INTERNATIONAL STANDARD 3091

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Meat and meat products — Determination of nitrate content (Reference method)

Viandes et produits à base de viande — Détermination de la teneur en nitrates (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 3091 was drawn up by Technical Committee ISO/TC 34, *Agricultural food products,* and circulated to the Member Bodies in May 1974.

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

Australia	Germany	South Africa, Rep. of
Austria	Hungary	Spain
Bulgaria	India	Thailand
Czechoslovakia	Ireland	Turkey
Denmark	Israel	United Kingdom
Egypt, Arab Rep. of	Netherlands	U.S.S.R.
Ethiopia	Poland	Yugoslavia
France	Romania	

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

Canada

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Meat and meat products — Determination of nitrate content (Reference method)

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a reference method for the determination of the nitrate content of meat and meat products.

2 REFERENCES

ISO 2918, *Meat and meat products — Determination of nitrite content (Reference method).*

ISO 3100, *Meat and meat products — Sampling.*

3 DEFINITION

nitrate content of meat and meat products : The nitrate content determined according to the procedure described in this International Standard and expressed as milligrams of potassium nitrate per kilogram (parts per million).

4 PRINCIPLE

Extraction of a test portion with hot water, precipitation of the proteins and filtration.

Reduction of the extracted nitrates to nitrite by metallic cadmium. Development of a red colour by addition of sulphanilamide and *N*-1-naphthylethylenediamine dihydrochloride to the filtrate and photometric measurement at a wavelength of 538 nm.

5 REAGENTS

All reagents shall be of analytical quality. The water used shall be distilled water or water of at least equivalent purity.

5.1 Zinc rods, length about 15 cm and diameter 5 to 7 mm.

5.2 Solutions for precipitation of proteins

5.2.1 Reagent I

Dissolve 106 g of potassium ferrocyanide trihydrate $[K_4Fe(CN)_6 \cdot 3H_2O]$ in water and dilute to 1 000 ml.

5.2.2 Reagent II

Dissolve 220 g of zinc acetate dihydrate $[Zn(CH_3COO)_2 \cdot 2H_2O]$ and 30 ml of glacial acetic acid in water and dilute to 1 000 ml.

5.2.3 Borax solution, saturated

Dissolve 50 g of disodium tetraborate decahydrate $(Na_2B_4O_7 \cdot 10H_2O)$ in 1 000 ml of tepid water and cool to room temperature.

5.3 Cadmium sulphate solution, 30 g/l.

Dissolve 37 g of cadmium sulphate $(3CdSO_4 \cdot 8H_2O)$ in water and dilute to 1 000 ml.

5.4 Hydrochloric acid solution, about 0,1 N.

Dilute 8 ml of concentrated hydrochloric acid solution (ρ_{20} 1,19 g/ml) to 1 000 ml with water.

5.5 Ammonia buffer solution, pH 9,6 to 9,7.

Dilute 20 ml of concentrated hydrochloric acid (ρ_{20} 1,19 g/ml) with 500 ml of water. After mixing, add 10 g of ethylenediamine tetra-acetic acid disodium-salt dihydrate, $[CH_2N(CH_2COOH)CH_2COONa]_2 \cdot 2H_2O$, and 55 ml of concentrated ammonia (ρ_{20} 0,88 g/ml). Dilute to 1 000 ml with water and mix. Check the pH.

5.6 Sodium nitrite standard solutions.

Dissolve 1,000 g of sodium nitrite ($NaNO_2$) in water and dilute to 100 ml in a one-mark volumetric flask. Pipette 5 ml of the solution into a 1 000 ml one-mark volumetric flask. Dilute to the mark.

Prepare a series of standard solutions by pipetting 5 ml, 10 ml and 20 ml of this solution into 100 ml one-mark volumetric flasks and diluting to the mark with water. These standard solutions contain respectively 2,5 μg, 5,0 μg and 10,0 μg of sodium nitrite per millilitre.

The standard solutions and the dilute (0,05 g/l) sodium nitrite solution from which they are prepared shall be made up on the day of use.