

CODEX ALIMENTARIUS COMMISSION



Food and Agriculture
Organization of the
United Nations



World Health
Organization

Viale delle Terme di Caracalla, 00153 Rome, Italy - Tel: (+39) 06 57051 - E-mail: codex@fao.org - www.codexalimentarius.org

Agenda Item 5.2

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ORIGINAL LANGUAGE ONLY

JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING

45th Session

9 – 13 March 2026

REVIEW OF METHODS OF ANALYSIS IN CXS 234: COCOA PRODUCTS AND CHOCOLATE WORKABLE PACKAGE

(Prepared by the EWG led by Serbia)

Introduction

1. CCMAS, as part of its ongoing work to ensure that methods of analysis in the *Recommended methods of analysis and sampling* (CXS 234-1999) are current and fit-for-purpose, has been reviewing the cocoa products and chocolate package.
2. Work on the review of these methods was undertaken by an EWG chaired by Serbia and co-chaired by USA, and the report of this EWG was considered by CCMAS44 (2025).
3. At CCMAS44, certain methods were endorsed and/or revoked, while other methods required further consideration.
4. CCMAS44 agreed to continue reviewing the relevant methods in workable packages for cocoa and chocolate products (REP25/MAS, Appendix II Part 3.1).
5. All interested Members and Standards Development Organizations (SDOs) were invited to assist in this work, as appropriate.
6. This report is based on the EWG activity following CCMAS44.

EWG-CCP process 2025/26

7. The terms of reference of the EWG-CCP review were to ensure that the methods of analysis listed in CXS 234 are fit-for-purpose and to re-type, if necessary, to facilitate the review process, but not to add new methods unless necessary.
8. The EWG review was completed using workbooks using information provided by the relevant SDOs (ICA, AOAC, and AOCS). All Codex Members and Observers were welcome to join the review of CCP methods and the EWG operated through the online Codex forum. The list of participants in the EWG is presented in Appendix II.
9. The EWG Chair prepared assignments and shared them with participants. Each participant was assigned methods to review and was reminded of the guidelines for the work and general guidance on how to proceed. The Chair of the EWG expressed the desire to have each method assigned to two independent experts. Members of the EWG were then asked to review a small number of methods for all appropriate commodities and to provide feedback.
10. The EWG Chair circulated the workbooks, collected responses, collated them, and prepared a summary of progress. This review process also identified an issue that may require further deliberation by CCMAS through the working group on endorsement of methods of analysis (see paragraph 12).

Results of the EWG consultation

11. Appendix I lists the methods for analysis of cocoa and chocolate products, as identified in CXS 234 and/or relevant commodity standards considered by the EWG. Where methods should be considered Type I (e.g. moisture, cocoa shell, fat), it was important to evaluate whether they were **identical** in cases where more than one of them was listed for the same commodity and provision. Evaluation of multiple Type I methods

required consideration of all parameters in the method including sample weights, grind size, time, temperature and other conditions (e.g. reagents, solutions, solvents).

12. The EWG received comments related to the method for fat-free milk solids determination. Considering that both lactose and minerals constitute a significant part of fat-free milk solids, it was the opinion of the EWG that determining only protein cannot provide an accurate measurement of fat-free milk solids in cocoa and chocolate products. While this method has been recommended for endorsement, it may require further work and suggestions.

13. From the responses of the EWG experts, the following observations were made:

- i. The International Office of Cocoa, Chocolate and Sugar Confectionery (IOCCC) has been renamed to International Confectionary Association (ICA) and the method names have been updated accordingly.
- ii. Method principles have been updated as needed.
- iii. The methods for moisture currently in CXS 234 were measured by both loss upon oven drying, and by Karl Fischer titration. Both methods are currently listed as Type I. The EWG decided to retain the loss upon drying methods as Type I, but also to include a provision for Moisture (determined as water) by Karl Fischer as Type II.
- iv. Where needed, minor editorial details have been added for clarification purposed. E.g. parenthetical added to clarify that “Fat-free milk solids” are determined as milk protein, “Cocoa Butter” is determined as fat, etc.
- v. Methods for proximate analyses (e.g. moisture) tended to be of considerable age and were developed by SDOs to meet the needs of industry at the time of development. Nonetheless, most of the methods have received positive reviews from the experts. Many of the reviewed methods are in use globally and are the subject of regular proficiency testing.

Conclusions

14. Appendix I was prepared based on the feedback received from EWG members. The appendix explains and tracks proposed changes to CXS 234. For ease of review and comparison, the appendix provides the information (Commodity, Provision, Codex Standard, Method, Principle, Type, Committee) following the new format for CXS 234. A column has been added to identify comments for consideration.

Recommendations

15. CCMAS45 is invited to:

- i. endorse the proposed amendments / revisions to CXS 234-1999 indicated in Appendix I; and
- ii. propose additional methods other than AOAC 980.14, if any, for the determination of full-fat cocoa powder, fat-reduced cocoa powder and highly fat-reduced cocoa powder (in mixtures).

APPENDIX I

Note: Amendments / revisions to CXS 234-1999 are indicated in ~~strike through~~, or **bold and underlined**. Revocations are indicated in **red**.

Cocoa products and chocolate					
Commodity	Standard	Provision	Method	Principle	Type
Chocolate and chocolate products	CXS 87	Cocoa butter (<u>determined as fat</u>)	<u>ICA No. 26 / AOAC 977.10 and AOAC 963.15 / IOCGG ICA No. 14</u>	<u>Calculation from moisture (Determined as Water) and</u> Gravimetry (Soxhlet extraction)	I
Chocolate and chocolate products	CXS 87	Milk_fat	IOCGG <u>ICA No. 5</u>	Titrimetry/Distillation	† <u>IV</u>
Chocolate and chocolate products	CXS 87	Milkfat	AOAC 945.34; 925.41B; 920.80	Titrimetry/Distillation	†
Chocolate and chocolate products	CXS 87	Moisture	AOAC 931.04	Gravimetry – <u>drying at 100 – 102 °C</u>	† <u>IV</u>
Chocolate and chocolate products	CXS 87	Moisture	IOCGG-26 or AOAC 977.10 (Karl Fischer method); IOCGG-4	Gravimetry	†
<u>Chocolate and chocolate products</u>	<u>CXS 87</u>	<u>Moisture (determined as water)</u>	<u>ICA No. 26 / AOAC 977.10</u>	<u>Titrimetry – Karl Fischer</u>	<u>II</u>
Chocolate and chocolate products	CXS 87	Non-cocoa butter vegetable fat	AOCS Ce 10/-02 and described in the standard	Described in the standard <u>GC-MS</u>	† <u>IV</u>
<u>Chocolate and chocolate products</u>	<u>CXS 87</u>	<u>Cocoa butter equivalents in cocoa butter and plain chocolate</u>	<u>ISO 23275-1 and ISO 23275-2 / AOCS Ce 11-05</u>	<u>GC-FID</u>	!
<u>Chocolate and chocolate products</u>	<u>CXS 87</u>	<u>Cocoa Butter Equivalents in Milk Chocolate</u>	<u>ISO 11053 / AOCS Ce 11a-07</u>	<u>GC-FID</u>	!
<u>Chocolate and chocolate products</u>	<u>CXS 87</u>	<u>Determination of centre and coating of filled chocolate</u>	<u>See Appendix **</u>		
Cocoa (cacao) mass or cocoa/ chocolate liquor, and cocoa cake	CXS 141	<u>Cocoa butter (determined as fat)</u> Fat	<u>ICA No. 26 / AOAC 977.10 and AOAC 963.15 / or IOCGG ICA No. 14</u>	<u>Calculation from moisture (Determined as Water) and</u> Gravimetry (Soxhlet extraction)	I
Cocoa butter	CXS 86	Free fatty acids	ISO 660 or <u>AOCS Cd 3d-63</u>	Titrimetry	I

Cocoa products and chocolate					
Commodity	Standard	Provision	Method	Principle	Type
Cocoa butter	CXS 86	Unsaponifiable matter	ISO 3596 or / ISO 18609 or / AOCS Ca 6b-53	Titrimetry Gravimetry after extraction with diethyl ether	I
Cocoa powders (cocoa) and dry cocoa-sugar mixtures	CXS 105	Moisture (determined as water)	AOAC ICA No. 26 or / AOAC 977.10 (Karl Fischer method)	Gravimetry Titrimetry - Karl Fischer	† II
<u>Cocoa powders (cocoas) and dry mixtures of cocoa and sugars</u>	<u>CXS 105</u>	<u>Determination of full-fat cocoa powder, fat-reduced cocoa powder and highly fat-reduced cocoa powder</u>	<u>AOAC 980.14</u>	<u>LC and calculation</u>	
<u>Cocoa powders (cocoas) and dry mixtures of cocoa and sugars</u>	<u>CXS 105</u>	<u>Cocoa butter (determined as fat)</u>	<u>ICA No. 26 / AOAC 977.10 and AOAC 963.15 / ICA No. 14</u>	<u>Calculation from moisture (Determined as Water) and Gravimetry (Soxhlet extraction)</u>	I

APPENDIX **: DETERMINATION OF CENTRE AND COATING OF FILLED CHOCOLATE IN CHOCOLATE AND CHOCOLATE PRODUCTS

All methods approved for the chocolate type used for the coating and those approved for the type of centre concerned.

List of relevant standards (for reference purposes)

CXS 86-1981	Standard for Cocoa Butter	CCPC
CXS 87-1981	Standard for Chocolate and Chocolate Products	CCPC
CXS 105-1981	Standard for Cocoa powders (cocoas) and dry mixtures of cocoa and sugars	CCPC
CXS 141-1983	Standard for Cocoa (Cacao) Mass (Cocoa/Chocolate Liquor) and Cocoa Cake	CCPC

APPENDIX II

LIST OF PARTICIPANTS

CHAIR

Serbia

Marija Vujić Stefanović

CO-CHAIR

United States of America

Patrick Gray

MEMBER NATIONS AND MEMBER ORGANIZATIONS
ÉTATS MEMBRES ET ORGANISATIONS MEMBRES
ESTADOS MIEMBROS Y ORGANIZACIONES MIEMBROS

AUSTRALIA - AUSTRALIE

Mr Richard Coghlan

BRAZIL - BRÉSIL - BRASIL

Ligia Lindner Schreiner

Ana Claudia Marquim Firmo De Araujo

CÔTE D'IVOIRE

Serge Pacôme N'CHO

EGYPT - ÉGYPTE - EGIPTO

Mariam Barsoum Onsy

FRANCE - FRANCIA

Jean-Luc Deborde

GHANA

Dr. Joel Cox Menka Banahene

Dr. Akwasi Akomeah Agyekum

Ms. Olivia Dzifa Peace Vordoagu

GRENADA – GRENADE - GRANADA

Mrs. Jillian St. Bernard-James

HUNGARY - HONGRIE - HUNGRÍA

Eszter Fejesné Tóth, dr

dr. Attila Nagy

Krisztina Bakó-Frányó

INDIA - INDE

Sh. Surendra Singh Raghav

Sh. Mahitosh Kumar

Prof (Dr) Alka Rao

MALAYSIA - MALAISIE - MALASIA

Wan Zalina binti Wan Faizal

Laila Rabaah binti Ahmad Suhaimi

MOROCCO - MAROC - MARRUECOS

Mr. Mr. RAHLAOUI Mounir

Mr. DIOURI Mounir

Dr. Lalla Chrif ALAOUI

Ms. MESSAOUDI Bouchra

Dr. Hecham EL HAMRI, Ph.D.

NETHERLANDS (KINGDOM OF THE) - PAYS-BAS (ROYAUME DES) - PAÍSES BAJOS (REINO DE LOS)

Mounira Tarnich

Martin Alewijn

NEW ZEALAND - NOUVELLE-ZÉLANDE - NUEVA ZELANDIA

Susan Morris

PARAGUAY

Mauricio Rebollo

PERU - PÉROU - PERÚ

Gloria Castillo Vargas

POLAND - POLOGNE - POLONIA

Mrs Magdalena Magner-Plociennik

QATAR

Jeffrey Bermundo Lavina

REPUBLIC OF KOREA - RÉPUBLIQUE DE CORÉE - REPÚBLICA DE COREA

Kiseon Hwang

Youngjun Kim

SAUDI ARABIA - ARABIE SAOUDITE - ARABIA SAUDITA

Nimah M. Baqadir

Abdulaziz A. Al Qaud

Mubarak M. Al-Garaiwi

Abdullah A. Al Sayari

Mohrah A. Alenazi

SERBIA - SERBIE

Milica Rankov

SINGAPORE - SINGAPOUR - SINGAPUR

Mr Ivan Ng (Official)

Mr Ken Lee (Alternate)

SPAIN - ESPAGNE - ESPAÑA

Ana Cristina Pérez de Diego Camacho

THAILAND - THAÏLANDE - TAILANDIA

Ms Chitrlada Booncharoen

Ms Rungrassamee Mahakhaphong

Ms Kittiporn Phuangsuk

Mr Wittawat Kaewdee

OBSERVERS - OBSERVATEURS – OBSERVADORES**NON-GOVERNMENTAL ORGANIZATIONS –
ORGANISATIONS NON GOUVERNEMENTALES –
ORGANIZACIONES NO GUBERNAMENTALES****EUROPEAN COCOA ASSOCIATION**

Catherine Entzminger

INTERNATIONAL CONFECTIONERY ASSOCIATION (ICA)

Allie Graham

Eleonora Alquati

Farida Mohamedshah