

Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method

The European Standard EN ISO 9831:2003 has the status of a
British Standard

ICS 65.120

National foreword

This British Standard is the official English language version of EN ISO 9831:2003. It is identical with ISO 9831:1998.

The UK participation in its preparation was entrusted to Technical Committee AW/10, Animal feeding stuffs, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, pages ii and iii, a blank page, pages 1 to 18, the Annex ZA page and a back cover.

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English version

**Animal feeding stuffs, animal products, and faeces or urine -
Determination of gross calorific value - Bomb calorimeter
method (ISO 9831:1998)**

Aliments des animaux, produits d'origine animale et
excréments ou urines - Détermination de la valeur
calorifique brute - Méthode à la bombe calorimétrique (ISO
9831:1998)

Futtermittel, tierische Produkte und Kot oder Urin -
Bestimmung des effektiven Brennwerths - Verfahren mit der
kalorimetrischen Bombe (ISO 9831:1998)

This European Standard was approved by CEN on 13 November 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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Foreword

The text of ISO 9831:1998 has been prepared by Technical Committee ISO/TC 34 "Agricultural food products" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 9831:2003 by Technical Committee CEN/TC 327 "Animal feeding stuffs - Methods of sampling and analysis", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2004, and conflicting national standards shall be withdrawn at the latest by May 2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 9831:1998 has been approved by CEN as EN ISO 9831:2003 without any modifications.

NOTE Normative references to International Standards are listed in annex ZA (normative).

INTERNATIONAL STANDARD

**ISO
9831**

First edition
1998-08-01

Animal feeding stuffs, animal products, and faeces or urine — Determination of gross calorific value — Bomb calorimeter method

*Aliments des animaux, produits d'origine animale et excréments ou
urines — Détermination de la valeur calorifique brute — Méthode à la
bombe calorimétrique*



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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.

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 9831 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 10, *Animal feeding stuffs*.

Annex A and Annex B are an integral part of this International Standard. Annex C to Annex F are for information only.

1 Scope

This International Standard specifies a method for the determination of the gross calorific value of animal feeding stuffs, animal products and faeces or urine at constant volume in an adiabatic, an isothermal, or a static bomb calorimeter.

The result obtained by this method is the gross calorific value of the test sample at constant volume, the water of the combustion products being condensed to liquid at the calorimeter temperature.

NOTE The international reference temperature for thermochemistry of 25 °C is used as the reference temperature for calorific value, although the temperature dependence of the calorific value of the materials to which this International Standard applies is small (about $1 \text{ J} \cdot \text{g}^{-1} \cdot \text{K}^{-1}$).

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 651:1975, *Solid-stem calorimeter thermometers*.

ISO 652:1975, *Enclosed-scale calorimeter thermometers*.

ISO 1770:1981, *Solid-stem general purpose thermometers*.

ISO 1771:1981, *Enclosed-scale general purpose thermometers*.

ISO 1928:1995, *Solid mineral fuels — Determination of gross calorific value by the bomb calorimeter method, and calculation of net calorific value*.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

ISO 6496: —¹⁾, *Animal feeding stuffs — Determination of moisture and volatile matter content*.

ISO 6498: —²⁾, *Animal feeding stuffs — Preparation of test samples*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 1928 apply.

4 Principle

Combustion of a weighed portion of the test sample in oxygen in a bomb calorimeter under standardized conditions. Calculation of the gross calorific value from the temperature rise of the water in the calorimeter vessel and the mean effective heat capacity of the calorimeter. Allowances are made for the heat released by the ignition fuse, for thermochemical corrections and, where appropriate, for heat losses from the calorimeter to the water jacket.

5 Reagents and materials

Use only reagents of recognized analytical grade.

5.1 Water, complying with at least grade 3 in accordance with ISO 3696.

5.2 Oxygen, at a pressure capable of filling the bomb to 3 MPa and free from combustible matter.

NOTE 1 Oxygen manufactured by an electrolytic process may contain up to 4 % of hydrogen and is therefore unsuitable.

NOTE 2 1 MPa = 1 MN/m².

¹⁾ To be published. (Revision of ISO 6496:1983)

²⁾ To be published. (Revision of ISO 6498:1983)