
**Animal and vegetable fats and oils —
Cocoa butter equivalents in cocoa butter
and plain chocolate —**

**Part 1:
Determination of the presence of cocoa
butter equivalents**

Corps gras d'origines animale et végétale — Équivalents au beurre de cacao dans le beurre de cacao et dans le chocolat de ménage —

Partie 1: Détermination de la présence d'équivalents au beurre de cacao



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 23275-1 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

ISO 23275 consists of the following parts, under the general title *Animal and vegetable fats and oils — Cocoa butter equivalents in cocoa butter and plain chocolate*:

- *Part 1: Determination of the presence of cocoa butter equivalents*
- *Part 2: Quantification of cocoa butter equivalents*

Introduction

“Cocoa butter equivalents” is the general term for fats used to replace cocoa butter in chocolate. They resemble the chemical composition and physical properties of cocoa butter very closely, making them therefore extremely difficult to quantify and even in some cases to detect. In principle, cocoa butter equivalents must by definition be fats low in lauric acid, rich in symmetrical mono-unsaturated triacylglycerols of the type 1,3-dipalmitoyl-2-oleoylglycerol, 1-palmitoyl-2-oleoyl-3-stearoylglycerol and 1,3-distearoyl-2-oleoylglycerol, miscible with cocoa butter, and obtained only by refining and fractionation.

Within the European Union, the following vegetable fats, obtained from the plants listed below, may be used singly or in blends, according to Directive 2000/36/EC [1]:

- illipé, Borneo tallow or tengkawang (*Shorea* spp.),
- palm oil (*Elaeis guineensis*, *Elaeis olifera*),
- sal (*Shorea robusta*),
- shea (*Butyrospermum parkii*),
- kokum gurgi (*Garcinia indica*), and
- mango kernel (*Mangifera indica*).

This part of ISO 23275 specifies a procedure for the detection of these fats (restrictions are only made for pure illipé fat samples) in cocoa butter and plain chocolate. ISO 23275-2 specifies a procedure allowing a reliable quantification of these fats at the level of 5 %, complying with the statutory limit laid down in Directive 2000/36/EC [1] of the European Parliament and the Council.

To facilitate the usage of both parts of ISO 23275, an analytical toolbox named “CoCal-1” has been established. “CoCal-1” contains the validated methods for detection (part 1) and quantification (part 2) of CBEs in plain chocolate, and also a certified cocoa butter reference material (IRMM-801) to calibrate the analyst’s instruments and an electronic evaluation sheet for Microsoft Excel® to calculate the final result. An analyst working on CBE detection and quantification has only to calibrate the gas chromatographic separation system using IRMM-801, separate the triglyceride fractions of the sample in question, and use the electronic evaluation sheet for subsequent data treatment to detect and quantify CBEs.

Information on “CoCal-1” is available on the website of the Institute for Reference Materials and Measurements: <http://www.irmm.jrc.be>.

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Animal and vegetable fats and oils — Cocoa butter equivalents in cocoa butter and plain chocolate —

Part 1:

Determination of the presence of cocoa butter equivalents

1 Scope

This part of ISO 23275 specifies a procedure for the detection of cocoa butter equivalents (CBEs) in cocoa butter (CB) and plain chocolate by high-resolution capillary gas liquid chromatography (HR-GC) of triacylglycerols and subsequent data evaluation by regression analysis.

The method is applicable for the detection of 2 % CBE admixture to cocoa butter, corresponding to about 0,6 % CBE in chocolate (i.e. the assumed fat content of chocolate is 30 %).

2 Terms and definitions

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

2.1

cocoa butter equivalents

CBEs

fats detected in cocoa butter and plain chocolate according to the procedure specified in this part of ISO 23275

NOTE The result is expressed as a qualitative result, i.e. CBEs present/CBEs not present (YES/NO).

3 Principle

Cocoa butter, or the fat obtained by solvent extraction from plain chocolate, is separated by HR-GC into triacylglycerol fractions according to their molecular mass and degree of unsaturation. The presence of CBEs is detected by linear regression analysis applied to individual triacylglycerol fractions of the fat analysed.

4 Reagents and materials

Use only reagents of recognized analytical grade, unless otherwise stated.

WARNING — Attention is drawn to the regulations which specify the handling of dangerous matter. Technical, organizational and personal safety measures shall be followed.

4.1 Cocoa butter Certified Reference Material (CRM) IRMM-801 [2], for calibration purposes and system suitability check.

4.2 Fat solvent, non-chlorinated solvents (e.g. diethyl ether, *n*-heptane, iso-octane).