ES ISO 1443:2005

ETHIOPIAN STANDARD

First edition
2005-03-12

Meat and meat products — Determination of total fat content

Des: 67.120.10

Descriptors: agricultural products, animal products, meat, chemical analysis, determination of conten fats.

Price based on 2 pages.

Reference number
ES 1443:2005

National Foreword

This Ethiopian Standard has been prepared under the direction of the Agriculture and Food Technicnology Technical Committee.

It is identical with ISO 1443 First edition, 1973 " Meat and meat products Determination of total fat content" published by the International standards organization (ISO)

For the purpose of this Ethiopian Standard the adopted text shall be modified as follows.

a) The words" International standard " shall be read as "Ethiopian Standard "

b) A full point (.) Shall substitute a comma (,) as a decimal marker

a) Reference to international standard shall be read as reference to the corresponding Ethiopian Standard listed below

International Standard (normative Reference	**Corresponding Ethiopian Standard)**
ISO 3100-1 :1991 Meat and meat products sampling	ES ISO 3100-1:2004, Meat and meat products preparation of test sample

INTERNATIONAL STANDARD ISO 1443

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Meat and meat products — Determination of total fat content

First edition — 1973-04-15

UDC 637.51/.52 : 543.85 Ref. No. ISO 1443-1973 (E)

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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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, International Standard ISO 1443 replaces ISO Recommendation R 1443-1970 drawn up by Technical Committee ISO/TC 34, *Agricultural food products.*

The Member Bodies of the following countries approved the Recommendation :

Australia	Hungary	Poland
Bulgaria	India	Portugal
Chile	Iran	Romania
Czechoslovakia	Israel	Spain
Egypt, Arab Rep. of	Korea, Rep. of	Thailand
France	Netherlands	Turkey
Germany	Norway	United Kingdom

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

New Zealand

Printed in Switzerland

Meat and meat products — Determination of total fat content

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a reference method for the determination of the total fat content of meat and meat products[1].

2 REFERENCE

ISO . . . , *Meat and meat products — Sampling.*[2]

3 DEFINITION

total fat of meat and meat products : The fat extracted under the operating conditions described.
The total fat content is expressed as a percentage by mass.

4 PRINCIPLE

Boiling of the test portion with dilute hydrochloric acid to free the occluded and bound lipid fractions, filtration of the resulting mass, drying, and extraction with *n*-hexane or light petroleum, of the fat retained on the filter.

5 REAGENTS

All reagents shall be of a recognized analytical quality. Water shall be distilled water or water of at least equivalent purity.

5.1 Extraction solvent, *n*-hexane or, alternatively, light petroleum distilling between 40 and 60 °C, and having a bromine value less than 1. For either solvent, the residue on complete evaporation shall not exceed 0,002 g per 100 ml.

5.2 Hydrochloric acid, approximately 4 N solution.

Dilute 100 ml of concentrated hydrochloric acid (ρ_{20} = 1,19 g/ml) with 200 ml of water and mix.

5.3 Blue litmus paper.

5.4 Boiling chips.

6 APPARATUS

Usual laboratory equipment not otherwise specified, and the following items :

6.1 Mechanical meat mincer, laboratory size, fitted with a plate with holes of diameter not exceeding 4 mm.

6.2 Conical flask, capacity 250 ml.

6.3 Clock glass or **Petri dish**, diameter not less than 80 mm.

6.4 Extraction thimble, made of filter paper and defatted.

6.5 Cotton wool, defatted.

6.6 Extraction apparatus, continuous or semi-continuous, for example the Soxhlet type, with an extraction flask of about 150 ml capacity.

6.7 Sand bath or **water bath**, electrically heated or similar suitable apparatus.

6.8 Drying oven, electrically heated, capable of being controlled at 103 ± 2 °C.

6.9 Desiccator, containing an efficient desiccant.

6.10 Analytical balance.

6.11 Fluted filter paper, qualitative, of medium speed.

7 SAMPLE

7.1 Start from a representative sample of at least 200 g taken according to ISO . . . .

7.2 Store the sample in such a way that deterioration and change in composition are prevented.

1) The fat obtained cannot be used for the determination of the characteristics of the fat.

2) In preparation.

8 PROCEDURE

8.1 Preparation of sample

Render the sample uniform by passing it at least twice through the meat mincer (6.1) and mixing. Keep it in a completely filled airtight container and store in such a way that deterioration and change in composition are prevented. Analyse the sample as soon as possible, but in any case within 24 h.

8.2 Test portion

According to the expected fat content, weigh 3 to 5 g of the minced sample to the nearest 0,001 g into the 250 ml conical flask (6.2).

8.3 Determination

Dry the flask of the extraction apparatus (6.6), containing some boiling chips (5.4), for 1 h at 103 ± 2 °C in the drying oven (6.8). Allow the flask to cool to room temperature in the desiccator (6.9) and weigh to the nearest 0,001 g.

Add to the test portion 50 ml of the hydrochloric acid (5.2) and cover the conical flask (6.2) with a small watch glass. Heat the conical flask on an asbestos wire gauze by means of a gas burner until the contents begin to boil. Continue boiling over a small flame for 1 h and shake occasionally. Add 150 ml of hot water.

Moisten the fluted filter paper (6.11) held in a glass funnel with water, and pour the hot contents from the flask onto the filter. Wash the flask and the watch glass thoroughly three times with hot water and dry in the oven. Wash the filter with hot water until the washings do not affect the colour of the blue litmus paper (5.3). Put the filter paper on the clock glass or Petri dish (6.3) and dry for 1 h in the oven at 103 ± 2 °C. Allow to cool.

Roll up the filter paper and insert it into the extraction thimble (6.4). Remove any traces of fat from the clock glass or the Petri dish, using cotton wool (6.5) moistened with the extraction solvent (5.1), and also transfer the cotton wool to the thimble. Place the thimble in the extraction apparatus. The filter paper shall be handled either with tongs that can be rinsed or with paper cover slips on the fingers. Pour the extraction solvent into the dried flask of the extraction apparatus. Wash the inside of the conical flask used for the disintegration with hydrochloric acid, and the covering watch glass with a portion of the extraction solvent and add it to the extraction flask. The total solvent quantity shall be one and a half to two times the capacity of the extraction tube of the apparatus. Fit the flask to the extraction apparatus. Heat the extraction flask for 4 h on the sand bath, water bath or other apparatus (6.7).

After extraction, take the flask containing the liquid from the extraction apparatus and distil off the solvent, using, for example, the sand bath or water bath. Evaporate the last traces of the solvent on the water bath, using air blowing if desired.

Dry the extraction flask for 1 h in the drying oven at 103 ± 2 °C and, after allowing to cool to room temperature in the desiccator, weigh to the nearest 0,001 g. Repeat these operations until the results of two successive weighings do not differ more than 0,1 % of the mass of the test portion.

Verify the completion of the extraction by taking a second extraction flask and extracting for a further period of 1 h with a fresh portion of the solvent. The increase in mass shall not exceed 0,1 % of the mass of the test portion.

Carry out two determinations on the same prepared sample.

9 EXPRESSION OF RESULTS

9.1 Method of calculation and formula

The total fat content of the sample, expressed as a percentage by mass, is equal to

$$(m_2 - m_1) \times \frac{100}{m_0}$$

where

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in grams, of the extraction flask with boiling chips;

m_2 is the mass, in grams, of the flask and boiling chips with the fat, after drying.

Take as the result the arithmetic mean of the two determinations, if the requirement of 9.2 is satisfied.

Report the result rounded to one decimal place.

9.2 Repeatability

The difference between the results of two determinations carried out simultaneously or in rapid succession by the same analyst shall not be greater than 0,5 g of total fat per 100 g of sample.

10 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, as well as any circumstances that may have influenced the result.

The report shall include all details required for complete identification of the sample.