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GB/T 6433-2025

Replacing GB/T 6433-2006

Determination of crude fat in feeds

饲料中粗脂肪的测定

(ISO 6492:1999, Animal feeding stuffs - Determination of fat content, MOD)

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Standardization Administration of the People's Republic of China.

Table of Contents

Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 "*Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*".

This document replaces GB/T 6433-2006 "*Determination of crude fat in feeds*". Compared with GB/T 6433-2006, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) DELETE the sampling (see Clause 7 of the 2006 edition);

b) MODIFY the sample preparation requirements (see 4.4 of this document, Clause r 8 of the 2006 edition);

c) ADD the pre-extraction requirements for extruded pellet feeds (see 4.1 and 4.5.1 of this document);

d) MODIFY the unit of determination results to percentage (see 4.6 of this document, Clause 10 of the 2006 edition);

e) MODIFY the precision requirements (see 4.7 of this document, Clause 11 of the 2006 edition);

f) ADD the filter bag method (see Clause 5 of this document).

This document has modified and adopted ISO 6492:1999 "*Animal feeding stuffs - Determination of fat content*". Compared with ISO 6492:1999, this document has made the following structural adjustments:

- 4.1 corresponds to Clause 4 of ISO 6492:1999;

- 4.2 corresponds to Clause 5 of ISO 6492:1999;

- 4.3 corresponds to Clause 6 of ISO 6492:1999;

- DELETE Clause 7 of ISO 6492:1999;

- 4.4 corresponds to Clause 8 of ISO 6492:1999;

- 4.5 corresponds to Chapter 9 of ISO 6492:1999;

- 4.6 corresponds to Clause 10 of ISO 6492:1999;

- 4.7 corresponds to Clause 11 of ISO 6492:1999;

- DELETE Clause 12, Annex A and bibliography of ISO 6492:1999;

- ADD Clause 5.

The technical differences between this document and ISO 6492:1999 and their reasons are as follows:

- ADD the pre-extraction requirements for extruded pellet feeds (see 4.1 and 4.5.1 of this document), to meet the needs of crude fat testing of extruded pellet feeds in China;

- REPLACE ISO 3696 with GB/T 6682 (see 4.2.1 of this document), to meet the technical characteristics of China;

- DELETE the content of sampling;

- REPLACE ISO 6498 with GB/T 20195 (see 4.4 of this document), to meet the technical characteristics of China;

- MODIFY the sample preparation requirements (see 4.4 of this document, Clause 7 of ISO 6492:1999), to meet the needs of crude fat testing in different forms of feed raw materials and feed products in China;

- MODIFY the unit of determination results to percentage (see 4.6 of this document, Clause 10 of ISO 6492:1999), to be consistent with the provisions of the national standards for feed labeling in China;

- MODIFY the precision requirements (see 4.7 of this document, Clause 11 of ISO6492:1999) to be applicable to the actual technical level of crude fat testing of feeds in China;

- ADD the filter bag method (see Clause 5 of this document), to meet the development trend of crude fat testing technology at home and abroad and meet the actual testing needs of feed industry of China.

This document has made the following editorial changes:

- MODIFY the standard name to "*Determination of crude fat in feeds*";

- CLARIFY the ISO 6492:1999 method as "Soxhlet extraction method", to distinguish the added filter bag method.

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

This document was proposed by and shall be under the jurisdiction of National Technical Committee on Feed Industry of Standardization Administration of China (SAC/TC 76).

Determination of crude fat in feeds

1 Scope

This document describes the Soxhlet extraction and filter bag methods for the determination of crude fat in feeds.

This document applies to the determination of crude fat in compound feeds, concentrated feeds, concentrate supplements, and feed ingredients (except algae and its processed products).

To ensure the effectiveness of crude fat determination in this document, feeds are divided into the following two categories, and Category B products need to be hydrolyzed before extraction.

Category B:

- animal-derived feed ingredients, including dairy products;
- plant-derived feed ingredients from which fats cannot be extracted without prior hydrolysis, such as gluten, yeast, soya and potato proteins, as well as heat-treated feed ingredients and feed products;
- compound feeds, concentrated feeds, and concentrate supplements that use animal-derived feed ingredients and/or plant-derived feed ingredients from which fats cannot be extracted without prior hydrolysis, where at least 20 % of the crude fat comes from these feed ingredients.

Category A:

- compound feeds, concentrated feeds, concentrate supplements, and feed ingredients other than category B.

2 Normative references

The following referenced documents are indispensable for the application 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.

GB/T 6682 Water for analytical laboratory use - Specification and test methods (GB/T 6682-2008, ISO 3696:1987, MOD)

GB/T 20195 Animal feed - Preparation of test samples (GB/T 20195-2024, ISO 6498:2012, MOD)

carbide chips (4.2.7) and weigh (m_1) to the nearest 0.0001 g, accurately transfer 50 mL of petroleum ether extract into this flask.

4.5.2.2 Distill off the solvent until it is nearly dry, add 2 mL of acetone (4.2.4) to the flask, swirl the flask and slowly heat it on the heating device (4.3.4) to remove the acetone. Dry the residue in the electric drying oven (4.3.5) at 103 ℃ ± 2 ℃ for 10 min, take out, place in the desiccator (4.3.7) to cool, and weigh (m_2) to the nearest 0.0001 g. The following steps can also be taken: distill off the solvent, dry the residue in the flask in the electric vacuum drying oven (4.3.6) at 80 ℃ for 90 min, take out, place in the desiccator (4.3.7) to cool, and weigh (m_2) to the nearest 0.0001 g.

4.5.2.3 Take out all the residue in the extraction thimble, evaporate in a fume hood to remove the residual petroleum ether, and weigh the residue mass (m_3) to the nearest 0.0001 g. Crush the residue so that it passes through a test sieve with a pore size of 1.0 mm, and process according to 4.5.3.

4.5.3 Sample weighing

Perform two tests in parallel. Weigh 5 g (m_4) of sample (4.4 or 4.5.2.3) to the nearest 0.0001 g. For category B samples, process according to 4.5.4; for category A samples, transfer to an extraction thimble (4.3.2), cover with absorbent cotton, and process according to 4.5.5.

4.5.4 Hydrolysis

Transfer the sample to a 400 mL beaker or a 500 mL conical flask (or flask), add 100 mL of hydrochloric acid solution (4.2.5), 4 ~ 6 glass beads or some silicon carbide chips (4.2.7), cover with a watch glass, or connect the conical flask (or flask) with a reflux condenser, heat on a hot plate or heating jacket until the mixture is slightly boiling, keep for 60 min, and swirl and shake every 10 min to prevent the sample from sticking to the container wall.

Cool to room temperature, add a certain amount of diatomaceous earth (4.2.8) to prevent loss of fat during the filtration, filter through a moistened fat-free double-layer filter paper in a Buchner funnel with suction, and wash the residue with cold water until it is neutral.

NOTE: If oil or fat appears on the surface of the filtrate, wrong results may be obtained. A possible solution is to reduce the sample weight (4.5.3) or increase the acid concentration and re-hydrolyze.

Carefully remove the filter, place the double-layer filter paper containing the residue in an extraction thimble (4.3.2), place in an electric vacuum drying oven (4.3.6), dry under vacuum at 80 ℃ for 60 min, remove the extraction thimble, and cover the sample with absorbent cotton.

4.5.5 Extraction

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