

Animal feeding stuffs - Methods of sampling and analysis - Determination of organic acids by Ion Chromatography with Conductivity Detection (IC-CD)

## EESTI STANDARDI EESSÕNA

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English Version

**Animal feeding stuffs - Methods of sampling and analysis -  
Determination of organic acids by Ion Chromatography  
with Conductivity Detection (IC-CD)**

Aliments des animaux - Méthodes d'échantillonnage et  
d'analyse - Dosage des acides organiques par  
chromatographie ionique avec détection  
conductimétrique (CI-DC)

Futtermittel - Probenahme- und  
Untersuchungsverfahren - Bestimmung organischer  
Säuren mittels Ionenchromatographie mit  
Leitfähigkeitsdetektion (IC-CD)

This European Standard was approved by CEN on 24 June 2019.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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## European foreword

This document (EN 17294:2019) 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of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2020.

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## 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 organic acids in animal feeding stuffs by Ion Chromatography with conductivity detection (IC-CD).

The method is intended to be used for the determination of formic acid, lactic acid, propionic acid, citric acid, fumaric acid and malic acid as active substances in feed additives, premixtures, feed materials, compound feed and water and for acetic acid in a limited manner in the same matrices. This method determines the total extractable concentration of the above mentioned organic acids and their salts.

It is advisable that the user of this standard determines the working range of the method for each organic acid. The lower limit of the working range depends on the matrix and the interferences encountered. It is advisable that a working range between 10 mg/l and 100 mg/l is achievable.

The method was successfully tested in an inter-laboratory study in concentrations between 0,02 % up to 27 % of the above mentioned organic acids.

**NOTE** Limitation occurs during simultaneous determination of high concentration of lactic acid and low concentration of acetic acid. If the ratio of concentration of lactic acid to acetic acid exceeds factor 20, the determination of acetic acid is not guaranteed.

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

**Table 1 — Limits of quantification (LOQ)**

<b>Organic acid</b>	<b>LOQ mg/kg</b>
Formic acid	200
Lactic acid	200
Propionic acid	200
Citric acid	200
Fumaric acid	200
Acetic acid	200
Malic 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)*

EN ISO 10304-1, *Water quality — Determination of dissolved anions by liquid chromatography of ions — Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate (ISO 10304-1)*