



JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

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REPORT OF THE IN-SESSION MEETING FOR PROPOSED DRAFT REVISION OF THE STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS (CXS 33-1981) – REVISION OF SECTIONS 3, 8 AND APPENDIX

(Prepared by the Electronic Working Group chaired by Spain and co-chaired by Argentina)

Introduction

1. During the 28th Session of CCFO the members assisting participated in a in-session meeting to review all the issues discussed during the work of EWG on the proposed draft revision to the *Standard for Olive Oils and Olive Pomace Oils* (CXS 33-1981) - Sections 3, 8 and the Appendix.

Participation and Methodology

2. The members assisting to the CCFO28 review the results of the issues discussed by the EWG.
3. During the in-session meeting the members the following issues that were left in brackets during the CCFO27:
 - a. Minimum value of oleic acid (C18:1) of [53%] versus [55%];
 - b. Uncertainty measurements for trans fatty acid - Whether or not to use two decimal places;
 - c. Whether or not to delete the footnote on the general statement on sterols in virgin olive oil;
 - d. Whether to adopt 3.5 as the median value of the most perceived defect for virgin olive oil;
 - e. Whether or not to delete the provisions for 1,2-diglycerides (% total diglycerides) and pyropheophytin "a" (% total chlorophyll pigments) for extra virgin oil and their corresponding analytical methods; and
 - f. The need to update the methods of analysis taking into account CRD24.

Summary of the discussion

4. All the members had the opportunity to show their position on the result obtained during the work of EWG.
 - a) **Section 3.2.1 GLC ranges of fatty acid composition - the minimum value of oleic acid (C18:1) of [53%] or [55%].**
5. The EWG considered the proposed two minimum values in square brackets i.e. [53] and [55]. There was support for maintaining the minimum value for oleic acid at 55%.
6. The assisting members show their position to the result obtained and the majority showed support to the result of the EWG.
7. From the positions showed during the interventions of the different members the chair decided to maintain the proposition arises from the discussion of the EWG for oleic acid to 55%.
 - b) **3.2.1 Uncertainty measurements for trans fatty acids**
8. The EWG considered whether or not to maintain or not two decimal places for the *trans* fatty acid. The result of the discussion during the EWG was to maintain the two decimal places with consensus.

9. The revision of this result during the in-session meeting was again of consensus to maintain the two decimal places in the trans fatty acid.
10. The chair proposed to maintain the proposition arises from the discussion of the EWG for *trans* fatty acids in two decimal places.
 - c) **3.2.3 Footnote on a general statement on sterols in virgin olive oil** - *“Virgin olive oil’s authenticity is not compromised if one sterol, or their minimum content, does not fall within the ranges provided for, if all other sterols and parameters tested referred to in this standard fall within the stated ranges.”*
11. The EWG considered whether the footnote should be eliminated from the proposed draft revised standard CXS 33-1981. The result of the discussion of the EWG was without consensus to not maintain the footnote in the standard.
12. During the in-session meeting there were different positions on whether to delete the footnote or maintain it. The majority of the participant were in favor of deleting the footnote.
13. From the positions showed during the interventions of the different members the chair proposes that the footnote should not be maintained in the standard.
 - d) **3.3.1 Organoleptic characteristics of virgin olive oils** - *the median of the most perceived defect for virgin olive oils with a footnote “includes the uncertainty predicted by the IOC method.”*
14. The EWG considered whether the value of 3.5 as the median of the most intense defect in the category of virgin olive oil would be the most suitable for this category since the uncertainty of the measurement should be added to the limit. The majority of the EWG members supported the addition of the uncertainty to the limit resulting in the value of the median of the most perceived defect for the virgin olive oil category of 3.5.
15. During the in-session meeting the majority of the participants were in favor of harmonizing the value of the most perceived defect of the virgin olive oil category in 3.5 with a footnote saying that the value including the uncertainty calculated by the IOC method.
16. From the positions showed during the interventions of the different members the chair proposes to harmonize the value of the most intense perceived defect in virgin olive oil category to 3.5 with the corresponding footnote.

APPENDIX

e) 1.5. 1,2-diglycerides (% total diglycerides)

17. CCFO27 agreed to keep the provision for 1,2-diglycerides (% total diglycerides) for extra virgin oil, to also put its corresponding analytical methods in square brackets for further discussion. There was majority support within the EWG to not adding the provision for 1,2-diglycerides (% total diglycerides) and its corresponding method to the standard CXS 33-1981.
18. During the in-session meeting the majority of the participants were in favor of not to add the 1,2-diglycerides (% total diglycerides) and the corresponding method to the standard.
19. From the positions showed during the interventions of the different members the chair proposes to not to add the provision for 1,2-diglycerides (% total diglycerides) for extra virgin oil and the corresponding method to the standard.

f) 1.6. Pyropheophytin “a” (% total chlorophyll pigments)

20. CCFO27 agreed to keep the provision for Pyropheophytin “a” (% total chlorophyll pigments) for extra virgin olive oil and its corresponding method in square bracket for further discussion. There was a majority of EWG participant to not adding the provision Pyropheophytin “a” (% total chlorophyll pigments) for extra virgin olive oil and its corresponding method to the standard.
21. During the in-session meeting the majority of the participants were in favor of not to add the Pyropheophytin “a” (% total chlorophyll pigments) for extra virgin olive oil and its corresponding method to the standard.
22. From the positions showed during the interventions of the different members the chair proposes to not to add the provision for Pyropheophytin “a” (% total chlorophyll pigments) for extra virgin olive oil and its corresponding method to the standard.

g) Section 8 and Section 3 of the Appendix, Methods of Analysis

23. CCFO27 agreed to consider CRD24 when finalizing Section 3 of the Appendix – methods of analysis and sampling. The majority of the EWG members agreed to the list of methods published in CRD24. It was further noted that the section for the methods of analysis in the standard CXS 33-1981 should be aligned

to the requirements of the Procedural Manual i.e. all methods have to be transferred to the *Recommended Methods of Analysis* (CXS 234-1999), and replaced with a standardized text i.e. "For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) relevant to the provisions in this standard shall be used."

24. During the in-session meeting the majority of the participants were in favor of the inclusion of the standardized text . "For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) relevant to the provisions in this standard shall be used." , although the list of method need to be reviewed as comments from members that were sent to CCFO28.
25. From the comments made during the in-session meeting the chair decide to include the standardized text "For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) relevant to the provisions in this standard shall be used." and review the list of methods that the CCFO has to send to the CCMAS for its consideration.

Conclusions

26. The Chair of the EWG will maintain all the conclusions arises from the discussion within the EWG and review the list of methods that CCFO have provide to CCMAS.

ANNEX I**PROPOSED DRAFT REVISION TO THE STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS
(CXS 33-1981)****(Step 3 and 4)**

NOTE - i. Provisions at Step 3 (considered by the EWG) are indicated in **BOLD AND DOUBLE UNDERLINED**; text proposed for deletion are indicated in ~~Strike through~~.

ii. All other text was discussed and agreed by CCFO27 and held at Step 4.

iii. The Composition and quality factors have been produced in a table format for purposes of editing the original standard, but these will be removed during the finalisation of the standard.

1. SCOPE

This standard applies to olive oils and olive-pomace oils described in Section 2 presented in a state for human consumption.

2. DESCRIPTION

Olive oil is the oil obtained solely from the fruit of the olive tree (*Olea europaea* L.) to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds.

Virgin olive oils are the oils obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decanting, centrifuging, and filtration.

Olive-pomace oil is the oil obtained by treating olive pomace with solvents other than halogenated solvents or by other physical treatments, to the exclusion of oils obtained by re-esterification processes and of any mixture with oils of other kinds.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS**3.1 Designations and definitions**

Extra virgin olive oil: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 0.8 grams per 100 grams and whose other physicochemical and organoleptic characteristics correspond to those laid down for this category.

Virgin olive oil: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 2.0 grams per 100 grams and whose other physicochemical and organoleptic characteristics correspond to those laid down for this category.

Ordinary virgin olive oil: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 3.3 grams per 100 grams and whose other characteristics correspond to those laid down for this category¹.

Refined olive oil: olive oil obtained from virgin olive oils by refining methods (including methods aiming to the complete or partial removal of chemical compounds responsible for organoleptic descriptors) that do not lead to alterations in the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other physicochemical characteristics correspond to those laid down for this category¹.

Olive oil composed of refined olive oil and virgin olive oils: olive oil consisting of a blend of refined olive oil and extra virgin olive oil and/or virgin olive oil. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.

Refined olive-pomace oil: Olive-pomace oil obtained from crude olive-pomace oil by refining methods that do not lead to alterations in the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other physicochemical characteristics correspond to those laid down for this category¹.

Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils: olive-pomace oil consisting of a blend of refined olive-pomace oil and extra virgin olive oil and/or virgin olive oil. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other physicochemical characteristics correspond to those laid down for this category. In no case shall this blend be called olive oil.

¹ This product may only be sold direct to the consumer if permitted in the country of retail sale (RETAINED UNTIL CCFO30 FOR ORDINARY OLIVE OIL)

Note: Genuine virgin olive oil that does not meet one or more of the virgin olive oil's quality criteria of this standard is referred to as LAMPANTE OLIVE OIL. It is considered unfit for human consumption either as it stands or blended with other oils.

3.2 COMPOSITION FACTORS

3.2.1 GLC ranges of fatty acid composition (expressed as percentages of total fatty acids)

The fatty acid values in this table apply to the oils described in Section 3.1 presented in a state for human consumption. However, to provide clarity in the trade of lampante olive oil and crude olive-pomace oil, the values of the table, trans isomers excluded, may also be applied.

Fatty acid	Extra virgin olive oil	Olive oil composed of refined olive oil and virgin olive oils	Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils
	Virgin olive oil	Refined olive oil	Refined olive-pomace oil
C14:0	≤ 0.03	≤ 0.03	≤ 0.03
C16:0	7.0 – 20.0	7.0 – 20.0	7.0 – 20.0
C16:1	0.3 – 3.5	0.3 – 3.5	0.3 – 3.5
C17:0	≤ 0.4	≤ 0.4	≤ 0.4
C17:1	≤ 0.6	≤ 0.6	≤ 0.6
C18:0	0.5 – 5.0	0.5 – 5.0	0.5 – 5.0
<u>C18:1</u>	<u>{53.0} 55.0– 85.0</u>	<u>{53.0} 55.0– 85.0</u>	<u>{53.0} 55.0– 85.0</u>
C18:2	2.5 – 21.0	2.5 – 21.0	2.5 – 21.0
<u>C18:3</u>	<u>≤ 1.0^a</u>	<u>≤ 1.0^a</u>	<u>≤ 1.0^a</u>
C20:0	≤ 0.6	≤ 0.6	≤ 0.6
C20:1	≤ 0.5	≤ 0.5	≤ 0.5
C22:0	≤ 0.2	≤ 0.2	≤ 0.3
C24:0	≤ 0.2	≤ 0.2	≤ 0.2
Trans fatty acids			
<u>Σ(t-C18:1)</u>	<u>{≤ 0.4} ≤ 0.05</u>	<u>{≤ 0.2} ≤ 0.20</u>	<u>{≤ 0.4} ≤ 0.40</u>
<u>Σ(t-C18:2) +</u> <u>Σ(t-C18:3)</u>	<u>{≤ 0.4} ≤ 0.05</u>	<u>{≤ 0.3} ≤ 0.30</u>	<u>{≤ 0.4} ≤ 0.35</u>
(a) In cases where an edible virgin olive oil exhibits 1.0 < linolenic acid % ≤ 1.4, then this oil is authentic provided that apparent β-sitosterol/campesterol ≥ 24 and all other composition factors lie within the official limits.			

3.2.2 ΔECN42 (Difference between the actual and theoretical ECN 42 triglyceride content)

Extra virgin olive oil Virgin olive oil	≤ 0.20
Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	≤ 0.30
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≤ 0.50

3.2.3 4 α -Desmethylsterols composition (% total 4 α -desmethylsterols)

Cholesterol	≤ 0.5
Brassicasterol	≤ 0.1 for olive oils ≤ 0.2 for olive-pomace oils
Campesterol	$\leq 4.0^b$
Stigmasterol	< campesterol
$\Delta 7$ -stigmastenol	$\leq 0.5^c$
Apparent β -sitosterol ^d	≥ 93.0
<p>(b) When an authentic oil naturally has a campesterol level > 4.0% and $\leq 4.5\%$, it is considered virgin or extra virgin olive oil if the stigmasterol level is $\leq 1.4\%$ and the delta-7-stigmastenol level is $\leq 0.3\%$. The other parameters shall meet the limits set out in the standard.</p> <p>(c) For virgin olive oils If the value is > 0.5 and $\leq 0.8\%$, campesterol must be ≤ 3.3, apparent β-sitosterol/(campesterol+$\Delta 7$-stigmastenol) ≥ 25, stigmasterol ≤ 1.4 and \squareECN42 ≤ 0.1. For refined olive pomace oils values > 0.5 and $\leq 0.8\%$ then stigmasterol $\leq 1.4\%$ and ΔECN42 ≤ 0.4.</p> <p>(d) Chromatographic peak composed by \square5,23-stigmastadienol+clerosterol+β-sitosterol+sitostanol+\square5-avenasterol+\square5,24-stigmastadienol peaks.</p> <p><u>[Virgin olive oil's authenticity is not compromised if one sterol, or their minimum content, does not fall within the ranges provided for if all other sterols and parameters tested referred to in this standard fall within the stated ranges.]</u></p>	

3.2.4 Total 4α-desmethylsterols content (mg/kg)	
Virgin olive oil Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	$\geq 1,000$
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	$\geq 1,800$ $\geq 1,600$

3.2.5 Erythrodiol and uvaol (% total 4α-desmethylsterols + erythrodiol and uvaol)	
Extra virgin olive oil Virgin olive oil Olive oil composed of refined olive oil and virgin olive oils Refined olive oil	≤ 4.5
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils Refined olive-pomace oil	> 4.5

3.2.6 Waxes content (mg/kg)	
Extra virgin olive oil Virgin olive oil	$\leq 150^e$
Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	$\leq 350^f$
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	> 350 ^f
(e) Sum of C ₄₂ esters+C ₄₄ esters+C ₄₆ ester	
(f) Sum of C ₄₀ esters+C ₄₂ esters+C ₄₄ esters+C ₄₆ ester	

3.2.7 Stigmastadienes content (mg/kg)	
Extra virgin olive oil	≤ 0.05
Virgin olive oil	

3.2.8 Percentage of 2-glycerol monopalmitate (2P) (% total monoacylglycerol)	
Extra virgin olive oil	} If C16:0 ≤ 14.0 %; 2P ≤ 0.9 % If C16:0 > 14.0 %, 2P ≤ 1.0 %
Virgin olive oil	
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive oil	} If C16:0 ≤ 14.0 %; 2P ≤ 0.9 % If C16:0 > 14.0 %, 2P ≤ 1.1 %
Refined olive-pomace oil	
Olive-pomace oil composed of refined olive pomace oil and virgin olive oils	2P ≤ 1.2 %

3.2.9 ΔK (g, h)	
Extra virgin olive oil	≤ 0.01
Virgin olive oil	
(g) Defined as:	
$\Delta K_{270} = K_{270} - \frac{K_{266} + K_{274}}{2}$ $\Delta K_{268} = K_{268} - \frac{K_{264} + K_{272}}{2}$	
(h): 270 nm when using cyclohexane; 268 nm when using iso-octane.	

3.3 QUALITY FACTORS

3.3.1 Organoleptic characteristics of virgin olive oils		
	Median of the most perceived defect	Median of the fruity attribute
Extra virgin olive oil	0.0	> 0.0
Virgin olive oil	2.5 [3] ≤ 3.5 ⁱ	> 0.0
Ordinary virgin olive oil ^j	<u>3.5 < Me ≤ 6.0^k</u>	
<u>(i) Include the uncertainty of the measure calculated by IOC method.</u>		
(j) RETAINED UNTILL CCFO30		
<u>(k) or when the median of the defect is less than or equal to 3.5 and the median of the fruity attribute is equal to 0.</u>		

3.3.2 Free fatty acids (g/100 g, expressed as oleic acid)	
Extra virgin olive oil	≤ 0.8
Virgin olive oil	≤ 2.0
Refined olive oil	≤ 0.3
Olive oil composed of refined olive oil and virgin olive oils	≤ 1.0
Refined olive-pomace oil	≤ 0.3
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≤ 1.0

3.3.3 Peroxide value (milliequivalents of active oxygen/kg oil)	
Extra virgin olive oil	≤ 20
Virgin olive oil	≤ 20
Refined olive oil	≤ 5
Olive oil composed of refined olive oil and virgin olive oils	≤ 15
Refined olive-pomace oil	≤ 5
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≤ 15

3.3.4 Absorbance in the ultraviolet region at 270/or 268 nm^(l) (expressed as K₂₇₀/or K₂₆₈)	
Extra virgin olive oil	≤ 0.22
Virgin olive oil	≤ 0.25
<u>Ordinary virgin olive oil^j</u>	≤ 0.30 (*)
Refined olive oil	≤ 1.25
Olive oil composed of refined olive oil and virgin olive oils	≤ 1.15
Refined olive-pomace oil	≤ 2.00
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≤ 1.70
(l): 270 nm when using cyclohexane; 268 nm when using iso-octane.	
<u>* After passage of the sample through activated alumina, absorbency at 270 nm shall be equal to or less than 0.11.</u>	
(j) RETAINED UNTILL CCFO30	
3.3.5 ΔK^(g, h)	
Refined olive oil	≤ 0.16
Olive oil composed of refined olive oil and virgin olive oils	≤ 0.15
Refined olive-pomace oil	≤ 0.20
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≤ 0.18
(g) Defined as	
$\Delta K_{270} = K_{270} - \frac{K_{266} + K_{274}}{2}$ $\Delta K_{268} = K_{268} - \frac{K_{264} + K_{272}}{2}$	
(h): 270 nm when using cyclohexane; 268 nm when using iso-octane.	

3.3.6 Fatty acid ethyl esters (mg/kg)	
Extra virgin olive oil	≤ 35

4. FOOD ADDITIVES

Antioxidants used in accordance with Tables 1 and 2 of the General Standard for Food Additives (CXS 1921995) in food category 02.1.2 (Vegetable oils and fats) are acceptable for use in foods conforming to this Standard.

No additives are permitted in virgin olive oils covered by this Standard.

5. CONTAMINANTS

5.1 The products covered by this Standard shall comply with the Maximum Levels of the *General Standard for Contaminants and Toxins in Food and Feed* (CXS 193-1995).

5.2 Pesticide residues

The products covered by the provisions of this standard shall comply with those maximum residue limits established by the Codex Alimentarius Commission for these commodities.

5.3 Halogenated solvents

Maximum content of each halogenated solvent: 0.1 mg/kg

Maximum content of the sum of all halogenated solvents: 0.2 mg/kg

6. HYGIENE

It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *General Principles of Food Hygiene* (CXC 1-1969), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

The products should comply with any microbiological criteria established in accordance with the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CXG 21-1997).

7. LABELLING

The products shall be labelled in accordance with the *General Standard for the Labelling of Pre-packaged Foods* (CXS 1-1985).

7.1 Name of the food

The name of the product shall be consistent with the descriptions as shown in Section 3 of this standard. In no case shall the designation 'olive oil' be used to refer to olive-pomace oils.

7.2 Labelling of Non-Retail Containers

Information on the above labelling requirements shall be given either on the container or in accompanying documents, except that the name of the food, lot identification and the name and address of the manufacturer or packer shall appear on the container.

However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF ANALYSIS AND SAMPLING

For checking the compliance with this standard, the methods of analysis and sampling contained in the Recommended Methods of Analysis and Sampling (CXS 234-1999) relevant to the provisions in this standard, shall be used.

Note: The list of methods will be deleted from the standard after the acceptance by CCFO and a sentence above is going to be the reference to the methods.

Olive oils and olive pomace oils: Methods of analysis for endorsement by CCMAS and placement/replacement in CXS 234				
Fats and oils and related products	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Absorbency in ultra-violet	COI/T.20/Doc. No. 19 / ISO 3656 / AOCS Ch 5-91	Absorption in ultra-violet	I
Olive oils and olive pomace oils	Acidity, free (acid value)	ISO 660 / AOCS Cd 3d-63 / COI/T.20/Doc. No 34	Titrimetry	I
Olive oils and olive pomace oils	Alpha-tocopherol	ISO 9936	HPLC (UV or fluorescence)	II
		AOCS Ce 8-89		III
Olive oils and olive pomace oils	Difference between the actual and theoretical ECN 42 triglyceride content	COI/T.20/Doc. no. 20 and COI/T.20/Doc. No 33	Analysis of triglycerides by HPLC and fatty acids by GC followed by calculation	I

Olive oils and olive pomace oils: Methods of analysis for endorsement by CCMAS and placement/replacement in CXS 234				
Fats and oils and related products	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	1,2-Diglycerides	ISO 29822	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Erythrodiol + uvaol	COI/T.20/Doc. No 26	Separation and gas chromatography (FID)	II
Olive oils and olive pomace oils	Fatty acid composition	COI/T.20/Doc. No 33	Gas chromatography (FID) of methyl esters	II
		AOCS Ce 2-66 and AOCS Ch 2-91 / Ce 1h-05		III
		ISO 12966-2 and ISO 12966-4		III
Olive oils and olive pomace oils	2-glyceryl monopalmitate percentage	COI/T.20/Doc. No 23	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Fatty acid ethyl ester content	COI/T.20/Doc. No 28	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Halogenated solvents, traces	ISO 16035	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Insoluble impurities in light petroleum	ISO 663	Gravimetry	I
Olive oils and olive pomace oils	Iodine value	ISO 3961 / AOAC 9930.20 / AOCS Cd 1d-92 / NMKL 39	Wijs-Titrimetry	I
Olive oils and olive pomace oils	Iron and copper	ISO 8294 / AOAC 990.05	AAS	II
Olive oils and olive pomace oils	Lead	Use performance criteria*		
Olive oils and olive pomace oils	Moisture and volatile matter	ISO 662	Gravimetry	I
Olive oils and olive pomace oils	Organoleptic characteristics	COI/T.20/Doc. no. 15	Panel test	I
Olive oils and olive pomace oils	Peroxide value	ISO 3960 / AOCS Cd 8b-90	Titrimetry	I
		COI/T.20/Doc. No 35		IV
Olive oils and olive pomace oils	Pyropheophytin "a"	ISO 29841	HPLC with UVA/VIS or fluorescence detection	II
Olive oils and olive pomace oils	Relative density	ISO 6883 / AOCS Cc 10c-95	Pycnometry	I
Olive oils and olive pomace oils	Refractive index	ISO 6320 / AOCS Cc 7-25	Refractometry	II

Olive oils and olive pomace oils: Methods of analysis for endorsement by CCMAS and placement/replacement in CXS 234				
Fats and oils and related products	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Sampling	ISO 5555 and ISO 661		
Olive oils and olive pomace oils	Saponification value	ISO 3657 / AOCS Cd 3-25	Titrimetry	I
Olive oils and olive pomace oils	4 α -desmethylsterol and total sterol content	COI/T.20/Doc. No 26	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Stigmastadienes	COI/T.20/Doc. no. 11	Gas chromatography (FID)	II
		ISO 15788-1		III
		AOCS Cd 26-96		III
		ISO 15788-2	HPLC	III
Olive oils and olive pomace oils	<i>trans</i> Fatty acids content	COI/T.20/Doc no. 33	Gas chromatography (FID) of methyl esters	II
		ISO 12966-2 and ISO 12966-4		III
		AOCS Ce 2-66 and AOCS Ce 1h-05		III
Olive oils and olive pomace oils	Unsaponifiable matter	ISO 3596 / AOCS Ca 6b-53	Gravimetry	I
Olive oils and olive pomace oils	Wax content	COI/T.20/Doc. no. 28	Gas chromatography (FID)	II
		AOCS Ch 8-02		III

Appendix I

OTHER QUALITY AND COMPOSITION FACTORS

These quality and composition factors are supplementary information to the essential composition and quality factors of the standard. A product which meets the essential quality and composition factors but does not meet these supplementary factors, may still conform to the standard.

1. QUALITY CHARACTERISTICS

1.1 Organoleptic characteristics				
Extra virgin and virgin olive oils: See Section 3.3.1				
<u>Type of oil</u>	<u>Perceptions</u>			
	<u>Odour</u>	<u>Taste</u>	<u>Colour</u>	
Refined olive oil	Acceptable		light yellow	
Olive oil composed of refined olive oil and virgin olive oils	Good		light yellow to green	
Refined olive-pomace oil	Acceptable		light yellow to brownish-yellow	
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	Good		light yellow to green	
1.2 Moisture and volatile matter (g/100 g)				
Extra virgin olive oil				≤ 0.2
Virgin olive oil				
Refined olive oil				≤ 0.1
Olive oil composed of refined olive oil and virgin olive oils				≤ 0.1
Refined olive-pomace oil				≤ 0.1
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils				≤ 0.1
1.3 Insoluble impurities in light petroleum (g/100 g)				
Extra virgin olive oil				≤ 0.1
Virgin olive oil				
Refined olive oil	}			≤ 0.05
Olive oil composed of refined olive oil and virgin olive oils				
Refined olive-pomace oil				
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils				
1.4 Absorbance in the ultraviolet region at 232 nm (expressed as K₂₃₂)				
Extra virgin olive oil				≤ 2.50
Virgin olive oil				≤ 2.60

<u>1.5 1,2-diglycerides (% total diglycerides)</u>	
<u>Extra virgin olive oil</u>	<u>> 35</u>

<u>1.6 Pyropheophytin "a" (% total chlorophyll pigments)</u>	
<u>Extra virgin olive oil</u>	<u>≤ 17</u>

1.7 Trace metals (mg/kg)	
All olive oils and olive-pomace oils	
Iron (Fe)	≤ 3.0
Copper (Cu)	≤ 0.1

2. CHEMICAL AND PHYSICAL CHARACTERISTICS	
2.1 Relative density (d_r^{20}) (20 °C/water at 20 °C)	
Extra virgin olive oil Virgin olive oil Refined olive oil Olive oil composed of refined olive oil and virgin olive oils Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	0.910-0.916

2.2 Refractive index (n_D^{20})	
Extra virgin olive oil Virgin olive oil Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	1.4677-1.4705
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	1.4680-1.4707

2.3 Saponification value (mg KOH/g)	
Extra virgin olive oil Virgin olive oil Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	184-196
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	182-193

2.4 Iodine value (Wijs method)	
Extra virgin olive oil Virgin olive oil Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	75-94
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	75-92

2.5 Unsaponifiable matter (g/kg)	
Extra virgin olive oil Virgin olive oil Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	≤ 15
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≤ 30

3. METHODS OF ANALYSIS AND SAMPLING

For checking the compliance with this standard, the methods of analysis and sampling contained in the Recommended Methods of Analysis and Sampling (CXS 234-1999) relevant to the provisions in this standard, shall be used.

Olive oils and olive pomace oils: Methods of analysis for endorsement by CCMAS and placement/replacement in CXS 234				
Fats and oils and related products	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Absorbency in ultra-violet	COI/T.20/Doc. No. 19 / ISO 3656 / AOCS Ch 5-91	Absorption in ultra-violet	I
Olive oils and olive pomace oils	Acidity, free (acid value)	ISO 660 / AOCS Cd 3d-63 / COI/T.20/Doc. No 34	Titrimetry	I
Olive oils and olive pomace oils	Alpha-tocopherol	ISO 9936	HPLC (UV or fluorescence)	II
		AOCS Ce 8-89		III
Olive oils and olive pomace oils	Difference between the actual and theoretical ECN 42 triglyceride content	COI/T.20/Doc. no. 20 and COI/T.20/Doc. No 33	Analysis of triglycerides by HPLC and fatty acids by GC followed by calculation	I
Olive oils and olive pomace oils	1,2-Diglycerides	ISO 29822 COI/T.20/Doc.No 32	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Erythrodiol + uvaol	COI/T.20/Doc. No 26	Separation and gas chromatography (FID)	II
		COI/T.20/Doc. No 33		II

Olive oils and olive pomace oils: Methods of analysis for endorsement by CCMAS and placement/replacement in CXS 234				
Fats and oils and related products	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Fatty acid composition	AOCS Ce 2-66 and AOCS Ch 2-91 / Ce 1h-05	Gas chromatography (FID) of methyl esters	III
		ISO 12966-2 and ISO 12966-4		III
Olive oils and olive pomace oils	2-glycerol monopalmitate percentage	COI/T.20/Doc. No 23	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Fatty acid ethyl ester content	COI/T.20/Doc. No 28	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Halogenated solvents, traces	ISO 16035	Gas chromatography (FID)	II
Olive oils and olive pomace oils	Insoluble impurities in light petroleum	ISO 663	Gravimetry	I
Olive oils and olive pomace oils	Iodine value	ISO 3961 / AOAC 9930.20 / AOCS Cd 1d-92 / NMKL 39	Wijs-Titrimetry	I
Olive oils and olive pomace oils	Iron and copper	ISO 8294 / AOAC 990.05	AAS	II
Olive oils and olive pomace oils	Lead	Use performance criteria*		
Olive oils and olive pomace oils	Moisture and volatile matter	ISO 662	Gravimetry	I
Olive oils and olive pomace oils	Organoleptic characteristics	COI/T.20/Doc. no. 15	Panel test	I
Olive oils and olive pomace oils	Peroxide value	ISO 3960 / AOCS Cd 8b-90	Titrimetry	I
		COI/T.20/Doc. No 35		IV
Olive oils and olive pomace oils	Pyropheophytin "a"	ISO 29841	HPLC with UV/VIS or fluorescence detection	II
Olive oils and olive pomace oils	Relative density	ISO 6883 / AOCS Cc 10c-95	Pycnometry	I
Olive oils and olive pomace oils	Refractive index	ISO 6320 / AOCS Cc 7-25	Refractometry	II
Olive oils and olive pomace oils	Sampling	ISO 5555 and ISO 661		
Olive oils and olive pomace oils	Saponification value	ISO 3657 / AOCS Cd 3-25	Titrimetry	I
Olive oils and olive pomace oils	4 α -desmethylsterol	COI/T.20/Doc. No 26	Gas chromatography (FID)	II

Olive oils and olive pomace oils: Methods of analysis for endorsement by CCMAS and placement/replacement in CXS 234				
Fats and oils and related products	Provision	Method(s)	Principle	Type
	and total sterol content			
Olive oils and olive pomace oils	Stigmastadienes	COI/T.20/Doc. no. 11	Gas chromatography (FID)	II
		ISO 15788-1		III
		AOCS Cd 26-96		III
		ISO 15788-2	HPLC	III
Olive oils and olive pomace oils	<i>trans</i> Fatty acids content	COI/T.20/Doc no. 33	Gas chromatography (FID) of methyl esters	II
		ISO 12966-2 and ISO 12966-4		III
		AOCS Ce 2-66 and AOCS Ce 1h-05		III
Olive oils and olive pomace oils	Unsaponifiable matter	ISO 3596 / AOCS Ca 6b-53	Gravimetry	I
Olive oils and olive pomace oils	Wax content	COI/T.20/Doc. no. 28	Gas chromatography (FID)	II
		AOCS Ch 8-02		III