



JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

Twenty-Seventh Session

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PROPOSED DRAFT REVISION OF THE *STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS* (CX/FO 21/27/06) - SECTIONS 3 AND 8

(Prepared by the Electronic Working Group[®] chaired by Spain and co-chaired by Argentina and Canada)

(At Step 3)

Codex members and Observers wishing to submit comments at Step 3 on **Annex I** of this draft should do so as instructed in CL 2021/29/OCS-FO available on the Codex webpage/Circular Letters 2021: <http://www.fao.org/fao-who-codexalimentarius/circular-letters/en/>

Background

1. At the 25th Session of the Codex Committee on Fats and Oils (CCFO25) held in Kuala Lumpur, Malaysia, in 2017, one delegation noted that the *Standard for Olive Oils and Olive Pomace Oils* (CX/FO 21/27/06) had not been reviewed in the past 15 years, despite the fact that there had been considerable technological and scientific innovations, cultivation areas had expanded, and the volumes and value of trade had increased.

2. The Committee agreed to start new work on the revision of Sections 3, 8 and the Appendix of the *Standard for Olive Oils and Olive Pomace Oils* (CX/FO 21/27/06). In considering this work, the Committee clarified that the proposed work would take into account the needs of Codex members, the latest technological knowledge, and scientific progress of the sector in order to facilitate trade, promote consumer protection and facilitate the harmonization of national legislation with Codex.

3. The Committee also agreed to establish an electronic working group (EWG), chaired by Spain, co-chaired by Argentina and Canada, and working in English only, to prepare the proposed draft revisions of the *Standard for Olive Oils and Olive Pomace Oils* (CX/FO 21/27/06), for consideration at the next CCFO session.

4. At the 26th Session of CCFO in 2019, the report of the EWG on the proposed draft revision to Sections 3, 8 and the Appendix of the *Standard for Olive Oils and Olive Pomace Oils* (CX/FO 21/27/06) was discussed at length and in detail at a physical working group (PWG) meeting held immediately prior to CCFO26, and the report of the PWG presented and discussed during the plenary sessions. After so much deliberation, there were still many areas of the proposed draft that needed further discussion and clarification. The Committee agreed to return the proposed draft sections 3, 8, and Appendix to Step 2 for redrafting, and re-established the EWG to continue working on these revisions, noting the following terms of reference:

- to focus on items in square brackets and issues where delegations expressed strong concerns, with a view to reach agreement;
- to collect available data and information on DAGs, PPPs, and FAEE, and to study ways how these can be taken into account in the standard;
- to review and discuss data on linolenic acid if available, and to propose a possible limit for this in the standard;
- to discuss other issues raised by members, e.g. lampante oil, campesterol content, waxes content for blends of refined and virgin olive oils; and to review the format of the tables; and
- to prepare a report of the EWG for consideration by CCFO27.

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Timeline and Discussions

5. The Electronic Working Group was re-established in July 2019 with an invitation from Spain, Argentina, and Canada to Codex members and observer organizations interested in participating in this electronic working group. Representatives from 31 Codex member countries including the European Union and one observer organization, expressed interest to participate (Annex II).

6. Two welcome letters were sent to the EWG members with suggestions on a path forward to address the ongoing issues. It was highlighted that the Codex guiding principles must be the references that must always be considered, and that negative responses to an argued proposal must be adequately supported by sound arguments in order to avoid stalling the discussions.

7. The EWG worked from September 2019 to March 2021 and discussed areas that the members could not agree on at the last session, and provisions that were placed in square brackets in the report of CCFO26. The group held its discussions over 11 rounds of working documents (WD), each round included a document that analyzed and presented arguments and evidence related to contentious sections in square brackets in the proposed draft revision to the standard. This included:

- Removal of ordinary virgin olive oil from the standard.
- Expression of the defect's median of the limit between fit and unfit for consumption categories.
- Removal of footnote of the definitions of refined olive oil and refined olive-pomace oil.
- Definition of oil consisting of a blend of refined olive oil and virgin olive oils.
- The naming of the blend of refined olive-pomace oil and edible virgin olive oils.
- Note on lampante olive oil.
- Decision scheme of delta-7-stigmastenol and, in general, of the applicability of decision schemes.
- Confirmation of the genuineness of olive and olive-pomace oils considering fatty acids and sterols.
- Harmonization of the waxes' limit content.
- Note on the application of cis-fatty acid values to crude oils not considered in CXS 33.
- Definition of organoleptic characteristics in refined olive and olive-pomace oil.
- Consideration of a limit to linolenic acid.
- Consideration of the edible virgin oils' total sterols content not as a purity parameter.
- Consideration of ΔK as a purity parameter of edible virgin oils.
- Applicability of PPP and 1, 2 DGAs in CXS 33.
- Updating Methods of analysis.
- Review of the Standard's format and tables, including changing of the order and location of certain parameters to improve the logic and flow of the document.

8. Consensus was reached on a few of the 22 proposals put forward through the working documents, and progress was made in bringing the majority of the members to support specific changes which could be considered for revision. However, there continued to be a number of areas where divergent opinions were received (consideration or not of the geographical, climatic and genetic variations on the fatty acids and sterols composition, consideration or not of the total sterols content as an essential composition factor, prohibition or not of the refined oils' marketing, fatty acids' limits expression with one or two decimal places, organoleptic median's limit between fit and unfit for consumption of virgin oils, consideration or not of PPP and DAGs as extra virgin olive oil quality criteria) and which will be brought to the 27th session of CCFO for consideration.

Conclusion and Recommendations

9. Annex I (clean version of the EWG Report) and **Annex II** (EWG Report in Track Change) contain the proposed draft revisions to the standard, including the amendments to section 3, 8 and the Appendix to CXS 33-1981 agreed by the EWG members. The items that the EWG did not reach consensus are indicated in square brackets for further consideration by CCFO27.

10. The EWG also recommends the consequential amendment to section 4 Food Additives to take into account the new definition of the blend of refined olive oil and virgin and extra virgin olive oil, named olive oil composed of refined olive oil and virgin olive oils, and the blend of refined olive-pomace oil and virgin and extra virgin olive oils, named olive-pomace oil composed of refined olive pomace oil and virgin olive oils.

PROPOSED DRAFT REVISION TO THE STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS
(CXS 33-1981)
(Step 3)

**The final output from the work of the EWG (clean version of the EWG's Annex 2)
for discussion at CCFO27**

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.

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 category^[1].

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 category^[1].

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».

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)

[Samples falling within the appropriate fatty acid ranges specified below are in compliance with this Standard. Supplementary criteria, for example national geographical and/or climatic variations, may be considered, as necessary, to confirm that a sample is in compliance with the Standard.]

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.

[¹ This product may only be sold direct to the consumer if permitted in the country of retail sale]

Fatty acid	<u>Extra virgin olive oil</u>	<u>Olive oil composed of refined olive oil and virgin olive oils</u>	<u>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</u>
	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
C18:1	[53.0] [55.0] – 85.0	[53.0] [55.0] – 85.0	[53.0] [55.0] – 85.0
C18:2	2.5 – 21.0	2.5 – 21.0	2.5 – 21.0
C18:3 ^[2]			
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			
Σ(t-C18:1)	[≤ 0.1]	[≤0.2]	[≤ 0.4]
Σ(t-C18:2) + Σ(t-C18:3) }	[≤ 0.1]	[≤ 0.3]	[≤ 0.4]

3.2.2 Δ ECN₄₂ (Difference between the actual and theoretical ECN 42 triglyceride content)

Extra virgin olive oil	≤ 0.2
Virgin olive oil	
Refined olive oil	≤ 0.3
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive-pomace oil	≤ 0.5
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	

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	≤ 4.0 ^(a)
Stigmasterol	< campesterol
Δ 7-stigmasterol	≤ 0.5 ^[b]
Apparent β -sitosterol ^(c)	≥ 93.0

* (a) When an authentic oil naturally has a campesterol level >4.0% and ≤ 4.5%, it is considered virgin or extra virgin olive oil if the stigmasterol level is ≤ 1.4% and the delta-7-stigmasterol level is ≤ 0.3%. The other parameters shall meet the limits set out in the standard.

[(b) For virgin olive oils If the value is >0,5 y ≤0,8%, campesterol must be ≤3,3, apparent β -sitosterol/(campesterol+ Δ 7-stigmasterol) ≥25, stigmasterol ≤1,4 and Δ ECN₄₂ ≤|0,1|. For refined olive pomace oils values >0,5 and ≤0,7% then stigmasterol ≤1,4% and Δ ECN₄₂ ≤ 0.4.]

(c) Chromatographic peak composed by Δ 5,23-stigmastadienol+clerosterol+ β -sitosterol+sitostanol+ Δ 5-avenasterol+ Δ 5,24-stigmastadienol peaks.

[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.]

3.2.4 Total 4 α -desmethylsterols content (mg/kg)

Refined olive oil	$\geq 1,000$
Olive oil composed of refined olive oil and virgin olive oils	$\geq 1,800$
Refined olive-pomace oil	$\geq 1,800$
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	$\geq 1,600$

3.2.5 Erythrodiol and uvaol (% total 4 α -desmethylsterols + erythrodiol and uvaol)

Extra virgin olive oil	}	≤ 4.5
Virgin olive oil		
Olive oil composed of refined olive oil and virgin olive oils		
Refined olive oil		
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	}	> 4.5
Refined olive-pomace oil		

3.2.6 Waxes content (mg/kg)

<u>Extra virgin olive oil</u>	}	$\leq 150^{(d)}$
Virgin olive oil		
Refined olive oil	}	$\leq 350^{(e)}$
<u>Olive oil composed of refined olive oil and virgin olive oils</u>		
Refined olive-pomace oil	}	$> 350^{(e)}$
<u>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</u>		

^(d) Sum of C₄₂ esters+C₄₄ esters+C₄₆ ester

^(e) Sum of C₄₀ esters+C₄₂ esters+C₄₄ esters+C₄₆ ester

3.2.7 Stigmastadienes content (mg/kg)

Extra virgin olive oil	≤ 0.05
Virgin olive oil	

3.2.8 Percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol)

Extra virgin olive oil	}	If C16:0 \leq 14.0 %; 2P \leq 0.9 % If C16:0 > 14.0 %, 2P \leq 1.0 %
Virgin olive oil		
Olive oil composed of refined olive oil and virgin olive oils		
Refined olive oil	}	If C16:0 \leq 14.0 %; 2P \leq 0.9 % If C16:0 > 14.0 %, 2P \leq 1.1 %
Refined olive-pomace oil		
Olive-pomace oil composed of refined olive pomace oil and virgin olive oils		2P \leq 1.2 %

3.2.9 [$\Delta K^{(f,g)}$]

Extra virgin olive oil	≤ 0.01
Virgin olive oil	

(f) Defined as

$$\Delta K_{270} = K_{270} - \frac{1}{2}(K_{266} + K_{274})$$

$$\Delta K_{268} = K_{268} - \frac{1}{2}(K_{264} + K_{272})$$

(g): 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]	> 0.0

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^(f) (expressed as K_{270} /or K_{268})

Extra virgin olive oil	≤ 0.22
Virgin olive oil	≤ 0.25
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

(f): 270 nm when using cyclohexane; 268 nm when using iso-octane.

3.3.5 $\Delta K^{(f,g)}$

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

(f) Defined as

$$\Delta K_{270} = K_{270} - \frac{1}{2}(K_{266} + K_{274})$$

$$\Delta K_{268} = K_{268} - \frac{1}{2}(K_{264} + K_{272})$$

(g): 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]
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4. FOOD ADDITIVES

4.1 Virgin olive oils

No additives are permitted in these products.

4.2 Refined olive oil, olive oil composed of refined olive oil and virgin olive oils, refined olive-pomace oil, and olive-pomace oil composed of refined olive-pomace oil and virgin olive oils.

The addition of alpha-tocopherols (d-alpha tocopherol (INS 307a); mixed tocopherol concentrate (INS 307b); dl-alpha-tocopherol (INS 307c)) to the above products is permitted to restore natural tocopherol lost in the refining process. The concentration of alpha-tocopherol in the final product shall not exceed 200 mg/kg.

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 Prepackaged 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

The most updated version of the methods should be used, in application of ISO/IEC 17025.

	Provision	Method	Principle	Type
8.1	Organoleptic characteristics of virgin olive oils	COI/T.20/Doc. n° 15	Panel test	I
8.2	Free fatty acids	ISO 660	Titrimetry	I
		COI/T.20/Doc. n° 34	Titrimetry	II
		AOCS Ca 5a-40	Titrimetry	II
8.3	Peroxide value	ISO 3960	Titrimetry	I
		AOCS Cd 8b-90	Titrimetry	II
		COI/T.20/Doc. n° 35	Titrimetry	II

8.4	Absorbance in the ultraviolet region	COI/T.20/Doc. n° 19	Absorption in ultraviolet	II
		ISO 3656	Absorption in ultraviolet	II
		AOCS Ch 5-91.	Absorption in ultraviolet	II
8.5	Fatty acid composition	COI/T.20/Doc. n°33	Gas chromatography	II
		AOCS Ch2-91	Gas chromatography	II
		ISO 12966-2 and ISO 12966-4.	Gas chromatography	II
8.6	4 α -desmethylsterol composition and its total content and erythrodiol and uvaol	COI/T.20/Doc. n°26	Gas chromatography	II
		ISO 12228-2	Gas chromatography	II
		AOCS Ch 6-91.	Gas chromatography	II
8.7	Waxes and ethyl esters content	COI/T.20/Doc. n° 28	Gas chromatography	II
		AOCS Ch 8-02	Gas Chromatography	II
8.8	Stigmastadienes content	COI/T.20/Doc. n° 11	Gas Chromatography	II
		ISO 15788-1	Gas Chromatography	II
		AOCS Cd 26-96	Gas Chromatography	II
8.9	Difference between the actual and theoretical ECN 42 triglyceride	COI/T.20/Doc. n° 20	HPLC and calculation	II
		AOCS Ce 5b-89.	HPLC and calculation	I
8.10	Percentage of 2-glyceryl monopalmitate	COI/T.20/Doc. n° 23	Gas Chromatography	II
		ISO 12872	Gas Chromatography	II
8.11	Determination of ΔK	COI/T.20/Doc. n° 19	Absorption in ultraviolet	II
		ISO 3656	Absorption in ultraviolet	II
		AOCS Ch 5-91	Absorption in ultraviolet	II
8.12	Alpha-tocopherol content	ISO 9936	HPLC	II
		AOCS Ce 8-89	HPLC	II
8.13	Detection of traces of halogenated solvents	ISO 16035	Static headspace gas chromatography	II

Commodity Category	Method of sampling	Notes
Olive oils and Olive-Pomace Oils	ISO 661 and ISO 5555	

Appendix

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	≤ 0.1
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	≤ 0.05
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	

1.4 Absorbance in the ultraviolet region at 232 nm (expressed as K₂₃₂)

Extra virgin olive oil	≤ 2.50
Virgin olive oil	≤ 2.60

[1.5 1,2-diglycerides (% total diglycerides)]

[Extra virgin olive oil]	[> 35]
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[1.6 Pyropheophytin "a" (% total chlorophyll pigments)]

[Extra virgin olive oil]	[≤ 17]
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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	0.910-0.916
Virgin olive oil	
Refined olive oil	
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive-pomace oil	0.910-0.916
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	

2.2 Refractive index (n_D^{20})

Extra virgin olive oil	1.4677-1.4705
Virgin olive oil	
Refined olive oil	
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive-pomace oil	1.4680-1.4707
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	

2.3 Saponification value (mg KOH/g)

Extra virgin olive oil	184-196
Virgin olive oil	
Refined olive oil	
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive-pomace oil	182-193
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	

2.4 Iodine value (Wijs method)

Extra virgin olive oil	75-94
Virgin olive oil	
Refined olive oil	
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive-pomace oil	75-92
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	

2.5 Unsaponifiable matter (g/kg)

Extra virgin olive oil	≤ 15
Virgin olive oil	
Refined olive oil	
Olive oil composed of refined olive oil and virgin olive oils	
Refined olive-pomace oil	≤ 30
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	

[2.6 Total 4 α -desmethylsterols content (mg/kg)]

[Extra virgin olive oil]

[> 1,000]

[Virgin olive oil]

3. METHODS OF ANALYSIS AND SAMPLING

	<u>Provision</u>	<u>Method</u>	<u>Principle</u>	<u>Type</u>
3.1	Moisture and volatile matter	ISO 662	Gravimetry	I
		AOCS Ca 2c-25	Gravimetry	
3.2	Insoluble impurities in light petroleum	ISO 663	Gravimetry	I
		AOCS Ca 3a-46	Gravimetry	
3.3	Trace metals (iron, copper)	ISO 8294	AAS	II
		ISO 21033	ICP-OES	I
		AOCS Ca 18b-91	AAS	II
3.4	Relative density	ISO 6883	Pycnometry	I
		AOCS Cc 10c-95	Pycnometry	
3.5	Refractive index	ISO 6320	Refractometry	II
		AOCS Cc 7-25	Refractometry	II
3.6	Saponification value	ISO 3657	Titrimetry	I
		AOCS Cd 3-25	Titrimetry	I
3.7	Iodine value	ISO 3961	Wijs-Titrimetry	I
		AOCS Cd 1d-92	Wijs-Titrimetry	I
3.8	Unsaponifiable matter	ISO 3596	Gravimetry	II
		AOCS Ca 6b-53	Gravimetry	I
3.9	Absorbance in the ultraviolet region – K ₂₃₂	COI/T.20/Doc. n° 19	Absorption in ultraviolet	II
		ISO 3656	Absorption in ultraviolet	II
		AOCS Ch 5-91	Absorption in ultraviolet	II
3.10	[Pyropheophytin "a"]	[ISO 29841]	HPLC	I
3.11	[1,2-diglycerides]	[ISO 29822]	Gas chromatography	I
3.12	[4 α -desmethylsterol total content]	COI/T.20/Doc. n° 26.	Gas chromatography	II
		ISO 12228-2	Gas chromatography	II
		AOCS Ch 6-91	Gas chromatography	II

<u>Commodity Category</u>	<u>Method of sampling</u>	<u>Notes</u>
Olive oils and Olive-Pomace Oils	ISO 661 and ISO 5555	



PROPOSED DRAFT REVISION TO THE STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS

(CXS 33-1981)

(Step 3)

The output from the EWG (track change version) (see Annex 1 for the clean version)

Notes on Proposed Revisions to Current Standard:

- **Bold and underlined with red font**: amendment agreed to by all/ majority of members of the electronic working group (consensus)
- **[In square brackets and underlined with red font]**: proposed amendment but not agreed to by all/majority of members (no consensus)
- **Single Strikethrough**: text agreed to be deleted (with consensus);
- **Double Strikethrough**: text identified for deletion at CCFO26
- **[Strikethrough in square brackets]**: text proposed to be deleted but not agreed to by all/ majority of EWG members.
- **Topics highlighted in blue were agreed upon by CCFO26 in the 2019's plenary.**

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 category^{††}.

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 category^{††}.

[†] This product may only be sold direct to the consumer if permitted in the country of retail sale

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 oils suitable for human consumption. 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 category².

Refined olive-pomace oil: Olive-pomace oil obtained from crude olive-pomace oil by refining methods which **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 category¹⁴.

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»².**

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)

[Samples falling within the appropriate fatty acid ranges specified below are in compliance with this Standard. Supplementary criteria, for example national geographical and/or climatic variations, may be considered, as necessary, to confirm that a sample is in compliance with the Standard.]

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 oils	Refined olive oil	Refined olive-pomace oil
C14:0	0.0—0.05 ≤ 0.03	0.0—0.05 ≤ 0.03	0.0—0.05 ≤ 0.03
C16:0	7.0 –5 – 20.0	7.0 –5 – 20.0	7.0 –5 – 20.0
C16:1	0.3 – 3.5	0.3 – 3.5	0.3 – 3.5
C17:0	0.0—0.3 ≤ 0.4	0.0—0.3 ≤ 0.4	0.0—0.3 ≤ 0.4
C17:1	0.0—0.3 ≤ 0.6	0.0—0.3 ≤ 0.6	0.0—0.3 ≤ 0.6
C18:0	0.5 -5.0	0.5 - 5.0	0.5 – 5.0
C18:1	[53.0] [55.0] – 83.0 85.0	[53.0] [55.0] – 83.0 85.0	[53.0] [55.0] – 83.0 85.0
C18:2	2.5 –5 – 21.0	2.5 –5 – 21.0	2.5 –5 – 21.0
C18:3 ¹³			
C20:0	0.0— ≤ 0.6	0.0— ≤ 0.6	0.0— ≤ 0.6
C20:1	0.0—0.4 ≤ 0.5	0.0—0.4 ≤ 0.5	0.0—0.4 ≤ 0.5
C22:0	0.0— ≤ 0.2	0.0— ≤ 0.2	0.0— ≤ 0.3
C24:0	0.0— ≤ 0.2	0.0— ≤ 0.2	0.0— ≤ 0.2

²The country of retail sale may require a more specific designation.

³ [Pending the results of IOC (International Olive Council) survey and further considerations by the Committee on Fats and Oils. National limits may remain in place.]

Trans fatty acids

$\Sigma(t\text{-C18:1})$	0.0-0.05 ≤ 0.1	0.0- ≤ 0.20	0.0- ≤ 0.40
The $c\Sigma(t\text{-C18:2}) + \Sigma(t\text{-C18:3})$	0.0-0.05 ≤ 0.1	0.0- ≤ 0.30	0.0-0.35 ≤ 0.4

3.2.2 ΔECN_{42} (Maximum difference between the actual and theoretical ECN 42 triglyceride content)

<u>Extra virgin olive oil</u> Virgin olive oils	≤ 0.2
Refined olive oil Olive oil <u>composed of refined olive oil and virgin olive oils</u>	≤ 0.3
Refined olive-pomace oil Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>	≤ 0.5

3.2.3 Sterol and triterpene dialcohol composition

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

Cholesterol	≤ 0.5
Brassicasterol	≤ 0.1 for olive oils ≤ 0.2 for olive-pomace oils ≤ 0.1 for other grades
Campesterol	$\leq 4.0^{*a)}$
Stigmasterol	< campesterol
Delta- Δ 7-stigmastenol	$\leq 0.5^{b)}$
<u>Apparent</u> β -sitosterol ^[c] + delta-5-avenasterol + delta-5-23-stigmastadienol + clerosterol + sitostanol + delta-5-24-stigmastadienol	≥ 93.0

*a) 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.

b) For virgin olive oils If the value is >0.5 y $\leq 0.8\%$, campesterol must be ≤ 3.3 , apparent β -sitosterol/(campesterol+ Δ 7-stigmastenol) ≥ 25 , stigmasterol ≤ 1.4 and $\Delta\text{ECN}_{42} \leq 0.1$. For refined olive pomace oils values >0.5 and $\leq 0.7\%$ then stigmasterol $\leq 1.4\%$ and $\Delta\text{ECN}_{42} \leq 0.4$.

c) Chromatographic peak composed by Δ 5,23-stigmastadienol+clerosterol+ β -sitosterol+sitostanol+ Δ 5-avenasterol+ Δ 5,24-stigmastadienol peaks.

[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.]

3.2.4 Minimum value for total sterol Total 4 α -desmethylsterols content (mg/kg)

[Virgin olive oils]	$\geq 1,000$
Refined olive oil	$\geq 1,000$
Olive oil <u>composed of refined olive oil and virgin olive oils</u>	$\geq 1,800$
Refined olive-pomace oil	$\geq 1,800$
Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>	$\geq 1,600$

3.2.5 Maximum α -Erythrodiol and uvaol [content] (% total sterols 4α -desmethylsterols + erythrodiol and uvaol)

Extra virgin olive oil

Virgin olive oils

Olive oil **composed of refined olive oil and virgin olive oils**

Refined olive oil



Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

Refined olive-pomace oil



3.2.6 Wax_{es} content (mg/kg)

Extra virgin olive oil

Virgin olive oils

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**

\leq **250** 150^(d)

\leq 350^(e)

$>$ 350^(e)

^(d) Sum of C₄₂ esters+C₄₄ esters+C₄₆ ester

^(e) Sum of C₄₀ esters+C₄₂ esters+C₄₄ esters+C₄₆ ester

Maximum difference between the actual and theoretical ECN 42 triglyceride content

Virgin olive oils	0.2
Refined olive oil	0.3
Olive oil	0.3
Olive-pomace oils	0.5

3.2.7 Maximum σ Stigmastadienes content (mg/kg)

Extra virgin olive oil

Virgin olive oils

\leq 0.15 0.05

3.2.8 Percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol)

Extra virgin olive oil

Virgin olive oil

Olive oil composed of refined olive oil and virgin olive oils

Refined olive oil

Refined olive-pomace oil

Olive-pomace oil composed of refined olive pomace oil and virgin olive oils

If C16:0 \leq 14.0 %, 2P \leq 0.9 %

If C16:0 $>$ 14.0 %, 2P \leq 1.0 %

If C16:0 \leq 14.0 %, 2P \leq 0.9 %

If C16:0 $>$ 14.0 %, 2P \leq 1.1 %

2P \leq 1.4 %

2P \leq 1.2 %

3.2.9 Delta-K/ $\Delta K^{(f,g)}$

Extra virgin olive oil

Virgin olive oil

\leq 0.01

(f) Defined as

$$\Delta K_{270} = K_{270} - \frac{1}{2}(K_{266} + K_{274})$$

$$\Delta K_{268} = K_{268} - \frac{1}{2}(K_{264} + K_{272})$$

(g): 270 nm when using cyclohexane; 268 nm when using iso-octane.

3.3 QUALITY FACTORS

3.3.1 Organoleptic characteristics (odour and taste) of virgin olive oils

	Median of the most perceived defect	Median of the fruity attribute
Extra virgin olive oil	Me = 0.0	Me > 0.0
Virgin olive oil	0 < Me ≤ [2.5] [3] [3.5]	Me > 0.0
Ordinary virgin olive oil	2.5 < Me ≤ 6.0*	

~~* or when the median of the defect is less than or equal to 2.5 and the median of the fruity attribute is equal to 0.~~

3.3.2 Free fatty acids (g/100 g, expressed as oleic acid)

<u>Extra virgin olive oil</u>	<u>≤ 0.8</u>
<u>Virgin olive oil</u>	<u>≤ 2.0</u>
<u>Refined olive oil</u>	<u>≤ 0.3</u>
<u>Olive oil composed of refined olive oil and virgin olive oils</u>	<u>≤ 1.0</u>
<u>Refined olive-pomace oil</u>	<u>≤ 0.3</u>
<u>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</u>	<u>≤ 1.0</u>

3.3.3 Peroxide value (milliequivalents of active oxygen/kg oil)

<u>Extra virgin olive oil</u>	≤ 20 milliequivalents of active oxygen/kg oil
Virgin olive oils	≤ 20 milliequivalents of active oxygen/kg oil
Refined olive oil	≤ 5 milliequivalents of active oxygen/kg oil
Olive oil <u>composed of refined olive oil and virgin olive oils</u>	≤ 15 milliequivalents of active oxygen/kg oil
Refined olive-pomace oil	≤ 5 milliequivalents of active oxygen/kg oil
Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>	≤ 15 milliequivalents of active oxygen/kg oil

3.3.4 Absorbency Absorbance in the ~~ultra-violet~~ ultraviolet region (K₂₇₀) at 270/or 268 nm^(f) (expressed as K₂₇₀/or K₂₆₈)

	Absorbency in ultra-violet at 270nm
Extra virgin olive oil	≤ 0.22
Virgin olive oil	≤ 0.25
<u>Ordinary virgin olive oil</u>	<u>≤ 0.30 (*)</u>

Refined olive oil	≤ 4.10 1.25
Olive oil <u>composed of refined olive oil and virgin olive oils</u>	≤ 0.90 1.15
Refined olive-pomace oil	≤ 2.00
Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>	≤ 1.70

(f): 270 nm when using cyclohexane; 268 nm when using iso-octane.

* After passage of the sample through activated alumina, absorbency at 270 nm shall be equal to or less than 0.11.

3.3.5 Delta K $\Delta K^{(f,g)}$

Extra Virgin olive oil	≤ 0.04
Virgin olive oil	≤ 0.04
Ordinary virgin olive oil	≤ 0.04
Refined olive oil	≤ 0.16
Olive oil <u>composed of refined olive oil and virgin olive oils</u>	≤ 0.15
Refined olive-pomace oil	≤ 0.20
Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>	≤ 0.18

(f) Defined as

$$\Delta K_{270} = K_{270} - \frac{1}{2}(K_{266} + K_{274})$$

$$\Delta K_{268} = K_{268} - \frac{1}{2}(K_{264} + K_{272})$$

(g): 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

4.1 Virgin olive oils

No additives are permitted in these products.

4.2 Refined olive oil, olive oil composed of refined olive oil and virgin olive oils, refined olive-pomace oil, and olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

The addition of alpha-tocopherols (d-alpha tocopherol (INS 307a); mixed tocopherol concentrate (INS 307b); dl-alpha-tocopherol (INS 307c)) to the above products is permitted to restore natural tocopherol lost in the refining process. The concentration of alpha-tocopherol in the final product shall not exceed 200 mg/kg.

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 Prepackaged 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

All the methods referenced in this appendix must be applied in its last revision. The most updated version of the methods should be used, in application of ISO/IEC 17025.

	<i>Provision</i>	<i>Method</i>	<i>Principle</i>	<i>Type</i>
8.1	Organoleptic characteristics of <u>virgin olive oils</u>	COI/T.20/Doc. n° 15	Panel test	I
8.2	Free acidity <u>fatty acids</u>	ISO 660:1996 amended in 2003	<u>Titrimetry</u>	I
		AOCS Cd 3d-63 (03)	<u>Titrimetry</u>	†
		<u>COI/T.20/Doc. n° 34</u>		II
		<u>AOCS Ca 5a-40</u>		II
8.3	Peroxide value	ISO 3960	Titrimetry	I
		AOCS Cd 8b-90 (03)	Titrimetry	II
		<u>COI/T.20/Doc. n° 35</u>	<u>Titrimetry</u>	II
8.4	<u>Absorbance</u> in the ultraviolet region	COI/T.20/Doc. n° 19	Absorption in ultraviolet	II
		ISO 3656	Absorption in ultraviolet	II
		AOCS Ch 5-91 (04)	Absorption in <u>ultraviolet</u>	II
8.5	Fatty acid composition	COI/T.20/Doc. n°24 <u>33</u> and ISO 5508:1990	<u>Gas chromatography</u>	II
		AOCS Ch2-91	<u>Gas chromatography</u>	II
		or AOCS Ce 1f-96		
		ISO 12966-2 and ISO 12966-4. Sample preparation ISO5509:20000 or AOCS Ce 2-66 (97)	<u>Gas chromatography</u>	II

8.6	<u>4α-desmethylsterol composition and its total content and erythrodiol and uvaol</u>	COI/T.20/Doc. n° 40 26	<u>Gas chromatography</u>	<u>II</u>
		ISO 12228-2:1999	<u>Gas chromatography</u>	<u>II</u>
		AOCS Ch 6-91 (97).	<u>Gas chromatography</u>	<u>II</u>
8.7	<u>Waxes and ethyl esters content</u>	COI/T.20/Doc. n° 4 28	Gas chromatography	II
		AOCS Ch 8-02 (02)	Gas Chromatography	II
8.8	<u>Stigmastadienes content</u>	COI/T.20/Doc. n° 11	Gas Chromatography	II
		or ISO 15788-1:1999 or ISO 15788-2	Gas Chromatography	II
		AOCS Cd 26-96	Gas Chromatography	II
8.9	<u>The Difference between the actual and theoretical ECN 42 triglyceride</u>	COI/T.20/Doc. n° 20	Analysis of triglycerides of HPLC and calculation	<u>II</u>
		AOCS Ce 5b-89 (02).	Analysis of triglycerides of HPLC and calculation	I
8.10	<u>Percentage of 2-glyceryl monopalmitate</u>	<u>COI/T.20/Doc. n° 23</u>	<u>Gas Chromatography</u>	<u>II</u>
		<u>ISO 12872</u>	<u>Gas Chromatography</u>	<u>II</u>
8.11	<u>Determination of ΔK</u>	<u>COI/T.20/Doc. n° 19</u>	<u>Absorption in ultraviolet</u>	<u>II</u>
		<u>ISO 3656</u>	<u>Absorption in ultraviolet</u>	<u>II</u>
		<u>AOCS Ch 5-91</u>	<u>Absorption in ultraviolet</u>	<u>II</u>
8.12	<u>Alpha-tocopherol content</u>	ISO 9936:1997	HPLC	<u>II</u>
		<u>AOCS Ce 8-89</u>	<u>HPLC</u>	<u>II</u>
8.13	<u>Detection of traces of halogenated solvents</u>	COI/T.20/Doc. N° 8	-	-
		<u>ISO 16035</u>	<u>Static headspace gas chromatography</u>	<u>II</u>
	<u>Determination of the content of fatty acid ethyl esters -FAEE-</u>	COI/T.20/Doc. N° 28		
	<u>Determination of trans fatty acid content</u>	COI/T.20/Doc.n°17 or ISO 15304:2002 or AOCS Ce 1f-96(02)		
	<u>Determination of erythrodiol content</u>	COI/T.20/doc. No 30-2011.		

	Determination of wax content	COI/T.20/Doc. n° 18 or AOCS Ch 8-02 (02)		
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<u>Commodity Category</u>	<u>Method of sampling</u>	<u>Notes</u>
<u>Olive oils and Olive-Pomace Oils</u>	ISO 661 and ISO 5555	

Appendix

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.

2. QUALITY CHARACTERISTICS

1.1 Organoleptic characteristics

Extra virgin and virgin olive oils: See Section 3.3.1

Others:

Type of oil	Perceptions		
	Odour	Taste	Colour
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	Acceptable	Good	light yellow to green

~~Appearance at 20°C for 24 hour~~

~~Refined olive oil, olive oil, refined olive pomace oil, olive pomace oil:~~

Limpid

1.2 Moisture and volatile matter (g/100 g)

	Maximum level
Virgin olive oils Extra virgin olive oil	≤ 0.2 %
Virgin olive oils	≤ 0.1 %
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 oils	
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	≤ 0.05 %

1.4 Absorbency Absorbance in the ultra-violet ultraviolet region at 232 nm (expressed as K_{232})

Extra virgin olive oil	≤ 2.50 ⁴
Virgin olive oil	≤ 2.60 ⁴

1.5 1,2-diglycerides (% total diglycerides)

<u>Extra virgin olive oil</u>	<u>> 35</u>
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1.6 Pyropheophytin "a" (% total chlorophyll pigments)

<u>Extra virgin olive oil</u>	<u>≤ 17</u>
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1.7 Trace metals (mg/kg)**All olive oils and olive-pomace oils**

Iron (Fe)	≤ 3.0 mg/kg
Copper (Cu)	≤ 0.1 mg/kg

~~2. COMPOSITION CHARACTERISTICS~~**~~Saturated fatty acids at the 2-position in the triglyceride (sum of palmitic & stearic acids):~~****~~Maximum level~~**

Virgin olive oils	1.5 %
Refined olive oil	1.8 %
Olive oil	1.8 %
Refined olive pomace oil	2.2 %
Olive pomace oil	2.2 %

32. CHEMICAL AND PHYSICAL CHARACTERISTICS**2.1 Relative density (d_4^{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 oils****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**

1.4677-1.4705

1.4680-1.4707

⁴The country of retail sale may require compliance with these limits when the oil is made available to the end consumer.

2.3 Saponification value (mg KOH/g)

Extra virgin olive oil

Virgin olive oils	}	184-196
Refined olive oil		
Olive oil <u>composed of refined olive oil and virgin olive oils</u>		

Refined olive-pomace oil	}	182-193
Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>		

2.4 Iodine value (Wijs method)

Extra virgin olive oil

Virgin olive oils	}	75-94
Refined olive oil		
Olive oil <u>composed of refined olive oil and virgin olive oils</u>		

Refined olive-pomace oil

Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>	}	75-92
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2.5 Unsaponifiable matter (g/kg)

Maximum level

Extra virgin olive oil

Virgin olive oils	}	≤ 15 g/kg
Refined olive oil		
Olive oil <u>composed of refined olive oil and virgin olive oils</u>		

Refined olive-pomace oil	}	≤ 30 g/kg
Olive-pomace oil <u>composed of refined olive-pomace oil and virgin olive oils</u>		

[2.6 Total 4 α -desmethylsterols content (mg/kg)]

[Extra virgin olive oil]

[> 1,000]

[Virgin olive oil]

43. METHODS OF ANALYSIS AND SAMPLING

The most updated version of the methods should be used, in application of ISO/IEC 17025.

	<i>Provision</i>	<i>Method</i>	<i>Principle</i>	<i>Type</i>
<u>3.1</u>	Moisture and volatile matter	ISO 662:1998	Gravimetry	I
		<u>AOCS Ca 2c-25</u>	<u>Gravimetry</u>	
<u>3.2</u>	Insoluble impurities in light petroleum	ISO 663:2000	Gravimetry	I
		<u>or AOCS Ca 3a-46</u>	<u>Gravimetry</u>	
<u>3.3</u>	Trace metals (iron, copper)	ISO 8294:1994 or	AAS	II
		<u>ISO 21033</u>	<u>ICP-OES</u>	!
		AOAC 990.05 <u>AOCS Ca 18b-91</u>	<u>AAS</u>	II
<u>3.4</u>	Relative density	IUPAC 2.101 with appropriate conversion factor	Pycnometry	!
		<u>ISO 6883</u>		
		<u>AOCS Cc 10c-95</u>	<u>Pycnometry</u>	!

3.5	Refractive index	ISO 6320:2000	Refractometry	II
		AOCS Cc 7-25 (02)	Refractometry	II
3.6	Saponification value	ISO 3657:2002	Titrimetry	I
		AOCS Cd 3-25 (03)	Titrimetry	I
3.7	Iodine value	ISO 3961:1996	Wijs-Titrimetry	I
		AOAC 993.20	Wijs-Titrimetry	
		AOCS Cd 1d-92 (97)	Wijs-Titrimetry	I
		NMKL 39(2003)	Wijs-Titrimetry	
3.8	Unsaponifiable matter	ISO 3596:2000	Gravimetry	II
		ISO 18609:2000		
		er-AOCS Ca 6b-53 (04)	Gravimetry	I
3.9	Absorbance in the ultraviolet region – K ₂₃₂	COI/T.20/Doc. n° 19	Absorption in ultraviolet	II
		ISO 3656:2002	Absorption in ultraviolet	II
		AOCS Ch 5-91 (04)	Absorption in ultraviolet	II
3.10	[pyropheophytin "a"]	[ISO 29841]	[HPLC]	[II]
3.11	[1,2-diglycerides]	[ISO 29822]	[Gas chromatography]	[II]
3.12	[4 α -desmethylsterol total content]	[COI/T.20/Doc. n° 26.]	[Gas chromatography]	[III]
		[ISO 12228-2]	[Gas chromatography]	[III]
		[AOCS Ch 6-91]	[Gas chromatography]	[III]
	Fatty acids in the 2-position of the triglycerides	ISO 6800:1997 or AOCS Ch 3-91 (97)		
	Organoleptic characteristics	COI/T.20/Doc. n° 15	Pane; Test	‡

Commodity Category	Method of sampling	Notes
Olive oils and Olive-Pomace Oils	ISO 661:1989 and ISO 5555:2004	

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