



**International
Standard**

ISO 5132

**Animal and vegetable fats and
oils — High-performance liquid
chromatography (HPLC) analysis of
phenolic antioxidants**

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document describes the analysis of synthetic phenolic antioxidants intentionally added to oils and fats, or inadvertently added during manufacturing processes. Information is also included for estimating the absence of an antioxidant from oils and fats within the limitations of the method. Interference from natural compounds present in rapeseed (canola) oil are also addressed.

This document represents AOCS Official Method Ce 6a-2021^[1].

Animal and vegetable fats and oils — High-performance liquid chromatography (HPLC) analysis of phenolic antioxidants

1 Scope

This document specifies a method for the analysis of phenolic antioxidants by high-performance liquid chromatography (HPLC).

It is applicable to quantifying the following synthetic phenolic compounds added to animal and vegetable fats, oils and shortenings as antioxidants, at concentrations normally added to oils:

- propyl gallate (PG);
- octyl gallate (OG);
- dodecyl gallate (also called “lauryl gallate (LG)”);
- 2,4,5-trihydroxybutyrophenone (THBP);
- tert-butylhydroquinone (TBHQ);
- nordihydroguaiaretic acid (NDGA);
- 2- and 3-tert-butyl-4-hydroxyanisole (BHA);
- 2,6-di-tert-butyl-4-(hydroxymethyl)phenol (BHT Alcohol or Ionox-100);
- 2,6-di-tert-butyl-4-hydroxytoluene (BHT).

A method for determining the absence of an antioxidant, or the maximum trace amount, within the limits of the analysis, is given in [Annex B](#).

The issue of canolol, a naturally occurring substance in rapeseed, interfering with the analysis is addressed in [Annex C](#).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

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

4 Principle

The sample is diluted in hexane. The antioxidants are extracted into acetonitrile, diluted with isopropanol and analysed by reversed-phase gradient HPLC with ultraviolet (UV) detection at 280 nm.