

This is a preview of "ISO 16634-1:2008". [Click here to purchase the full version from the ANSI store.](#)

First edition
2008-11-01

Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content —

Part 1: Oilseeds and animal feeding stuffs

Produits alimentaires — Détermination de la teneur en azote total par combustion selon le principe Dumas et calcul de la teneur en protéines brutes —

Partie 1: Graines oléagineuses et aliments des animaux



Reference number
ISO 16634-1:2008(E)

© ISO 2008

This is a preview of "ISO 16634-1:2008". [Click here to purchase the full version from the ANSI store.](#)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 16634-1:2008". Click here to purchase the full version from the ANSI store.

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Principle	2
5 Reagents	2
6 Apparatus	3
7 Sampling.....	4
8 Preparation of test sample.....	4
9 Procedure	4
9.1 General.....	4
9.2 Test portion	4
9.3 Control of oxygen demand	5
9.4 Calibration	5
9.5 Determination.....	5
9.6 Detection and integration	6
10 Calculation and expression of results.....	6
10.1 Calculation.....	6
10.1.1 Nitrogen content	6
10.1.2 Crude protein content	6
10.2 Expression of results	7
11 Precision.....	7
11.1 Interlaboratory tests	7
11.2 Repeatability.....	7
11.3 Reproducibility.....	7
12 Test report	7
Annex A (informative) Flowchart for the basic design of a Dumas apparatus	8
Annex B (informative) Schemes of suitable types of Dumas apparatus	9
Annex C (informative) Equipment calibration	12
Annex D (informative) Examples of factors for converting nitrogen content to protein content	14
Annex E (informative) Result of collaborative studies	15
Annex F (informative) Relationship between Dumas nitrogen and Kjeldahl nitrogen.....	24
Bibliography	28

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16634-1 was prepared by Technical Committee ISO/TC 34, *Food products*.

ISO 16634 consists of the following parts, under the general title *Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content*:

— *Part 1: Oilseeds and animal feeding stuffs*

A part 2 on cereals, pulses and milled cereal products is in preparation.

This is a preview of "ISO 16634-1:2008". [Click here to purchase the full version from the ANSI store.](#)

Introduction

For a long time the Kjeldahl method has been the most frequently used method for the determination of protein content of food products. However, in recent years, the Kjeldahl method has increasingly been replaced by the Dumas method, which is faster and does not use dangerous chemicals. Although the principles of the two methods are different, both measure the nitrogen content of the product. Nitrogen can be converted into protein content by using an appropriate factor. The value of this factor varies with the relative amounts of different proteins and their amino-acid composition in the given product.

Neither the Dumas nor the Kjeldahl method distinguishes between protein and non-protein nitrogen. In most cases, results obtained by the Dumas method are slightly higher than those of the Kjeldahl method. This is due to the fact that the Dumas method measures almost all of the non-protein nitrogen, whereas the Kjeldahl method measures only a part of it.

Taking into consideration that the calculated protein content of a product by both methods only approximates the true value, it is a matter of discretion which one is accepted. The most appropriate solution should be the use of a second factor for the elimination of the systematic error caused by the non-protein nitrogen content of the different products. However, this second factor has to be determined for each product, like existing factors, which show the ratio of the protein to the nitrogen content.