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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 21514-2025

Replacing GB/T 21514-2008

Determination of fatty acids in feeds

饲料中脂肪酸的测定

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 21514-2008 "Determination of fatty acid content in feed". Compared with GB/T 21514-2008, except for the structure in addition to adjustments and editorial changes, the main technical changes are as follows.

- a) Change the scope of application to "compound feed, concentrated feed, concentrate supplement, pet feed and feed ingredients (algae and its processed products) (Except for products)" (see Chapter 1, Chapter 1 of the 2008 edition);
- b) Added hydrolysis extraction method (see 4.5.2.2);
- c) The Soxhlet extraction method has been changed (see 4.5.2.3, 5.1 of the 2008 edition);
- d) The saponification of fats and methyl esterification of fatty acids have been modified (see 4.5.3, 5.3.4 of the 2008 edition);
- e) Deleted "Preparation of fatty acid methyl esters containing four or more carbon atoms (potassium hydroxide-hydrogen chloride method)" (see 2008 Version 5.4);
- f) The determination steps have been changed (see 4.5.4, 6.3 of the 2008 edition);
- g) The test data processing has been changed (see 4.6, Chapter 7 of the 2008 edition);
- h) The precision requirements have been changed (see 4.7, Chapter 8 of the 2008 edition);
- i) Added normalization method (see Chapter 5);
- j) Added the detection limit and quantification limit of 37 fatty acids, basic information of 37 fatty acid methyl ester standards, Conversion factors for esters, fatty acids and fatty acid

triglycerides (see Appendices A, B and D).

This document is modified to adopt ISO/T S17764-1.2002 "Determination of fatty acid content in animal feeds - Part 1: Preparation of methyl esters", ISO/T S17764-2.2002 "Determination of fatty acid content in animal feeds - Part 2: Gas chromatography method", document type is ISO 's technical the technical specifications are adjusted to my country's national standards.

Compared with ISO/T S17764-1.2002 and ISO/T S17764-2.2002, this document has made the following structural adjustments.

- Chapter 1 corresponds to Chapter 1 of ISO/T S17764-1.2002 and ISO/T S17764-2.2002;
- Chapter 2 corresponds to Chapter 2 of ISO/T S17764-1.2002 and ISO/T S17764-2.2002;
- Chapter 3 corresponds to Chapter 3 of ISO/T S17764-2.2002;
- 4.1 corresponds to 5.1 of ISO/T S17764-1.2002 and Chapter 4 of ISO/T S17764-2.2002;
- 4.2 corresponds to 5.2 of ISO/T S17764-1.2002 and Chapter 5 of ISO/T S17764-2.2002;
- 4.3 corresponds to 5.3 of ISO/T S17764-1.2002 and Chapter 6 of ISO/T S17764-2.2002;
- The added sample is 4.4;
- Added sample weighing to 4.5.1;
- 4.5.2 corresponds to Chapter 3 of ISO/T S17764-1.2002;
- 4.5.3 corresponds to 5.4 of ISO/T S17764-1.2002;
- Deleted Chapter 4, Chapter 6, Chapter 7 and Chapter 8 of ISO/T S17764-1.2002;
- 4.5.4 corresponds to Chapter 7 and Chapter 8 of ISO/T S17764-2.2002;
- 4.6 corresponds to Chapter 9 of ISO/T S17764-2.2002;
- 4.7 corresponds to Chapter 10 of ISO/T S17764-2.2002;
- Deleted Chapter 11, Appendix A and references of ISO/T S17764-2.2002;
- Added normalization method to Chapter 5.

The technical differences between this document and ISO/T S17764-1.2002 and ISO/T S17764-2.2002 and their reasons are as follows.

- The term and definition of "exlutable content" (see 3.2 of ISO/T S17764-2.2002) have been deleted to comply with the requirements of my country's feed Actual situation of fatty acid detection;
- Added the hydrolysis extraction method for fat extraction (see 4.5.2.2), and changed the

Soxhlet extraction method (see 4.5.2.3, ISO/T S17764-1.

2002, Chapter 3), to meet the needs of fatty acid detection in feed in my country;

--- Changed the saponification conditions of fats and methyl esterification of fatty acids (see 4.5.3, 5.4 of ISO/T S17764-1.2002) to meet our the need for fatty acid testing in feed in China;

--- Deleted "Preparation of fatty acid methyl esters containing four or more carbon atoms (potassium hydroxide-hydrogen chloride method)", "storage", "testing the three chapters of the "Report" (see Chapter 6, Chapter 7 and Chapter 8 of ISO/T S17764-1.2002) are in line with the requirements of the fatty acid test in feed in my country.

Measure the actual situation;

--- Modified the fatty acid determination steps (see 4.5.4, Chapter 7 and Chapter 8 of ISO/T S17764-2.2002) to comply with domestic and foreign standards.

The current status of gas chromatography technology development and the actual situation of fatty acid detection in feed in my country;

--- The test data processing (see 4.6, Chapter 9 of ISO/T S17764-2.2002) has been changed to meet the actual test requirements of my country's feed industry.

Measurement needs;

---Changed the precision requirements (see 4.7, Chapter 10 of ISO/T S17764-2.2002) to meet the actual testing requirements of my country's feed industry Technical conditions;

--- Added the "normalization method" (see Chapter 5) to meet the needs of fatty acid detection in feed in my country.

The following editorial changes have been made to this document.

--- To coordinate with the existing standard, the name of the standard is changed to "Determination of Fatty Acids in Feed";

--- Deleted Notes 1 and 2 of Chapter 1 and Note 5.4.6 of ISO/T S17764-1.2002, as well as the Notes of ISO/T S17764-2.2002 Notes on 3.1, 5.4, 6.2, 6.3;

--- Deleted Appendix A and references of ISO/T S17764-2.2002.

1 Scope

This document describes a method for the gas chromatographic determination of fatty acids in feeds.

This document applies to compound feed, concentrated feed, concentrate supplement, pet feed and feed ingredients (except algae and its processed products) Determination of fatty acids.

This document is not applicable to the determination of polymerized fatty acids.

The detection limits and quantification limits of fatty acids in this document shall be implemented in accordance with Appendix A.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 6433 Determination of crude fat in feeds (GB/T 6433-2025, ISO 6492:1999, MOD)
GB/T 6682 Specifications and test methods for water used in analytical laboratories (GB/T 6682-2008, ISO 3696:1987, MOD) GB/T 20195 Preparation of Animal Feed Samples (GB/T 20195-2024, ISO 6498:2012, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.

fatty acid content

The mass fraction of fatty acids in samples such as oils, fats, fat extracts, free fatty acids or soaps.

The percentage of a certain fatty acid in the sample to the total amount of all fatty acids.

4.1 Principle

After the fat in the sample is extracted by Soxhlet extraction or hydrolysis (animal and vegetable oil samples are not extracted), it is saponified and methylated under alkaline conditions to produce the fatty acid methyl esters were separated by gas chromatography and determined by flame ionization detector using internal standard method.

4.2 Reagents or materials

Warning. Boron trifluoride is a toxic substance. It is recommended that analysts do not directly use methanol and boron trifluoride to prepare boron trifluoride methanol solution.

The solution was purchased directly, and the saponification and methylation operations were completed in a fume hood.

Unless otherwise specified, only analytical grade reagents were used.