CODEX ALIMENTARIUS COMMISSION

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Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda Item 5 **CX/FO 24/28/8**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

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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[1])

(Steps 3 and 4)

Codex Members and Observers wishing to submit comments, at Step 3/4, on the proposed draft revision to the *Standard for Olive Oils and Olive Pomace Oils* (CXS 33-1981): Revision of Sections 3, 8 and Appendix should do so as instructed in **CL 2023/61/OCS-FO** available on the Codex webpage/Circular Letters 2023: https://www.fao.org/fao- who-codexalimentarius/resources/circular-letters/en/

Introduction

1. The 27th Session of CCFO held in 2021 considered the report of the 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 and agreed that there were still several areas in the proposed draft revised standard that needed further discussion and clarification.

Terms of Reference

2. CCFO27 agreed:

   i. to retain all provisions in Sections 3, 8 and Appendix at Step 4, for which CCFO and the EWG had reached consensus for consideration at CCFO28; and

   ii. to re-establish an Electronic Working Group (EWG) chaired by Spain and co-chaired by Argentina and working in English to: a) review and revise the items in square brackets in Section 3 and the Appendix and taking into account comments made and written comments received at this session; and b) revise Section 8 of the main body and Section 3 of the Appendix, taking into consideration CRD24.

Participation and Methodology

3. The EWG started its work in May 2022 when an invitation to participate in the work was sent out by Spain and Argentina to all interested Members and Observers. Representatives from 37 Members and two Observers registered to participate. The EWG worked between May 2022 and November 2023 using the Codex EWG Platform.

4. A welcome letter was sent to the EWG members with proposals on the way forward to address the outstanding issues. It was highlighted that the Codex guiding principles should be the reference that must always be considered, and that responses not supporting the proposal should be adequately supported by sound scientific arguments.

5. The EWG discussed issues outstanding from CCFO27, especially the provisions that were placed in square brackets, as highlighted in the report of CCFO27. The EWG held over three (3) rounds of consultations based on its working documents (WD), with each round including a document that analysed and presented

[1] Algeria, Argentina, Australia, Bahrain, Brazil, Canada, China, Croatia, Egypt, European Union, France, Germany, Greece, Iran (Islamic Republic of), Iraq, Italy, Malaysia, Mexico, Morocco, New Zealand, Peru, Poland, Portugal, Republic of Korea, Saudi Arabia, Senegal, Slovenia, Spain, Syria, Thailand, Türkiye, Uganda, United Kingdom, Uruguay, United States of America, IOC and USP*

arguments and evidence relating to the following contentious provisions in square brackets in the proposed draft revision to CXS 33-1981:

a. Minimum value of oleic acid (C18:1) of [53%] versus [55%];

b. Whether or not to maintain value of linolenic acid of 1.0%;

c. For values of linolenic acid from 1.0 to 1.4%, whether or not to use the IOC proposed decisional tree;

d. Uncertainty measurements for trans fatty acid - Whether or not to use two decimal places;

e. Whether or not to delete the footnote on the general statement on sterols in virgin olive oil;

f. Whether to adopt 3.5 as the median value of the most perceived defect for virgin olive oil;

g. 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

h. The need to update the methods of analysis taking into account CRD24.

Summary of the discussion

6. A total of 37 members and two observers registered to participate in the EWG, however a maximum of 18 members and observers made comments on the proposals put forward by the Chair on the above-mentioned outstanding provisions in paragraph 5.

***a) Section 3.2.1 GLC ranges of fatty acid composition** - the minimum value of oleic acid (C18:1) of [53%] or [55%].*

7. 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%. However, four (4) EWG members who did not support the value of 55% explained that they had another limit set in their national legislation and that they preferred a lower value of 53% due to the change of composition arising from climatic conditions and/or cultivation conditions.

8. There was no consensus reached in the EWG but based on the majority support, the Chair of the EWG proposes a value of 55% as the minimum value of oleic acid (18:1), because olive oil quality and authenticity are based on the fatty acid composition and defined as a high monounsaturated vegetable oil.

***b) Section 3.2.1 GLC ranges of fatty acid composition** - Footnote associated with values of C18:3 Ln ≤ 1.0% and to use decisional trees for olive oils with 1.0 < Ln ≤ 1.4%.*

9. Linolenic acid is an important parameter used to guarantee the authenticity of olive oil; however, it does not have a value in the standard CXS 33-1981 and the absence of a value of linolenic acid might increase the possibility of fraud and affect consumer protection. The majority of the EWG members were in favour of setting the linolenic acid limit of 1.0%. However, some Members were opposed to this value based on the same reasons provided in (a) above.

10. There was no consensus reached in the EWG, but the EWG Chair proposes to maintain the limit of Ln ≤ 1% and to use a decision tree for olive oils with 1.0% < Ln ≤ 1.4% so as to ensure that authentic olive oils would not be excluded if they did not meet the parameter of linolenic acid.

c) Section 3.2.1 GLC ranges of fatty acid composition - Footnote associated with values of C18:3 - Use the IOC proposal for olive oils with 1.0 < Ln ≤ 1.4%: apparent b-sitosterol/campesterol ≥ 24.

11. There was majority support within the EWG to use the IOC decision tree when the linolenic acid percentages were between 1.0 to 1.4%. One Member proposed to set the limit at 1% without any additional range. EWG members against this proposal (of 1.0 to 1.4%) also noted that they had different limits set in their national legislation, the climatic conditions, the cultivation conditions and the difficulty in the application of decision trees because not all varieties met this extra parameter.

12. It was noted that the IOC, with the aim of not excluding any authentic oil with non-compliant percentages of linolenic acid, performed a 3-year study to look for additional parameters to be applied only to non-compliant oils, and to consider them authentic if they met this additional parameter. The study concluded that the percentages of linolenic acid in oils ranged between 1.0 to 1.4% of linolenic acid and if the ratio between apparent β-sitosterol/campesterol was ≥ 24, the oil could be considered authentic olive oil.

13. There was no consensus on the issue, but the EWG Chair proposes to use the decision tree with the parameter “apparent β-sitosterol/campesterol ≥ 24” for olive oils with 1.0% < Ln ≤ 1.4%, based on the outcome of the IOC study.

d) 3.2.1 Uncertainty measurements for trans fatty acids

14. The EWG supported "maintaining two decimal places for *trans* fatty acid", noting that *trans* fatty acids were an important authenticity parameter to detect the addition of refined oil to virgin olive oils, and that the actual limit in virgin olive oils has been set in international standards as 0.05%. This limit has been set because modern refining processes produce small amounts of *trans* fatty acids. Even though the quantification of *trans* fatty acids requires skilled personnel, that should not be the reason to reduce the sensitivity of the parameter by twenty folds from 0.05% to 0.1% with the corresponding consequence of increasing the possibility of fraud.

15. The EWG agreed that two decimal places in *trans* fatty acids be maintained.

e) 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."*

16. The EWG considered whether the footnote should be eliminated from the proposed draft revised standard CXS 33-1981. There were mixed views on whether to delete the footnote or maintain it. It was noted that sterols were one of the most important parameters to guarantee the authenticity of olive oils because they were related to the botanical family, allowing for the detection of the addition of vegetable/seed oils to virgin olive oils. All sterols were important because each of them was related to a specific detection of an addition of vegetable/seed oil.

17. There was no consensus on this issue, but the EWG Chair proposes that the footnote should not be maintained in the standard.

f) 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."*

18. 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.

19. There was no consensus on this issue, but the EWG Chair proposes to set the limit for virgin olive oil category to 3.5 with a footnote "*includes the uncertainty predicted by the IOC method"* because any limit in a standard should include the uncertainty of the method.

APPENDIX

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

20. 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, and noted the views expressed by some delegations that there was not enough technical data on the parameter.

21. 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, because the method had many variables that might influence the results and there were other methods to evaluate the quality. However, four members objected to this proposal, noting that the method could be used to determine freshness of the oil and that it was already being used in some national standards.

22. There was no consensus on this issue, but the EWG Chair proposes that the provision for 1,2-diglycerides (% total diglycerides) for extra virgin oil and its corresponding analytical methods are not included in the standard noting that this would not prevent individual Members from still using the method.

h) 1.6. Pyropheophytin "a" (% total chlorophyll pigments)

23. There was majority support within the EWG to not adding the provision Pyropheophytin "a" (% total chlorophyll pigments) and its corresponding method because the method had many variables that might influence the results and there were other methods to evaluate the quality. However, four members objected to this proposal, noting that the method could be used to determine freshness of the oil and it was used in some national standards.

24. There was no consensus on this issue, but the EWG Chair proposes that the provision for Pyropheophytin "a" (% total chlorophyll pigments) and its corresponding method of analysis not to be added to the standard noting that this would not prevent individual Members from still using the method.

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

25. CCFO27 agreed to consider CRD24 and the need to delete the method for 4α-desmethylsterols (see paragraph 132 of REP22/FO) when finalizing Section 3 of the Appendix – methods of analysis and sampling.

26. 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.”

27. The EWG recommended that the methods of analysis be endorsed by CCFO as presented in the proposed draft revised standard. It is further recommended that:

a. the revised methods be forwarded to CCMAS for purposes of revising and updating the methods for olive oil in the standard CXS 234-1999; and

b. When included in the standard CXS-234, taking into account the requirements of the Procedural manual, the methods of analysis would be removed and replaced by the following text into the standards for Section 8 and 3 (Appendix) under the section ‘Method 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.”

Conclusions

28. The Chair of the EWG would like to observe that broad consensus was reached only on two provisions – “*uncertainty of the measure for trans fatty acid*” and the provisions for “*Methods of analysis*” as listed in CRD24 as well their replacement with a statement making reference to CXS 234-1999.

29. However, there continued to be a number of issues where divergent opinions were expressed (consideration or not of the geographical, climatic and genetic variations on the fatty acids and sterols composition, limits of linolenic and oleic acid, use of decision trees for oils with compositions outside to the limits, consideration or not of the sterols content as an essential composition factor, organoleptic median's limit for virgin oils, consideration or not of PPP and DAG as extra virgin olive oil quality criteria) and these issues will need to be carefully considered by CCFO28.

30. In order to provide more information on the issues above, the EWG will provide an additional supporting document (to be published as a CRD) containing technical explanation and arguments to accompany this report.

Recommendations

31. Following the analysis of all the responses provided by EWG members on all the outstanding provisions, CCFO28 is requested to consider the proposed draft revised standard CXS 33-1981 (Annex I) taking into account the provisions where consensus was reached and those where there were divergent views.

32. The Chair of the EWG would like to propose that CCFO28 consider holding an in-session working group with a view to resolve outstanding issues.

ANNEX I

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

(Steps 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 category[2].

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.

[2] This product may only be sold direct to the consumer if permitted in the country of retail sale [RETAINED UNTILL CCFO30]

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**~~-~~ 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** 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	**≤ 1.0***	**≤ 1.0***	**≤ 1.0***
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] 0.05~~**	**~~[≤0.2] 0.20~~**	**~~[≤ 0.4] 0.40~~**
Σ(t-C18:2) + Σ(t-C18:3)	**~~[≤ 0.1] 0.05~~**	**~~[≤ 0.3] 0.30~~**	**~~[≤ 0.4] 0.40~~**

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

Cholesterol	≤ 0.5
Brassicasterol	≤ 0.1 for olive oils ≤ 0.2 for olive-pomace oils
Campesterol	≤ 4.0 [a]

Stigmasterol	< campesterol
Δ7-stigmastenol	≤ 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-stigmastenol 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+Δ7-stigmastenol) ≥25, stigmasterol ≤1,4 and $\Delta ECN_{42} \leq |0,1|$. For refined olive pomace oils values >0,5 and ≤0,7% then stigmasterol ≤1,4% and $\Delta ECN_{42} \leq 0.4$.

(c) Chromatographic peak composed by Δ5,23-stigmastadienol+clerosterol+β-sitosterol+sitostanol+Δ5-avenasterol+Δ5,24-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 4α-desmethylsterols content (mg/kg)	
Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	≥ 1,000
Refined olive-pomace oil	≥ 1,800
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	≥ 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	≤ 150[(d)]
Refined olive oil Olive oil composed of refined olive oil and virgin olive oils	≤ 350[(e)]
Refined olive-pomace oil Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils	> 350[(e)]

[(d)] Sum of C_{42} esters+C_{44} esters+C_{46} ester

[(e)] 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 Virgin olive oil	≤ 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	If C16:0 ≤ 14.0 %; 2P ≤ 0.9 % If C16:0 > 14.0 %, 2P ≤ 1.0 %
Refined olive oil	If C16:0 ≤ 14.0 %; 2P ≤ 0.9 % If C16:0 > 14.0 %, 2P ≤ 1.1 %
Refined olive-pomace oil	2P ≤1.4 %
Olive-pomace oil composed of refined olive pomace oil and virgin olive oils	2P ≤1.2 %

3.2.9 ΔK (f, g)	
Extra virgin olive oil Virgin olive oil	≤ 0.01

(f) Defined as:

$$\Delta K_{270} = K_{270} - \frac{K_{266} - K_{274}}{2}$$

$$\Delta K_{268} = K_{268} - \frac{K_{264} - K_{272}}{2}$$

(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
Ordinary virgin olive oil**	~~2.~~**5 3.5 < 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.

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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
Ordinary virgin olive oil**	**⩽ 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
(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.** ** RETAINED UNTILL CCFO30	
3.3.5 ΔK (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 $\Delta K_{270} = K_{270} - \frac{K_{266} - K_{274}}{2}$ $\Delta K_{268} = K_{268} - \frac{K_{264} - K_{272}}{2}$ (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 concentrates (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 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.

Matrix	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Absorbency in ultraviolet	COI/T.20/Doc. No 19	Spectrophotometry	II
		ISO 3656		III
		AOCS Ch 5-91		III
Olive oils and olive pomace oils	Acidity, free	ISO 660	Titrimetric	I
		AOCS Cd 3d-63		
		COI/T.20/Doc. No 34		
Olive oils and olive pomace oils	Alpha-tocopherol	ISO 9936	Liquid chromatography with fluorescence detector	II
		AOCS Ce 8-89		III
Olive oils and olive pomace oils	4 α– desmethylsterol and total sterol content	COI/T.20/Doc. No 26	Thin layer chromatography or preparative liquid chromatography and gas chromatography with flame ionization detector	II
		ISO 12228-2	Thin layer chromatography and gas chromatography with flame ionization detector	III
		AOCS Ch 6-91		III

Matrix	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Difference between the actual and theorical ECN 42 triglyceride content	COI/T.20/Doc. No 20	Calculation from triglycerides by liquid Chromatography and fatty acid methyl ester by Gas Chromatography, differential refractometer detector.	I
Olive oils and olive pomace oils	Erythrodiol and uvaol	COI/T.20/Doc. No 26	Thin-layer chromatography or preparative liquid chromatography and gas chromatography with flame ionization detector	II
Olive oils and olive pomace oils	Halogenated solvents, traces	ISO 16035	Gas chromatography with electron capture detector	II
Olive oils and olive pomace oils	Fatty acid composition	COI/T.20/Doc. No 33	Gas chromatography of methyl esters with flame ionization detector	II
		AOCS Ch 2-91		III
		ISO 12966-2		III
		ISO 12966-4		III
Olive oils and olive pomace oils	Fatty acid ethyl esters content	COI/T.20/Doc. No 28	Preparative column chromatography and gas chromatography with flame ionization detector	II
Olive oils and olive pomace oils	Insoluble impurities in light petroleum	ISO 663	Gravimetry	I
Olive oils and olive	Iodine value	ISO 3961	Wijs-Titrimetric	I
		AOAC 9930.20		
		AOCS Cd 1d-92		
Pomace oils		NMKL 39		
Olive oils and olive pomace oils	Iron and copper	Include methods according to performance criteria		
		ISO 8294	Atomic absorption spectrometry	II
		AOAC 990.05		III
Olive oils and olive pomace oils	Lead	Include methods according to performance criteria		
		ISO 12193	Atomic absorption spectrometry	II
		AOAC 994.02		III
		AOCS Ca 18c-91		III
Olive oils and olive pomace oils	Moisture and volatile matter	ISO 662	Gravimetry drying at 103ºC	I
Olive oils and olive pomace oils	Organoleptic characteristics	COI/T.20/Doc. No 15	Sensory analysis by panel	I
Olive oils and olive pomace oils	Peroxide value	ISO 3960	Titrimetric	I
		AOCS Cd 8b-90		
		COI/T.20/Doc. No 35		
Olive oils and olive pomace oils	Relative density	ISO 6883	Picnometry	I
		AOCS Cc 10c-95		
Olive oils and olive pomace oils	Saponification value	ISO 3657	Titrimetric	I
		AOCS Cd 3-25		

Matrix	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Stigmastadienes content	COI/T.20/Doc. No 11	Preparative column chromatography and gas chromatography with flame ionization detector	II
		ISO 15788-1		III
		AOCS Cd 26-96		III
		ISO 15788-2	Liquid chromatography with UV detector	III
Olive oils and olive pomace oils	Trans fatty acids content	COI/T.20/Doc. No 33	Gas chromatography of methyl esters with flame ionization detector	II
		ISO 12966-4		III
		AOCS Ce 1h-05		III
Olive oils and olive pomace oils	Unsaponifiable matter	ISO 3596	Gravimetry, drying at 103ºC and titrimetric (colorimetry)	I
		AOCS Ca 6b-53		
Olive oils and olive pomace oils	Wax content	COI/T.20/Doc. No 28	Preparative column chromatography and gas chromatography with flame ionization detector	II
		AOCS Ch 8-02		III
Olive oils and olive pomace oils	2 glicerylmonopalmitate, percentage	COI/T.20/Doc. No 23	Gas chromatography with flame ionization detector	II
		ISO 12872		III
Olive oils and olive pomace oils	1,2 Diglycerides	ISO 29822	Gas chromatography with flame ionization detector	II
Olive oils and olive pomace oils	Pyropheophytin “a”	ISO 29841	Liquid chromatography with UV/VIS or fluorescence detector	II

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

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	Good		light yellow to green

1.2 Moisture and volatile matter (g/100 g)

Extra virgin olive oil Virgin olive oil	≤ 0.2
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 Virgin olive oil	≤ 0.1
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 Absorbance in the ultraviolet region at 232 nm (expressed as K_{232})

Extra virgin olive oil	≤ 2.50
Virgin olive oil	≤ 2.60

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

~~**[Extra virgin olive oil]**~~	~~**[≥ 35]**~~

~~[1.6 Pyropheophytin "a" (% total chlorophyll pigments)]~~	
~~[Extra virgin olive oil]~~	~~[≤ 17]~~

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 ºC/water at 20 ºC)	
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

Matrix	Provision	Method(s)	Principle	Type
Olive oils and olive pomace oils	Absorbency in ultraviolet	COI/T.20/Doc. No 19	Spectrophotometry	II
		ISO 3656		III
		AOCS Ch 5-91		III
Olive oils and olive pomace oils	Acidity, free	ISO 660	Titrimetric	I
		AOCS Cd 3d-63		
		COI/T.20/Doc. No 34		
Olive oils and olive pomace oils	Alpha-tocopherol	ISO 9936	Liquid chromatography with fluorescence detector	II
		AOCS Ce 8-89		III
Olive oils and olive pomace oils	4 α– desmethylsterol and total sterol content	COI/T.20/Doc. No 26	Thin layer chromatography or preparative liquid chromatography and gas chromatography with flame ionization detector	II
		ISO 12228-2	Thin layer chromatography and gas chromatography with flame ionization detector	III
		AOCS Ch 6-91		III
Olive oils and olive pomace oils	Difference between the actual and theorical ECN 42 triglyceride content	COI/T.20/Doc. No 20	Calculation from triglycerides by liquid Chromatography and fatty acid methyl ester by Gas Chromatography, differential refractometer detector.	I
Olive oils and olive pomace oils	Erythrodiol and uvaol	COI/T.20/Doc. No 26	Thin-layer chromatography or preparative liquid chromatography and gas chromatography with flame ionization detector	II
Olive oils and olive pomace oils	Halogenated solvents, traces	ISO 16035	Gas chromatography with electron capture detector	II
Olive oils and olive pomace	Fatty acid composition	COI/T.20/Doc. No 33	Gas chromatography of methyl esters with flame ionization	II

Matrix	Provision	Method(s)	Principle	Type
oils		AOCS Ch 2-91	detector	III
		ISO 12966-2		III
		ISO 12966-4		III
Olive oils and olive pomace oils	Fatty acid ethyl esters content	COI/T.20/Doc. No 28	Preparative column chromatography and gas chromatography with flame ionization detector	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	Wijs-Titrimetric	I
		AOAC 9930.20		
		AOCS Cd 1d-92		
Pomace oils		NMKL 39		
Olive oils and olive pomace oils	Iron and copper	Include methods according to performance criteria		
		ISO 8294	Atomic absorption spectrometry	II
		AOAC 990.05		III
Olive oils and olive pomace oils	Lead	Include methods according to performance criteria		
		ISO 12193	Atomic absorption spectrometry	II
		AOAC 994.02		III
		AOCS Ca 18c-91		III
Olive oils and olive pomace oils	Moisture and volatile matter	ISO 662	Gravimetry drying at 103ºC	I
Olive oils and olive pomace oils	Organoleptic characteristics	COI/T.20/Doc. No 15	Sensory analysis by panel	I
Olive oils and olive pomace oils	Peroxide value	ISO 3960	Titrimetric	I
		AOCS Cd 8b-90		
		COI/T.20/Doc. No 35		
Olive oils and olive pomace oils	Relative density	ISO 6883	Picnometry	I
		AOCS Cc 10c-95		
Olive oils and olive pomace oils	Saponification value	ISO 3657	Titrimetric	I
		AOCS Cd 3-25		
Olive oils and olive pomace oils	Stigmastadienes content	COI/T.20/Doc. No 11	Preparative column chromatography and gas chromatography with flame ionization detector	II
		ISO 15788-1		III
		AOCS Cd 26-96		III
		ISO 15788-2	Liquid chromatography with UV detector	III
Olive oils and olive pomace oils	Trans fatty acids content	COI/T.20/Doc. No 33	Gas chromatography of methyl esters with flame ionization detector	II
		ISO 12966-4		III
		AOCS Ce 1h-05		III
Olive oils and olive pomace oils	Unsaponifiable matter	ISO 3596	Gravimetry, drying at 103ºC and titrimetric (colorimetry)	I
		AOCS Ca 6b-53		
Olive oils and olive pomace oils	Wax content	COI/T.20/Doc. No 28	Preparative column chromatography and gas chromatography with flame	II
		AOCS Ch 8-02		III

Matrix	Provision	Method(s)	Principle	Type
			ionization detector	
Olive oils and olive pomace oils	2 glicerylmonopalmitate, percentage	COI/T.20/Doc. No 23	Gas chromatography with flame ionization detector	II
		ISO 12872		III
Olive oils and olive pomace oils	1,2 Diglycerides	ISO 29822	Gas chromatography with flame ionization detector	II
Olive oils and olive pomace oils	Pyropheophytin “a”	ISO 29841	Liquid chromatography with UV/VIS or fluorescence detector	II