



BSI Standards Publication

Animal feeding stuffs — Methods of sampling and analysis — Determination of benzoic and sorbic acid by High Performance Liquid Chromatography (HPLC)

National foreword

This British Standard is the UK implementation of EN 17298:2019.

The UK participation in its preparation was entrusted to Technical Committee AW/10, Animal feeding stuffs.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 94203 7

ICS 71.040.40; 65.120

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

English Version

**Animal feeding stuffs - Methods of sampling and analysis -
Determination of benzoic and sorbic acid by High
Performance Liquid Chromatography (HPLC)**

Aliments des animaux - Méthodes d'échantillonnage et
d'analyse - Dosage de l'acide benzoïque et de l'acide
sorbique par chromatographie liquide à haute pression
(CLHP)

Futtermittel - Probenahme- und
Untersuchungsverfahren - Bestimmung von
Benzoessäure und Sorbinsäure mittels Hochleistungs-
Flüssigchromatographie (HPLC)

This European Standard was approved by CEN on 17 June 2019.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Principle	6
5 Reagents	6
6 Apparatus.....	7
7 Sampling.....	8
8 Preparation of test sample	8
9 Procedure.....	8
9.1 General.....	8
9.2 Extraction.....	8
9.3 Calibration	9
9.4 Measurement of the calibration standards and sample solutions.....	10
9.5 Confirmation of identity	10
10 Calculation and expression of results.....	10
11 Precision.....	11
11.1 Interlaboratory test.....	11
11.2 Repeatability.....	12
11.3 Reproducibility	12
12 Test report.....	12
Annex A (normative) Flow chart.....	13
Annex B (informative) Precision data — Results of the validation study.....	14

European foreword

This document (EN 17298:2019) has been prepared 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 February 2020, and conflicting national standards shall be withdrawn at the latest by February 2020.

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

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Organic acids and their salts such as citric acid, formic acid, lactic acid, acetic acid, propionic acid, fumaric acid, benzoic acid and sorbic acid are animal feed additives which play an important role in animal feeding by improving the animals' performance and decreasing the development of pathogenic microorganisms in the intestine especially in the pig production. Concerning the feed legislation the substances can be used for different purposes depending on its functions and properties. According to their functional principle or their function, the relevant organic acid could be allocated within one or more of the functional groups mentioned in Annex I of Regulation (EC) no. 1831/2003 as preservative, acidity regulators, flavouring compounds, silage additives or other zoo-technical additives.

1 Scope

This document specifies a method for the determination of benzoic acid and sorbic acid in animal feeding stuffs by high-performance liquid chromatography method with ultraviolet detection (HPLC-UV).

The method is intended to be used for the determination of benzoic acid and sorbic acid as active substances in feed additives, premixtures, feed materials and compound feed and for benzoic acid in water. This method determines the total extractable concentration of these organic acids and their salts.

It is advisable that the working range of the method is determined for each organic acid by the user of this standard. The lower limit of the working range depends on the matrix and the interferences encountered. It is advisable that a working range between 5 mg/l and 100 mg/l is accessible.

The method was successfully tested in an inter-laboratory study in concentrations between 0,02 % up to 9,0 %.

On the basis of the referred working range, sample weight and extraction volume, limits of quantification (LOQ), as calculated (Table 1) on the basis of a wavelength of 230 nm, can be achievable.

Table 1 — Limits of quantification (LOQ) at 230 nm

Organic acid	LOQ (mg/kg)
Benzoic acid	200
Sorbic acid	200

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.

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

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

3 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

feed additives

substances, micro-organisms or preparations, other than feed material and premixtures, which are intentionally added to feed or water

[SOURCE: Regulation (EC) No 1831/2003/Article 2/2 a [1]]

3.2

animal feeding stuffs

any substance or product, including additives, whether processed, partially processed or unprocessed, intended to be used for oral feeding to animals

[SOURCE: Regulation (EC) No 178/2002/Article 2/4 [2]]