

CODEX ALIMENTARIUS COMMISSION

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Food and Agriculture
Organization of the
United Nations



World Health
Organization

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CL 2022/60/OCS-MAS
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TO: Codex Contact Points
Contact Points of international organizations having observer status with Codex

FROM: Secretariat, Codex Alimentarius Commission,
Joint FAO/WHO Food Standards Programme

SUBJECT: **Review of methods in CXS 234 - 1999: Request for comments on the fats and oils workable package**

DEADLINE: **3 February 2023**

BACKGROUND

1. For information, please refer to report of the EWG attached to this CL.

REQUEST FOR COMMENTS

2. Codex members and observers are invited to submit comments on the fats and oils workable package which is uploaded to the Codex Online Commenting System (OCS): <https://ocs.codexalimentarius.org/>, as per the guidance below. In particular, members and observers are requested to consider the proposals presented in the Appendix to the report of the EWG and to endorse the proposed changes to CXS 234 - 1999.

GUIDANCE ON THE PROVISION OF COMMENTS

3. Comments should be submitted through the Codex Contact Points of Codex members and observers using the OCS.
4. Contact Points of Codex members and observers may login to the OCS and access the document open for comments by selecting "Enter" in the "My reviews" page, available after login to the system.
5. Contact Points of Codex members and observers organizations are requested to provide proposed changes and relevant comments/justifications on a specific method/provision and/or at the document level (general comments or summary comments). Additional guidance on the OCS comment categories and types can be found in the OCS [Frequently Asked Questions \(FAQs\)](#).
6. Other OCS resources, including the user manual and short guide, can be found at the following link: <http://www.fao.org/fao-who-codexalimentarius/resources/circular-letters/en/>.
7. For questions on the OCS, please contact Codex-OCS@fao.org.

REVIEW OF METHODS OF ANALYSIS IN CXS 234 FATS AND OILS WORKABLE PACKAGE

(Prepared by the Electronic Working Group chaired by the Netherlands)

INTRODUCTION

1. At its 41st session, CCMAS agreed to continue efforts on the workable packages for the review and update of CODEX STAN 234-1999 (CXS 234-1999). The Committee agreed to continue the review of all methods related to relevant fats and oils. An EWG chaired by the Netherlands has provided CCMAS with the review as presented in Appendix I for consideration in CCMAS42.
2. CCFO27 were forwarded a number of questions raised from CCMAS41 concerning the review of methods in section A of Appendix I¹. Furthermore, a CRD was prepared for CCFO27 to additionally inform CCFO27 of this matter.² CCFO27 agreed³:
 - i. to the proposed editorial amendments to the methods of analysis (including changes to typing of methods) for fats and oils as proposed by CCMAS and contained in CXS 234-1999 and to inform CCMAS that there were no trade implications related to retyping of methods;
 - ii. to forward the proposed performance criteria for total arsenic in edible fats and oils and inorganic arsenic in fish oils to CCMAS for consideration;
 - iii. to inform CCMAS that the Crismer value and Halphen test in the *Standard for Named Vegetable Oils* (CXS 210-1999) were still in use and requested CCMAS to retain those methods.
3. CAC44 adopted the methods of analysis for provisions for fats and oils (part 4.3 of REP21/MAS), which had been considered and agreed upon by CCFO27.⁴

EWG PROCESS AND DISCUSSION

4. The EWG was initiated and operated through coordination of the EWG chair via e-mail. The EWG chair managed all communication within the EWG and kept track of all documents and comments. The list of participants is attached in Appendix II.
5. The EWG focused discussions on the remaining methods for review and took into account the feedback from CCFO27. The questions discussed in the EWG and the replies thereto are available [here](#).
6. The outcomes of the EWG are presented in Appendix I.
7. Concerning Fish oils – Vitamin A and Vitamin D, an elaborated review is provided in documents available [here](#). Section B of Appendix I contains the suggested changes to CXS 234-1999.
8. Concerning the Olive Oil and Olive Pomace oils, an elaborated review is provided in the document available [here](#). Section C of Appendix I contains the suggested changes to CXS 234-1999. Methods up for review were selected by comparison of the proposed review of the *Standard for Olive Oils and Olive Pomace Oils* CXS 33 - 1981 with the items currently listed in CXS 234 - 1999.⁵ Provisions where significant changes are proposed for CXS 33 - 1981 (i.e. removal of a provision or method, introduction of a new method or provision) were omitted in this review. This resulted in 11 provisions for this commodity that were reviewed.

RECOMMENDATION

9. The Committee is invited to consider Appendix I and endorse the proposed changes to CXS 234 - 1999.

¹ [REP/MAS41](#)

² [CCFO27 / CRD02](#)

³ [CCFO27 / REP22/FO](#)

⁴ [CAC44 / REP21 CAC](#) – Para 49.

⁵ [CX/FO 21/27/06](#)

APPENDIX I

Summary of the fats and oils review and suggested changes to CXS-234 - 1999.
(for comments)

Section A – Matters agreed by CCFO27

Commodity	Provision	Method	Principle	Type
Fats and oils	Butylhydroxyanisole, butylhydroxytoluene, tert-butylhydroquinone, & propylgallate	AOAC 983.15; or AOCS Ce 6-86	Liquid chromatography	II
Fats and oils	Synthetic antioxidants	AOCS Ce 6-86	Liquid chromatography	II
Fats and oils	Synthetic antioxidants	AOAC 983.15	Liquid chromatography	III
Fish oils	Fatty acid composition	AOCS Ce 1a-13	Capillary GLC	III
Fish oils	Fatty acid composition	AOCS Ce 2-66	Preparation of methyl esters by fatty acids	III
Fish oils	Fatty acid composition	AOCS Ce 1b-89	GLC	III
Fish oils	Fatty acid composition	AOCS Ce 2b-11	Alkali hydrolysis	III
Fish oils	Fatty acid composition	AOCS Ce 2b-11 and AOCS Ce 1j-07	Gas Chromatography of methyl esters	III
Fish oils	Fatty acid composition	AOCS Ce 1i-07	Capillary GLC	III
Fish oils	Fatty acid composition	ISO 12966-2	Gas chromatography	III
Fish oils	Fatty acid composition	ISO 5508	Gas chromatography	III
Fish oils	Fatty acid composition	AOCS Ce 2-66 and AOCS Ce 1i-07	Gas Chromatography of methyl esters	II
Fish oils	Fatty acid composition	AOCS Ce 2-66 and AOCS Ce 1a-13	Gas Chromatography of methyl esters	<u>Remove</u>
Fish oils	Fatty acid composition	AOCS Ce 2b-11 and AOCS Ce 1i-07 or AOCS Ce 1j-07	Gas Chromatography of methyl esters	III
Fish oils	Fatty acid composition	ISO 12966-2 and ISO 12966-4	Gas Chromatography of methyl esters	III
Fish oils	Fatty acid composition	AOCS Ce 1b 89	Gas Chromatography of methyl esters	III
Named Animal Fats	GLC ranges of fatty acid composition	ISO 5508 and ISO 12966-2; or AOCS Ce 2-66 and Ce 1e-91 or Ce 1f-96	Gas chromatography of methyl esters	II
Named Animal Fats	Fatty acid composition	ISO 12966-2 and ISO 12966-4 / AOCS Ce 2-66 and Ce 1f-96 1j-07	Gas Chromatography of methyl esters	II
Named Animal Fats	Fatty acid composition	Ce 2-66 and Ce 1f-96 1j-07	Gas Chromatography of methyl esters	II
Named Animal Fats	Fatty acid composition	Ce 2-66 and Ce 1f-96	Gas Chromatography of methyl esters	III
Named Animal Fats	Fatty acid composition	ISO 12966-2 and ISO 12966-4	Gas Chromatography of methyl esters	III
Named Animal Fats	Titre	ISO 935; or AOCS Ce 12-59	Thermometry	I
Named Animal Fats	Titre	ISO 935	Thermometry	I
Named Animal Fats	Titre	AOCS Cc 12-59	Thermometry	IV
Commodity	Provision	Method	Principle	Type

Named Vegetable Oils	Crismer value	AOCS Cb 4-35 and AOCS Ca 5a-40	Calculation from individual fatty acid composition (gas chromatography of methyl esters) and turbidity	I
Named Vegetable Oils	Halphen test	AOCS Cb 1-25	Colorimetry	I
Named Vegetable Oils	Unsaponifiable matter	ISO 3596; or ISO 18609; or AOCS Ca 6b-53	Gravimetry	I
Named Vegetable Oils	Unsaponifiable matter	ISO 3596 / AOCS Ca 6b-53	Gravimetry, drying at 103 °C and titrimetry (colorimetry)	I
Named Vegetable Oils	Unsaponifiable matter	ISO 18609	Gravimetry, drying at 103 °C and titrimetry (colorimetry)	IV

Section B – Fish oil - Vitamin A and Vitamin D review

Commodity	Provision	Method	Principle	Type
Fish Oil	Vitamin A	European Pharmacopeia Monograph on Cod Liver Oil (Type A), monograph 01/2005:1192, with LC end-point 2.2.29	LC	III
Fish Oil	Vitamin A	EN 12823-1 (Determination of vitamin A by high performance liquid chromatograph – Part 1: Measurement of all-E-retinol and 13-Z-retinol)	LC	III
Fish Oil	Vitamin A ^a	EN 12823-1	Liquid Chromatography	II
Fish Oil	Vitamin A ^a	European Pharmacopeia Monograph on Cod Liver Oil (Type A), monograph 01/2020:1192, with LC end-point 2.2.29	Liquid Chromatography	III
Fish oil	Vitamin D	EN 12821 (Determination of vitamin D by high performance liquid chromatography – Measurement of cholecalciferol (D3) or ergocalciferol (D2))	LC	III
Fish oil	Vitamin D	NMKL 167 (Cholecalciferol (vitamin D3) and Ergocalciferol (vitamin D2)). Determination by HPLC in food-stuffs	LC	III
Fish oil	Vitamin D	EN 12821	Liquid Chromatography	II
Fish oil	Vitamin D	NMKL 167	Liquid Chromatography	III

^a **Suggested footnote:** The respective standard on fish oils CXS 329-2017 states that Vitamin A is expressed as 'Retinol equivalents'(RE) where RE takes into account the fact that different vitamers of vitamin A differ in activity. ISO/TR 23304:2021 "Food products – Guidance on how to express vitamins and their vitamers" may give clarity on this matter, for example for the relevant activities of the all-E-retinol levels and 13-Z-retinol levels.

Section C – Review of Olive oil and Olive Pomace Oils methods

Provision	Method	Principle	Type
Absorbency in ultra-violet	COI/T.20/Doc. No. 19; or ISO 3656; or AOCS Ch 5-91	Absorption in ultra violet	II
Absorbance in ultra-violet	COI/T.20/Doc. No. 19 / ISO 3656 /	Spectrophotometry	II
Absorbance in ultra-violet	AOCS Ch 5-91	Spectrophotometry	III
Difference between the actual and theoretical ECN 42 triglyceride content	COI/T.20/Doc. No. 20; or AOCS Ce 5b-89	COI/T.20/Doc. No. 19; or AOCS Ce 5b-89 of HPLC and calculation	
Difference between the actual and theoretical ECN 42 triglyceride content	COI/T.20/Doc. no. 20 and COI/T.20/Doc. No. 33/Rev.1	Calculation from triglycerides by HPLC and Fatty Acid Methyl Esters by Gas Chromatography	I
Lead	AOAC 994.02; or ISO 12193; or AOCS Ca 18c-91	AAS	II
Lead	AOAC 994.02 / ISO 12193 / AOCS Ca 18c-91	Atomic absorption spectrophotometry (direct graphite furnace)	II
Organoleptic characteristics	COI/T.20/Doc. No. 15	Panel test	I
Organoleptic characteristics	COI/T.20/Doc. No. 15	Sensory analysis by a panel	I
Refractive index	ISO 3960; or AOCS Cd 8b-90	Refractometry	I
Refractive index	ISO 6320 / AOCS Cc 7-25	Refractometry	I
Relative density	ISO 6883, with the appropriate conversion factor; or AOCS Cc 10c-95	Pycnometry	I
Relative density	ISO 6883, with the appropriate conversion factor / AOCS Cc 10c-95	Pycnometry	I
Saponification value	ISO 3657; or AOCS Cd 3-25	Titrimetry	I
Saponification value	ISO 3657 / AOCS Cd 3-25	Titrimetry (Colorimetric)	I
Sterol composition and total sterols	COI/T.20/Doc. No. 30; or ISO 12228-2; or AOCS Ch 6-91	Gas Chromatography	II
4 α -desmethylsterol and total sterol content	COI/T.20/Doc. No. 26 / ISO 12228-2 / AOCS Ch 6-91	Thin-layer chromatography and gas chromatography	II
Stigmastadienes	Col/T.20/Doc. No. 11; or ISO 15788-1; or AOCS Cd 26-96	Gas chromatography	II
Stigmastadienes	ISO 15788-2	HPLC	III
Stigmastadienes content	Col/T.20/Doc. No. 11 / ISO 15788-1 / AOCS Cd 26-96	Preparative column chromatography and gas chromatography	II
Stigmastadienes content	ISO 15788-2	Liquid chromatography	III

Provision	Method	Principle	Type
Unsaponifiable matter	ISO 3596; or ISO 18609; or AOCS Ca-6b-53	Gravimetry	†
Unsaponifiable matter	ISO 3596 / AOCS Ca 6b-53	Gravimetry, drying at 103 °C and titrimetry (colorimetry)	I
Unsaponifiable matter	ISO 18609	Gravimetry, drying at 103 °C and titrimetry (colorimetry)	IV
Wax content	COI/T.20/Doc. no. 18; or AOCS Ch 8-02	Gas chromatography	II
Wax content	COI/T.20/Doc. no. 28 / AOCS Ch 8-02	Gas chromatography	II

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