

INTERNATIONAL
STANDARD

ISO
9874

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**Milk — Determination of total phosphorus
content — Method using molecular absorption
spectrometry**

*Détermination de la teneur en phosphore total du lait — Méthode par
spectrométrie d'absorption moléculaire*



Reference number
ISO 9874:1992(E)

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.

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 9874 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Sub-Committee SC 5, *Milk and milk products*, in collaboration with the International Dairy Federation (IDF) and the Association of Official Analytical Chemists (AOAC), and will also be published by these organizations.

Annex A of this International Standard is for information only.

Milk — Determination of total phosphorus content — Method using molecular absorption spectrometry

1 Scope

This International Standard specifies a spectrometric method for the determination of the total phosphorus content of milk.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 648:1977, *Laboratory glassware — One-mark pipettes*.

ISO 1042:1983, *Laboratory glassware — One-mark volumetric flasks*.

ISO 4788:1980, *Laboratory glassware — Graduated measuring cylinders*.

3 Definition

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

3.1 total phosphorus content: The mass fraction of substances determined by the method specified in this International Standard. It is expressed as a percentage (*m/m*).

4 Principle

Wet digestion of milk using sulfuric acid and hydrogen peroxide, or dry ashing of milk. Formation of

molybdenum blue by the addition of molybdate/ascorbic acid solution. Spectrometric measurement of the absorbance at a wavelength of 820 nm.

5 Reagents

All reagents shall be of recognized analytical grade, unless otherwise specified. The water used shall be distilled or deionized water, free from phosphorus compounds.

5.1 Concentrated sulfuric acid, $\rho_{20} = 1,84$ g/ml, $c(\text{H}_2\text{SO}_4) = 18$ mol/l approximately.

5.2 Dilute sulfuric acid, $c(\text{H}_2\text{SO}_4) = 5$ mol/l approximately.

Carefully add, while stirring continuously, 278 ml of concentrated sulfuric acid (5.1) to 722 ml of water.

5.3 Hydrochloric acid, $c(\text{HCl}) = 1$ mol/l approximately. (Used for dry ashing.)

Dilute 83 ml of concentrated hydrochloric acid ($\rho_{20} = 1,19$ g/ml) to 1 000 ml with water.

5.4 Hydrogen peroxide, $c(\text{H}_2\text{O}_2) = 9$ mol/l approximately, free from phosphorus-containing substances.

5.5 Sodium molybdate, $c(\text{Na}_2\text{MoO}_4) = 0,1$ mol/l approximately.

Weigh 2,5 g of sodium molybdate dihydrate into a 100 ml one-mark volumetric flask (6.10). Add a sufficient volume of dilute sulfuric acid solution (5.2) to dissolve the sodium molybdate dihydrate. Make up to the mark with the same acid (5.2) and mix.

5.6 Ascorbic acid, $c(\text{C}_6\text{H}_8\text{O}_6) = 0,25$ mol/l approximately.

Weigh 5 g of ascorbic acid into a 100 ml one-mark volumetric flask (6.10). Add a sufficient volume of