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Yogurt — Determination of titratable acidity — Potentiometric method

Yaourt — Détermination de l'acidité titrable — Méthode potentiométrique

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Foreword

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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 11869 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 5, *Milk and milk products*, in collaboration with the International Dairy Federation (IDF) and AOAC INTERNATIONAL, and will also be published by these organizations.

Annex A of this International Standard is for information only.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

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Yogurt — Determination of titratable acidity — Potentiometric method

1 Scope

This International Standard specifies a potentiometric method for the determination of the titratable acidity of natural yogurt, flavoured sweetened yogurt and fruit yogurt.

2 Definitions

For the purposes of this International Standard, the following definition applies.

2.1 titratable acidity of yogurt: Volume of sodium hydroxide solution required to titrate a quantity of yogurt to pH 8,3 ± 0,01, divided by the mass of the test portion.

The titratable acidity is expressed in millimoles per 100 g.

3 Principle

Suspension of a test portion in water. Potentiometric titration with sodium hydroxide solution [c(NaOH) = 0,1 mol/l] to pH 8,3 ± 0,01. Calculation of titratable acidity.

4 Reagents

Use only reagents of recognized analytical quality, unless otherwise specified, and distilled or deionized water, freed from carbon dioxide by boiling for 10 min before use.

4.1 Sodium hydroxide, standard volumetric solution, c(NaOH) = 0,1 mol/l ± 0,002 mol/l, carbon free.

Protect this solution against the absorption of carbon dioxide.

NOTE 1 Absorption of carbon dioxide can be avoided by connecting a washing bottle that contains the sodium hydroxide solution (4.1) to the burette which itself contains the sodium hydroxide solution, or by connecting a small tube with fresh sodium hydroxide/calcium oxide to the end of the burette to obtain a closed system. CO_2 will either be bound in the washing bottle or in the tube to protect the solution in the burette against absorption which would influence the concentration.

5 Apparatus

Usual laboratory equipment and, in particular, the following.

5.1 Analytical balance, capable of weighing to ± 0,01 g.

5.2 pH-meter, equipped with a measuring and a reference electrode, calibrated by means of two buffer solutions of pH approximately 7 and 9 respectively, known to within ± 0,01 pH unit.

5.3 Spoon or spatula

5.4 Homogenizer, for example a macerator (Ultra-Turax[1)] or equivalent).

5.5 Burette, of capacity 25 ml or 50 ml, graduated in 0,05 ml increments.

6 Sampling

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

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 707 [1].

7 Preparation of test sample

7.1 Natural yogurt or flavoured sweetened yogurt

Bring the sample to a temperature between 20 °C and 25 °C. Mix the sample carefully by means of a spoon or spatula (5.3) or homogenizer (5.4), using a rotary motion which passes from the lower layers to the surface layers of the sample so as to displace and mix them well.

7.2 Fruit yogurt

Bring the sample to a temperature between 20 °C and 25 °C. Homogenize it using an appropriate device (5.4) in order to facilitate the grinding and dispersion of the fruit.

If fat separation is observed in the sample, the temperature of the sample may be raised to 38 °C for a better homogenization. Thereafter the sample should be cooled to a temperature between 20 °C and 25 °C.

8 Procedure

8.1 Test portion

Weigh approximately 10 g of the prepared test sample (clause 7), to the nearest 0,01 g, into a 50 ml beaker. Add approximately 10 ml of water and mix.

8.2 Determination

8.2.1 Insert the electrodes of the pH-meter (5.2) into the suspension (8.1) and ensure that they are properly immersed.

8.2.2 Titrate the contents of the beaker, whilst stirring, with the sodium hydroxide solution (4.1), to pH 8,3 ± 0,01.

Record the volume, in millilitres, of sodium hydroxide solution used, to the nearest 0,05 ml.

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1) Ultra-Turax is an example of the suitable product available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this product.

9 Calculation and expression of results

Calculate the titratable acidity, w, expressed in millimoles per 100 g, using the following equation:

$$w = \frac{V \times 0{,}9}{m}$$

where

V is the numerical value of the volume, in millilitres, of the sodium hydroxide solution used for the titration (8.2.2);

m is the numerical value of the mass, in grams, of the test portion;

0,9 is the conversion factor for lactic acid.

Express the results to two decimal places.

10 Precision

10.1 Repeatability

The absolute difference between two independent single test results, obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time, should not exceed 0,55 mmol per 100 g.

Reject both results if the difference exceeds 0,55 mmol per 100 g and carry out two new single determinations.

11 Test report

The test report shall specify:

— the method in accordance with which sampling was carried out, if known;

— the method used;

— the test result(s) obtained; and

— if the repeatability has been checked, the final quoted result obtained.

It shall also mention all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents that may have influenced the test result(s).

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

Annex A
(informative)

Bibliography

[1] ISO 707:— [2], *Milk and milk products — Methods of sampling.*

2) To be published. (Revision of ISO 707:1985)

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