INTERNATIONAL STANDARD

**ISO 14244**

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# Oilseed meals — Determination of soluble proteins in potassium hydroxide solution

*Tourteaux de graines oléagineuses — Détermination de la teneur en protéines solubles en solution d'hydroxyde de potassium*



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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 2, *Oleaginous seeds and fruits and oilseed meals*.



 

# Oilseed meals — Determination of soluble proteins in potassium hydroxide solution

## 1 Scope

This International Standard specifies a method for the determination of soluble proteins in potassium hydroxide solution in soya meals, rapeseed meals and sunflower pellets, which are then assayed using the Kjeldahl method as specified in ISO 5983-1 and ISO 5983-2.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 5500, *Oilseed residues — Sampling*

ISO 5502, *Oilseed residues — Preparation of test samples*

ISO 5983-1, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 1: Kjeldahl method*

ISO 5983-2, *Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content — Part 2: Block digestion and steam distillation method*



## 3 Principle

The sample is dispersed in a solution of potassium hydroxide of approximately 12,5 pH, stirred and centrifuged. Then, the nitrogen content of the clarified liquid is determined by the Kjeldahl method for crude protein and compared with the value of crude protein of the original sample.

NOTE The Kjeldahl method is described in ISO 5983-1 and ISO 5983-2.

## 4 Reagents

WARNING 1 The tests, according to this International Standard, involve risks for persons and the possibility of releasing substances which might cause damage to the environment. For this reason, appropriate measures shall be taken to prevent risk, protect personnel, and avoid the release of the substances involved.

WARNING 2 Attention shall be paid to preserving the environment in all phases of this activity. For further information, it is recommended to make reference to ASTM D4447, which describes the classification of the kind of residues and pretreatment methods for their recovery or disposal.

Use only reagents of recognized analytical grade.

### 4.1 Potassium hydroxide.

### 4.2 Potassium hydroxide solution, $c$(KOH) = 0,036 mol/l.

Preparation: Dissolve 2,4 g of potassium hydroxide (mass fraction $w$ = 85 g/100 g) in 1 000 ml of distilled water.

**4.3 n-hexane or hexane mixed isomers or petroleum ether**.

## 5 Apparatus

Usual laboratory apparatus and, in particular, the following.

**5.1 Sieve**, 500 µm for sunflower pellets and 250 µm for soya and rapeseed meals (as specified in ISO 565).

**5.2 Analytical balance**, capable of weighting to the nearest 0,001 g.

**5.3 Stirrer's vessels**, of 150 ml capacity.

**5.4 Magnetic stirrer with revolutions per minute (r/min) indicator or mechanical rotary stirrer**, composed of an axis, and allowing the centrifuge tubes to invert totally as the axis rotates.

**5.5 Grinder**.

**5.5.1 Cutting mill**, type of coffee grinder or grinder equipped with a grid or equivalent.

**5.5.2 Cyclone mill**, or similar.



**5.6 Centrifuge,** allowing reaching a relative acceleration of 800 g ± 100 g.

The value of the rotational frequency, *v*, is calculated using Formula (1):

$$v = 423\sqrt{\frac{F_c}{d}} \tag{1}$$



where

$v$ is the rotational frequency, in revolutions per minute;

$d$ is the spinning diameter, in centimetres, measured between the ends of the opposite tubes, in rotation position;

$F_c$ is the relative centrifugal acceleration (in this case, 800 g).

**5.7 One-mark volumetric pipettes**, of 25 ml capacity.

**5.8 Burette**, of 100 ml capacity.

**5.9 Centrifuge tube or centrifugation ampoule**.

**5.10 Filter paper**, nitrogen free or glass pot, with a filter plate.

## 6 Sampling

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 5500.

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