall not exceed 0,15 pH unit.

10 NOTE ON PROCEDURE

The following buffer solutions may be used for calibration.

All reagents used in the preparation of the solutions shall be of analytical reagent quality. Use distilled water or water of equal purity.

10.1 Buffer solution with pH 4,00 at 20 °C, prepared as follows :

Weigh, to the nearest 0,001 g, 10,211 g of potassium hydrogen phthalate [$KHC_6H_4(COO)_2$], previously dried to constant mass at 125 °C, and dissolve in water.

Dilute to 1 000 ml.

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

10.2 Buffer solution with pH 5,45 at 20 °C, prepared as follows :

Mix 500 ml of a 0,2 N solution of citric acid in water with 375 ml of a 0,2 N solution of sodium hydroxide in water.

The pH of this solution is 5,42 at 10 °C and 5,48 at 30 °C.

10.3 Buffer solution with pH 6,88 at 20 °C, prepared as follows :

Weigh, to the nearest 0,001 g, 3,402 g of potassium dihydrogen orthophosphate (KH_2PO_4) and 3,549 g of *di*sodium hydrogen orthophosphate (Na_2HPO_4) and dissolve in water. Dilute to 1 000 ml.

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

11 TEST REPORT

The test report shall show the method used and the result obtained. It shall also mention any operating conditions not specified in this International Standard or regarded as optional and any circumstances that may have influenced the result.

The report shall include all information necessary for complete identification of the sample.

In the case of measurements on products which cannot be homogenized, the various points of measurement shall be mentioned, by means of a diagram if necessary.