CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda Item 5 **CX/FO 21/27/6 Add.1**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

Twenty-Seventh Session

Virtual, 18 – 22 October and 26 October 2021

PROPOSED DRAFT REVISION OF THE *STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS* (CXS 33-1981) - SECTIONS 3 AND 8

Comments at Step 3 (reply to CL 2021/29/OCS-FO)

Comments of Australia, Brazil, Canada, Chile, China, Cuba, Ecuador, Egypt, European Union, India, Iraq, Jordan, Kenya, Lebanon, Morocco, Panama, Peru, Saudi Arabia, Syrian Arab Republic, Turkey, Uganda, USA and the International Olive Oil Council

Background

1. This document compiles comments received through the Codex Online Commenting System (OCS) in response to CL 2021/29/OCS-FO issued in June 2021. Under the OCS, comments are compiled in the following order: general comments are listed first, followed by comments on specific sections.

Explanatory notes on the appendix

2. The comments submitted through the OCS are hereby attached as Annex I and are presented in table format. Annex II are the comments submitted via email.

ANNEX I

Comments at Step 3 (reply to CL 2021/29/OCS-FO)

GENERAL COMMENTS	Member/Observer
Lebanon believes that we do not have enough arguments and health and nutritional scientific facts to delete this category, Lebanon suggests re-considering the elimination proposal of OOO category from the codex STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS. Lebanon appreciates the opportunity to comment on circular letter CL 2021/29/OCS–FO and thanks the Chair and Co-chairs for leading the eWG to progress this work. Lebanon expresses concerns regarding the deletion of the ordinary olive oil category from the standard Our concerns regarding this tentative deletion proposal are at two levels: - health, safety & nutritional level, - commercial and trade level. At the commercial and trade level, it is to be noted that the annual production of Ordinary olive oil (OOO) is still not negligible, roughly estimated about 25%. Although the production of virgin and extra virgin olive oil counts for the majority of the annual production(not less than 75%), nevertheless the OOO production increases as a result of post processing practices and storage conditions. For these reasons we believe that eliminating this category of Olive oil from the standard will have a huge economic impact especially on developing countries. As for the health, safety and nutritional level, we recognize the fact that OOO is not as nutritious and anti- carcinogenic as the other virgin Oil categories, but it's nutritional value is still higher than the widespread and heavily consumed vegetable oils, and is less harmful to the consumer health. In fact, OOO is produced by mechanical press tools and does not undergo any chemical or thermal treatments as it is the case for vegetables oils. OOO is mostly composed of the mono unsaturated fatty acids proved healthier than the polyunsaturated and saturated fatty acids characterizing almost all vegetable oils. In conclusion, and based on the above, we do not believe that this committee has enough arguments and health and nutritional scientific facts to delete this category, and the economic impact will be enormous to developing countries. OOO is surely more nutritious than the other vegetable oils allowed in other codex standards, and its consumption should be encouraged and privileged. Considering the above reasons, Lebanon suggests re-considering the elimination proposal of OOO category from the codex STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS.	**Lebanon**
The EU comments on the sections 3 and 8 and Appendix I will focus in general on items still in square brackets. However, on occasions, the EU comments address items that documents CX/FO 21/27/6 and CX/FO 21/27/6 Add.1 consider as agreed.	**European Union**
Jordan object on the deletion of ordinary virgin olive oil (category3), and the reflection of this deletion on other parameters including all quality , physio-chemical, and sensory(organoleptic characteristics)	**Jordan**
Syria generally agrees with the proposed revision of the draft, with the exception of those related to clauses (3.1 and 3.2.3) that need further consideration as mentioned under specific comments.	**Syrian Arab Republic**
The Kingdom of Saudi Arabia the proposed draft revision to the standard. In addition, to include the common name of the fatty acid carbon chain: Myristic acid C14:0 Palmitic acid C16:0 Palmitoleic acid C16:1 Heptadecanoic acid C17:0 Heptadecanoic acid C17:1 Stearic acid C18:0 Oleic acid C18:1 Linoleic acid C18:2 Linolenic acid C18:3 Arachidic acid C20:0	**Saudi Arabia**

GENERAL COMMENTS	Member/Observer
Gadoleic acid (eicosenoic) C20:1 Behenic acid C22:0 Lignoceric acid C24:0	
Canada agrees with most of the changes in the proposed draft revisions to the standard for Olive Oils and Olive Pomace Oils (CXS 33-1981) contained in the report of the electronic working group in CX/FO 21/27/06. Canada supports the changes that are based on sound scientific evidence, and those that are inclusive of the authentic olive oils produced in various regions and geographical locations. Canada also supports reorganization of the layout of the standard as presented in the report of the EWG.	**Canada**
Egypt supports the IOC comments on the proposed draft standard CODEX STAN (33-1981) referred to as follows: The Executive Secretariat (ES) of the International Olive Council (IOC) would like to begin by expressing its compliments for the work and activities carried out by the chair and co-chairs of the CCFO eWG and the Secretariat of the Codex Alimentarius Commission to develop international codes of practice for food safety, quality and fair trade. We particularly commend your efforts and the Commission's collaboration with the IOC on the standard for olive oils and olive-pomace oils (CODEX STAN 33-1981). As you are surely aware, the IOC is an intergovernmental organization charged with administering the International Agreement on Olive Oil and Table Olives 2015, which has been signed, ratified and deposited with the Secretariat of the UN by its member states. The IOC's mission is to safeguard the authenticity of olive products and monitor and harmonize legislation, regulations and international standards on olive oils and table olives. It is also a reference organization for the Codex. To date, the signatory members of the International Agreement 2015 (Albania, Algeria, Argentina, Egypt, Georgia, Iran, Israel, Jordan, Lebanon, Libya, Morocco, Montenegro, Palestine, Tunisia, Turkey, the European Union and Uruguay) produce more than 90% of the world's olive oil and table olives and account for 75% of international trade in olive products. Over the course of four years, the eWG on the revision of the standard on olive oil and olive-pomace oils has worked on numerous response forms proposed by the chair of the eWG, where some questions were repeated, leading to confusion. However, the IOC would like to express its point of view concerning the chair's report, CX/FO 21/27/6. The IOC would like to highlight certain aspects of the proposed draft standard by the chair: 'Topics highlighted in blue were agreed upon by CCFO26 at the 2019 plenary' as well as in the report REP 19/FO, point 55 c: 'The Committee also agreed that to the extent possible, members should refrain from opening up discussion in the eWG on items for which there has been clear agreement'. It is important to return to the points on which consensus was reached and which the IOC invites the CCFO to adopt at its 27th plenary session, such as: - The change of the denomination of olive oil composed of refined olive oil and virgin olive oils. - The change of the denomination of olive-pomace oil composed of refined olive-pomace oil and virgin olive oils. - To eliminate the reference to odour and taste in the heading "Organoleptic characteristics (odour and taste) of virgin olive oils". - To include the unit of peroxide value (milliequivalents of active oxygen/kg oil). - To include the unit of free fatty acids (g/100 g expressed as of oleic acid). - To replace "Absorbency" by "Absorbance" and to add how it is expressed (expressed as K270/ or K268) and the definitions of ΔK. - To add an explanatory note for apparent beta-sitosterol. - The content of waxes in extra virgin olive oil and virgin olive oil (C42 +C44 +C46). - The percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol) instead of the saturated fatty acids in position 2. - Maximum stigmastadienes content ≤ 0,05 mg/kg. - To add the sign ≤ before the limit of the ΔECN42.	**Egypt**

GENERAL COMMENTS	Member/Observer
- Fatty acid methyl esters composition (expressed as percentages of total fatty acids): C14:0 (myristic acid): ≤0.03; C16 :0 (palmitic acid): 7.0 – 20.0 C17:0 (margaric acid): ≤0.4 C17:1 (heptadecenoic acid): ≤0.6 C18:1 (oleic acid): upper limit 85.0 C18:2 (linoleic acid): 2.5 – 21.0 C20:1 (gadoleic acid): ≤0.5 - Methods of analysis that were presented at the CCFO and the CCMAS meetings. The tables showing differences among methods are in ANNEX 1 of this document after an exhaustive revision between IOC, ISO and AOCS methods. However, it is also very important to focus on the following issues discussed in the rounds of working documents (WD) on which there is no consensus and which appear in square brackets in Annex 2 of the proposed draft standard sent by the chair: 1. Removal of the footnote of the definitions of refined olive oil and refined olive-pomace oil (page 3 of CX/FO 21/27/06 June 2021). This footnote states: "This product may only be sold direct to the consumer if permitted in the country of retail sale" and it is referred to in the definitions of the refined olive oil and refined olive-pomace oil categories. The chair of the Codex eWG proposed removing this note in WD1, WD4, WD9 and again in WD12. Even though most countries were against removing this note, it is considered an issue for which there is no consensus. As mentioned in CXS 33 PROPOSED REVISIONS, this footnote “is a trade restriction on refined olive and olive-pomace oils, which the Codex considers edible. This note is in the IOC standard as recognition of protectionist practices carried out by some of its members. Codex should be uninvolved in this type of practice.” The IOC does not agree with the removal of this note, since it does not ban the retail sale of refined olive oils and refined olive-pomace oils, but, given the needs, habits and quality policies of various countries, acknowledges the fact that countries may have different positions on the marketing of these two categories. For example, EU legislation allows refined olive oil or refined olive-pomace oil to be sold to the final consumer only as part of a blend. The IOC is of the opinion that an international standard should specify which categories are available in all markets of the world and the categories for which there are restrictions in certain countries, in order to be in line with its purpose of ensuring the fair trade of a product. It should be emphasized that the oil produced from olives is different to all other vegetable oils, because it can be edible either as virgin or as refined oil. It is widely known that virgin olive oil is a product of high biological and nutritional value and of superior value from all other vegetable oils. 2. Statement on fatty acids composition [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.] (Page 3 of CX/FO 21/27/06 June 2021). This statement was proposed in WD9 and again in WD12 as option 1. The IOC formulated its arguments to disagree with this statement, which are still valid. Regarding this issue, the chair commented in RF12 SUMMARY REPORT: “Because of the replies received, options 2, 3, and 4 are rejected, as indicated at the beginning of this document, and option 1 would remain to present to the CCFO should a compromise solution it is not possible in the time remaining until October.” In addition, in CXS 33 PROPOSED REVISIONS, it is stated: “It is proposed to include the statement appearing in CXS 210 about the anomalies existing with fatty acids. It is not agreed on. A decision scheme developed by the IOC for linolenic acid is expected to arrive presently, which may help to achieve consensus. An agreement on this topic is expected before the plenary session.” The IOC would like to reiterate its arguments against this proposal. The proposed statement is general and vague: it does not specify which oils are considered compliant (is it sufficient	

GENERAL COMMENTS	Member/Observer
for the oils to comply only with the fatty acid limits and not with the other criteria included in the standard?) and which are the criteria to justify deviations and to ensure the authenticity of an oil. Therefore, the adoption of this statement will result in the CODEX STAN not being fit for purpose, namely to ensure fair trade and protect the consumer. The IOC considers the mandatory application of all quality and authenticity criteria to be an extremely important issue. Otherwise, the probability that an oil is blended with oils other than olive oil is significantly higher than the probability that an oil results from an anomalous composition of authentic olive oil. For the time being, the only reliable tool for facing the deviations of some authentic olive oils from the official limits regarding fatty acids or individual sterols is the adoption of a decision tree through scientific evidence. This way, the authenticity of an oil coming from cultivars of specific origins is recognized while excluding the risk of adulteration. After thorough study, the IOC has adopted a decision tree for extra virgin and virgin olive oils that deviate from the official limit regarding campesterol and four decision trees for olive oils and olive-pomace oils that deviate from the official limit regarding Regarding this issue, the chair commented on RF12 SUMMARY REPORT: “The IOC and its members want the decision tree proposed by the IOC to be considered, they should forward it sooner rather than later, so have time to distribute it, study and comment on it, which takes time, as you know. If it is unsubmitted in time to go through all these steps, it will be unconsidered. These informal contacts can be used until the first week of October, to reach agreements that will allow us to present an easy document to the CCFO plenary”. In CXS 33 PROPOSED REVISIONS, it is written “Not agreed so far.” The group of IOC expert chemists has discussed and studied the linolenic acid limit for many years and at different periods, since a significant amount of virgin olive oils deviate from the official linolenic acid limit. However, it was very difficult to find an effective solution to this issue. This period, the IOC’s work on the linolenic acid limit issue has progressed and the eWG proposed an effective decision tree for linolenic acid values from 1.0 to 1.4%. So, the IOC considers that the linolenic acid limit should be ≤ 1.0 with an asterisk referring to a note saying that “An edible virgin olive oil that exhibits 1.0 < linolenic acid% ≤ 1.4 is authentic, provided that app. β-sito/campesterol ≥ 24 and all other purity criteria lie within the official limits”. The parameter apparent β-sito/campesterol includes the two most sensitive parameters for detecting olive oil fraud with high linolenic acid extraneous oils. This note is easy to use since it includes a condition that must be met by virgin olive oils that deviate from the linolenic acid limit. It is effective both for detecting fraud and the deviant virgin olive oils from Spain and Morocco, which are the main countries with a significant amount of virgin olive oils that deviate from the official linolenic acid limit. The data and studies carried out by the IOC eWG on the linolenic acid limit are available from the IOC Executive Secretariat. The chair must consider this decision tree before the final revision of the CODEX STAN is drafted. The adoption of this decision tree by the CODEX STAN could be a very good decision provided that all olive oil producing countries check its effectiveness in the olive oils that deviate regarding linolenic acid. This check needs great care to avoid the need for modifications in the future. It should be noted that the effectiveness of this decision tree is checked only on the deviated samples and not on all olive oils of each country. 5. Expression of trans fatty acids to one decimal place (page 4 of CX/FO 21/27/06 June 2021). On RF11 SUMMARY REPORT, the chair commented: “Regarding the expression of the limits and the number of decimal places to consider, this issue has also been explained in two documents, but there is no objection to doing it again. For consistency between Codex standards CXS 33 and CXS 210, the fatty acid limits in the draft appear with a single decimal place. Put differently, nothing has been changed, just the Codex format has been retained. Also, both in the first and second working period, it was proven, considering the IOC data, that the method measurement's uncertainty is in the second decimal place, which means that this figure is uncertain, i.e., it is unknown with certainty. So, the legal limit cannot be placed in the second decimal place because it would cause legal uncertainty in the event a value is close to the limit exceeding it.”	

GENERAL COMMENTS	Member/Observer
In CXS 33 PROPOSED REVISIONS, it is written: “Regarding the number of decimal places for the trans isomers, the change is due the precision values of the method do not allow the use of two decimal places”. The IOC cannot agree to express the trans-fatty acids limits to one-decimal place. More careful consideration is needed regarding the method measurement's uncertainty. The IOC would like to note that the difference between the IOC and Codex standards regarding the number of decimal places appears not only in trans-fatty acids but also in the expression of all fatty acids limits except for myristic acid. In the CODEX STAN, all fatty acids limits (cis and trans) are expressed to one decimal place, while in the IOC standard and Commission Regulation (EEC) 2568/91, the fatty acids limits are expressed to two decimal places. This expression has a great influence on limits and can result in the non-uniform implementation of international standards and in the effectiveness of the method on TAG coherence in the detection of olive oil fraud. 6. Decision trees for Δ7-stigmastenol (page 4 of CX/FO 21/27/06 June 2021). The limit for Δ7-stigmastenol is written ≤ 0.5 [b] and is accompanied by the note [(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 ΔECN42 ≤|0.1|. For refined olive-pomace oils values > 0.5 and ≤ 0.7% then stigmasterol ≤1.4% and ΔECN42 ≤ 0.4.] On RF12 SUMMARY REPORT, the chair commented: “Four of the five published schemes are aimed to solve the Δ7-stigmastenol anomalies, and as can be seen, the four schemes are different. For the same problem, four different solutions are provided, depending on the oil considered. This creates instability since a similar problem is approached in four different ways, which also generates confusion, especially when the restrictive criteria in each scheme are also different. In this restrictive scheme, a criterion that cannot be met, number 2, is imposed. On the other hand, stigmasterol, which does meet the specified limit, is restricted by 57.6%, bringing it to values that many virgin oils cannot meet, and finally, the fourth criterion, related to fatty acids, which also meet the specified limit, is restricted by half. What is also surprising about these schemes is that restrictions are imposed on parameters that already meet the standard. Why? The IOC members indicate that these decision schemes respond to the characteristics of the off-standard oils. Hence, this information should always be available for consultation. Therefore, and for the sake of transparency, the studies resulted in the five decision schemes should be made available to all CCFO members, given that the intention is to implement these schemes in CXS 33.” In CXS 33 PROPOSED REVISIONS, there is no reference whatsoever to this issue. Before responding to the chair's comments on RF12 SUMMARY REPORT, it is useful to recall what a decision tree is. The main principle behind adopting a decision tree is based on the fact that, while a higher limit on a deviated parameter is acceptable, one or more other parameters are inserted in the decision tree with limits that are stricter than the official limits. Why? When we accept a looser limit for a critical authenticity parameter, we reduce the effectiveness of this parameter in the detection of fraud. We therefore need to find other parameters that have approximately the same efficiency in detecting fraud as that of the deviated parameter when it is used with its official limit. If there is no substitute for the deviated parameter, then this parameter is irreplaceable and alternative solutions to a decision tree should be sought. The above should clarify “why restrictions are imposed on parameters that already meet the standard”. The decision tree makes sense when the limits of the parameters included in the decision tree are stricter than the official ones. Before adopting a decision tree, the following must be examined: 1. The effectiveness of the decision tree in the detection of olive oil fraud. 2. The effectiveness of the application of the decision tree in the deviated analysed samples. The IOC expert chemist group has studied the adoption of decision trees regarding olive oils that deviate from the Δ7-stigmastenol limit since 2013.	

GENERAL COMMENTS	Member/Observer
The parameter Δ7-STIGMASTENOL is very effective in detecting the adulteration of olive oils, especially in sunflower and safflower oils. So, the only solution to deviations of olive oils from Δ7-stigmastenol limit is to adopt a decision tree. As mentioned above, the IOC has adopted, after thorough study, the following four decision trees for olive oils and olive-pomace oils that are deviated from the official limit regarding Δ7-stigmastenol: IOC Δ7-stigmastenol decision trees Used criterion Category EVOO and VOO COO, ROPO and ROPO+VOOs LOO ROO and ROO+VOOs Δ7- Stigmastenol % >0.5 and ≤0.8 >0.5 and ≤0.7 >0.5 and ≤0.8 >0.5 and ≤0.8 Campesterol % ≤ 3.3 ≤ 3.3 Stigmasterol % ≤1.4 ≤1.4 (app. β-sito)/ (campe+ Δ7-stigma) ≥ 25 ≥ 24 Stigmastadiene (mg/kg) ≤0,30 ΔECN42 ≤ |0.10| ≤ |0.40| ≤ |0.15| ≤ |0.15| The other parameters will abide by the limits fixed in the standard. All the adopted decision trees were examined for: 1. Their effectiveness in the detection of olive oil fraud, i.e., the risk of adulteration when a decision tree is applied due to a permitted increase in the official limit of a parameter. During this examination, the most effective parameters in the detection of fraud and their limits are selected. 2. Their effectiveness in the deviant samples regarding Δ7-stigmastenol. This entails processing the statistical data for the deviant samples and calculating the percentage of samples tested that comply with the proposed limit for each parameter. The most suitable parameters are selected based on sample conformity and a decision tree is created for the deviant parameter and category of virgin olive oil. The seed oils which exhibit high Δ7-stigmastenol content are: sunflower, sunflower high-oleic, sunflower mid-oleic, safflower, safflower high-oleic, soyabean and sesame. The vegetable oils with high Δ7-stigmastenol % content exhibit simultaneously a very high campesterol (ranging from 6.5% to 24.2%) and stigmasterol content (ranging from 4.5% to 19.2%). The examination of the first stage revealed that the most effective parameters to distinguish a high Δ7-stigmastenol olive oil from an olive oil adulterated with high Δ7-stigmastenol seed	

GENERAL COMMENTS	Member/Observer
oils are: Δ7-stigmastenol, ΔECN42, Apparent β-sitosterol, Apparent β-sitosterol /(campe+Δ7-stigma), campesterol and stigmasterol. The effectiveness of the above parameters is affected by the corresponding limit. Thus, the stigmasterol parameter (limit ≤1.8%) is useless, since in this case the parameters campesterol (limit ≤3.3%), apparent β-sitosterol (limit ≥93.0), and apparent β-sitosterol /(campesterol+Δ7-stigmastenol) (even with limit ≥23) are more effective in controlling fraud. During the examination of the second stage, a decision tree was created for each category based on the conformity of the available deviant samples with the proposed limit for each parameter. Thus, the "four schemes are different" because the composition of the oils of each category is different. The comment "This creates instability…also generates confusion" is incorrect, since the decision trees should be effective both for detecting fraud and the deviant samples. The decision tree for extra virgin and virgin olive oils includes all the sensitive parameters for the detection of high Δ7–stigmastenol seed oils. It is strict but very effective in the detection of fraud. In addition, the conformity of the available deviant samples was very good. The comment "a criterion that cannot be met, number 2, is imposed" is not true. Only when a sample exhibits campesterol=3.3, it is rarely the case to comply with the limit of 25 or 24 regarding app. β-sito)/ (campe + Δ7-stigma). Usually, samples that deviate in Δ7-stigmastenol exhibit low campesterol content. Regarding stigmasterol, for this parameter there is no official limit (only < campesterol). However, as mentioned before, value of stigmasterol 1.8% is useless for detecting seed oils with high Δ7- stigmastenol content. Similarly, stigmasterol could not be used to detect the addition of high Δ7- stigmastenol content seed oils to lampante olive oils due to the higher stigmasterol content of this category compared to that of extra virgin and virgin olive oils (in some cases higher than campesterol). As for the parameter ΔECN42, its presence in the decision tree with the official limit $\left\lvert 0.20 \right\rvert$ is meaningless; on the other hand, the conformity of the available deviant samples to the limit ≤ $\left\lvert 0.10 \right\rvert$ was very good. The decision tree for COO, ROPO and ROPO+VOOs includes only the parameters stigmasterol and ΔECN42 because the conformity of the available deviant samples of these categories to the limits of other parameters was not good. In addition, the upper limit for Δ7-stigmastenol is 0.7% due to the statistical data of these categories. Finally, the decision tree for ROO and ROO+VOOs includes only the parameters app. β-sito)/ (campe+Δ7-stigma) and ΔECN42. The IOC eWG proposed this decision tree in March 2021; it is a simplification of the previous decision tree. The IOC would like to state that it is in the process of simplifying decision trees to make them easier to use and more efficient. Given that a decision tree that includes many parameters and limits sets many restrictions and makes it difficult to use, the simplification of a decision tree (not to the detriment of its effectiveness in fraud control) corrects some incompatibilities as well. For example, the campesterol parameter could be removed from a decision tree if the parameter app. β-sito)/ (campe+ Δ7-stigma) is included. The IOC also considers it absolutely necessary to confirm the effectiveness of the decision trees in the deviant samples by analysing lots of data from olive oil producing counties which exhibit deviations regarding Δ7-stigmastenol. In conclusion, the IOC clarifies that the studies on these decision trees began in 2013 and are ongoing. All are available from the IOC Executive Secretariat. 7. Statement on sterols composition [The authenticity of virgin olive oil is not compromised if one sterol, or their minimum content, does not fall within the given ranges if all other sterols and parameters referred to in this standard fall within the stated ranges] (page 5 of CX/FO 21/27/06 June 2021). This statement was proposed in WD5, WD7 and WD10. The IOC sent its arguments for its disagreement with this statement. Even though most countries were against this statement, it is considered an issue for which there is no consensus. Regarding this issue, the chair commented in RF10 SUMMARY REPORT: "If the rest of the sterols and authenticity parameters meet the standard, there is no need to ask this question (how do we conclude if deviation is due to cultivars of specific origins or to the adulteration of this olive oil with certain seed oils?) and the oil should be considered compliant. Once more, it is pointed to that not doing so implies accepting an uncertain decision. Even though	

GENERAL COMMENTS	Member/Observer
the oil is declared not in compliance, the question raised by the IOC remains without an answer. Moreover, the resulting risk that the presumption of innocence of a producer or operator may be violated remains since there would not be unquestionable evidence that the oil was adulterated.". In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "This statement is not agreed on and most likely not considered." The IOC disagrees with this proposal. According to the chair, the proposal allows only one deviation from the official limits on any independent sterol or total sterols content of an olive oil in order to avoid an uncertain decision on authenticity. However, sterols analysis is valuable for detecting fraud. The limits for each independent sterol were adopted after thorough study to detect the adulteration of an olive oil with a different kind of vegetable oil, and no sterol limit can be replaced by another. Accepting a deviation without setting another criterion would lead to the conclusion that the oil is uncontrollable both in terms of its fair marketing and its consumption. The IOC would like to reiterate the fact that the compliance of an olive oil with all sterol limits and generally with all purity criteria should be mandatory in order to verify its authenticity. Otherwise, the probability that oils other than olive oil are added to it is significantly higher than the probability that it is produced from an anomalous composition of an authentic olive oil. For the time being, the only reliable tool for facing the deviations of some authentic olive oils from the official limits regarding fatty acids or individual sterols is the adoption of a decision tree through scientific evidence. This way, the authenticity ofan oil that comes from cultivars of specific origins is recognised while excluding the risk of adulteration. The IOC expert chemists are working in this direction to adopt standards fit for purpose, namely to ensure fair trade and protect the consumer. 8. To consider ΔK as an authenticity parameter for the categories extra virgin and virgin olive oils (page 5 of CX/FO 21/27/06 June 2021). This proposal was made in WD10. Even though most countries were against the proposal, it is considered an issue for which there is no consensus. The IOC sent its arguments for its disagreement with this proposal. On RF10 SUMMARY REPORT, the chair commented: "ΔK is going to be maintained as an authenticity parameter of virgin oils, without being expressed as an absolute value, as indicated by the IOC and which, by mistake, has been so indicated in the draft. It is maintained as a quality parameter for refined oils and their blends with virgin and extra virgin olive oil although in the upcoming months it may be debated whether to maintain it in the standard." In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "The name of the analytical determination has been agreed on. It is included as a composition factor of virgin and extra virgin oils because it is an indicator of the presence of refined oils." The IOC would like to repeat its opinion on including ΔK in the quality or purity criteria. Absorbency at 270 or 268 nm is caused by compounds, which are produced in a secondary stage of oxidation or when oil is subjected to technological treatments. The index ΔK is a criterion for discriminating between a bad quality virgin olive oil and an olive oil adulterated with refined oil. Consequently, the absorbency at K270 or K268 and the index ΔK, apart from being quality criteria, could also be used as purity criteria. Based on the above, the IOC considers that the parameter ΔK should remain a quality criterion for the extra virgin and virgin olive oil categories as it is for the other categories. However, a note could be adopted that states: "both K270 or K268 and ΔK can also be used as purity criteria for the detection of refined oils". This note also helps the control authorities, so that they do not necessarily conclude that values of ΔK falling out of the limit mean fraud and not that the virgin olive oil is of poor quality. 9. To express the defect's median of the limit between fit and unfit categories with no decimal places. Consequently, the median of the most perceived defect should be 3 (page 6 of CX/FO 21/27/06 June 2021). This proposal was discussed in WD4 and again in WD11. Even though most countries were against this proposal, it is considered an issue for which there is no consensus. On RF10 SUMMARY REPORT, the chair commented: "If the majority position of the IOC and its members is only to adopt a median of 3.5, then there is nothing more to add.	

GENERAL COMMENTS	Member/Observer
However, the Chair feels that a limit with a decimal place is inconsistent and will cause legal uncertainty to the standard. Therefore, wishes the CCFO's plenary to have the final word, and so relieving him of any responsibility for adopting a limit that is felt in all conscience is wrong from diverse points of view." In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "A limit of three, without decimal places, has been proposed as a consensus solution, given that is in the first decimal place the analytical error and the uncertainty of the measurement are. Legal limits cannot be affected by either. For discussion." This proposal was discussed extensively in the IOC eWG MEDIAN, and the IOC sent its arguments for its disagreement with this proposal. The IOC considers this a very important issue since after removing the ordinary category, the proposed median of the predominant defect will be the limit between fit and unfit categories. The current Codex limit of 2.5 corresponds to the limit 3.5 set in the IOC trade standard, taking into consideration that the IOC limit already considers the uncertainty of the method. The Codex proposal is simply a rounding of the already existing limit of 2.5 in CODEX STAN 33. This means that median values from 2.5 to 3.4 are considered within the limit. 3. It could be noted that the fewer decimal places to which a limit is expressed, the greater its tolerance, meaning the range within which lies a compliant result. However, this proposal does not specify whether it will accept the statement included in the IOC method (§10.4 of the COI/T.20/Doc. No. 15/Rev. 10 method: "The error of the method has been taken into account when establishing the limits of these ranges, which are therefore considered to be absolute"). If not, the above statement should be removed from the method. Each lab can then use the calculation done by the lab expanded uncertainty when assessing the compliance of a sample with the legal limit. Here, the conformity or not of a sample depends on the values of CVr% and Me. When the CVr% value is high (max value 20.0), an ordinary virgin olive oil that almost reaches the IOC lampante category may be characterised as virgin olive oil. This is an argument against the eWG Chair's proposal. If the mentioned proposal accepts the statement from COI/T.20/Doc. No. 15/Rev. 10, then it is simply an increase of the limit of the Codex standard from 2.5 to 3. 4. However, in this case the limit should contain the value 3.5, according to the 2007 reasoning for the modification of the limit from 2.5 to 3.5. In conclusion, in both above cases, the proposal leaves a lot of margins for the interpretation of the results, and it causes modifications in the statistics of the method. Different approaches regarding the use of measurement uncertainty prevent the uniform implementation of legislative standards. Consequently, agreement should be obtained for the use of uncertainty. The IOC organoleptic method is the result of nearly 40 years of study and application, carried out under a scientific approach and with the consensus of all IOC members. This method is specifically designed for the classification of virgin olive oil, using a non-parametric statistical treatment. While it is important to seek harmonisation between different standards and consensus on this issue in Codex to be of great help to international trade, it cannot be done with a mathematical calculation involving comparable numbers but with different meanings. The IOC considers that scientific consideration is needed by the IOC experts before adopting such a proposal. The permitted number of decimal places of a legal limit related to the number of decimal places of the analytical error and the use or not of measurement uncertainty when checking conformity should be clarified. Only if agreement is reached can uniform application of legal standards be achieved. (See IOC report on median limit of 3 for the predominant defect – 11 June 2020 -) 10. [Fatty acid ethyl esters (mg/kg)] To add this parameter to section 3 (page 6 of CX/FO 21/27/06 June 2021). This proposal was discussed in WD6 (to include the quality parameter of ethyl esters in the Appendix of CXS-33) and again in WD11 (to add this parameter to the main body). It is considered an issue for which there is consensus. In the document CXS 33 PROPOSED REVISIONS, it is referred: "This parameter is proposed to be included as a quality factor for extra virgin olive oil. Some members want	

GENERAL COMMENTS	Member/Observer
the PPP and the 1, 2 DGAs to be included at the same time. This parameter has been contrasted by the IOC and its members for many years. For discussion." The IOC agrees. Since this parameter is a quality criterion, the method of its determination has been thoroughly studied and its limit (35 mg / kg) has been verified by applying it to extra virgin olive oils from various countries, the ethyl esters parameter should be included in the standard as a mandatory criterion. (See IOC report on fatty acid ethyl esters – 11 June 2020 -) 11. [1,2-diglycerides (% total diglycerides)] quality criterion for extra virgin olive oils. To add this parameter to the Appendix (page 9 of CX/FO 21/27/06 June 2021). This proposal was discussed in WD11 (to add this parameter to the Appendix) and in WD13. It is considered an issue for which there is no consensus. In CXS 33 PROPOSED REVISIONS, it is stated: "This parameter is proposed to be included in the Annex. It is a quality test for extra virgin olive oil. Its value should be greater than 35. Its inclusion is not agreed on." The IOC studies so far are not encouraging for the use of the parameters pyropheophytin A and 1,2-diglycerides as quality criteria. In addition, the methods of their determination are under investigation. (See IOC report on PPP and DAGs – 11 June 2020 -) 12. [Pyropheophytin "a" (% total chlorophyll pigments)] quality criterion for extra virgin olive oils. To add this parameter in the Appendix (page 9 of CX/FO 21/27/06 June 2021). This proposal was discussed in WD11 (to add this parameter to the Appendix) and in WD13. It is considered an issue for which there is no consensus. In CXS 33 PROPOSED REVISIONS, it is stated: "This parameter is a quality test for extra virgin olive oil. It is proposed to include it in the Annex. Its value should be less than 17. Its inclusion is not agreed on." The IOC studies so far are not encouraging for the use of the parameters pyropheophytin A and 1,2-diglycerides as quality criteria. In addition, the methods of their determination are under investigation. (See IOC report on PPP and DAGs – 11 June 2020 -). 13. To move the virgin olive oils' sterols total content to the appendix of CXS-33 (page 11 of CX/FO 21/27/06 June 2021). This proposal was discussed in WD7, WD8, WD10 and again in WD11. The IOC sent its arguments for its disagreement with this proposal. Even though most countries were against this proposal, it is considered an issue for which there is no consensus. On RF10 SUMMARY REPORT, the chair commented: "The key question is why the total sterols' content is considered an authenticity parameter. Several arguments were established that seriously questioned this consideration. It is unknown so far what the considered grounds are, and, above all, which is the fraudulent practice that can objectively be demonstrated if one genuine oil presents a content below 1,000 mg/kg…. If there is a choice between safeguarding the genuine virgin olive oils' producers with consistent arguments, and not doing so because it could increase an alleged theoretical risk of fraud with oils that can be easily revealed with another simpler, more sensitive, and specific tests, the most sensible position is to favor the first option….. Therefore, the total sterol content of virgin oils will initially be included in the appendix of the standard to present to the CCFO plenary to produce the ultimate decision." In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "This virgin oil's factor is proposed to be transferred to the appendix because it is unconsidered proper to check the genuineness of one oil, for two reasons: 1. It lacks specificity and 2. There are many genuine oils with contents below 1,000 mg/kg. This issue it is not agreed on." The total sterols content was adopted as an authenticity criterion to protect olive oil from adulteration with seed oils with low total sterols. Low total sterol seed oils are mainly desterolised seed oils and all types of palm and palm kernel oils. Despite the fact that there are some other parameters effective in the detection of extraneous oils with low total sterols, the IOC considers that the total sterol content for extra virgin and virgin olive oils should remain in the main body of the Codex standard, alongside individual sterols, since it is part of the method to determine sterols. Indeed, in recent years, a lot of monocultivar extra virgin olive oils have been found to exhibit lower total sterols than the adopted limit. It may be time to consider reducing the limit, once scientific data has been collected and an assessment made into the potential impact this may have on the effectiveness of individual sterols in detecting fraud. The limit 1000 mg/kg was adopted in	

GENERAL COMMENTS	Member/Observer
the past, when monocultivar extra virgin olive oils produced from early-harvest olives was not common. The IOC is currently conducting a study on this parameter and has asked all producing countries to provide data and samples. Consequently, any decision regarding this parameter would be premature if taken before the studies are completed. Except for the above issues for which consensus was not reached and which will be brought to the 27th session of CCFO for consideration, the following points that need corrections appear in ANNEX 2 of the proposed draft standard sent by the chair: PAGE 6 Decision trees for Δ7-stigmastenol: As for the campesterol decision tree, in the decision trees for Δ7-stigmastenol, the sentence “The other parameters shall meet the limits set out in the standard” should be added. PAGE 8 8.11 Determination of ΔK: The name of the method is “Absorbance in the ultraviolet region”. This method is already referred in 8.4. So, paragraph 8.11 should be removed. PAGE 8 8.13 Detection of traces of halogenated solvents: The IOC method COI/T.20/Doc. N° 8 should be added. PAGE 8 Method of sampling ISO 661 and ISO 5555: The two methods should be written separately with their title. That is, ‘ISO 661 Sample preparation’ and ‘ISO 5555 Sampling’. PAGE 9 1.1 Organoleptic characteristics extra virgin and virgin olive oils: See Section 3.3.1. For the homogeneity of the standard, this reference should be removed. Two other parameters, ΔK and total sterols content, are also included in the main body of the text and in the appendix, according to the applied category. However, there is no analogous reference for these parameters as for the organoleptic characteristics. PAGE 11 Method of sampling ISO 661 and ISO 5555: The two methods should be written separately with their title. That is, ‘ISO 661 Sample preparation’ and ‘ISO 5555 Sampling’. In addition, on page 5 of the IOC trade standard revision 16, note 2 on refined olive oil states: “When the oil has an erythrodiol + uvaol content of between 4.5 and 6 %, the erythrodiol content must be < 75 mg/kg”. This note was not discussed by the Codex eWG. Besides of the above, the IOC considers useful to discuss some other points, such as the removal of the ordinary virgin category from the standard for which while there was no consensus, it was agreed upon by CCFO26 in the 2019 plenary. In fact, in P1 of RF1, it was proposed to remove the ordinary virgin olive oil category from CODEX STAN 33-1981. - According to the response forms, Algeria, Argentina, Morocco, Syria, and Tunisia were against removing this category to ensure that international standards remain harmonised and given the lack of scientific evidence that ordinary virgin olive oil is harmful to humans. - Argentina also stated the commercial importance of this category for some countries and highlighted the importance of reaching consensus before the next CCFO meeting. - Australia, Canada, Germany, Iran, Italy, Poland, Portugal, Spain and the US supported the proposal. The EU would support the removal of the ordinary category from the Codex standard, as it is currently defined, but highlighted the lack of scientific evidence that ordinary virgin olive oil is harmful to consumers. Some Codex members consider ordinary virgin olive oil fit to sell directly to consumers. - Brazil, Croatia and Greece suggested the Committee provide an alternative proposal. - At the last CCFO meeting, some countries that are not represented in the eWG did not agree with the proposal to remove the ordinary virgin olive oil category, namely Ghana, Tanzania, Uganda and Uruguay. Following this point, we recall that, following section 3 point 27 of REP 19/FO: ‘One delegation questioned the rationale for removing the definition. Underscoring the mandate of Codex to harmonise international food standards, promote fair trade in food and protect the consumer, the delegation pointed out that the ordinary virgin olive oil classification appears in the International Agreement on Olive Oil and Table Olives, 2015, and removing it would hamper trade due to potential disharmony between standards. This view was supported by other delegations and one observer’; and point 29: ‘The delegation of Morocco, supported by Syria and Sudan, expressed their reservations about the decision, and drew the Committee’s attention to the written comments of Tunisia and Uruguay on the issue’.	

GENERAL COMMENTS	Member/Observer
Furthermore, the IOC and other delegations expressed their preoccupations about removing the ordinary virgin olive oil category from the draft revision of CXS 33-1981. This was mentioned in point 105 of the report REP19/CODEX ALIMENTARIUS COMISSION (CAC): 'CAC 42 noted a concern expressed by observer the IOC regarding a proposal by the CCFO to remove the ordinary virgin olive oil category from the standard on olive oil and olive-pomace oils (CXS 33-1981). This concern was shared by two other delegations who requested that the CCFO and the eWG reconsider this proposal in line with the reservation made at CCFO26.' It is important to also note that the IOC sent scientific reports approved by all the IOC experts on 11 June 2020. The reports were on the following topics: 1. The ordinary virgin olive oil category 2. The median limit of 3 for the predominant defect 3. Fatty acid composition 4. Ethyl esters 5. Pyropheophytins and Diacylglycerols (PPP and DAGs) Unfortunately, the chair did not take these reports into account in the conclusions. In addition, the following items are covered in the International Agreement 2015: - Article 1 sets as its main objective to work towards the uniformity of national and international legislation on the characteristics of olive oils to prevent barriers to trade. - Article 20 asks its members to apply the denominations outlined in the Agreement in their international trade and to encourage their application in their national trade. - Article 22 obliges signatory members to not adopt any measure that is contrary to their obligations under the Agreement. This category is recognized as edible and is traded nationally and internationally in several IOC member countries. The chair's proposal, to which the IOC Executive Secretariat did not agree, also provoked the reaction of several countries. They highlighted the prejudice that the removal of the ordinary virgin olive oil category would cause to trade and the confusion that could result from the coexistence of different international standards. The IOC noted that Algeria, Egypt, Lebanon, Jordan, Morocco, Tunisia and Turkey expressed their concerns about this issue and informed the Codex Secretariat about its impact. Uruguay was also against this proposal during the 26th CCFO meeting. The tables below show the statistics on IOC producing countries. The IOC considers that there is no consensus on these points and that, given the significant impact it may have on international trade, this proposal should not be adopted. Regarding the note mentioned in point 3.1 of the eWG chair's proposal "Note: Genuine virgin olive oil that does not meet one or more of the quality criteria for virgin olive oil 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." The IOC expressed its opinion regarding this point: • In RF2: "A category for oils which are not directly edible should not be included in the Codex Alimentarius standard. This standard is a food standard and should therefore only apply to edible oils, in accordance with the General Principles of the Codex Alimentarius. In any case, the denomination and definition of international standards should be harmonised in order to prevent barriers to international trade." • In RF4: "The scope of the Codex standard as indicated in the Codex Alimentarius General Objectives (Section I Art. 2) are the edible oils. Lampante virgin olive oils are not fit for consumption as they are, so this category should not be included in the Codex Alimentarius Standard. The Codex standard is a food standard created to facilitate harmonisation and international trade. (Section I Art.1). The Codex food standards are not an alternative to national legislations (Section I Art. 3)".	

GENERAL COMMENTS	Member/Observer
The IOC therefore considers that consensus has not been reached on this issue and this note should be given in brackets. Finally, the IOC would like to address another important issue for which there is no room for discussion. This is the number of decimal places of the limits for free fatty acids, peroxide value, fatty acids composition and ΔECN42 and which is related to the analytical error and the measurement's uncertainty. This matter has already been mentioned in point 5 of this document concerning the expression of trans fatty acids limits to one decimal place and in point 9 concerning the expression of the defect's median of the limit between fit and unfit categories to no decimal places. The number of decimal places has a great influence on the limits resulting in the non-uniform implementation of international standards. In addition, different approaches regarding the use of measurement uncertainty prevent the uniform implementation of legislative standards. The IOC considers that scientific consideration is needed by the IOC experts on this item. The permitted number of decimal places of a legal limit related to the number of decimal places of the analytical error and the use or not of measurement's uncertainty when checking conformity should be clarified. Only if agreement is reached on this issue can uniform application of legal standards be achieved. Conclusion: The IOC proposes adopting the proposals where consensus was reached at the 27th plenary session of the CCFO and continuing to work on a scientific and objective basis in order to reach consensus on the other items. In addition, certain significant issues which were agreed upon at CCFO26 in the 2019 plenary but for which there was no consensus should be reconsidered in order to reach an agreement. Such an issue is the removal of the ordinary virgin category from the standard which does not appeared in Annex 2 of the proposed draft standard sent by the chair. This is an issue of the utmost importance for countries that produce about a third of olive oil around the world and consequently for international trade. Agreement must be reached CVE: on this issue. Otherwise, there will be no uniform application of the standards and therefore harmonisation will not be achieved. We should always keep in mind that harmonising international standards promotes fair trade, prevents olive oil fraud and protects the consumer.	
Upon review of the circular letter, Peru concludes the following: 1) Peru considers that the minimum oleic acid value for virgin and extra virgin oil must be 53 (expressed as a percentage of total fatty acids); and 2) Peru supports including the paragraph that clarifies that 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.	**Peru**
Ecuador appreciates the work done by the Electronic Working Group in connection with the "Proposed draft revision of the standard for olive oils and olive pomace oils". The country believes that the criteria and all other information included are generally well structured, so we have no comments about the document submitted for consideration with regard to composition factors, methods of analysis and sampling, or its annexes. We encourage the continuation of this work according to the relevant decisions.	**Ecuador**
Panama appreciates the work done, we agree with the proposed document, and we recommend its progress.	**Panama**
Chile agrees in general with the draft provisions, except for those related to the sections detailed in the specific comments.	**Chile**
The United States appreciates the opportunity to provide comments 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 (CL 2021/29/OCS – FO). The United States supports CCFO efforts to amend the Codex Standard for Olive Oils and Olive Pomace Oils (CXS 33-1981) to safeguard the integrity of olive oils and to ensure fair practices in trade. However, as noted in previous U.S. comments, the U.S. believes that changes to the Standard should reflect variation in olive oils due to climatic, geographic and varietal differences and that changes made must accommodate authentic oils from all member countries.	**USA**

GENERAL COMMENTS	Member/Observer
Kenya supports amendments where there has been consensus during the working group as presented in annex I and II (clean and tracked copies) of CX/FO 21/27/06.	**Kenya**
SPECIFIC COMMENTS	
4.2 The concentration of alpha-tocopherol in the final product shall not exceed 200 mg/kg. China suggests that addition of alpha -tocopherol shall not exceed **200mg/kg**. According to the test results of alpha-tocopherol in the refined olive oil and the olive oil composed of refined olive oil and virgin olive oils as follows. Place of origin Classificaiton α-tocopherol (mg/kg) Spain refined olive oil 223.60 Spain refined olive oil 234.12 Spain refined olive oil 220.81 Spain the olive oil composed of refined olive oil and virgin olive oils 238.58 Spain the olive oil composed of refined olive oil and virgin olive oils 233.71 Spain the olive oil composed of refined olive oil and virgin olive oils 206.45	**China**
China appreciates the opportunity to provide comments on the proposed draft of revision of the standard for olive oils and olive pomace oils (CXS 33-1981). 3.2.3 “For virgin olive oils If the value is >0,5 y ≤0,8%” should be revised to“For virgin olive oils If the value is >0,5 and ≤0,8%”. 3.2.9 and 3.3.5, China suggests merge these two clauses. 3.2.3 China suggests that“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.”be revised to “Virgin olive oil's authenticity is not compromised if one or more of the sterols don’t fall within the ranges provided”, which will be clearer to readers.	**China**
Objection on proposal draft revision of standard because remove of Ordinary virgin olive oil from standard, so we want return add Ordinary virgin olive oil to standard.	**Iraq**
3.1 Designations and definitions	
Change to layout of section 3: Regarding proposal to move the contents of section “3.1 Designations and definitions” to section “2. Description”, to harmonize the format of this standard with other similar Codex Standards, based on the Codex Procedural Manual. Canada agrees to reorganizing the layout of the standard. Canada supports harmonizing the format of this standard with other Codex Standards to the extent possible The title of this subsection can just be called “3.1 Designations”. The title “Designations and definitions” should be in all capital letters, to be consistent with the other similar sections (3.2 COMPOSITION FACTORS and 3.3 QUALTIY FACTORS) Section 3.1: Designations and definitions: Removal of ***Ordinary Olive Oil*** Category Although the removal of the Ordinary Virgin Olive Oil has been agreed to at the CCFO26 plenary session, a number of member countries have raised concerns on the removal of this category from the Codex standard, citing significant impacts to farmers and livelihood where this oil is still produced, traded and consumed. Some of these countries have asked to be given time, for example, two to three years, to help the impacted sectors of their industry to improve their systems and processing procedures in order to improve the quality of the oil produced. While Canada recognizes that many producing countries have removed this category of olive oil from their national standards, in the spirit of compromise, Canada could agree to consider retaining this category in the standard for the period requested by the impacted countries to make the necessary adjustments to their system. Therefore, Canada is proposing that the text be placed in square brackets and retained in the Codex standard CXS 33-1981, provided it is reviewed and considered for deletion in the next session of CCFO (2023). Note that the original footnote 1 would apply. [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].	**Canada**

GENERAL COMMENTS	Member/Observer
Footnote 1: [1 This product may only be sold direct to the consumer if permitted in the country of retail sale]	
Extra virgin olive oil:.	
Canada agrees with the proposed changes (i.e. to include "physicochemical and organoleptic" in the definitions of EVOO and VOO.)	**Canada**
Refined olive oil: Deletion of Footnote 1	
Deletion of footnote 1 in the category of "refined olive oil" and "refined olive-pomace oil" The EU maintains its views that it would be preferable to maintain this footnote in the standard. This footnote is neither a barrier to trade, nor a technical specification, but it acknowledges the fact that countries may have different positions on refined olive oil and refined olive-pomace oil and provides clarity on that point at international level.	**European Union**
The United States supports the proposed draft revision on section "3.1 Designations and definitions" including removal of footnote 1 that states: This product may only be sold direct to the consumer if permitted in the country of retail sale.	**USA**
Morocco proposes to keep the category of ordinary virgin olive oil between brackets on the proposed Codex draft standard for the following reasons: - there was no consensus between the members of the EWG, - OVOO exists in the international agreement of the IOC (2015) - no scientific evidence considers the OVOO as unfit for consumption.	**Morocco**
Syria is supporting the maintenance of footnote [1]	**Syrian Arab Republic**
There must be no restriction for marketing of refined olive oil and refined olive-pomace oil.	**Turkey**
This Note – "[[1]This product may only be sold direct to the consumer if permitted in the country of retail sale]" – is not required as there are no technical or consumer-based reasons to restrict the sale of refined olive oil or refined olive pomace oil to consumers. Any such restrictions in other olive oil standards are to do with regional marketing objectives and should not be in CXS 33. Individual nations that are signatories to Codex Alimentarius can of course impose their own internal rules and regulations.	**Australia**
Section 3.1: Removal of Footnote 1 (in refined olive oil and refined olive pomace oils): [1 This product may only be sold direct to the consumer if permitted in the country of retail sale] Canada is in agreement with the proposed deletion of footnote 1 for refined olive oil and refined olive pomace oils, because national standards can still restrict the retail sale of these products within their jurisdiction. Deleting this footnote will be beneficial for global trade and consumer options. Canada notes that while all the countries agree that refined olive oil and olive-pomace oil are fit for human consumption, there are some producing countries that do not allow the sale of these oils direct to consumers unless these are blended with virgin olive oils. Those countries could continue to restrict this sale within their jurisdiction if they choose to. While Canada would prefer to delete the footnote, we could agree to retain this, but suggests to reword it (which should now be footnote 2 if footnote 1 is retained for Ordinary Virgin Olive Oil) to indicate the following, for example: 2 Some countries do not permit the sale of this product direct to consumers, unless blended with [extra virgin and/or virgin] olive oils. Canada agrees to the proposed changes to the definition of refined olive oil.	**Canada**
Syria confirms its request to adopt footnote [1]	**Syrian Arab Republic**
Brazil agrees with the exclusion of the footnote 1 related to refined olive oil and refined olive-pomace oil considering that these refined oils are adequate to human consumption and the decision of a state member to commercialize it or not is independent of the existence of the footnote.	**Brazil**

GENERAL COMMENTS	Member/Observer
Olive oil composed of refined olive oil and virgin olive oils:	
Definition of olive oil: Canada agrees to the changes to the definition of Olive oil category, including removal of the footnote referring to "2 The country of retail sale may require a more specific designation."	**Canada**
Refined *olive-pomace oil*:	
Deletion of footnote 1 in the category of "refined olive oil" and "refined olive-pomace oil" The EU maintains its views that it would be preferable to maintain this footnote in the standard. This footnote is neither a barrier to trade, nor a technical specification, but it acknowledges the fact that countries may have different positions on refined olive oil and refined olive-pomace oil and provides clarity on that point at international level.	**European Union**
The United States supports the proposed draft revision on section "3.1 Designations and definitions" including removal of footnote 1 that states: This product may only be sold direct to the consumer if permitted in the country of retail sale.	**USA**
Syria support the maintenance of footnote [1] Syria is surprised that refined olive-pomace oil is considered as an edible oil, while ordinary virgin olive oil has been removed from the document and considered unfit for human consumption	**Syrian Arab Republic**
Definition of refined olive-pomace oil: Canada agrees to the changes to the definition of Refined olive-pomace oil category. While Canada would prefer to delete the footnote, we could agree to retain this, but suggests that the text be amended as proposed in Refined olive oil: 2 Some countries do not permit the sale of this product direct to consumers, unless blended with [extra virgin and/or virgin] olive oils.	**Canada**
***Olive*-pomace *oil* composed of refined olive-pomace oil and virgin olive oils**	
Definition of olive-pomace oil: Canada agrees to the changes to the definition of Olive-pomace oil category, including removal of the footnote referring to "2 The country of retail sale may require a more specific designation." And addition of the statement: In no case shall this blend be called «olive oil».	**Canada**
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.	
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~~oils and is intended for refining or technical use.** The EU supports the introduction of the note on "lampante olive oil". In order to clarify the meaning of "unfit for human consumption", which has a different meaning here than in the Codex General Principles of Food Hygiene (CAC/RCP 1-1969), the EU proposes to add at the end of the last sentence, before the full-stop: "and is intended for refining or technical use"	**European Union**
Syria does not agree with this note which is considered that virgin olive oil does not meet one or more of the criteria mentioned in this standard, whether it is physical, chemical or organoleptic characteristics as an oil unfit for human consumption and is not allowed to be mixed with any type of olive oil, because the standard did not specify any mechanism or analytical criteria proved that the mixing was done to modify sensory or even quality's defects as a result of mixing it with ordinary virgin oil or extra virgin olive oil.	**Syrian Arab Republic**
Brazil agrees with the inclusion of the note considering that it makes clear reference to what is considered lampante olive oil. However, Brazil considers that it is necessary to clarify that the quality criteria are those defined on item 3.3.	**Brazil**
Addition of statement related to lampante oil: Canada agrees to the addition of this statement.	**Canada**

GENERAL COMMENTS	Member/Observer
3.2 COMPOSITION FACTORS	
GENERAL COMMENT ABOUT COMPOSITIONAL ASPECTS OF GLOBAL OLIVE OIL STANDARDS As has previously been discussed at length at CCFO, and in the current EWG for olive oil, global standards cannot accommodate all possible variations in varietal and climatic compositional outcomes. This applies to all standards for fats and oils. Australia emphasizes that CXS 33 is a true global standard and so must be accommodating of natural variations in a global context, perhaps more so than other standards applying to olive oils of more limited origin and/or origin of consumed products. (Such other standards may apply to particular groups of countries of major olive oil production and consumption (EU), solely to the exports of member states (IOC), to individual producer and consumer nations (China, Australia, South Africa) and to states within nations (California).) In this context the use of the Notes "Samples falling within the appropriate fatty acid (or sterol) 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" in CXS 33 is an effective way to deal with natural variations in olive oil composition regarding fatty acids and sterols. Their adoption would resolve longstanding disagreements about the ranges for several parameters – disagreements which in some cases have been with CCFO for nearly 20 years. The adoption of these Notes would be a global solution for a global standard.	**Australia**
Change to layout of section 3 Canada agrees with reorganizing the layout of the section, where the analytical determinations have been divided into two main groups: "3.2 Composition factors" and "3.3 Quality factors" in the same way as in CXS 210. Numbering the subsections makes it easier for referencing.	**Canada**
3.2.1 GLC ranges of fatty acid composition (expressed as percentages of total fatty acids)	
General remark: the EU would like to ask the members to reconsider the arguments for expressing the fatty acid ranges with one decimal figure. This will have a negative impact on the calculation of ΔECN42.	**European Union**
Syria agrees to amendment the limits of fatty acids, since the composition of these acids is significantly affected by geographical and environmental variations in addition to genetic factors, especially within the entry of new producing countries in the olive oil international market.	**Syrian Arab Republic**
Turkey supports IOC's concerns about one decimal expression of the trans fatty acids limit and recommend that limits of the fatty acid composition and trans fatty acids be indicated in two decimals.	**Turkey**
In relation to the fatty acid ranges: 1. Brazil agrees with the proposal to express the ranges with one decimal in the standard; 2. Brazil agrees to maintain the lower limit of C18:1 (oleic acid) in 55%; e 3. Brazil agrees with the exclusion of footnote 2 related to C18:3 (linoleic acid) and suggests that the Committee includes the range or limit for this fatty acid.	**Brazil**
Canada agrees to the changes to the title of this subsection.	**Canada**
[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 EU does not support this proposal due to the uncertainty it causes by introducing criteria, which are neither included nor defined in the standard by measurable limits (such as "national geographical and/or climatic variations"). Trading olive oils based on their provenance (national/geographic) would require strict traceability. Weather patterns change yearly and therefore cannot be considered as a criterion for assessing authenticity. Therefore, this proposal would lead to a high number of undefined exceptions and a lack of clarity on how to deal with those exemptions, to the benefit of fraudsters. In our view, fighting fraud makes an important and valuable contribution to both consumer protection and fair trade practices, which are the main aims of Codex Alimentarius.	**European Union**

GENERAL COMMENTS	Member/Observer
The United States supports the statement in brackets as follows: 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.	**USA**
Syria agrees to amendment the limits of fatty acids, since the composition of these acids is significantly affected by geographical and environmental variations in addition to genetic factors, especially within the entry of new producing countries in the olive oil international market. We also confirm Syria's demand to increase the limit of arachidic acid (C20: 0) to 0.8% instead of 0.6%, similar to other amendments that were proposed to fatty acids percentages in the same table, noting that Syria has provided EWG with documents proving the highly content of this acid in varieties Syrian olive.	**Syrian Arab Republic**
Turkey disagrees this statement because olive oil authenticity is defined using both fatty acids and sterol composition and any uncontrolled flexibility in this criteria may cause irreversible problems in olive oil market. However linolenic acids is known to be affected by climatic changes. Therefore this may be regulated as suggested by IOC in WD14 P23.	**Turkey**
Brazil agrees that it would be better to have a definitive solution for the variations in fatty acid composition due to geographical or climatic variations. However, this paragraph is difficult to apply in practice. How can we confirm or prove that variations observed are related to geographical or climatic variations? Will these proofs be accepted by an importer country? It would be interesting that countries that have already used this paragraph that is included in CXS 210-1981, share their experience with the Committee. Moreover, the expression “supplementary criteria” by itself does not help in clarifying what can be considered to justify the observed variations. For the moment, the only option to accommodate these variations is to change fatty acids ranges on demand, counting that member states recognize the need to do it when properly justified.	**Brazil**
Australia strongly supports this Note. This Note serves to reflect industry practices and to accommodate natural variations that may fall outside the ranges for these parameters in CSX 33 while enabling the prevention of fraud. With regard to olive oil trade practice, olive oils from a particular region and especially of a particular variety have fatty acids and sterols that are characteristic of those oils with values for parameters within much narrower ranges than the broad ranges that are necessary in a global standard. It is common in the olive oil trade to check these parameters as a means of assuring authenticity. In fact, oils from particular origins and varieties are sought for particular qualities conferred for example by their characteristic fatty acid profiles. Oils from warmer climates such as Arbequina oils with palmitic acid levels around 20% (may be higher than the proposed range in CXS 33 and have oleic acid lower than the proposed range in CSX 33) have particularly pleasurable taste and mouth-feel characteristics and are also harvested earlier than the major production regions. Conversely, oils from cool climates of varieties such as Picual may be sought for their stability with high levels of oleic acid (in some cases exceeding the range in CSX 33) and low levels of linoleic acid. In these and other cases checking the fatty acid and sterol profiles are available techniques commonly used for confirmation of authenticity - within much narrower ranges of acceptability for the parameters than the necessarily broad ranges in global standards and using knowledge of regional olive oil composition. As has previously been discussed at length at CCFO and in the current EWG global standards cannot accommodate all possible variations in varietal and climatic compositional outcomes. At best they can be well researched guidelines where exceptions can be checked and this is the purpose of the Note that Australia supports. With regard to determining fraud, in the application of the Note that Australia supports - 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 absence of valid data supporting an exception would result in the likely determination of fraud and rejection of the product. Such an approach encourages the trade to maintain product knowledge according to origin, specifications and traceability, further strengthening the practical barriers to fraud. In addition, there is widespread knowledge about the chemistry of oils from other species that can assist in such determinations.	**Australia**

GENERAL COMMENTS	Member/Observer
In the particular case of linolenic acid (C18:3) in both the recent WD14 of the EWG and the IOC document of July 29 2021 "IOC Comments on the proposed draft of the standard CODEX STAN 33-1981" circulated by the EWG there is a new proposed decision tree for oils exceeding a level of 1.0% for C18:3: "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." Australia strongly rejects this proposal. This decision tree is flawed for a global standard like the other decision trees proposed for CXS 33. Australia examined the database for sterols from Australian olive oils that has previously been provided to CCFO EWGs and to the IOC. This database covers the varieties and regions planted in Australia including major varieties from the major European production zones, albeit planted in a wider range of climates. The database has 682 samples of olive oils representative of the climatic and varietal origins of Australian olive oils during harvest years from 2006 to 2012. 43% of these oils have values lower than 24 for the ratio apparent β-sitosterol/campesterol. On this basis it is likely that olive oils will fail both the proposed limits for linolenic acid and/or the proposed ratio of (β-sitosterol/campesterol) ≥ 24. Australia also examined the more recent database of samples taken in 2014, 2015, 2016 and 2017 across numerous varieties and all major regions in California, compiled for the Olive Oil Commission of California. There are 308 samples in this database. 24% of the oils had values lower than 24 for the ratio apparent β-sitosterol/campesterol. In this database the fatty acids are also analysed for all the samples and 9% of the oils with values below 24 for the ratio apparent β-sitosterol/campesterol also had values of greater than 1% for linolenic acid. In all cases where oils from the OOCC database failed the proposed apparent β-Sitosterol/campesterol ratio ≥ 24 and had linolenic acid >1.0%, the varieties were Arbequina, Arbosana or Koroneiki – varieties used in intensive plantings including large areas of recent and new plantings in conventional and warmer climates in all the arable continents of the world. Climates that arise from warmer latitudes are conducive to olive oils with higher levels of both linolenic acid and campesterol and correspondingly lower levels of apparent β-sitosterol. That the varieties Arbequina, Arbosana and Koroneiki may be more susceptible to such variations as indicated by the database from California is of serious concern regarding the impact of such decision trees. Many hundreds of thousands of hectares of these varieties have been planted globally including increasingly in warmer climates where irrigation water may be more available than in traditional production zones. Hundreds of thousands of hectares continue to be planted. These are now major global varieties. Further, the percentage of land area of global olive cultivation planted to these olive varieties underestimates their relative percentage of total production because these plantings are mostly irrigated and farmed under super-intensive or intensive systems. Australia is therefore concerned that what is proposed in authenticity in the CXS 33 parameters for fatty acids combined with the proposed decision tree for C18:3 (and any other similar schemes that may be put forwards) pose an unnecessary risk to global olive oil producers on all arable continents especially those involved in recent industry expansion and relocation. The risk is unnecessary because there is an effective Note as an alternative. Australia notes that in the IOC document of July 29 2021 "IOC Comments on the proposed draft of the standard CODEX STAN 33-1981" regarding the proposed decision tree of P23 ("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.") it states: "It is effective both for detecting fraud and the deviant virgin olive oils from Spain and Morocco, which are the main countries with a significant amount of virgin olive oils that deviate from the official linolenic acid limit." Australia respectfully submits that this ignores known areas of the production of such oils such as Argentina and, as shown above, California, along with the obvious indications for major recent plantings in other warmer climates in numerous other parts of the world. Australia also notes that, while it is similar to one parameter in one of the decision trees in draft of CXS 33 (and in the EU regulations), the proposal of apparent (β-sitosterol/campesterol) ≥ 24 is a new parameter that has not previously been included in	

GENERAL COMMENTS	Member/Observer
any National standards. The EWG has been advised that inclusion in National standards is a desirable precursor for consideration of the inclusion of a parameter in CSX 33. Relevant publications: Li, Xi., Flynn, J.D. and Wang, S.C. (2019) The Effects of Variety, Growing Region and Drought Stress on Fatty Acid and Sterol Compositions of California Olive Oil. J Am Oil Chem Soc 96(3), 215-230 Mailer, R.J., Ayton, J. and Graham, K. (2010) The Influence of Growing Region, Cultivar and Harvest Timing on the Diversity of Australian Olive Oil. J Am Oil Chem Soc 87, 877-884 Mailer, R. (2007) The natural chemistry of Australian extra virgin olive oil. Rural Industries Research and Development Corporation Publication No. 06/132 16pp Carelli, A. (2008) Olive Oil Chemistry in Argentina. AOCS annual meeting Seattle, Hot Topic presentation Tous, J. (2017) The influence of growing region and cultivar on olives and olive oil characteristics and on their functional constituents. pp 45-80, in Olives and Olive Oil as Functional Foods: Bioactivity, Chemistry and Processing. Edited by Kiritsakis, A. and Shahidi,F. Published 2017 by John Wiley and Sons Ltd. Fundacion Caja Rural Jaen (2017) INTERNATIONAL OLIVE GROWING Worldwide Analysis and Summary	
Proposed Statement 1 under section 3.2, regarding fatty acid composition: Canada agrees to the use of this statement that appears in CXS 210, about the anomalies existing with fatty acids in some authentic oils. Canada believes that olive oil as elaborated in CXS 33-1981 should be treated similarly as other vegetable oils in CXS 210-1999. Canada notes that it is part of laboratory diligence to determine if the off limit results could be due to other factors such as geographical or climatic variations. To ensure that this is done, Canada suggests to add to the statement, such text, for example: "Samples falling within the appropriate ranges specified in this section are in compliance with this Standard. Should one or more parameter(s) fall outside of the appropriate range, supplementary criteria, for example, national geographical and/or climatic variations, may be considered, as necessary, to confirm a sample is in compliance with the Standard. Note: Any sample confirmed to be in compliance with results falling outside the appropriate range(s) must have the reason technically justified and documented."	**Canada**
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.	
Syria agrees to the proposal because the composition of fatty acids are not affected by the categories of the olive oil, taking into considerations that lampant oils are not considered edible to be included in the Codex Standards	**Syrian Arab Republic**
Brazil agrees with the inclusion of the paragraph because it makes it clearer about lampante olive oil and crude olive-pomace oil fatty acid composition.	**Brazil**
Statement 2 under section 3.2: Canada agrees to this addition.	**Canada**
The United States supports the increase in ranges for fatty acid composition for C16:0, C18:1 and C18:2 to accommodate authentic olive oils from all member countries.	**USA**
C14:0 ≤ 0.03 Fatty acid ranges: Canada agrees to the proposed change to the fatty acid ranges for the various categories of olive oil	**Canada**
C18:1	
C18:1 – In view of inclusivity for certain authentic oils with low C18:1, the United States supports the value of 53.0 as the lower value of the range for C18:1.	**USA**
1) Uganda supports adopting of a wide range of C18:1 of 53 – 85 as proposed in square brackets 2) Adopt the proposed provision of transfatty acids as proposed in square brackets 3) Uganda finds the requirement for organoleptic properties very subjective and may not serve any purpose in this standard. The scale of measure is not clear for this parameter.	**Uganda**

GENERAL COMMENTS	Member/Observer
We propose to have the parameter deleted from the standard or replaced by better measures such as hedonic scale 4) Uganda supports the addition of a parameter Fatty acid ethyl esters (mg/kg)] and the limit proposed (max. 35) in extra virgin olive oil which notes is included in International Olive Council standard for olive oil and olive pomace oil COI/T.15/NC No 3/Rev. 16. This will ensure harmony in published standards. 5) Uganda supports the addition of Pyropheophytin "a" (% total chlorophyll pigments) in the standard for purposes of assessing the quality of extra virgin in an olive oil Justification The above proposal will make it easy to be able to assess the quality and authenticity of these oils while making the standard implementable	
Changing the limit of trans-fatty acids (Σ(t-C18:1) and cΣ(t-C18:2) + Σ(t-C18:3)) by rounding up to express them with one decimal figure The EU does not support this proposal, as trans-fatty acids are essential in the detection of fraud. Changing the lower limit for oleic acid (C18:1) to 53.0% The EU does not support this proposal, as a high oleic acid content is a factor of identity of olive oil and confers to the product part of its healthy properties. Therefore, the EU considers necessary to be very cautious on considering changes on oleic acid content limits.	**European Union**
Comment: We support adopting the new proposed ranges of the fatty acids of C 18:1. Rationale: The new range will accommodate more products varying on this FA mainly due to climatic condition.	**Kenya**
The [53.0] value is supported. Rationale: Geographical and climatic variations could affect the fatty acid range for C18:1.	**Chile**
~~[53~~53.0] ~~[55.0]~~ 0 – 85.0	**USA**
Oleic acid is a major fatty acid of olive oil and higher concentrations are always desirable. That' why the lower limit should be kept as 55%	**Turkey**
Lower limit of C18:1 With regards to the lower limit of oleic acid (C18:1), Canada supports lowering the limit to 53.0% to be more inclusive of authentic oils from other producing countries. However, if majority of the Codex member countries support retaining the current level of 55.0%, Canada would accept this.	**Canada**
[53.0] **~~[55.0]~~** – 85.0 With regard to the oleic acid and linoleic acid values, we believe that, as long as parameters are changed to a lower percentage of oleic acid and a higher percentage of linoleic acid, we can allow oils genuinely produced in our region to be considered as conforming to the standard. There are results available of tests conducted over the last few years, which have evidenced that the oleic acid value of oil produced in our country is sometimes about 53.0 and that it is sometimes lower.	**Peru**
~~[53~~53.0] ~~[55.0]~~ 0 – 85.0	**USA**
C18:3	
C18:3[2] Setting a limit for linolenic acid (C18:3) The EU supports setting the linolenic acid limit at ≤ 1,00 with a footnote stating the following: "For extra virgin and virgin olive oil with 1.00 < linolenic acid% ≤ 1.40, apparent β-sitosterol/campesterol must be ≥ 24" Linolenic acid is critical for detecting adulteration with other vegetable oils (rapeseed oil).	**European Union**
C18:3: The United States supports the removal of footnote but does not support the IOC proposal/decision tree (i.e., C18:3 < 1.0* *In cases where an edible virgin olive oil exhibits 1.0 < linolenic acid % < 1.4, then this oil is authentic provided that apparent (B-sitosterol/campesterol) > 24 and all other composition factors lie within the official limits). The United States supports the development of a value that would accommodate authentic	**USA**

GENERAL COMMENTS	Member/Observer
olive oils from all member states. For example, the United States could support a value of ≤ 1.4 for C18:3	
According to IOC data, the highest deviation in linolenic acid is 8.0%. Linolenic acid is a very critical fatty acid for the detection of fraud. Therefore, Turkey supports the IOC decision tree proposal as "In cases where an edible virgin olive oil exhibits 1.0 < linolenic acid % ≤ 1.4, then this oil is authentic provided that apparent (βsitosterol/campesterol) ≥ 24 and all other composition factors lie within the official limits"	**Turkey**
Values for linoleic acid (C18:3) and removal of footnote: Canada agrees to remove footnote 3 which is no longer needed if values for linolenic acid would be available as proposed below. Regarding the range of linolenic acid (C18:3), Canada understands that the IOC has proposed the following: "C18:3 <1.0 * *In cases where an edible virgin olive oil exhibits 1.0 < linolenic acid% <1.4, then this oil is authentic provided that apparent (B-sitosterol/campesterol) > 24 and all other composition factors lie within the official limits." Canada does not support the use of decision trees in Codex standards as this discriminates against authentic products with off limit values. Decision trees create more issues than they solve since all possible samples have not been included in their development. Moreover, the actual limits are less important if the above statement regarding fatty acid composition is approved. Canada supports identifying the value for C18:3 that would be inclusive of authentic olive oils, i.e. < 1.4%	**Canada**
Morocco recommend to maintain the following footnote for the linoleic acid composition C18:3 due to : • No range is proposed for this fatty acid at the level of the Codex standard for olive oils; • A study in its final phase coordinated by the IOC, the objective of which is the establishment of a decision tree relating to linolenic acid. This decision tree is the result of several years of scientific studies carried out by several countries, reflecting the real varietal potential in specific given environments and experiments on the possibility of potential fraud by vegetable oils.	**Morocco**
[2Pending the results of IOC (International Olive Council) survey and further considerations by the Committee on Fats and Oils. National limits may remain in place.] According to IOC data, the highest deviation in linolenic acid is 8.0%. Linolenic acid is a very critical fatty acid for the detection of fraud. Therefore, Turkey supports the IOC decision tree proposal as "In cases where an edible virgin olive oil exhibits 1.0 < linolenic acid % ≤ 1.4, then this oil is authentic provided that apparent (βsitosterol/campesterol) ≥ 24 and all other composition factors lie within the official limits"	**Turkey**
C20:0	
≤ 0.8~~0.6~~ Syria confirms its demand to increase the limit of arachidic acid (C20: 0) to 0.8% instead of 0.6%, similar to other amendments that were proposed to fatty acids percentages in the same table, noting that Syria has provided EWG with documents proving the highly content of this acid in Syrian olive varieties	**Syrian Arab Republic**
Trans fatty acids	
Adopt the new provisions Rationale: The proposed levels are within the range of naturally occurring transfatty acids.	**Kenya**
Σ(t-C18:1)	
Σ(t-C18:1) The values proposed for each category, [≤ 0.1] [≤ 0.3] [≤ 0.4] are supported. In addition, it is relevant to also consider parameter Σ(t-C18:2) + Σ(t-C18:3) for the categories proposed.	**Chile**
[≤ 0.0~~50.1~~]	**Syrian Arab Republic**

GENERAL COMMENTS	Member/Observer
Syria does not agree to raise the percentage of trans fatty acids to 0.1% and requests that the limit be kept at 0.05% because it is the best in detecting the fraud of olive oil with refined oils.	
[≤ 0.1] Trans fatty acids – values rounded to one decimal place instead of two Canada supports keeping to one decimal place the values for the trans isomers. The IOC fatty acid method, for a mean of 0.01 area%, has the standard deviation close to 0.01 area%. Laboratories often set the LOQ (limit of quantification) as 10 times the standard deviation. Therefore a single decimal place trans area% limit is preferred with an approximate LOQ near 0.1 area%.	**Canada**
Σ(t-C18:2) + Σ(t-C18:3)	
[≤ 0.050.1]] Syria does not agree to raise the percentage of trans fatty acids to 0.1% and requests that the limit be kept at 0.05% because it is the best in detecting the fraud of olive oil with refined oils.	**Syrian Arab Republic**
3.2.2 $DECN_{42}$ (Difference between the actual and theoretical ECN 42 triglyceride content)	
Canada agrees to the changes to this subsection	**Canada**
The values proposed for each category, ≤ |0.2| ≤ |0.3| ≤ |0.5|, are supported. In addition, it is relevant to also consider parameter DECN42 as put forward in the Proposed draft revision of the standard for olive oils and olive pomace oils.	**Chile**
3.2.3 4α-Desmethylsterols composition (% total 4α-desmethylsterols)	
Regarding b note, Brazil does not have data to confirm that the note is being useful to accommodate variations in □7-stigmastenol between 0.5 and 0.8 and would like to ask for producing countries of olive oil with Δ7-stigmastenol levels between 0.5 and 0.8% if this decision tree is effective for authentic olive oil. Brazil can agree with the inclusion of the note but would like to highlight that the note complicates the genuineness assessment and is restrictive.	**Brazil**
In this section there are three decision trees and a Note under consideration. In the draft of CXS 33 these include: *(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 □ECN42 ≤|0,1|. For refined olive pomace oils values >0,5 and ≤0,7% then stigmasterol ≤1,4% and ΔECN42 ≤ 0.4.] [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.] In addition, in the recent WD14 for the EWG, the following had been proposed: “In cases where olive oils (virgin and refined) and refined olive-pomace oils exhibit 0.5 < Δ7-stigmastenol % ≤ 0.8, then these oils are considered as authentic provided that (apparent β-sitosterol/campesterol) ≥ 24 and all other composition factors lie within the official limits." Australia strongly supports replacing all of these with the following Note with the same intent as that proposed in section 3.2.1: “Samples falling within the appropriate sterol 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.” This note is more effective than the note “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”. This is because variation in one sterol parameter (for example campesterol) may affect the relative % of another (for example apparent β-sitosterol) and both may fall outside the	**Australia**

GENERAL COMMENTS	Member/Observer
respective proposed ranges. This is why the recent national standards of Australia - AS5264-2011 - and South Africa - SANS 1377 - have adjusted both of these parameters to reflect natural variations (along with setting a limit of ≤ 1.9 for stigmasterol to protect against fraud). The Note that Australia supports is also more effective than the three decision trees that have been put forwards, all of which are flawed. Australia examined the database for sterols from Australian olive oils that has previously been provided to CCFO EWGs and to the IOC. This database covers the varieties and regions planted in Australia including major varieties from the major European production zones, albeit planted in a wider range of climates. The database has 682 samples of olive oils representative of the climatic and varietal origins of Australian olive oils during harvest years from 2006 to 2012. 43% of these oils have values lower than 24 for the ratio apparent β-sitosterol/campesterol proposed in WD14. On this basis it is likely that olive oils will fail both the proposed decision tree (β-sitosterol/campesterol) ≥ 24 if Δ7-stigmastenol was greater than 0.5% depending on variety, season and region. A significant number of Australia's oils fail the decision tree proposed in the draft for CXS 33 for oils with >4.0% campesterol. Of the 682 samples 38% have campesterol > than 0.4 and of these 14% fail the EU decision tree for campesterol. Australian analyses of its olive oils rarely show oils with greater than 0.5% of Δ7-stigmasterol; 5 of the 682 samples in this database exceeded a level of 0.5%. We believe that these were varieties of Italian origin and these did not fail the proposed decision tree in WD14 of the EWG. Australia also examined the more recent database of samples taken in 2014, 2015, 2016 and 2017 across numerous varieties and all major regions in California, compiled for the Olive Oil Commission of California. There are 308 samples in this database. 24% of the oils had values lower than 24 for the ratio apparent β-sitosterol/campesterol. There were 3 oils in this OOCC database with values for Δ7-stigmastenol greater than 0.5% and two of these also had values lower than 24 for the ratio of apparent β - Sitosterol/campesterol. All 3 would fail the proposed decision tree for Δ7-stigmastenol in the current draft of CXS 33. More than 40% of samples in the OOCC database had values less than 25 for the ratio apparent β-sitosterol/(campesterol+Δ7-stigmastenol) used in that decision tree. 77% of these samples were of the varieties Arbequina, Arbosana or Koroneiki. 19% of the OOCC database samples had values >4.0 for campesterol, and of these 1/3 would fail the proposed tree for campesterol in the current draft of CSX 33. 79% of the samples with campesterol greater than 4.0 were of the varieties Arbequina, Arbosana or Koroneiki. The decision trees proposed in Section 3.2.4 pose the same risks for global olive producers as those described above for the decision tree proposed for C18:3 in Section 3.2.1. Climates that arise from warmer latitudes are conducive to olive oils with higher levels of campesterol and correspondingly lower levels of apparent β-sitosterol. That the varieties Arbequina, Arbosana and Koroneiki may be more susceptible to such variations as indicated in the database from California is of concern. That the few cases where Δ7-stigmastenol exceeded 0.5% and failed the proposed decision trees were oils of these varieties merit further investigation when evaluating such decision trees. This is particularly important for regions where issues with the Δ7-stigmastenol and campesterol ranges in traditional standards have been previously raised at CCFO and where new plantings of super-intensive olive farms of these varieties have been established. Many hundreds of thousands of hectares of these varieties have been planted globally including increasingly in warmer climates where irrigation water may be more available than in traditional production zones. Hundreds of thousands of hectares continue to be planted in all arable continents. These are now major global varieties. Further, the percentage of land area of global olive cultivation planted to these olive varieties underestimates their relative percentage of total production because these plantings are mostly irrigated and farmed under super-intensive or intensive systems. Australia is therefore concerned that what is proposed in authenticity in CXS 33 parameters for sterols combined with the proposed decision trees for C18:3 (and any other similar schemes that may be put forwards) pose an unnecessary risk to global	

GENERAL COMMENTS	Member/Observer
olive oil producers on all arable continents especially those involved in recent industry expansion and relocation. The risk is unnecessary because there is an effective Note as an alternative. With regard to determining fraud, in the application of the Note that Australia supports - Samples falling within the appropriate sterol 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 absence of valid data supporting an exception would result in the likely determination of fraud and rejection of the product. Such an approach encourages the trade to maintain product knowledge according to origin, specifications and traceability, further strengthening the practical barriers to fraud. In addition, there is widespread knowledge about the chemistry of oils from other species that can assist in such determinations. Australia also notes that, while it is similar to one parameter in one of the decision trees in draft of CXS 33 (and in the EU regulations), the proposal of apparent (β-sitosterol/campesterol) ≥ 24 is a new parameter that has not previously been included in any National standards. The EWG has been advised that inclusion in National standards is a desirable precursor for consideration of the inclusion of a parameter in CSX 33. Relevant publications: Li, Xi., Flynn, J.D. and Wang, S.C. (2019) The Effects of Variety, Growing Region and Drought Stress on Fatty Acid and Sterol Compositions of California Olive Oil. J Am Oil Chem Soc 96(3), 215-230 Mailer, R.J., Ayton, J. and Graham, K. (2010) The Influence of Growing Region, Cultivar and Harvest Timing on the Diversity of Australian Olive Oil. J Am Oil Chem Soc 87, 877-884 Mailer, R. (2007) The natural chemistry of Australian extra virgin olive oil. Rural Industries Research and Development Corporation Publication No. 06/132 16pp Carelli, A. (2008) Olive Oil Chemistry in Argentina. AOCS annual meeting Seattle, Hot Topic presentation Tous, J. (2017) The influence of growing region and cultivar on olives and olive oil characteristics and on their functional constituents. pp 45-80, in Olives and Olive Oil as Functional Foods: Bioactivity, Chemistry and Processing. Edited by Kiritsakis, A. and Shahidi,F. Published 2017 by John Wiley and Sons Ltd Abu-Alruz, K., Afaneh I.A., Quasem, J.M., Hmidat, M.A., Abbady, J. and Mazahreh, A.S. (2011) Factors Affecting D-&-Stigmastenol in Palestinian Olive Oil. J. Applied Sci., 11(5) pp797-805 Fundacion Caja Rural Jaen (2017) INTERNATIONAL OLIVE GROWING Worldwide Analysis and Summary	
4α-Desmethylsterols composition: Canada agrees with the proposed changes to this subsection	**Canada**
Δ7-stigmastenol	
≤ 0.5 *[b]* The United States does not support footnote (b) because it does not accommodate for authentic oils from all member countries.	**USA**
≤ 0.5 *[b]* D7-stigmastenol – footnote [b]: Canada supports removing footnote b for delta-7 stigmastenol. Decision trees create more issues than they solve since all possible authentic samples have not been included in their development. The values in the footnote were experimentally determined for olive oils for a relatively short time frame in a selected part of the world. Hence these values may not be applicable to other growing seasons, especially with climate change, nor applicable to different geographic locations. Furthermore, these additional limits are not required if the statement related to sterols below is accepted.	**Canada**
[(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 ΔECN_{42} ≤|0,1|. For refined olive pomace oils values >0,5 and ≤0,7% then stigmasterol ≤1,4% and ΔECN_{42} ≤ 0.4.]	

GENERAL COMMENTS	Member/Observer
[(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 □ECN$_{42}$ ≤|0,1|. For olive oil composed of refined olive ~~pomace oils values~~ oil and virgin olive oils: If the value is >0,5 and ≤0,8%, apparent β-sitosterol/(campesterol+Δ7-stigmastenol) ≥24 and ΔECN42 ≤|0,15|. For olive-pomace oil composed of refined olive-pomace oil and virgin olive oils: if the value is>0,5 and ≤0,7% then stigmasterol ≤1,4% and ΔECN$_{42}$ ≤ 0.4.] The EU supports the inclusion of this footnote. In addition, the EU would like to point out that further decision trees for delta-7-stigmastenol are in the process of approval within the IOC. The EU would like to propose that this footnote is supplemented with the following one, between the first and the second sentence: "For olive oil composed of refined olive oil and virgin olive oils: If the value is >0,5 and ≤0,8%, apparent β-sitosterol/(campesterol+Δ7-stigmastenol) ≥24 and ΔECN42 ≤|0,15|" The EU would like to modify the third sentence as follows: "For olive-pomace oil composed of refined olive-pomace oil and virgin olive oils: if the value is >0,5 and ≤0,7% then stigmasterol ≤1,4% and ΔECN42 ≤ 0.4." These footnotes would correspond to the decision trees included in the IOC standard.	**European Union**
~~[(~~(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 □ECN$_{42}$ ≤|0,1|. For refined olive pomace oils values >0,5 and ≤0,7% then stigmasterol ≤1,4% and ΔECN$_{42}$ ≤ 0.4.] Syria confirms its request to adopt footnote(b) related to the decision tree of Δ7-stigmastenol which was the solution of problems in specification of olive oil in some countries to achieve justice in international trade. And we note that footnote (a) is of the same standards of International Olive Council and it was approved as an amendment to this standards in 2017. While the deletion or keeping of footnote (b) is currently being discussed, despite the presence of scientific studies and documents from the International Olive Council confirming it	**Syrian Arab Republic**
[(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 □ECN$_{42}$ ≤|0,1|. For refined olive pomace oils values >0,5 and ≤0,7% then stigmasterol ≤1,4% and ΔECN$_{42}$ ≤ 0.4.] Decision tree approach should be adopted for solving the problem and protection of the quality, authenticity and fair trade of olive oils. The deviations in the sterol composition due to geographical, climatic and variety effects, especially in the deviation of the delta-7-stigmastenol limit have increased more in recent years with the effect of global climate change. In this concern, the notes "a" and "b" and the expression of "The other parameters shall meet the limits set out in the standard" for 4α-Desmethylsterols composition should definitely be included in the CXS-33 standard. The decision tree should be accepted for ROO and ROO+VOOs includes the parameters (app. β-sito)/ (campe+Δ7-stigma ≥ 24) and ΔECN42≤ |0.15| .	**Turkey**
[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.]	
[[a v~~Virgin~~ irgin olive oil's authenticity is not compromised if one sterol, or **~~their~~ its** minimum content, does not fall within the ranges **~~provided for~~ provided** if all other sterols and parameters **~~tested referred to in this standard~~** fall within the stated ranges.] The United States supports the proposed statement in brackets with minimal changes for clarity: a virgin olive oil's authenticity is not compromised if one sterol, or its minimum content, does not fall within the ranges provided if all other sterols and parameters fall within the stated ranges.	**USA**
The EU does not support this proposal as it considers that all sterol fractions, as well as the total sterol content, are essential to check the authenticity of an olive oil. No independent sterol can be replaced by another, because the limits for each sterol are set to detect fraud with a different kind of extraneous oils. To accommodate authentic olive oils that deviate from the set limits, the EU considers that it would be appropriate and justified to use a harmonised decision tree.	**European Union**

GENERAL COMMENTS	Member/Observer
Furthermore, the EU considers that all parameters in the standard have to be checked to confirm the category and authenticity of an oil and that all parameters are equally important and valid.	
Syria does not agree to this note and confirms its request regarding the retention of all footnotes (a,b,c) including footnote (b)	**Syrian Arab Republic**
Not acceptable We should always keep in mind importance of the decision trees of delta-7-stigmastenol, campesterol and linolenic acid for all kind olive oils for the promotion of fair trade, prevention of fraud and the protection of the consumer. We support the IOC's comment "the compliance of an olive oil with all purity criteria should be mandatory in order to confirm the authenticity of the oil." Some parameters should be set for the deviations in the values caused by climatic conditions, as in the flexibility made for campesterol.	**Turkey**
Brazil does not agree with the inclusion of the paragraph. If note b is included in the standard, this paragraph must be removed.	**Brazil**
Statement on sterol content: As per the comments above on fatty acid composition, Canada would be in agreement with the statement related to sterols as being common laboratory practice, but would also like to add the note below: Note: Any sample confirmed to be in compliance with results falling outside the appropriate range(s) must have the reason technically justified and documented.	**Canada**
We believe that this paragraph should be included in the standard, since genuinely produced oils sometimes have a campesterol level above 4.0, and all other esterols and parameters tested fall within the stated ranges.	**Peru**
3.2.4 Total 4α-desmethylsterols content (mg/kg)	
Deletion of the category virgin olive oils (extra virgin olive oil and virgin olive oil) from the parameter Total 4α-desmethylsterols content (mg/kg) and moving it to the appendix The EU does not support this proposal to move the total sterol content to the appendix, since it is used to detect seed oils (palm and palm kernel oils and the desterolised seed oils). The detection of fraud implies testing all authenticity parameters, as the sum is always stronger than one component. In this regard, moving this parameter to the appendix will weaken the overall capacity to detect fraud.	**European Union**
Total sterols' content should not be considered as an authenticity parameter for all types of olive oils. Because its amount is affected by variety, climate, ripeness, oil extraction and refining. Therefore all of them should be transferred to the appendix of the Standard.	**Turkey**
Brazil agrees to move the total sterols to the appendix because the minimum limit is not helpfull in authenticity assessment of olive oil.	**Brazil**
Total 4α-desmethylsterols content: Canada agrees to the changes to this subsection, including moving the value for virgin olive oils to the appendix of the standard. Further, since the majority of the oils in CXS- 210 have total sterol content over 1000 mg/kg, Canada could support to move the total sterol contents of all olive and olive-pomace oils to the quality and composition factors in the Appendix of the standard. However, if majority of the member countries support keeping all these in the main body of the standard, Canada would not object.	**Canada**
3.2.5 Erythrodiol and uvaol (% total 4α-desmethylsterols + erythrodiol and uvaol)	
The EU supports the introduction of a footnote for the refined olive oils stating the following: "When the oil has an erythrodiol + uvaol content of between 4.5 and 6 %, the erythrodiol content must be < 75 mg/kg."	**European Union**
As in the IOC Trade standard, expression: *"When the oil has an erythrodiol + uvaol content of between 4.5 and 6 %, the erythrodiol content must be < 75 mg/kg."* should be add to the refined olive oil.	**Turkey**
Brazil agrees to move the □K for virgin and extravirgin olive oils to item 3.3.5 as a quality criteria.	**Brazil**

GENERAL COMMENTS	Member/Observer
Erythrodiol and uvaol: Canada agrees to the changes to this subsection.	**Canada**
3.2.6 Waxes content (mg/kg)	
Waxes: Canada agrees to the changes to this subsection.	**Canada**
≤ 150(d) Syria agree to reduce the percentage of waxes content to 150 (mg/kg) which corresponds to the Syrian olive varieties.	**Syrian Arab Republic**
3.2.7 Stigmastadienes content (mg/kg)	
Stigmastadienes: Canada agrees to the changes to this subsection.	**Canada**
≤ 0.05 Syria agrees to amend Stigmastadiene's percentage to 0.05% instead of 0.15%, as it is considered a basic evidence for detecting fraud in olive oil with refined oils.	**Syrian Arab Republic**
3.2.8 Percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol)	
3.2.8 Percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol) 2-glyceryl monopalmitate: Canada agrees to this new subsection.	**Canada**
3.2.9 [$\Delta K^{(f,g)}$]	
Agree as suggested.	**Turkey**
Canada agrees to changes to this subsection which reflect the IOC method. The IOC method COI/T.20/Doc. No 19/Rev. 5 2019 states: "The specific extinctions at 232 nm and 268 nm in iso-octane or 232 nm and 270 nm in cyclohexane are calculated for a concentration of 1% (m/V) in a 10 mm cell."	**Canada**
Virgin olive oil See Canada's comments in section 3.1 regarding deletion of ordinary virgin olive oil. Canada could support retaining ordinary virgin olive oil under this parameter, but to put it in square brackets.	**Canada**
3.3 QUALITY FACTORS	
Specific Quality Factors in both Section 3 QUALITY FACTORS and the Appendix OTHER QUALITY AND COMPOSITION FACTORS of the current draft of CXS 33 [3.3.6 Fatty acid ethyl esters (mg/kg)], (FAEE), [1.5 1,2-diglycerides (% total diglycerides)] (DAGs) and [1.6 Pyropheophytin "a" (% total chlorophyll pigments)] (PPP) This EWG is considering inclusion in the CXS 33-1981 of three additional quality parameters for extra virgin olive oil - DAGs, PPP and FAEE. This represents a major opportunity for Codex Alimentarius - to benefit consumers of extra virgin olive oils worldwide regarding the quality and truth in labelling of extra virgin olive oil products - by adopting parameters that have been in national standards for a decade and that continue to show increasing utility for the entire supply chain with positive outcomes for consumers. Australia's position remains strongly that the three quality parameters for extra virgin olive oil being considered for inclusion in the CXS 33 - percentage of 1,2-diglycerides (DAGs), percentage of pyropheophytin "a" (PPP) and fatty acid ethyl esters (mg/kg) (FAEE) - should all be included within the main body of the Codex Alimentarius Standard for Olive Oils and Olive-Pomace Oils (CXS 33-1981). The three parameters should be treated equally in this regard. The current proposal - the inclusion of FAEE in the main body of CXS 33-1981 and the inclusion of DAGs and PPP in the Appendix of CXS 33-1981 - implies lesser value in DAGs and PPP than FAEE. This is illogical considering the evidence and threatens to undermine this opportunity. - Presence of the Parameters in National Standards All three parameters have been in national standards for about a decade. Since 2011 DAGs and PPP are in the Australian Standard for Olive oils and olive-pomace oils AS 5264-2011. DAGs and PPP are also in the South African National	**Australia**

GENERAL COMMENTS	Member/Observer
Standard SANS 1377 that was published in 2014. While it is a State regulation, it is also significant that DAGs and PPP have been in the California Department of Food and Agriculture Grade and Labeling Standards For Olive Oil, Refined-Olive Oil and Olive-Pomace Oil since they were first published in 2014. In all cases the limits - for DAGs minimum 35, for PPP maximum 17 – have been consistent throughout as have been the methods of determination - ISO 29822:2009 for DAGs and ISO 29841:2009 for PPP. In 2011 fatty acid alkyl esters (FAAE) – including fatty acid ethyl esters (FAEE) and fatty acid methyl esters (FAME) – were first included in the European regulations on the characteristics of olive oil and olive-residue oil and on the relevant methods of analysis (Commission Regulation (EEC) No 2568/91) and considered in the International Olive Council (IOC) Trade Standard Applying to Olive Oils and Olive Pomace Oils since about the same time. In 2013 FAEE was selected as the sole FAAE parameter for these European regulations with proposed limit changes from an initial maximum limit of 40 for the 2013-2014 crop to be reduced to a maximum of 30 after the 2015 crop year. In 2016 the limit for FAEE in these European regulations was revised to a maximum of 35 and has remained at that level since 2016. - Utility for Consumer Products - the Consumer Focus and Context of CXS 33-1981 The consumer focus of Codex Alimentarius has been emphasised during the work of the EWG on CXS 33-1981. The introduction of DAGs and PPP and limits for these parameters in standards has had a positive impact on the label compliance and quality of extra virgin olive oils in retail markets affected by those standards. In Australia the standard is the basis for a Code of Practice that has been progressively adopted by major retailers for their Private Label olive oil brands and the majority of the commercial olive oil brands sold in Australia by number and volume. Monitoring of the Australian retail market between 2015 and 2019 showed positive trends of improvements in label compliance - from less than 40% compliance in 2015 to over 80% compliance in 2019 of sampled retail oils labelled as extra virgin with regard to their labelled quality grade (https://olivebiz.com.au/wp-content/uploads/2019/11/Peter-McFarlane-OliveCare-Upping-The-Ante-On-Quality.pdf) . These positive outcomes have coincided with the increased use of DAGs and PPP along with other quality parameters to predict the comparative shelf life of extra virgin olive oils and to specify their quality for bulk purchases. In California the Impact Report of 2014 to 2019 by the Olive Oil Commission of California (http://www.oliveoilcommission.org/wp-content/uploads/2019/01/Impact-Report-2018.pdf) highlighted the following points: • Since the introduction of the CDFA standard there has been progressive improvement in the quality and trueness to label of California-produced olive oils taking into consideration seasonal variations in supply and conditions. • An evaluation of 2018-19 produced oils found 92% of oils compliant with the standards. • The OOCC is utilising the CDFA standard as the basis for the education of its producers about shelf life of olive oil products and is implementing the shelf-life calculation included in the proposed petition. The use of PPP and DAGs is not new - in conjunction with other parameters (in particular sensory quality) as tools to ensure retail compliance and as product specifications. Since the mid-2000s retailers in northern Europe have issued specifications to commercial laboratories for the analysis of oils destined for their shelves. Tens of thousands of analyses have been completed in that part of Europe since then by major commercial laboratories against these specifications – specifications that anticipate the changes over time by such parameters. These specifications set limits that are within the ranges for these parameters in the Australian, South African and Californian standards and within what is being proposed for CX-33 1981. That PPP in particular and also DAGs are sensitive to the conditions that extra virgin olive oils are exposed to during transport and distribution to retail stores has been the	

GENERAL COMMENTS	Member/Observer
subject of discussion within the global olive oil industry. Producers are concerned that products may be damaged far from when they are initially shipped where producers have no control over the storage conditions. Naturally this is of no concern for consumers – they are simply entitled to products of labelled quality, consistent with the focus of Codex Alimentarius in its standards. It is up to the trade to solve these problems. That this can be achieved has been demonstrated in Europe and other countries this century as described above when these tools are used to specify and monitor oil quality in the supply chain while using the standard limits in place since 2011 as the ultimate restriction. The extensive research to date on DAGs and PPP was documented in the work of a recent IOC e-working group (IOC E- WG 5 Pyropheophytins and Diacylglycerols, Final report, 15/04/2020). This report concluded that both parameters can give information about the oil quality and that PPP in particular can be considered as a good indicator of oil quality in terms of “freshness”. This term is not well defined but in Australia and California its use generally refers to the effectiveness of these parameters to monitor both age and quality of extra virgin olive oils – quality that reflects both the quality of the olives and the extraction process - along with sensitivity to the effects on quality of the treatment of the olive oil in the supply chain. Importantly for a global standard such as CSX 33-1981, DAGs and PPP have demonstrated in research and practice not to be influenced by either variety or geographical location of production. When the Australian, South African and Californian standards were being developed there were queries as to whether these parameters would be used and technical barriers to trade however this has never been an issue in the places subject to these standards given the independence of these parameters from origin or variety of the olives from which the oil was extracted. In fact, the experience in the last decade (and for longer in northern Europe) has been quite the contrary with the retail sector utilising these parameters along with other quality considerations for oils from diverse countries and regions to ensure truth in labelling and quality for consumers. FAEE (like DAGs) in virgin olive oils is affected by the olive fruit quality and the length of time between harvest of the olives and oil production. These factors also affect the level of free fatty acids (FFA) in olive oil. Like FFA and the official sensory fermentative defects, FAEE is sensitive to quality defects in extra virgin olive oil resulting from the fermentative degradation of olives (and the damage to the oil contained within them because of this) when the oil is extracted as well as ongoing deterioration in the oil due to inadequate storage conditions when sediments are not removed and further fermentation occurs. The levels of FAEE are also influenced by olive variety and geographical location of production which impacts on the interpretation of results. This is not the case for DAGs, PPP, FFA and the official sensory fermentative defects that are all independent of olive variety and location of production. An Australian evaluation of the FAEE parameter was completed in 2013 - https://www.agrifutures.com.au/product/survey-to-determine-olive-oil-compliance-with-new-methodologies-in-international-standards/ . Australian olive oils readily complied with the then proposed limit for FAEE of 30 mg/kg. This work and experience since then indicate that the proposed limit of 35 for FAEE for CSX-33 1981 is far less effective regarding detection of flaws in extra virgin olive oil quality than the limits currently set for FFA and for the detection of sensory fermentative defects within CSX-33 1981. Australia believes that the utility of FAEE for consumers may be enhanced with lower limits - likely between 20 and 30 - although setting such limits requires further research. Notwithstanding this Australia is prepared to support the inclusion of FAEE in the main body of CXS-33 1981 given the current inclusion of FAEE in some national standards and as a deterrent regarding the marketing of virgin olive oils damaged by fermentation while labelled as extra virgin quality. The inclusion of DAGs, PPP and FAEE in the main body of CXS-33 1981 (not separated as currently proposed) is therefore supported by their presence in national standards for a decade, well researched methods and activity, effective utilisation in the supply chain and importantly positive outcomes for consumers.	
3.3.1 Organoleptic characteristics of virgin olive oils	
Brazil agrees with the limit of 3.5.	**Brazil**

GENERAL COMMENTS	Member/Observer
Comment: We are not able to support either of the proposed figures (2.5, 3 or 3.5) Rationale: It is not clear the unit of measure for this parameter. Clarification on this should be provided.	**Kenya**
Deletion of Ordinary virgin olive oil: 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. See Canada's comments in section 3.1 regarding deletion of ordinary virgin olive oil. Canada could support retaining this text and to put it in square brackets. Organoleptic Characteristics: Canada agrees with the changes to this subsection.	**Canada**
Median of the most perceived defect	
Morocco is not in favor of revising only the limit of the median of the VOO defect, as the latter is closely related to the physicochemical characteristics, which supports the proposal to review the limits of all categories VOO	**Morocco**
The median of the most perceived defect for the <u>virgin olive oil category</u> The EU supports that the above-mentioned limit is set at 3.5. The only method to determine the organoleptic characteristics of virgin olive oil is the IOC method, COI/T.20/Doc. nº 15. In this method, uncertainty is included. Therefore, the equivalent of the 2.5 median defect limit in the Codex standard is indeed the IOC limit of 3.5 (as 3.5 takes into account the uncertainty), which is also the limit in the EU legislation. A footnote should be included to clarify that the limit of 3.5 includes the uncertainty of measurement (as provided for in the method).	**European Union**
<u>Virgin olive oil category</u> The United States supports retaining the value of 2.5 as the median of the most perceived defect for virgin olive oil.	**USA**
<u>Virgin olive oil category</u> ~~[2.5] [3] [3.5]~~ **3.5]** Syria agree to the adoption of a one decimal place to determine the values of Organoleptic characteristics, because it is difficult to determine the second decimal place by the sensor's analyst or taster, provided that the median defects for virgin oil is less than 3.5%, which corresponds to the limit set in the IOC standard as the authority body who set the limits for olive oil's organoleptic characteristics.	**Syrian Arab Republic**
Our view is that the 3.5 limit should be accepted as in IOC standards and EU Regulation.	**Turkey**
Median of most perceived defects: Canada supports the value [3] with no decimal place for the most perceived defects. This is supported by recent studies published on sensory evaluation of olive oil.	**Canada**
[2.5] ~~**[3] [3.5]**~~ The Virgin olive oil category should have only a slight defect, so the 2.5 value is appropriate for it.	**Chile**
3.3.2 Free fatty acids (g/100 g, expressed as oleic acid)	
Brazil agrees with the inclusion of this parameter as a quality parameter.	**Brazil**
FFA: Canada agrees with this subsection.	**Canada**
~~**≤ 0.8**~~**<u>≤ 0.5</u>** The ≤ 0.5 value is proposed, since this acidity is adequate for an extra virgin olive oil that meets certain quality criteria. It is an indicator of the oil extraction process standards.	**Chile**
~~**≤ 2.0**~~**<u>≤ 1.0</u>** The ≤ 2.0 value is high for a virgin oil, since it indicates that the hydrolysis of triglycerides has advanced to a certain degree due to fermentation, etc. which can be a sign of inferior quality.	**Chile**
3.3.3 Peroxide value (milliequivalents of active oxygen/kg oil)	
Peroxide value: Canada agrees with the change.	**Canada**

GENERAL COMMENTS	Member/Observer
~~≤ 20~~ ≤ 15 A value above ≤ 15 implies accepting inferior quality oils for the extra virgin olive oil category. Higher peroxide values are associated, among other things, with some degree of mishandling of the raw material, and with high temperatures and/or prolonged times of the churning/kneading stage, variables which have negative effects on oil quality because the paste makes contact with air.	**Chile**
3.3.4 Absorbance in the ultraviolet region at 270/or 268 nm[f] (expressed as K_{270}/or K_{268})	
Virgin olive oil - Canada agrees with the changes in this subsection See Canada's comments in section 3.1 regarding deletion of ordinary virgin olive oil. Canada could support retaining text and value for ordinary virgin olive oil and to put this in square brackets.	**Canada**
3.3.5 □K[f,g]	
Canada agrees with the changes to this subsection.	
[3.3.6 Fatty acid ethyl esters (mg/kg)]	
The EU supports the inclusion of this parameter for the extra virgin olive oil category together with the limit of ≤ 35 mg/kg.	**European Union**
~~[~~33~~.~~**3.6 Fatty acid ethyl esters ~~(mg/kg)~~](mg/kg)** The United States supports the inclusion of "Fatty acid ethyl esters (mg/kg)" as an essential quality factor for extra virgin olive oil that should be included in the main body of the Standard.	**USA**
Syria does not agree to adding a new criteria like FAEE as a quality parameter in document, until conducting enough studies on all Syrian olive's species ,and all factors that may affect the proposed limits have been identified according to accurate and integrated studies about it	**Syrian Arab Republic**
Fatty acid ethyl esters is a very important parameter for quality of extra virgin olive oil and the determination of soft deodorized olive oils Thus, 35 mg/kg limit is appropriate. However, this is a quality parameter and may change with the storage in some olive oils. Therefore, it needs more research for giving advice to producers and the other stakeholders about good manufacturing processes in order not to excess the limit.	**Turkey**
FAEE: With a proposal to permit out of range compliance for fatty acids and sterols, it is logical to add other tests to support olive oil authenticity. Therefore, Canada supports the proposal to include this parameter among the quality factors for extra virgin olive oil within the main body of the standard. Note that Canada indicates its preference that the PPP and the 1, 2 DAGs be included together with FAEE within the body of the standard. However, if majority of the countries would prefer the latter two to be placed in the appendix, Canada is willing to accept this.	**Canada**
~~**[Extra virgin olive oil]**~~ ~~[≤ 35]~~ Syria does not agree to adding a new criteria like FAEE as a quality parameter in document, until conducting enough studies on all olive's species in CODEX member's countries, and all factors that may affect the proposed limits have been identified according to accurate and integrated studies about it	**Syrian Arab Republic**
[≤ 35] It is relevant to include this parameter because it is an indicator of possible alterations in the handling or manipulation of extra virgin olive oil, which is evidenced by the generation of ethyl esters.	**Chile**
4. FOOD ADDITIVES	
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. Canada agrees with the changes to this subsection.	**Canada**
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-~~	**European Union**

GENERAL COMMENTS	Member/Observer
~~tocopherol~~ process in ~~the final product shall not exceed 200 mg/kg.~~accordance with Good Manufacturing Practices. Although section 4 is not in the scope of the mandate for the revision of the standard, the EU would like to request that in point 4.2 of the standard (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 second sentence "The concentration of alpha-tocopherol in the final product shall not exceed 200 mg/kg." is deleted; - at the end of the first sentence the following text is added: "in accordance with Good Manufacturing Practices". The reason behind this request is that the current limit for alpha-tocopherol in the finished product is a barrier to trade. Historically, such as limit was set to restore natural tocopherol lost in the refining process. However, the present refinement processes are milder and do not extract alpha-tocopherol to such a high extent. Therefore, in the resulting olive oils natural alpha-tocopherol may be present in higher amounts than the current limit. The IOC standard has been changed to reflect this new situation.	
8. METHODS OF ANALYSIS AND SAMPLING	
The phrase: "The most updated version of the methods should be used, in application of ISO/IEC 17025." is a general rule that applies to all the standards and is already included in CXS 234-1999. So Brazil understands that it does not need to be included in the standards individually.	**Brazil**
Comment: We propose the new introductory statement and proposed new methods be referred to the Codex Committee for consideration and endorsement and inclusion in CXS 234 and removed from CXS 33-1981. Rationale: The Procedural Manual (Pg 52) require all commodity standards to make reference to CXS 234 for all methods of test so as to make CXS 234 the single most reference for methods of test.	**Kenya**
Statement and methods under section 8: Canada agrees with the changes under this section.	**Canada**
Method Typing: Method typing is a feature of Codex endorsed methods of analysis as covered in the Codex Procedural Manual. There are four "types" of methods: Type I through Type IV. The current table needs significant help from the relevant Standards Development Organizations (SDOs), namely ISO, AOCS and IOC, as there would be a question of equivalence for Type I methods, and only a single Type I or Type II method is possible, but multiple Type III's. The "sameness" of the methods must be established, which would require access and comparison of all suggested versions.	**Canada**
Detection of traces of halogenated solvents The EU does not support the deletion of the IOC method from this point.	**European Union**
Method of ~~sampling~~sampling and sample preparation The second to last line in the table of Section 8, stating "Method of sampling", should state "Methods of sampling and sample preparation"	**European Union**
OTHER QUALITY AND COMPOSITION FACTORS **1.1 Organoleptic characteristics**	
Regarding the four grades refined olive oil, olive oil composed of refined olive oil and virgin olive oils, refined olive-pomace oil, and olive-pomace composed of refined olive-pomace oil and virgin olive oils: The descriptors "acceptable" and "good" for these grades of olive oil are inadequate. The EWG has considered at length the possibility of applying the current organoleptic method to these oils, at a minimum for the detection of rancidity. The minimum qualification for all of these grades of olive oil should be "free from rancid odour" determined using the techniques well described in COI/T.20/Doc. nº 15. It is a trade practice to evaluate both blends of virgin and refined olive oils and olive pomace oils in this way along with 100% refined olive oils and refined olive pomace oils, in particular with regard to the detection of	**Australia**

GENERAL COMMENTS	Member/Observer
rancidity. No further research needs to be done for this method to be used on oils in these grades. The adoption of “free from rancid odour” as a quality parameter would benefit consumers and encourage the trade of good quality olive oils of these grades.	
Canada agrees with the changes under section 1.1.	**Canada**
~~**Extra virgin and virgin olive oils: See Section 3.3.1**~~ **For consistency reasons, the EU would like to propose the deletion of the first sentence “Extra virgin and virgin olive oils: See Section 3.3.1”.**	**European Union**
1.2 Moisture and volatile matter (g/100 g) Canada agrees with the changes under this section.	**Canada**
1.3 Insoluble impurities in light petroleum (g/100 g) Canada agrees with the changes under this section.	**Canada**
1.4 Absorbance in the ultraviolet region at 232 nm (expressed as K_{232}) Canada agrees with the changes under this section.	**Canada**
[1.5 1,2-diglycerides (% total diglycerides)]	
[~~1~~1.5 1,2-diglycerides (% total ~~diglycerides)~~]diglycerides) The United States supports the inclusion of 1,2-diglycerides (DAGs) as an additional quality factor in the Standard in either the main body or in the appendix (as proposed). If DAGs are included in the appendix, the United States recommends the committee consider moving the parameter to the main body of the Standard at the next meeting of the CCFO based on available data.	**USA**
The EU might consider the inclusion of this parameter for extra virgin olive oils and its proposed limit in the appendix. The EU would like to draw the attention of the members to the study carried out by the IOC in 2020 on this matter, which concludes that many doubts remain on its usefulness as quality parameter and on the methods for its determination.	**European Union**
Syria does not agree to adding a new criteria like DAGs and PPPs as a quality parameter in document, until conducting enough studies on all olive's species in CODEX member's countries, and all factors that may affect the proposed limits have been identified according to accurate and integrated studies about it	**Syrian Arab Republic**
We do not think it is appropriate to include these parameters in this standard, even as appendix, since the studies have still been ongoing.	**Turkey**
1,2 DAGs: With a proposal to permit out of range compliance for fatty acids and sterols, it is logical to add additional quality and composition factors to support olive oil authenticity. These are useful parameters to distinguish extra virgin olive oil. Therefore, Canada supports the addition of section 1.5 for 1,2-diglycerides, and 1.6 for pyropheophytin “a”, preferably within the body of the standard, or at least in the Appendix. Thus adoption of these tests by Codex into CXS 33 would allow for the collection of more data and perhaps speed up the process of moving the tests from the Appendix to the main body of the standard.	**Canada**
~~**[Extra virgin olive oil] [> 35]**~~ Syria does not agree to adding a new criteria like DAGs and PPPs as a quality parameter in document, until conducting enough studies on all olive's species in CODEX member's countries, and all factors that may affect the proposed limits have been identified according to accurate and integrated studies about it	**Syrian Arab Republic**
It is relevant to include this parameter because it helps detect possible fraud resulting from the use of technologies like soft refining. Extra virgin olive oil must contain > 35 1,2-diglycerides.	**Chile**
[1.6 Pyropheophytin "a" (% total chlorophyll pigments)]	
[~~1~~1.6 Pyropheophytin "a" (% total chlorophyll ~~pigments)~~]pigments) The United States supports the inclusion of pyropheophytin “a” (PPP) as an additional quality factor in the Standard in either the main body or in the appendix (as proposed). If PPP are included in the appendix, the United States recommends the committee consider moving the parameter to the main body of the Standard at the next meeting of the CCFO based on available data.	**USA**

GENERAL COMMENTS	Member/Observer
The EU might consider the inclusion of this parameter for extra virgin olive oils and its proposed limit in the appendix. The EU would like to draw the attention of the members to the study carried out by the IOC in 2020 on this matter, which concludes that many doubts remain on its usefulness as quality parameter and on the methods for its determination.	**European Union**
Syria does not agree to adding a new criteria like PPPs as a quality parameter in document, until conducting enough studies on all olive's species in CODEX member's countries, and all factors that may affect the proposed limits have been identified according to accurate and integrated studies about it	**Syrian Arab Republic**
We do not think it is appropriate to include these parameters in this standard, even as appendix, since the studies have still been ongoing.	**Turkey**
Brazil agrees with the inclusion of the parameter in the appendix after the evaluation of the purpose and method as proposed by IOC.	**Brazil**
PPP: With a proposal to permit out of range compliance for fatty acids and sterols, it is logical to add additional quality and composition factors to support olive oil authenticity. These are useful parameters to distinguish extra virgin olive oil. Therefore, Canada supports the addition of section 1.5 for 1,2-diglycerides, and 1.6 for pyropheophytin "a", preferably within the body of the standard, or at least in the Appendix. Thus adoption of these tests by Codex into CXS 33 would allow for the collection of more data and perhaps speed up the process of moving the tests from the Appendix to the main body of the standard.	**Canada**
~~**[Extra virgin olive oil] [≤ 17]**~~ Syria does not agree to adding a new criteria like PPPs as a quality parameter in document, until conducting enough studies on all olive's species in CODEX member's countries, and all factors that may affect the proposed limits have been identified according to accurate and integrated studies about it	**Syrian Arab Republic**
[≤ 17] The inclusion of this parameter is relevant for extra virgin olive oil, so as to determine the different ages of oils.	**Chile**
1.7 Trace metals (mg/kg)	
Copper (Cu) Canada agrees with the deletion of the parameter below: Saturated fatty acids at the 2-position in the triglyceride (sum of palmitic & stearic acids)	**Canada**
2. CHEMICAL AND PHYSICAL CHARACTERISTICS	
Revisions to sections 2.1 to 2.5: Canada agrees with the changes to these sections.	**Canada**
[2.6 Total 4α-desmethylsterols content (mg/kg)]	
[~~2~~2.6 Total 4α-desmethylsterols content ~~(mg/kg)~~](mg/kg) The United States does not object to the proposal to move total 4α-desmethylsterols content to the appendix for virgin and extra virgin olive oil.	**USA**
The EU does not support the inclusion of this parameter for extra virgin and virgin olive oils in the appendix. Please see comments for point Point 3.2.4	**European Union**
If this criterion is kept, the concentration should be reduced as maximum 900 mg/kg.	**Turkey**
Brazil agrees with moving this parameter to the appendix considering that as it is currently defined (minimum limit) it is not helpfull to confirm the authenticity of a virgin olive oil.	**Brazil**
Total 4α-desmethylsterols content for EVOO and VOO: Since the majority of the oils in CXS- 210 have total sterol content over 1000 mg/kg, Canada supports to move the total sterol contents of all olive oils and olive-pomace oils to the quality and composition factors in the Appendix of the standard. However, if majority of the member countries support keeping these in the main body of the standard, Canada would not object.	**Canada**
[> 1000] It is relevant to include this parameter.	**Chile**
3. METHODS OF ANALYSIS AND SAMPLING	
The phrase: "The most updated version of the methods should be used, in application of ISO/IEC 17025." is a general rule that applies to all the standards and is already included	**Brazil**

GENERAL COMMENTS	Member/Observer
in CXS 234-1999. So Brazil understands that it does not need to be included in the standards individually. Moreover, Brazil would like to suggest the inclusion of the following methods: • Item 3.1 - Moisture and volatile matter: AOCS Ca 2d-25, principle gravimetry, type I; • Item 3.8 - Unsaponifiable matter: AOCS Ca 6a-40, principle gravimetry, type I.	
3.10 [Pyropheophytin "a"] [ISO 29841] The method for the parameter Pyropheophytin “a” (PPP) should be ISO 29841. This method has been in widespread use for more than a decade and has proved effective.	**Australia**
3.11 [1,2-diglycerides] [ISO 29822] The method for the parameter 1,2-diglycerides (DAGs) should be ISO 29822. This method has been in widespread use for more than a decade and has proved effective.	
The following statement should be shown after the section title: - *The most updated version of the methods should be used, in application of ISO/IEC 17025.* Canada agrees with the changes to this section, in particular, where the methods have been updated and obsolete methods have been removed. The analytical determinations' names have also been harmonized.	**Canada**
Method Typing: Method typing is a feature of Codex endorsed methods of analysis as covered in the Codex Procedural Manual. There are four “types” of methods: Type I through Type IV. The current table needs significant help from the relevant Standards Development Organizations (SDOs), namely IOC, ISO and AOCS, as there would be a question of equivalence for Type I methods, and only a single Type I or Type II method is possible, but multiple Type III’s. The “sameness” of the methods must be established, which would require access and comparison of all suggested versions.	**Canada**
3.10 [Pyropheophytin "a"] The inclusion of a method of analysis for this parameter will depend on the inclusion of the parameter itself in the standard. 3.11 [1,2-diglycerides] The inclusion of a method of analysis for this parameter will depend on the inclusion of the parameter itself in the standard. 3.12 [4α-desmethylsterol total content] The EU does not support the inclusion of this method of analysis in the appendix. Please see comments in points 2.6 and 3.2.4. **Method of ~~sampling~~sampling and sample preparation** The second to last line in the table of Section 3, stating “Method of sampling”, should state “Methods of sampling and sample preparation”	**European Union**

ANNEX II

COMMENTS SUBMITTED BY EMAIL

Comments from the International Olive Council (OIC)

Dear chair, co-chairs, Codex Secretariat and members of the CCFO,

The Executive Secretariat (ES) of the International Olive Council (IOC) would like to begin by expressing its compliments for the work and activities carried out by the chair and co-chairs of the CCFO eWG and the Secretariat of the Codex Alimentarius Commission to develop international codes of practice for food safety, quality and fair trade.

We particularly commend your efforts and the Commission's collaboration with the IOC on the standard for olive oils and olive-pomace oils (CODEX STAN 33-1981).

As you are surely aware, the IOC is an intergovernmental organization charged with administering the International Agreement on Olive Oil and Table Olives 2015, which has been signed, ratified and deposited with the Secretariat of the UN by its member states. The IOC's mission is to safeguard the authenticity of olive products and monitor and harmonise legislation, regulations and international standards on olive oils and table olives. It is also a reference organization for the Codex.

To date, the signatory members of the International Agreement 2015 (Albania, Algeria, Argentina, Egypt, Georgia, Iran, Israel, Jordan, Lebanon, Libya, Morocco, Montenegro, Palestine, Tunisia, Turkey, the European Union and Uruguay) produce more than 90% of the world's olive oil and table olives and account for 75% of international trade in olive products.

Over the course of four years, the eWG on the revision of the standard on olive oil and olive-pomace oils has worked on numerous response forms proposed by the chair of the eWG, where some questions were repeated, leading to confusion.

However, the IOC would like to express its point of view concerning the chair's report, **CX/FO 21/27/6**. The IOC would like to highlight certain aspects of the proposed draft standard by the chair: 'Topics highlighted in blue were agreed upon by CCFO26 at the 2019 plenary' as well as in the report **REP 19/FO**, **point 55 c:** 'The Committee also agreed that to the extent possible, members should refrain from opening up discussion in the eWG on items for which there has been clear agreement'.

It is important to return to the points on which consensus was reached and which the IOC invites the CCFO to adopt at its 27th plenary session, such as:

- The change of the denomination of olive oil composed of refined olive oil and virgin olive oils.
- The change of the denomination of olive-pomace oil composed of refined olive-pomace oil and virgin olive oils.
- To eliminate the reference to odour and taste in the heading "Organoleptic characteristics (odour and taste) of virgin olive oils".
- To include the unit of peroxide value (milliequivalents of active oxygen/kg oil).
- To include the unit of free fatty acids (g/100 g expressed as of oleic acid).
- To replace "Absorbency" by "Absorbance" and to add how it is expressed (expressed as K270/ or K268) and the definitions of ΔK.
- To add an explanatory note for apparent beta-sitosterol.
- The content of waxes in extra virgin olive oil and virgin olive oil (C42 +C44 +C46).
- The percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol) instead of the saturated fatty acids in position 2.
- Maximum stigmastadienes content ≤ 0,05 mg/kg.
- To add the sign ≤ before the limit of the ΔECN42.
- Fatty acid methyl esters composition (expressed as percentages of total fatty acids):

  C14:0 (myristic acid): ≤0.03;

  C16:0 (palmitic acid): 7.0 – 20.0

  C17:0 (margaric acid): ≤0.4

  C17:1 (heptadecenoic acid): ≤0.6

C18:1 (oleic acid): upper limit 85.0

C18:2 (linoleic acid): 2.5 – 21.0

C20:1 (gadoleic acid): ≤0.5

- Methods of analysis that were presented at the CCFO and the CCMAS meetings.

  The tables showing differences among methods are in **ANNEX 1** of this document after an exhaustive revision between IOC, ISO and AOCS methods.

However, it is also very important to focus on the following issues discussed in the rounds of working documents (WD) on which there is no consensus and which appear in square brackets in Annex 2 of the proposed draft standard sent by the chair:

1. **Removal of the footnote of the definitions of refined olive oil and refined olive-pomace oil** (page 3 of CX/FO 21/27/06 June 2021)**.**

   This footnote states: "*This product may only be sold direct to the consumer if permitted in the country of retail sale*" and it is referred to in the definitions of the refined olive oil and refined olive-pomace oil categories.

   The chair of the Codex eWG proposed removing this note in WD1, WD4, WD9 and again in WD12. Even though most countries were against removing this note, it is considered an issue for which there is no consensus. As mentioned in CXS 33 PROPOSED REVISIONS, this footnote "*is a trade restriction on refined olive and olive-pomace oils, which the Codex considers edible. This note is in the IOC standard as recognition of protectionist practices carried out by some of its members. Codex should be uninvolved in this type of practice.*"

   The IOC does not agree with the removal of this note, since it does not ban the retail sale of refined olive oils and refined olive-pomace oils, but, given the needs, habits and quality policies of various countries, acknowledges the fact that countries may have different positions on the marketing of these two categories. For example, EU legislation allows refined olive oil or refined olive-pomace oil to be sold to the final consumer only as part of a blend.

   The IOC is of the opinion that an international standard should specify which categories are available in all markets of the world and the categories for which there are restrictions in certain countries, in order to be in line with its purpose of ensuring the fair trade of a product. It should be emphasized that the oil produced from olives is different to all other vegetable oils, because it can be edible either as virgin or as refined oil. It is widely known that virgin olive oil is a product of high biological and nutritional value and of superior value from all other vegetable oils.

2. **Statement on fatty acids composition** *[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.]* (Page 3 of CX/FO 21/27/06 June 2021).

   This statement was proposed in WD9 and again in WD12 as option 1. The IOC formulated its arguments to disagree with this statement, which are still valid.

   Regarding this issue, the chair commented in RF12 SUMMARY REPORT: *"Because of the replies received, options 2, 3, and 4 are rejected, as indicated at the beginning of this document, and option 1 would remain to present to the CCFO should a compromise solution it is not possible in the time remaining until October."*

   In addition, in CXS 33 PROPOSED REVISIONS, it is stated: *"It is proposed to include the statement appearing in CXS 210 about the anomalies existing with fatty acids. It is not agreed on. A decision scheme developed by the IOC for linolenic acid is expected to arrive presently, which may help to achieve consensus. An agreement on this topic is expected before the plenary session."*

   The IOC would like to reiterate its arguments against this proposal. The proposed statement is general and vague: it does not specify which oils are considered compliant (is it sufficient for the oils to comply only with the fatty acid limits and not with the other criteria included in the standard?) and which are the criteria to justify deviations and to ensure the authenticity of an oil.

   Therefore, the adoption of this statement will result in the CODEX STAN not being fit for purpose, namely to ensure fair trade and protect the consumer.

   The IOC considers the mandatory application of all quality and authenticity criteria to be an extremely important issue. Otherwise, the probability that an oil is blended with oils other than olive oil is significantly higher than the probability that an oil results from an anomalous composition of authentic olive oil.

For the time being, the only reliable tool for facing the deviations of some authentic olive oils from the official limits regarding fatty acids or individual sterols is the adoption of a decision tree through scientific evidence. This way, the authenticity of an oil coming from cultivars of specific origins is recognized while excluding the risk of adulteration.

After thorough study, the IOC has adopted a decision tree for extra virgin and virgin olive oils that deviate from the official limit regarding campesterol and four decision trees for olive oils and olive-pomace oils that deviate from the official limit regarding Δ7-stigmastenol. In Annex 2 of the proposed draft standard sent by the chair, the decision tree for campesterol is included as an issue on which there is consensus, while the two decision trees for Δ7-stigmastenol are included in square brackets (no consensus). The CODEX STAN could adopt the 3 decision trees for Δ7-stigmastenol (except the decision tree for lampante virgin olive oil). The chair's opinion that decision trees create confusion and instability is incorrect since these decision trees ensure the authenticity of anomalous oils.

What is more, the IOC's work on the issue of the linolenic acid limit has progressed and the IOC eWG has proposed an effective decision tree for linolenic acid values from 1.0 to 1.4%. This decision tree must be considered by the chair before the final revision of the CODEX STAN is drafted.

3. **The lower limit for oleic acid: 53.0 instead of 55.0** (page 4 of CX/FO 21/27/06 June 2021).

   In Annex 2 of the proposed draft standard, the values 53.0 and 55.0 are written in square brackets. In CXS 33 PROPOSED REVISIONS, the values 53.0 and 55.0 are written in square brackets but are not highlighted in blue, like the other points for which there is no consensus.

   The IOC considers it necessary to be very cautious when considering changes to the lower oleic acid limit. High oleic acid content is a major factor in identifying olive oils and in the early observation of the healthy properties of an olive oil (before polyphenols had been discovered in EVOO). In addition, oleic/linoleic and oleic/linolenic ratios are highly relevant for the peculiar nutritional characteristics of olive oil and its shelf-life. So, the IOC eWG decided to increase the oleic acid limit from 83.0% to 85.0%, but the proposal to lower the oleic acid limit from 55.0% to 53.0% was not accepted.

4. **The linolenic acid limit** (page 4 of CX/FO 21/27/06 June 2021).

   Linolenic acid is written C18:3[2]. It appears without a limit but is accompanied by the note: *"[2 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.]"*

   This issue was discussed in WD9 and again in WD12. The IOC sent its reply.

   Regarding this issue, the chair commented on RF12 SUMMARY REPORT: *"The IOC and its members want the decision tree proposed by the IOC to be considered, they should forward it sooner rather than later, so have time to distribute it, study and comment on it, which takes time, as you know. If it is unsubmitted in time to go through all these steps, it will be unconsidered. These informal contacts can be used until the first week of October, to reach agreements that will allow us to present an easy document to the CCFO plenary".* In CXS 33 PROPOSED REVISIONS, it is written *"Not agreed so far."*

   The group of IOC expert chemists has discussed and studied the linolenic acid limit for many years and at different periods, since a significant amount of virgin olive oils deviate from the official linolenic acid limit. However, it was very difficult to find an effective solution to this issue.

   This period, the IOC's work on the linolenic acid limit issue has progressed and the eWG proposed an effective decision tree for linolenic acid values from 1.0 to 1.4%.

   So, the IOC considers that the linolenic acid limit should be ≤ 1.0 with an asterisk referring to a note saying that "An edible virgin olive oil that exhibits 1.0 < linolenic acid% ≤ 1.4 is authentic, provided that app. β-sito/campesterol ≥ 24 and all other purity criteria lie within the official limits". The parameter apparent β-sito/campesterol includes the two most sensitive parameters for detecting olive oil fraud with high linolenic acid extraneous oils.

   This note is easy to use since it includes a condition that must be met by virgin olive oils that deviate from the linolenic acid limit. It is effective both for detecting fraud and the deviant virgin olive oils from Spain and Morocco, which are the main countries with a significant amount of virgin olive oils that deviate from the official linolenic acid limit. The data and studies carried out by the IOC eWG on the linolenic acid limit are available from the IOC Executive Secretariat. The chair must consider this decision tree before the final revision of the CODEX STAN is drafted.

   The adoption of this decision tree by the CODEX STAN could be a very good decision provided that all olive oil producing countries check its effectiveness in the olive oils that deviate regarding linolenic acid. This check needs great care to avoid the need for modifications in the future. It should be noted that the effectiveness of this decision tree is checked only on the deviated samples and not on all olive oils of each country.

5. Expression of trans fatty acids to one decimal place (page 4 of CX/FO 21/27/06 June 2021).

On RF11 SUMMARY REPORT, the chair commented: "*Regarding the expression of the limits and the number of decimal places to consider, this issue has also been explained in two documents, but there is no objection to doing it again. For consistency between Codex standards CXS 33 and CXS 210, the fatty acid limits in the draft appear with a single decimal place. Put differently, nothing has been changed, just the Codex format has been retained.*

Also, both in the first and second working period, it was proven, considering the IOC data, that the method measurement's uncertainty is in the second decimal place, which means that this figure is uncertain, i.e., it is unknown with certainty. So, the legal limit cannot be placed in the second decimal place because it would cause legal uncertainty in the event a value is close to the limit exceeding it."

In CXS 33 PROPOSED REVISIONS, it is written: *"Regarding the number of decimal places for the trans isomers, the change is due the precision values of the method do not allow the use of two decimal places".*

The IOC cannot agree to express the trans-fatty acids limits to one-decimal place. More careful consideration is needed regarding the method measurement's uncertainty.

The IOC would like to note that the difference between the IOC and Codex standards regarding the number of decimal places appears not only in trans-fatty acids but also in the expression of all fatty acids limits except for myristic acid. In the CODEX STAN, all fatty acids limits (cis and trans) are expressed to one decimal place, while in the IOC standard and Commission Regulation (EEC) 2568/91, the fatty acids limits are expressed to two decimal places. This expression has a great influence on limits and can result in the non-uniform implementation of international standards and in the effectiveness of the method on TAG coherence in the detection of olive oil fraud.

6. Decision trees for Δ7-stigmastenol (page 4 of CX/FO 21/27/06 June 2021).

The limit for Δ7-stigmastenol is written ≤ 0.5 [b] and is accompanied by the note *[(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 ΔECN42 ≤|0.1|. For refined olive-pomace oils values > 0.5 and ≤ 0.7% then stigmasterol ≤1.4% and ΔECN42 ≤ 0.4.]*

On RF12 SUMMARY REPORT, the chair commented: *"Four of the five published schemes are aimed to solve the Δ7-stigmastenol anomalies, and as can be seen, the four schemes are different. For the same problem, four different solutions are provided, depending on the oil considered. This creates instability since a similar problem is approached in four different ways, which also generates confusion, especially when the restrictive criteria in each scheme are also different.*

In this restrictive scheme, a criterion that cannot be met, number 2, is imposed. On the other hand, stigmasterol, which does meet the specified limit, is restricted by 57.6%, bringing it to values that many virgin oils cannot meet, and finally, the fourth criterion, related to fatty acids, which also meet the specified limit, is restricted by half.

What is also surprising about these schemes is that restrictions are imposed on parameters that already meet the standard. Why?

The IOC members indicate that these decision schemes respond to the characteristics of the off-standard oils. Hence, this information should always be available for consultation. Therefore, and for the sake of transparency, the studies resulted in the five decision schemes should be made available to all CCFO members, given that the intention is to implement these schemes in CXS 33."

In CXS 33 PROPOSED REVISIONS, there is no reference whatsoever to this issue.

Before responding to the chair's comments on RF12 SUMMARY REPORT, it is useful to recall what a decision tree is.

The main principle behind adopting a decision tree is based on the fact that, while a higher limit on a deviated parameter is acceptable, one or more other parameters are inserted in the decision tree with limits that are stricter than the official limits. Why? When we accept a looser limit for a critical authenticity parameter, we reduce the effectiveness of this parameter in the detection of fraud. We therefore need to find other parameters that have approximately the same efficiency in detecting fraud as that of the deviated parameter when it is used with its official limit.

If there is no substitute for the deviated parameter, then this parameter is irreplaceable and alternative solutions to a decision tree should be sought.

The above should clarify *"why restrictions are imposed on parameters that already meet the standard".* The decision tree makes sense when the limits of the parameters included in the decision tree are stricter than the official ones.

Before adopting a decision tree, the following must be examined:

1. The effectiveness of the decision tree in the detection of olive oil fraud.
2. The effectiveness of the application of the decision tree in the deviated analysed samples.

The IOC expert chemist group has studied the adoption of decision trees regarding olive oils that deviate from the Δ7-stigmastenol limit since 2013.

The parameter Δ7-STIGMASTENOL is very effective in detecting the adulteration of olive oils, especially in sunflower and safflower oils. So, the only solution to deviations of olive oils from Δ7-stigmastenol limit is to adopt a decision tree.

As mentioned above, the IOC has adopted, after thorough study, the following four decision trees for olive oils and olive-pomace oils that are deviated from the official limit regarding Δ7-stigmastenol:

IOC Δ7-stigmastenol decision trees				
Used criterion	**Category**			
	EVOO and VOO	**COO, ROPO and ROPO+VOOs**	**LOO**	**ROO and ROO+VOOs**
Δ7- Stigmastenol %	>0.5 and ≤0.8	>0.5 and ≤0.7	>0.5 and ≤0.8	>0.5 and ≤0.8
Campesterol %	≤ 3.3		≤ 3.3	
Stigmasterol %	≤1.4	≤1.4		
(app. β-sito)/ (campe+ Δ7-stigma)	≥ 25			≥ 24
Stigmastadiene (mg/kg)			≤0,30	
ΔECN42	≤ |0.10|	≤ |0.40|	≤ |0.15|	≤ |0.15|

The other parameters will abide by the limits fixed in the standard.

All the adopted decision trees were examined for:

1. Their effectiveness in the detection of olive oil fraud, i.e., the risk of adulteration when a decision tree is applied due to a permitted increase in the official limit of a parameter. During this examination, the most effective parameters in the detection of fraud and their limits are selected.

2. Their effectiveness in the deviant samples regarding Δ7-stigmastenol.

This entails processing the statistical data for the deviant samples and calculating the percentage of samples tested that comply with the proposed limit for each parameter. The most suitable parameters are selected based on sample conformity and a decision tree is created for the deviant parameter and category of virgin olive oil.

The seed oils which exhibit high Δ7-stigmastenol content are: sunflower, sunflower high-oleic, sunflower mid-oleic, safflower, safflower high-oleic, soyabean and sesame. The vegetable oils with high Δ7-stigmastenol % content exhibit simultaneously a very high campesterol (ranging from 6.5% to 24.2%) and stigmasterol content (ranging from 4.5% to 19.2%).

The examination of the first stage revealed that the most effective parameters to distinguish a high Δ7-stigmastenol olive oil from an olive oil adulterated with high Δ7-stigmastenol seed oils are: Δ7-stigmastenol, ΔECN42, Apparent β-sitosterol, Apparent β-sitosterol /(campe+Δ7-stigma), campesterol and stigmasterol.

The effectiveness of the above parameters is affected by the corresponding limit. Thus, the stigmasterol parameter (limit ≤1.8%) is useless, since in this case the parameters campesterol (limit ≤3.3%), apparent β-sitosterol (limit ≥93.0), and apparent β-sitosterol /(campesterol+Δ7-stigmastenol) (even with limit ≥23) are more effective in controlling fraud.

During the examination of the second stage, a decision tree was created for each category based on the conformity of the available deviant samples with the proposed limit for each parameter.

Thus, the "*four schemes are different"* because the composition of the oils of each category is different. The comment *"This creates instability…also generates confusion"* is incorrect, since the decision trees should be effective both for detecting fraud and the deviant samples.

The decision tree for extra virgin and virgin olive oils includes all the sensitive parameters for the detection of high Δ7–stigmastenol seed oils. It is strict but very effective in the detection of fraud. In addition, the conformity of the available deviant samples was very good. The comment "*a criterion that cannot be met, number 2, is imposed"* is not true. Only when a sample exhibits campesterol=3.3, it is rarely the case to comply with the limit of 25 or 24 regarding app. β-sito)/ (campe + Δ7-stigma). Usually, samples that deviate in Δ7-stigmastenol exhibit low campesterol content.

Regarding stigmasterol, for this parameter there is no official limit (only < campesterol). However, as mentioned before, value of stigmasterol 1.8% is useless for detecting seed oils with high Δ7- stigmastenol content. Similarly, stigmasterol could not be used to detect the addition of high Δ7- stigmastenol content seed oils to lampante olive oils due to the higher stigmasterol content of this category compared to that of extra virgin and virgin olive oils (in some cases higher than campesterol). As for the parameter ΔECN42, its presence in the decision tree with the official limit $\left|0.20\right|$ is meaningless; on the other hand, the conformity of the available deviant samples to the limit $\leq \left|0.10\right|$ was very good.

The decision tree for COO, ROPO and ROPO+VOOs includes only the parameters stigmasterol and ΔECN42 because the conformity of the available deviant samples of these categories to the limits of other parameters was not good. In addition, the upper limit for Δ7- stigmastenol is 0.7% due to the statistical data of these categories.

Finally, **the decision tree for ROO and ROO+VOOs** includes only the parameters app. β-sito)/ (campe+Δ7-stigma) and ΔECN42. The IOC eWG proposed this decision tree in March 2021; it is a simplification of the previous decision tree.

The IOC would like to state that it is in the process of simplifying decision trees to make them easier to use and more efficient. Given that a decision tree that includes many parameters and limits sets many restrictions and makes it difficult to use, the simplification of a decision tree (not to the detriment of its effectiveness in fraud control) corrects some incompatibilities as well. For example, the campesterol parameter could be removed from a decision tree if the parameter app. β-sito)/ (campe+ Δ7-stigma) is included. The IOC also considers it absolutely necessary to confirm the effectiveness of the decision trees in the deviant samples by analysing lots of data from olive oil producing counties which exhibit deviations regarding Δ7-stigmastenol.

In conclusion, the IOC clarifies that the studies on these decision trees began in 2013 and are ongoing. All are available from the IOC Executive Secretariat.

7. **Statement on sterols composition** [The authenticity of virgin olive oil is not compromised if one sterol, or their minimum content, does not fall within the given ranges if all other sterols and parameters referred to in this standard fall within the stated ranges] (page 5 of CX/FO 21/27/06 June 2021).

   This statement was proposed in WD5, WD7 and WD10. The IOC sent its arguments for its disagreement with this statement. Even though most countries were against this statement, it is considered an issue for which there is no consensus.

   Regarding this issue, the chair commented in RF10 SUMMARY REPORT: "*If the rest of the sterols and authenticity parameters meet the standard, there is no need to ask this question (how do we conclude if deviation is due to cultivars of specific origins or to the adulteration of this olive oil with certain seed oils?) and the oil should be considered compliant. Once more, it is pointed to that not doing so implies accepting an uncertain decision. Even though the oil is declared not in compliance, the question raised by the IOC remains without an answer. Moreover, the resulting risk that the presumption of innocence of a producer or operator may be violated remains since there would not be unquestionable evidence that the oil was adulterated*.". In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "*This statement is not agreed on and most likely not considered.*"

   The IOC disagrees with this proposal. According to the chair, the proposal allows only one deviation from the official limits on any independent sterol or total sterols content of an olive oil in order to avoid an uncertain decision on authenticity. However, sterols analysis is valuable for detecting fraud. The limits for each independent sterol were adopted after thorough study to detect the adulteration of an olive oil with a different kind of vegetable oil, and no sterol limit can be replaced by another. Accepting a deviation without setting another criterion would lead to the conclusion that the oil is uncontrollable both in terms of its fair marketing and its consumption.

   The IOC would like to reiterate the fact that the compliance of an olive oil with all sterol limits and generally with all purity criteria should be mandatory in order to verify its authenticity. Otherwise, the probability that oils other than olive oil are added to it is significantly higher than the probability that it is produced from an anomalous composition of an authentic olive oil.

   For the time being, the only reliable tool for facing the deviations of some authentic olive oils from the official limits regarding fatty acids or individual sterols is the adoption of a decision tree through scientific evidence.

This way, the authenticity of an oil that comes from cultivars of specific origins is recognised while excluding the risk of adulteration.

The IOC expert chemists are working in this direction to adopt standards fit for purpose, namely to ensure fair trade and protect the consumer.

8. **To consider ΔK as an authenticity parameter for the categories extra virgin and virgin olive oils** (page 5 of CX/FO 21/27/06 June 2021).

   This proposal was made in WD10. Even though most countries were against the proposal, it is considered an issue for which there is no consensus.

   The IOC sent its arguments for its disagreement with this proposal. On RF10 SUMMARY REPORT, the chair commented: "*ΔK is going to be maintained as an authenticity parameter of virgin oils, without being expressed as an absolute value, as indicated by the IOC and which, by mistake, has been so indicated in the draft. It is maintained as a quality parameter for refined oils and their blends with virgin and extra virgin olive oil although in the upcoming months it may be debated whether to maintain it in the standard*."

   In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "*The name of the analytical determination has been agreed on. It is included as a composition factor of virgin and extra virgin oils because it is an indicator of the presence of refined oils.*"

   The IOC would like to repeat its opinion on including ΔK in the quality or purity criteria.

   Absorbency at 270 or 268 nm is caused by compounds, which are produced in a secondary stage of oxidation or when oil is subjected to technological treatments.

   The index ΔK is a criterion for discriminating between a bad quality virgin olive oil and an olive oil adulterated with refined oil.

   Consequently, the absorbency at K270 or K268 and the index ΔK, apart from being quality criteria, could also be used as purity criteria.

   Based on the above, the IOC considers that the parameter ΔK should remain a quality criterion **for the extra virgin and virgin olive oil categories as it is for the other categories**. However, a note could be adopted that states: "both K270 or K268 and ΔK can also be used as purity criteria for the detection of refined oils". This note also helps the control authorities, so that they do not necessarily conclude that values of ΔK falling out of the limit mean fraud and not that the virgin olive oil is of poor quality.

9. **To express the defect's median of the limit between fit and unfit categories with no decimal places. Consequently, the median of the most perceived defect should be 3** (page 6 of CX/FO 21/27/06 June 2021).

   This proposal was discussed in WD4 and again in WD11. Even though most countries were against this proposal, it is considered an issue for which there is no consensus.

   On RF10 SUMMARY REPORT, the chair commented: "*If the majority position of the IOC and its members is only to adopt a median of 3.5, then there is nothing more to add. However, the Chair feels that a limit with a decimal place is inconsistent and will cause legal uncertainty to the standard. Therefore, wishes the CCFO's plenary to have the final word, and so relieving him of any responsibility for adopting a limit that is felt in all conscience is wrong from diverse points of view.*"

   In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "*A limit of three, without decimal places, has been proposed as a consensus solution, given that is in the first decimal place the analytical error and the uncertainty of the measurement are. Legal limits cannot be affected by either. For discussion.*"

   This proposal was discussed extensively in the IOC eWG MEDIAN, and the IOC sent its arguments for its disagreement with this proposal.

   The IOC considers this a very important issue since after removing the ordinary category, the proposed median of the predominant defect will be the limit between fit and unfit categories. The current Codex limit of 2.5 corresponds to the limit 3.5 set in the IOC trade standard, taking into consideration that the IOC limit already considers the uncertainty of the method.

   The Codex proposal is simply a rounding of the already existing limit of 2.5 in CODEX STAN 33. This means that median values from 2.5 to 3.4 are considered within the limit 3. It could be noted that the fewer decimal places to which a limit is expressed, the greater its tolerance, meaning the range within which lies a compliant result. However, this proposal does not specify whether it will accept the statement included in the IOC method (§10.4 of the COI/T.20/Doc. No. 15/Rev. 10 method: "The error of the method has been taken into account when establishing the limits of these ranges, which are therefore considered to be absolute"). If not, the above statement should be removed from the method. Each lab can then use the calculation done by the

lab expanded uncertainty when assessing the compliance of a sample with the legal limit. Here, the conformity or not of a sample depends on the values of CVr% and Me. When the CVr% value is high (max value 20.0), an ordinary virgin olive oil that almost reaches the IOC lampante category may be characterised as virgin olive oil. This is an argument against the eWG Chair's proposal.

If the mentioned proposal accepts the statement from COI/T.20/Doc. No. 15/Rev. 10, then it is simply an increase of the limit of the Codex standard from 2.5 to 3.4. However, in this case the limit should contain the value 3.5, according to the 2007 reasoning for the modification of the limit from 2.5 to 3.5.

In conclusion, in both above cases, the proposal leaves a lot of margins for the interpretation of the results, and it causes modifications in the statistics of the method. Different approaches regarding the use of measurement uncertainty prevent the uniform implementation of legislative standards. Consequently, agreement should be obtained for the use of uncertainty.

The IOC organoleptic method is the result of nearly 40 years of study and application, carried out under a scientific approach and with the consensus of all IOC members. This method is specifically designed for the classification of virgin olive oil, using a non-parametric statistical treatment. While it is important to seek harmonisation between different standards and consensus on this issue in Codex to be of great help to international trade, it cannot be done with a mathematical calculation involving comparable numbers but with different meanings. The IOC considers that scientific consideration is needed by the IOC experts before adopting such a proposal. The permitted number of decimal places of a legal limit related to the number of decimal places of the analytical error and the use or not of measurement uncertainty when checking conformity should be clarified. Only if agreement is reached can uniform application of legal standards be achieved. (See IOC report on median limit of 3 for the predominant defect – 11 June 2020 -)

10. **[Fatty acid ethyl esters (mg/kg)] To add this parameter to section 3** (page 6 of CX/FO 21/27/06 June 2021).

    This proposal was discussed in WD6 (to include the quality parameter of ethyl esters in the Appendix of CXS-33) and again in WD11 (to add this parameter to the main body). It is considered an issue for which there is consensus.

    In the document CXS 33 PROPOSED REVISIONS, it is referred: *"This parameter is proposed to be included as a quality factor for extra virgin olive oil. Some members want the PPP and the 1, 2 DGAs to be included at the same time. This parameter has been contrasted by the IOC and its members for many years. For discussion."*

    The IOC agrees. Since this parameter is a quality criterion, the method of its determination has been thoroughly studied and its limit (35 mg / kg) has been verified by applying it to extra virgin olive oils from various countries, the ethyl esters parameter should be included in the standard as a mandatory criterion. (See IOC report on fatty acid ethyl esters – 11 June 2020 -)

11. [**1,2-diglycerides (% total diglycerides)] quality criterion for extra virgin olive oils. To add this parameter to the Appendix** (page 9 of CX/FO 21/27/06 June 2021).

    This proposal was discussed in WD11 (to add this parameter to the Appendix) and in WD13. It is considered an issue for which there is no consensus.

    In CXS 33 PROPOSED REVISIONS, it is stated: *"This parameter is proposed to be included in the Annex. It is a quality test for extra virgin olive oil. Its value should be greater than 35. Its inclusion is not agreed on."*

    The IOC studies so far are not encouraging for the use of the parameters pyropheophytin A and 1,2-diglycerides as quality criteria. In addition, the methods of their determination are under investigation. (See IOC report on PPP and DAGs – 11 June 2020 -)

12. [**Pyropheophytin "a" (% total chlorophyll pigments)] quality criterion for extra virgin olive oils. To add this parameter in the Appendix** (page 9 of CX/FO 21/27/06 June 2021).

    This proposal was discussed in WD11 (to add this parameter to the Appendix) and in WD13. It is considered an issue for which there is no consensus.

    In CXS 33 PROPOSED REVISIONS, it is stated: *"This parameter is a quality test for extra virgin olive oil. It is proposed to include it in the Annex. Its value should be less than 17. Its inclusion is not agreed on."*

    The IOC studies so far are not encouraging for the use of the parameters pyropheophytin A and 1,2-diglycerides as quality criteria. In addition, the methods of their determination are under investigation. (See IOC report on PPP and DAGs – 11 June 2020 -).

13. **To move the virgin olive oils' sterols total content to the appendix of CXS-33** (page 11 of CX/FO 21/27/06 June 2021).

This proposal was discussed in WD7, WD8, WD10 and again in WD11. The IOC sent its arguments for its disagreement with this proposal. Even though most countries were against this proposal, it is considered an issue for which there is no consensus.

On RF10 SUMMARY REPORT, the chair commented: "*The key question is why the total sterols' content is considered an authenticity parameter. Several arguments were established that seriously questioned this consideration. It is unknown so far what the considered grounds are, and, above all, which is the fraudulent practice that can objectively be demonstrated if one genuine oil presents a content below 1,000 mg/kg…. If there is a choice between safeguarding the genuine virgin olive oils' producers with consistent arguments, and not doing so because it could increase an alleged theoretical risk of fraud with oils that can be easily revealed with another simpler, more sensitive, and specific tests, the most sensible position is to favor the first option….. Therefore, the total sterol content of virgin oils will initially be included in the appendix of the standard to present to the CCFO plenary to produce the ultimate decision.*"

In addition, in CXS 33 PROPOSED REVISIONS, it is stated: "*This virgin oil's factor is proposed to be transferred to the appendix because it is unconsidered proper to check the genuineness of one oil, for two reasons: 1. It lacks specificity and 2. There are many genuine oils with contents below 1,000 mg/kg. This issue it is not agreed on.*"

The total sterols content was adopted as an authenticity criterion to protect olive oil from adulteration with seed oils with low total sterols. Low total sterol seed oils are mainly desterolised seed oils and all types of palm and palm kernel oils.

Despite the fact that there are some other parameters effective in the detection of extraneous oils with low total sterols, the IOC considers that the total sterol content for extra virgin and virgin olive oils should remain in the main body of the Codex standard, alongside individual sterols, since it is part of the method to determine sterols. Indeed, in recent years, a lot of monocultivar extra virgin olive oils have been found to exhibit lower total sterols than the adopted limit. It may be time to consider reducing the limit, once scientific data has been collected and an assessment made into the potential impact this may have on the effectiveness of individual sterols in detecting fraud. The limit 1000 mg/kg was adopted in the past, when monocultivar extra virgin olive oils produced from early-harvest olives was not common. The IOC is currently conducting a study on this parameter and has asked all producing countries to provide data and samples. Consequently, any decision regarding this parameter would be premature if taken before the studies are completed.

Except for the above issues for which consensus was not reached and which will be brought to the 27th session of CCFO for consideration, the following points that need corrections appear in ANNEX 2 of the proposed draft standard sent by the chair:

- ✓ **PAGE 6 Decision trees for Δ7-stigmastenol**: As for the campesterol decision tree, in the decision trees for Δ7-stigmastenol, the sentence "The other parameters shall meet the limits set out in the standard" should be added.
- ✓ **PAGE 8 8.11 Determination of ΔK**: The name of the method is "Absorbance in the ultraviolet region". This method is already referred in 8.4. So, paragraph 8.11 should be removed.
- ✓ **PAGE 8 8.13 Detection of traces of halogenated solvents**: The IOC method COI/T.20/Doc. N° 8 should be added.
- ✓ **PAGE 8 Method of sampling ISO 661 and ISO 5555**: The two methods should be written separately with their title. That is, 'ISO 661 Sample preparation' and 'ISO 5555 Sampling'.
- ✓ **PAGE 9 1.1 Organoleptic characteristics extra virgin and virgin olive oils: See Section 3.3.1**. For the homogeneity of the standard, this reference should be removed. Two other parameters, ΔK and total sterols content, are also included in the main body of the text and in the appendix, according to the applied category. However, there is no analogous reference for these parameters as for the organoleptic characteristics.
- ✓ **PAGE 11 Method of sampling ISO 661 and ISO 5555**: The two methods should be written separately with their title. That is, 'ISO 661 Sample preparation' and 'ISO 5555 Sampling'.

In addition, on page 5 of the IOC trade standard revision 16, note 2 on refined olive oil states: "When the oil has an erythrodiol + uvaol content of between 4.5 and 6 %, the erythrodiol content must be < 75 mg/kg". This note was not discussed by the Codex eWG.

Besides of the above, the IOC considers useful to discuss some other points, such as the removal of the ordinary virgin category from the standard for which while there was no consensus, it was agreed upon by CCFO26 in the 2019 plenary.

In fact, in **P1 of RF1,** it was proposed to remove the ordinary virgin olive oil category from CODEX STAN 33-1981.

- According to the response forms, Algeria, Argentina, Morocco, Syria, and Tunisia were against removing this category to ensure that international standards remain harmonised and given the lack of scientific evidence that ordinary virgin olive oil is harmful to humans.
- Argentina also stated the commercial importance of this category for some countries and highlighted the importance of reaching consensus before the next CCFO meeting.
- Australia, Canada, Germany, Iran, Italy, Poland, Portugal, Spain and the US supported the proposal. The EU would support the removal of the ordinary category from the Codex standard, as it is currently defined, but highlighted the lack of scientific evidence that ordinary virgin olive oil is harmful to consumers. Some Codex members consider ordinary virgin olive oil fit to sell directly to consumers.
- Brazil, Croatia and Greece suggested the Committee provide an alternative proposal.
- At the last CCFO meeting, some countries that are not represented in the eWG did not agree with the proposal to remove the ordinary virgin olive oil category, namely Ghana, Tanzania, Uganda and Uruguay.

Following this point, we recall that, following **section 3 point 27** of **REP 19/FO:** 'One delegation questioned the rationale for removing the definition. Underscoring the mandate of Codex to harmonise international food standards, promote fair trade in food and protect the consumer, the delegation pointed out that the ordinary virgin olive oil classification appears in the International Agreement on Olive Oil and Table Olives, 2015, and removing it would hamper trade due to potential disharmony between standards. This view was supported by other delegations and one observer'; and **point 29:** 'The delegation of Morocco, supported by Syria and Sudan, expressed their reservations about the decision, and drew the Committee's attention to the written comments of Tunisia and Uruguay on the issue'.

Furthermore, the IOC and other delegations expressed their preoccupations about removing the ordinary virgin olive oil category from the draft revision of CXS 33-1981. This was mentioned in **point 105** of the report **REP19/CODEX ALIMENTARIUS COMISSION (CAC)**: 'CAC 42 noted a concern expressed by observer the IOC regarding a proposal by the CCFO to remove the ordinary virgin olive oil category from the standard on olive oil and olive-pomace oils (CXS 33-1981). This concern was shared by two other delegations who requested that the CCFO and the eWG reconsider this proposal in line with the reservation made at CCFO26.'

It is important to also note that the IOC sent scientific reports approved by all the IOC experts on 11 June 2020. The reports were on the following topics:

1. The ordinary virgin olive oil category
2. The median limit of 3 for the predominant defect
3. Fatty acid composition
4. Ethyl esters
5. Pyropheophytins and Diacylglycerols (PPP and DAGs)

Unfortunately, the chair did not take these reports into account in the conclusions.

In addition, the following items are covered in the International Agreement 2015:

- Article 1 sets as its main objective to work towards the uniformity of national and international legislation on the characteristics of olive oils to prevent barriers to trade.
- Article 20 asks its members to apply the denominations outlined in the Agreement in their international trade and to encourage their application in their national trade.
- Article 22 obliges signatory members to not adopt any measure that is contrary to their obligations under the Agreement.

This category is recognized as edible and is traded nationally and internationally in several IOC member countries. The chair's proposal, to which the IOC Executive Secretariat did not agree, also provoked the reaction of several countries. They highlighted the prejudice that the removal of the *ordinary virgin olive oil* category would cause to trade and the confusion that could result from the coexistence of different international standards. The IOC noted that Algeria, Egypt, Lebanon, Jordan, Morocco, Tunisia and Turkey expressed their concerns about this issue and informed the Codex Secretariat about its impact. Uruguay was also against this proposal during the 26th CCFO meeting.

The tables below show the statistics on IOC producing countries.

OLIVE OILS						
Country	Crop year 2018-19			Crop year 2018-19- Provisional balance		
	Prod1 (1000tonnes)	Export (1000tonnes)	% Export/Prod1	Prod1 (1000tonnes)	Export (1000tonnes)	%Export/Prod 1
Algeria	97	0	0,0	125,5	0,0	0,0
Egypt	41	0,5	1,2	40,0	1,0	2,5
Iran	11,5	0	0,0	9,0	0,0	0,0
Jordan	21	0,5	2,4	24,5	3,5	14,3
Lebanon	17,5	6,5	37,1	14,0	6,5	46,4
Morocco	200	28	14,0	145,0	10,5	7,2
Tunisia	140	160	114,3	440,0	355,0	80,7
Turkey	193,5	55	28,4	230,0	45,0	19,6
Urugay	0,5	0	0,0	2,5	1,0	40,0
Syria	154	18	11,7	118,0	15,0	12,7
total A	876	268,5	30,7	1148,5	437,5	38,1
% total A/TOTAL	26,5	27,7		35,2	35,3	
TOTAL	3304	969	29,3	3258,9	1241,0	38,1

The IOC considers that there is no consensus on these points and that, given the significant impact it may have on international trade, this proposal should not be adopted.

Regarding the note mentioned in point 3.1 of the eWG chair's proposal "Note: Genuine virgin olive oil that does not meet one or more of the quality criteria for virgin olive oil 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."

The IOC expressed its opinion regarding this point:

- In RF2:

"A category for oils which are not directly edible should not be included in the Codex Alimentarius standard. This standard is a food standard and should therefore only apply to edible oils, in accordance with the General Principles of the Codex Alimentarius.

In any case, the denomination and definition of international standards should be harmonised in order to prevent barriers to international trade."

- In RF4:

"*The scope of the Codex standard as indicated in the Codex Alimentarius General Objectives (Section I Art. 2) are the edible oils. Lampante virgin olive oils are not fit for consumption as they are, so this category should not be included in the Codex Alimentarius Standard. The Codex standard is a food standard created to facilitate harmonisation and international trade. (Section I Art.1). The Codex food standards are not an alternative to national legislations (Section I Art. 3)*".

The IOC therefore considers that consensus has not been reached on this issue and this note should be given in brackets.

Finally, the IOC would like to address another important issue for which there is no room for discussion. This is the number of decimal places of the limits for free fatty acids, peroxide value, fatty acids composition and ΔECN42 and which is related to the analytical error and the measurement's uncertainty. This matter has already been mentioned in point 5 of this document concerning the expression of trans fatty acids **limits to one decimal place** and in point 9 concerning the expression of **the defect's median of the limit between fit and unfit categories to no decimal places.**

The number of decimal places has a great influence on the limits resulting in the non-uniform implementation of international standards. In addition, different approaches regarding the use of measurement uncertainty prevent the uniform implementation of legislative standards. The IOC considers that scientific consideration is needed by the IOC experts on this item. The permitted number of decimal places of a legal limit related to the number of decimal places of the analytical error and the use or not of measurement's uncertainty when checking conformity should be clarified. Only if agreement is reached on this issue can uniform application of legal standards be achieved.

Conclusion: The IOC proposes adopting the proposals where consensus was reached at the 27th plenary session of the CCFO and continuing to work on a scientific and objective basis in order to reach consensus on the other items.

In addition, certain significant issues which were agreed upon at CCFO26 in the 2019 plenary but for which there was no consensus should be reconsidered in order to reach an agreement. Such an issue is the removal of the ordinary virgin category from the standard which does not appeared in Annex 2 of the proposed draft standard sent by the chair. This is an issue of the utmost importance for countries that produce about a third of olive oil around the world and consequently for international trade. Agreement must be reached on this issue. Otherwise, there will be no uniform application of the standards and therefore harmonisation will not be achieved.

We should always keep in mind that harmonising international standards promotes fair trade, prevents olive oil fraud and protects the consumer

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ANNEX 1

Differences among IOC, ISO and AOCS methods

Acidity			
Standard	**IOC T.20/Doc.34/Rev. 1 (2017)**	**ISO 660 (2020) Cold method**	**AOCS Cd 3d-63 (2017)**
Solvent	Diethyl ether/ethanol (1:1)	Diethyl ether/ethanol (1:1)	Toluene/2-propanol (1:1)
Alternative solvents	Toluene/ethanol (1:1) Toluene/2-propanol (1:1)	Toluene/ethanol (1:1) Toluene/2-propanol (1:1) Tert-butyl methyl ether/ethanol (1:1) Tert-butyl methyl ether/2-propanol (1:1) Light petroleum/ethanol (1:1) Light petroleum/2-propanol (1:1)	No
KOH solution	KOH ethanolic solution 0.1 or 0.5M	KOH ethanolic solution 0.1 or 0.5M	KOH in water 0.1M
Alternative solutions	KOH in water NaOH in water	KOH in water NaOH in water KOH in methanol NaOH in methanol	KOH in methanol
Indicator solution	10g/L phenolphthalein in ethanol 20 g/L alkaline blue 6B in ethanol 20 g/L Thymolphthalein in ethanol	20 g/L alkaline blue in ethanol 20 g/L Thymolphthalein in ethanol	10 g/L phenolphthalein in 2-propanol
Persistence of color at end point	10 seconds	15 seconds	30 seconds
Sample amount	According to Table	According to Table	According to Table
Results	Single determination	Single determination	Single determination
Precision data	Yes (olive oil)	Yes (for olive oils too)	Not available

Peroxide Value			
Standard	**IOC T.20/Doc. 35/Rev. 1 (2017)**	**ISO 3960:2018**	**AOCS Cd 8b-90 (2017)**
Solvent	Acetic acid/chloroform (3:2)	Acetic acid/iso-octane (3:2)	Acetic acid/iso-octane (3:2)
Volume	25 mL	50 mL	50 mL
Thiosulfate solution **Titration of the solution**	0.01N Yes	0.1 N or 0.01N No	0.1N or 0.01N Yes (with potassium dichromate)
Volume of KI solution	1 mL	0.5 mL	0.5 mL
Starch solution **Volume** **Preparation method** **Quality of starch**	10 g/L Not specified No No	10 g/L 0.5 mL Yes No	5 g/L 0.5 mL Yes Yes
Sample amount	According to Table	According to Table	According to Table
Reaction time	1 min + 5 min	1 min	1 min
Water volume	75 mL	100 mL	30 mL
Emulsifier addition	NO	Optional	Yes
Maximum blank	0.05 mL thiosulfate 0.01N	0.1 mL thiosulfate 0.01N	0.1 mL thiosulfate 0.1N
results	Mean of 2 determinations	Single determination	Single determination
Precision data	Yes (for olive oils)	Yes (for olive oils too)	Yes (for olive oils)

UV Absorption

Standard	IOC /T.20/Doc.19/Rev.5 (2019)	ISO 3656 (2017)	AOCS Ch 5-91 (2017)
Solvents	Iso-octane Cyclohexane	Iso-octane Cyclohexane	Iso-octane Cyclohexane Others (ethanol for castor oil)
Sample amount	0.25 gr	0.05 to 0.25 gr	0.25 gr
Preparation of sample	Yes (filter at 30 ºC)	Yes (filter at 30 ºC)	Yes (filter at 30 ºC)
Measurements at	232 and 270 (cyclohexane) or 232 and 268 (iso-octane)	232 and 270 (cyclohexane) or 232 and 268 (iso-octane)	232 and 270 (cyclohexane) or 232 and 268 (iso-octane)
Cell	10 mm	10 mm	
Determination of □K	Yes (λmax, λmax+4 and λmax-4)	Yes (λmax, λmax+4 and λmax-4)	Yes (λmax, λmax+4 and λmax-4) only for 270
Specified absorbance	< 0.12 at 232 and < 0.05 at 270	< 0.12 at 232 and < 0.05 at 270	No
Precision data	Yes (232, 268, 270 and □K for olive oils)	Yes (232, 268, 270 and □K for olive oils)	Yes (232 and 268 for olive oil too) IOC precision data for 270 and □K for olive oils)
Passage over alumina	No	No	Yes
Testing of alumina activity	No	No	Yes
Calibration of UV-spectrometer	Yes	Yes	No

Percentage of 2-glyceryl monopalmitate		
Standard	**COI/T.20/Doc. n°23/Rev.1 (2017)**	**ISO 12872 (2010)**
Solvent	Hexane or iso-octane as an alternative	Hexane
Neutralization of oils with free acidity greater than 3%: identical procedure	50 g + 200 ml hexane + +100 ml isopropanol + a volume of KOH aqueous solution 12 % - Shake and add 100 ml water - removal of the soapy phase - organic phase washed with portions of isopropanol/water mixture 1:1 - removal of hexane by distillation under vacuum	
Conventional chromatography clean-up: identical procedure	Sample solution: 1 g of oil dissolved in 10 ml of hexane/diethyl ether mixture 87:13 - purification of the solution on a 25 g silica gel column by elution of 150 ml of hexane/diethyl ether mixture 87:13 - evaporation of the solvent	

Alternative chromatography clean-up by SPE	purification of 1 ml of the sample solution on a ready-to-use silica SPE cartridges and elution with 4 ml of hexane/diethyl ether mixture 9/1	purification of 1 ml of the sample solution on a ready-to-use silica SPE cartridges and elution with 4 ml of hexane/diethyl ether mixture 87:13
Hydrolysis with pancreatic lipase: identical procedure	0,1 g oil + 2 ml buffer solution + 0,5 ml sodium cholate solution 0,1 % + 0,2 ml calcium chloride solution 22 % + 20 mg lipase - 2 min at 40°C - 1 ml diethyl ether - transfer the ether solution to another tube	
Silylation: identical procedure: identical procedure	100 µl of the ether solution - solvent elimination + 200 µl pyridine/HMDS/TMCS 9:3:1 - 20 min at ambient temp + 5 ml hexane	
GC column: identical	Silica capillary column, length 8 m to 12 m; internal diameter 0,25 mm to 0,32 mm, coated with methylpolysiloxane or 5 % phenyl methylpolysiloxane, with a film thickness of 0,10 µm to 0,30 µm, suitable for use at 370 °C	
GC oven temperature: almost identical	isothermal at 60°C for 1 min; up to 180°C at 15°C/min; up to 340°C at 5°C/min; maintain at 340°C for13 min	isothermal at 60°C for 1 min; up to 180°C at 15°C/min; up to 340°C at 5°C/min; maintain at 340°C for 20 min
Results	Single determination	Single determination
Precision data	Yes (for olive oils)	Yes (for olive oils)

Difference between the actual and theoretical ECN 42 triglyceride		
Standard	**COI/T.20/Doc.nº 20/Rev4 (2017)**	**AOCS Ce 5b-89 (revised 2017)**
Title	Determination of the difference between actual and theoretical content of triacyglycerols with ECN 42	Triglycerides in vegetable oils by HPLC
Scope	Determination of the absolute difference between the experimental values of triacylglycerols (TAGs) with equivalent carbon number 42 (ECN42 HPLC) obtained by determination in the oil by high performance liquid chromatography and the theoretical value of TAGs with an equivalent carbon number of 42 (ECN 4 2theoretical) calculated from the fatty acid composition	Separation and quantitative determination of the triglycerides in liquid vegetable oils, as a function of their equivalent carbon number (ECN) using high performance liquid chromatography
Solvent for purification of the sample	Petroleum ether or hexane (may be replaced by iso-octane) - Heptane (may be replaced by iso-octane)	No purification of the sample
Conventional chromatography clean-up	Sample solution: 2,5 g of oil dissolved in 50 ml of hexane/diethyl ether mixture 87:13 - purification of 20 ml of the sample solution on a 25 g silica gel column by	No purification of the sample

	elution of 150 ml of hexane/diethyl ether mixture 87:13 - evaporation of the solvent - weighting of the residue	
Alternative chromatography clean-up by SPE	Sample solution: 0,12 g of oil dissolved in 0,5 ml of hexane - purification of the sample solution on a ready-to-use 1 g-silica SPE cartridge and elution with 10 ml of hexane/diethyl ether mixture 87:13 - evaporation of the solvent	No purification of the sample
GC analysis of fatty acid methyl esters	Analysis according to COI/T.20/Doc.n°33/Rev.1 (2017) of an aliquot of the purified sample dissolved in heptane	Analysis of FAME not required
HPLC analysis of triacylgycerols	0,5 g of the purified sample into 10 ml acetone	0,5 g of the purified sample into 10 ml acetone or acetone/chloroform 1:1
HPLC injected volume	10 µl	10 µl
HPLC column : identical	stainless steel tube 250 mm length x 4.5 mm internal diameter packed with 5 µm diameter particles of silica with 22 to 23% carbon in the form of octadecylsilane	
HPLC detector	differential refractometer	differential refractometer, or UV detector, or MS detector
HPLC elution phase	Acetonitrile/acetone (proportions to be adjusted) or propionitrile	Acetonitrile/acetone (proportions to be adjusted)
HPLC solvent flow rate	1,5 ml/min	1,5 ml/min
HPLC TAG composition	% individual triglyceride = area of peak x 100 / (sum of peak areas of TAGs from ECN 42 up to ECN 52) Calculation of triacylglycerols with ECN 42 Results given to at least two decimal place	% ECN-triglyceride = area of peaks with the same ECNx 100 / (sum of peak areas of TAGs) Results given to one decimal place
Theoretical TAG composition	Calculation of triacylglycerols composition (moles %) from fatty acid composition data (area %) - Calculation of triacylglycerols with ECN 42	No calculation of theoretical TAG composition
Delta ECN 42 calculation	Delta ECN 42 = difference in the absolute value of the HPLC data minus the theoretical data	No calculation of Delta ECN 42
Results	Single determination	Single determination
Precision data	Yes for Delta ECN 42(for olive oils)	Yes for ECN 42 (for olive oils) but no for Delta ECN 42

Regarding the two methods for the determination of the difference between actual and theoretical ECN42 triglycerides, these methods are not technically Equivalent as they do not give the same answer (scope and calculation are different)

Only the COI/T.20/Doc. nº 20 method should be mentioned in the Codex standard.