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Interested committees:

Title: Draft BS EN ISO 16634-1 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.

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Introduction

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For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 16634-1

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

ICS: 65.120; 67.200.20

This document has not been edited by the ISO Central Secretariat.

ISO/CEN PARALLEL PROCESSING

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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.

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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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 10, *Animal feeding stuffs*.

This second/third/... edition cancels and replaces the first/second/... edition (ISO #####:#####), which has been technically revised.

The main changes are as follows:

- Removal of informative [annex B](#) (Schemes of suitable types of Dumas apparatus), annex D (Examples of factors for converting nitrogen content to protein content) and annex F (Relationship between Dumas nitrogen and Kjeldahl nitrogen).
- Harmonization with ISO 16634-2.

A list of all parts in the ISO 16634 series can be found on the ISO website.

- Part 1 : Oilseeds and animal feeding stuffs
- Part 2 : Cereals, pulses and milled cereal products

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

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

1 Scope

This part of ISO 16634 specifies a method for the determination of the total nitrogen content and the calculation of crude protein content of oilseeds, oilseeds meals, compound feed, feed raw materials, premixtures from plant origin, and excreta.

For mineral premixtures and feed additives, the method of determination of the total nitrogen content described in this International Standard can be used. However, for these 2 matrices, the calculation of the protein content described in this international standard do not apply.

For excreta, the accuracy of the method has to be checked individually

This method, like the Kjeldahl method, does not distinguish between protein nitrogen and non-protein nitrogen. For the calculation of protein content, the conversion factors used is 6,25.

This method is not applicable to milk and milk products, for which a method is specified in ISO 14891 | IDF 185^[10].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 664, *Oilseeds — Reduction of laboratory sample to test sample*

ISO 665, *Oilseeds — Determination of moisture and volatile matter content*

ISO 771, *Oilseed meals — Determination of moisture and volatile matter content*

ISO 6496, *Animal feeding stuffs — Determination of moisture and other volatile matter content*

ISO 6498, *Animal feeding stuffs — Guidelines for sample preparation*

ISO 12099, *Animal feeding stuffs, cereals and milled cereal products — Guidelines for the application of near infrared spectrometry*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1 nitrogen content

mass fraction of the total nitrogen determined by the procedure specified in this part of ISO 16634

Note 1 to entry: The mass fraction is expressed as a percentage.

3.2 crude protein content

nitrogen content (3.1) multiplied by a factor, equal to 6,25

3.3 excreta

substances released by the body; nutritional and metabolic waste (faeces, droppings, urine, etc.)

4 Principle

Food samples are combusted (burned) into gas in the furnace adjusted to greater than or equal to 850 °C under a flow of pure oxygen in a combustion tube and carrier gas. Combusted gasses are swept passing through copper oxide platinum catalyst to reduce any remaining nitrogen oxide to N₂ gas and remove excess oxygen. Other interfering gas (CO₂ and H₂O) are removed and then the nitrogen content is quantitatively determined using a thermal conductivity detector cell. The nitrogen content is calculated by a microprocessor.

5 Reagents

Use only reagents of recognized analytical grade, or reagents of equivalent purity as specified by instrument manufacturers. Except for the reference materials (5.12), all reagents shall be free from nitrogen.

5.1 Carrier gas(es): use one of 5.1.1, and 5.1.2 and 5.1.3.

5.1.1 Carbon dioxide, as pure as possible and of minimum volume fraction, $\phi(\text{CO}_2) \geq 99,99\%$.

5.1.2 Helium, as pure as possible and of minimum volume fraction, $\phi(\text{He}) \geq 99,99\%$.

5.1.3 Argon, as pure as possible and of minimum volume fraction, $\phi(\text{Ar}) \geq 99,99\%$.

The collaborative data were obtained in the 1990s with helium and carbon dioxide as carrier gas. Some devices (6.5) can be used with argon as carrier gas. If so, the results obtained with argon shall be verified by the laboratory.

5.2 Oxygen, as pure as possible and of minimum volume fraction, $\phi(\text{O}_2) \geq 99,99\%$.

5.3 Sulfur dioxide and halogen absorbent, to eliminate any sulfur from the sample [e.g. lead chromate (PbCrO₄) or steel wool].

5.4 Copper oxide platinum catalyst (filling material for the post-combustion tube).

Platinum catalyst [5 % of Pt on alumina (Al₂O₃)] is blended with CuO at a ratio of 1:7 parts or 1:8 parts according to the manufacturer's recommendations.

To prevent separation as a result of the different bulk densities of the two materials, it is recommended not to prepare the mixture before filling the tube. It is advisable to pour the platinum catalyst and copper oxide simultaneously into the post-combustion tube using a suitable funnel.