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

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

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

INTRODUCTION

1. The 27th Session of CCFO held in 2021 considered the report of the EWG on the proposed draft revision to the *Standard for Olive Oils and Olive Pomace Oils* (CXS 33-1981) - Sections 3, 8 and the Appendix and agreed that there were still several areas in the proposed draft revised standard that needed further discussion and clarification.

2. The EWG discussed issues outstanding from CCFO27, especially the provisions that were placed in square brackets, as highlighted in the report of CCFO27. The EWG held over three (3) rounds of consultations based on its working documents (WD), with each round including a document that analysed and presented arguments and evidence relating to the following contentious provisions in square brackets in the proposed draft revision to CXS 33-1981:

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

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

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

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

e. Whether or not to delete the provisions for 1,2-diglycerides (% total diglycerides) and pyropheophytin "a" (% total chlorophyll pigments) for extra virgin oil and their corresponding analytical methods; and

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

3. The discussion of the issues and the proposals of the Chair of the EWG were based in the arguments exposed in the paragraph thereafter.

ARGUMENTS OF THE CHAIR FOR THE DISCUSSION

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

The EWG considered the proposed two minimum values in square brackets i.e. [53] and [55]. There was support for maintaining the minimum value for oleic acid at 55%. However 4 EWG members did not support the value of 55% explained that they had other limit in their national legislation and that a lower value of 53% was due to the change of composition arising from climatic conditions and/or cultivation in non-traditional countries.

Chair arguments: Oleic acid plays an active role in many body processes by changing cell membrane composition and altering which receptors are present on the membrane as a result. By changing receptor presence at the cellular membrane, oleic acid has the following effects. It blocks transport of cholesterol in the small intestine by reducing cholesterol receptor production, increases production of proteins to promote healthy blood vessel function, assists immune cells (neutrophils) to identify inflammation, reduces the oxidative damage caused by free radicals and is required for the formation of myelin and for nerve growth and repair. Because of its high degree of resistance to attack by oxygen free radicals, higher levels of oleic acid in an olive oil help keep it fresher for longer, by preventing the formation of peroxidized (rancid) fats and because your body will absorb any peroxidized fats that you consume and incorporate them into your cells, oleic acid's superior resistance to free radical attack also protects your cell membranes, proteins, and DNA from being damaged, even as it protects the oil from spoiling. Also, substituting oleic acid for saturated fatty acids in animal fats improves cholesterol balance.

For these and other reasons, the US FDA has approved the health claim that "Limited and not conclusive scientific evidence suggests that eating about 2 tablespoons (23 grams) of olive oil daily may reduce the risk of coronary heart disease due to the monounsaturated fat in olive oil". The amount of oleic acid is the main reason of the US FDA health claim and therefore lowering the amount of oleic acid may compromise the health properties of the olive oil.

Besides, there are research in seed and other vegetable oils to increase the amount of oleic acid not only to give them more oxidative stability but to provide some of the health properties of the olive oil and it would be an incongruence to reduce the amount of oleic acid in olive oils while in seeds and other vegetable oils the tendency is to increase the amount of oleic acid. This action may confuse consumers about the recognition of olive oil as one of the healthiest oils.

On the other hand, the fatty acid methyl ester profile is an important tool to guarantee the quality and authenticity of the olive oil. The diminution of the percentage of oleic acid may produce a decrease of the shelf life of the olive oil and an increase of the non-conformities related to rancidity, becoming a problem in the trade. Moreover, the change of the oleic acid percentage may have influence in certain authenticity parameters as DECN42 and the coherence between FAME and TAG.

The general comments to lower the % of oleic acid to 53, because the inclusion of this value in national standard will not be considered, because it is not compulsory to use CODEX standard and will not affect their standards.

Regarding the cultivation in non-traditional climatic conditions, there are more related to the degree of lability of the variety and the type of cultivation than exclusively the climatic conditions. There is no scientific evidence that may support the influence of climatic conditions in the decrease of the percentage of oleic acid together with the percentage of the olive oil production affected.

Finally, the inclusion of the sentence included in the CODEX CX-210 saying that "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" cannot be included because there are not any supplementary criteria proposed by the members and may mean the use of decisional trees that are also have not been accepted by the members that were not in favor of the proposal. It should be also taking into account that the authenticity issues in vegetable oils are much less that the ones that might suffer olive oils.

d) *3.2.1 Uncertainty measurements for trans fatty acids*

The EWG supported the proposal to "maintain two decimal places for trans fatty acid", noting that trans fatty acids are an important authenticity parameter to detect the addition of refined oil to virgin olive oils, the actual limit in virgin olive oils is set in international standards in 0.05%. This limit was set because new refining process produce small amounts of trans fatty acids. Even though, the quantitation of trans fatty acid requires skilled personnel that should be the reason to reduce the sensitivity of the parameter by twenty folds by passing from 0.05% to 0.1% with the corresponding consequence of increasing the possibility of fraud.

Chair arguments: The parameter *trans* fatty acid is an important parameter in the authentication of olive oil, the presence of the trans-isomers of oleic, linoleic, and linolenic acids in olive oils, above the maximum levels, can indicate adulteration with hydrogenated seed oils, esterified or refined olive oils or mutant (or genetically altered) seed oils desterolized at high temperatures.

During the refining process, compounds with conjugated double bonds can be formed from both unsaturated fatty acids linked to glycerol and unsaturated free fatty acids. The monounsaturated fatty acids (e.g., oleic acid) by the action of bleaching earth facilitates the formation of trans isomers, the deodorization step can form trans isomers of polyunsaturated fatty acids (e.g., linoleic, linolenic acids). In extra virgin olive oils should not contain any trans isomers of the fatty acid, because by definition extra virgin olive oils cannot be subjected to any treatment that may lead to its glyceridic alteration, therefore the limit for the trans fatty acid should be the uncertainty of the method.

The expression of the results of the fatty acid is two decimal places, therefore the minimum value is 0.01%, applying the most unfavorable coefficient of variation of reproducibility, RSDR (%), of the IOC document of Precision values (COI/T.20/Doc. no. 42-2/Rev. 3 2019) of 100 % for *trans* oleic fatty acid. The uncertainty calculated with a 95 % confidence; it is the following one: U = 0.01 × 1.00 × 1.96 = 0.0196, the maximum value using two decimal places would be 0.03%, below the limit of 0.05%. In the case of *trans* linoleic + *trans* linolenic applying the same principle: U = 0.01 × 1.30 × 1.96 = 0.02548, and the maximum value would be 0.04% being also below the limit.

Finally, the use of two decimal places in the determination of trans fatty acid should remain for coherence with the number of decimal places of the rest of fatty acids and even more important, prevent the increase of possible frauds in olive oils.

e) ***3.2.3 Footnote on a general statement on sterols in virgin olive oil -*** *"Virgin olive oil's authenticity is not compromised if one sterol, or their minimum content, does not fall within the ranges provided for, if all other sterols and parameters tested referred to in this standard fall within the stated ranges."*

The EWG considered whether the footnote should be eliminated from the proposed revised standards. There were mixed views on whether to delete of the footnote or maintain it. Sterols are one of the most important parameters to guarantee the authenticity of olive oils because there are related to the botanical family allowing the detection of the addition of vegetable/seed oils to virgin olive oils. All sterols are important because each of them is related to a specific detection of an addition of a vegetable/seed oil.

The sentence saying, *"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."* is very dangerous because the different possible interpretation make cause big problems in the authenticity of olive oil, because this may cause an increase of fraud with the implication in the consumer protection. In any case, olive oils with campesterol or D7-stigmastenol outside of the established limits are considered authentic if they meet the decisional trees already included in the CX 33 covering oils with content of those sterols outside the established limits. In any case, this sentence was added without consensus or majority in the CCFO 27 session and should not be maintained. We can consider the majority of the members were in favor of the proposal of the chair of not maintaining this sentence in the standard.

Chair arguments: The removal of the footnote saying, "the authenticity of an olive oil is not compromised if one of the sterols 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.", the opinion of the Chair is that it should be removed.

Each of the sterols included in the standard has a justification in the detection of different types of seed and/or vegetable oils since the sterol composition is closely related to the family of the plant to which the corresponding oil belongs. Thus, campesterol, apparent □-sitosterol, □7-stigmastenol and triterpenic dialcohols have equal importance in ensuring the authenticity of an olive oil and none of them can be overlooked and at the same time be sure of the genuineness of such olive oil even it complies with the rest of the parameters included in the legislation.

The position of some members of the EWG on the variation of the chemical composition of certain varieties of olive trees, in particular regarding the sterol composition/content, due to the conditions and/or place of cultivation are understandable and have been considered by other organizations other than CODEX (e.g., International Olive Council and the European Union).

The protocol that was decided by these organizations was always to consider that when oils have a chemical composition out of the values set in the standard, only one parameter could be out of the limits. In that case since the non-compliance would have an important impact on the authenticity of olive oils, that difference in composition must be treated through a specific decision tree, compelling to meet stricter values in some other limits. Using these decision trees, the authenticity of olive oils is guaranteed only in the case that an olive oil has one parameter (and not more) outside the standard.

The conditions that oil with the non-compliant parameter have to meet can be reviewed much more easily by studying the parameters included in the decision tree and by adapting them to the changes that may occur in the chemical composition of the varieties grown under extreme climatic conditions and/or origins, different from those used to establish the limits currently included in the legislation.

In fact, the IOC, through the Expert Group of Composition, is presently studying the sterol composition/content of oils from different varieties of olive trees from different origins, at the request of some member states and observers to adapt the values of the decision trees currently in use to possible changes in the chemical composition of the oils.

The study will be carried out for three years to make sure that the changes in the composition remain through several harvest seasons and that they do not occur punctually. Any member country or observer can send samples of oils with sterols outside the standard limits, so that they can be considered in the study and can be considered genuine in compliance with the decisional tree.

This should be the protocol to be used by all those members of the working group who have olive oils with non-standard compositions, instead of changing the absolute limit currently in the standard. The inclusion of the footnote may imply that an increase of campesterol, high in seed oils, can produce an increase in the possibility of fraud. Something alike might occur if an oil did not meet the cholesterol or brassicasterol limits. In such case it could also be considered genuine if it met all the others, having in mind that brassicasterol is a sterol used for the detection of rapeseed oil and cholesterol for the addition of animal fats.

Another aspect to consider when modifying absolute limits is the percentage of the oil production that is compromised by non-conformity with the currently established limits. If this percentage is high, the need to consider all the necessary mechanisms to guarantee the genuineness of these oils is necessary. However, but we must not mistake ‘percentage of production’ with ‘percentage of samples analyzed’. In fact, some members have included in their answers the percentage of samples that does not comply with the absolute values currently in force and also the percentage of samples that do not comply with the decision trees proposed by the IOC. The fact that some samples do not comply with the decision trees should not be an obstacle for their adoption because the path would be for those samples to be studied by the IOC to adapt the corresponding decision tree so that samples can be considered genuine. Probably these samples do not comply with the proposed decision tree because they have not been sent to the IOC and therefore studied.

In any case, opening the possibility of fraud in olive oils due to the inclusion of the footnote in the CODEX standard goes against the arguments put forward by these same members regarding consumer protection, which can be seen committed.

I must remember that the maintenance of the absolute values currently in force and the inclusion of decision trees does not mean that these countries have to change their legislation, which may be more or less lax than the international legislation.

The CODEX standard is defined as a standard that can be used between operators to guarantee a safe international trade and that should be homogeneous with other international standards so that there are not barriers to the international trade.

f) ***3.3.1 Organoleptic characteristics of virgin olive oils*** *- the median of the most perceived defect for virgin olive oils with a footnote “includes the uncertainty predicted by the IOC method.”*

For the issue “harmonize median defect in virgin olive oil with IOC with a footnote about include uncertainty”, from the 15 members and 1 observer participating, 12 members were in favor of the chair proposal and 3 members, and 1 observer were against. The organoleptic assessment is one of the most important parameters to classify the oil in the different categories and the harmonization with other international standards will guarantee fair and barrier-free international trade. Most of the members agrees that the harmonization between CODEX and IOC standards will be beneficial for consumers and international trade. Every single parameter with a limit included in the international standards should have their uncertainty calculated and added to the limit to give legal security to producers and consumers. CODEX standard is not reviewed so often as other international standards and this is the reason of having 2.5 as the limit of the most perceived defect in the virgin category, because it was the limit that IOC have it before, but IOC reviewed the value and added the uncertainty resulting in the new value of 3.5. We must remind that the method to assess the organoleptic characteristic of the olive oil is the IOC method. Reference is also made to the fact that its harmonization is essential since when the ordinary olive oil category is eliminated, the median of the predominant defect among

the virgin category will mark the border between edible and non-edible oils and edible virgin olive oils classified using the other international standards would be considered non-edible if the country apply the CODEX standard because ordinary olive oil will disappear in 2025. The consumer protection argument does not seem consistent either since precisely the calculation and application of uncertainty would give greater security to consumers. Finally, the argument of the limit of 2.5 being adopted by many international standards also are not consistent, the main international standards are IOC and EU together with the CODEX and in the earlier ones the limit is set to 3.5. The limit of 2.5 might be in national standards that are not at the level of the internationals. We can consider the majority of the members were in favor of the proposal of the chair of harmonizing the value of the most perceived defect for virgin olive oil category to 3.5 to be in line with other international standards.

Chair arguments: In relation to the harmonization between the values of the defect mostly perceived in the virgin olive oil category, which in the CODEX standard is set at 2.5 and in the IOC and EU standard at 3.5, we again remind members that the main objective of this EWG is the harmonization between international legislations to avoid restrictions on the international trade.

It must also be remembered that the method used to determine the organoleptic attributes of olive oil for its classification into the different categories is the 'COI Method T20/Doc. 15' which includes this value as the limit of the virgin category. CODEX standard is a standard used to guarantee fair and barrier-free international trade.

Among the reasons given for not harmonizing these values is that the difficulty of the method. This reason does not seem to be a consistent argument. This difficulty should not be an obstacle for it to be applied internationally and can be solved with greater knowledge of the method, training of panel leaders and training of the tasters. This would ensure sufficient reliability of the results.

Moreover, accrediting the determination with ISO 17025 would allow greater control of the tasters' results and a continuous training program for them. On the other hand, in every analytical method accredited or not, the uncertainty must be calculated.

By definition, uncertainty is the quantitative estimation of the error of the results given by any analytical method in a laboratory when determining a parameter following a standardized method. This calculation of uncertainty is the reason to set the new value of the defect mostly perceived to 3.5, since for the verification of the category by the competent authorities it is necessary to know the uncertainty of the method to provide legal certainty to the operators.

The IOC sensory analysis method establishes that the greatest admissible error in the determination of an organoleptic attribute is 20 %. In order to consider valid a sensory analysis session, it would imply that the robust standard deviation S* would be 20*2.5/100, which would result in a value of 0.5; if we use this value in the calculation of the uncertainty (defined as U=S*x 1.96), the uncertainty would be 0.5*1.96 which would give a value of 0.98, that is approximately 1.

The addition of the uncertainty to the value of the most perceived defect of the virgin olive oil of 2.5 results in an absolute value of 3.5. What must be considered is that in any application of a limit in the international legislations the uncertainty must be calculated and included in the values.

On the other hand, the consumer protection argument does not seem consistent either since precisely the calculation and application of uncertainty would give greater security to consumers.

Finally, the fear that ordinary olive oils could be included in the virgin category does not make sense since the value of the most perceived negative attribute in the IOC standard is 3.5 and such category does not exist in EU legislation and soon neither in the IOC and CODEX, as decided at CCFO 27.

As a conclusion of the revision of the comments the question could be re-formulated to harmonize the limit for virgin olive oil category to 3.5, with the footnote "includes the uncertainty predicted by the IOC method." And included in a later WD.

APPENDIX

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

CCFO27 agreed to keep the provision for 1,2-diglycerides (% total diglycerides) for extra virgin oil and its corresponding analytical methods should also be put in square brackets for further discussion; and noted the views expressed by some delegations that there was not enough technical data on the parameter.

There was majority support within the EWG to delete the provision for 1,2-diglycerides (% total diglycerides) and its corresponding method from CXS 33-1981. However, four members objected to this proposal noting that the method can be used to determine the freshness of the oil, give more information on the quality than

other parameters already in the standards and it is used widely in international standards.

Chair arguments: The ratio of diacylglycerol (DAG) isomers was proposed quite some time ago to the IOC panel of chemistry experts to evaluate its usefulness as a parameter for assessing the addition of soft deodorized oil to extra virgin olive oils.

The principle was based on the fact that a freshly obtained oil has a low DAG content and mostly as 1,2-DAG isomer.

The amount of DAG and of this isomer is directly related to the state of the fruit, the ripening and therefore to the acidity.

Temperature has a great influence on the isomerization of DAG and the interconversion from 1,2 to 1,3-DAG, so the temperature of production, storage and that which the oil may undergo in its international trade, both packaged and in bulk may influence the final content of 1,2-DAG.

The rate of isomerization from 1,2 to 1,3-DAG, is another characteristic of this isomerization process and the equilibrium is reached at about approximately 35% of 1,2-DAG, so that after that percentage do not change significantly. So, the combined effect of acidity and temperature are the factors that have most influence in the isomerization.

Its utility as a quality parameter has too many variables that would need to be controlled for its use to be unequivocal.

On the other hand, the ISO method proposed for its analysis uses a chromatographic column with a silica phase that has been shown that if the activation of the phase is not controlled, isomerization can occur, and false positives can be obtained.

All these factors led the IOC chemical expert groups not to consider the DAG isomer parameter as a sufficiently reliable parameter to evaluate the quality of the oils and also not as an authenticity parameter for the detection of soft deodorized oils.

The justification to maintain the parameter is because it is possible to know the moment of production, or even to be more sensitive than free acidity as a quality parameter are not totally certain since for the moment of production there are too many variables to take into account for this prediction to be reliable, among others the initial acidity, the temperature of production, storage and transport, in spite of the good practices of production many of these parameters are not controllable and only is possible to evaluate the quality if it is determined in oils recently produced and with acidities lower than 0.5% as stated in publications.

The reason for not eliminating the % of DAG from the annex because it is used by producers globally and authorities is not true either, only some countries require it, the requirement between operators are contracts between private companies and do not mean that it should be included in international legislation. The use by authorities only produced in those countries that have implemented it in their legislation and only a few countries have implemented it.

In addition, the defense of the inclusion of the 1,2-DAG as a quality method, because the standards must include the most recent methods, the method of determination of DAG isomers is not recent in any case and the ISO standardized method has risks of producing isomerization if the activation of the column phase is not well controlled, in fact the ISO is in the process of including in this standardized method an alternative using solid phase extraction with diol phase that has been demonstrated in publications that it does not produce isomerization. Moreover, the fact that a parameter is in a national legislation does not mean that it is not in the international legislation, since these can be stricter and also remember that the objective of this EWG is to homogenize with the international legislations that do not have it.

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

There was majority support within the EWG to delete the provision for 1,2-diglycerides (% total diglycerides) and its corresponding method from CXS 33-1981. However, four members objected to this proposal with the same reasons than the 1,2-DAG.

Chair arguments: Similarly, to the DAG parameter the pyropheophytin parameter (PPP) was also evaluated long time ago to be used for the detection of soft deodorized oil and due to the amount of factors that have influence in the value was not accepted by the IOC as either an authenticity parameter nor a quality parameter.

We have to consider that the value is a ratio between the content of pyropheophytin and the content of pheophytin, therefore all factor affecting the production of the pyropheophytin and the loss of pheophytin will affect the final result of the parameter.

During virgin olive oil storage, pheophytins can be converted into pyropheophytin and, therefore, the PPP will increase is all pheophytin lost are converted into pyropheophytin stoichiometrically. The increase depends on five factors: temperature, time, olive cultivar as concentration of pigments, ripeness index and light exposure.

At low temperature (15 °C), the increase is 2-3% per year but at room temperature (25-35 °C), the formation of pyropheophytin is higher since at the end of 10 months of storage, the PPP of different oil cultivars ranged between 8 and 14 %. These findings indicate a strong effect of the storage temperature. In producing countries that suffer high temperatures during the summer (30-40 °C) high PPP values are observed after the summer in stored oils.

The evolution of PPP has also a strong influence of the cultivar due to the total amount of chlorophyll pigments in the fruits that depends on the olive variety and ripeness index.

In a study with different varieties of oils stored at 25 ºC in darkness, the results showed that with the storage time there are a diminution of the pheophytin and pyropheophytin, and an increase of P-ratio. Most of the varieties exceed the proposed limit just after 12 months of storage. Besides, in a study on the effect of different types of illumination on the content chlorophyll derivatives. In daylight illumination a significant and rapid decay of pheophytin concentration whereas pyropheophytin values showed scarce variation. Consequently, the PPP increase in a short time, only few days, and diminishing after that. Similarly in UV illumination, there is a rapid decay of pheophytin and pyropheophytin and an increase of the PPP only in few days, overpassing the limit only in ten days.

Virgin olive oils are obtained from mid-October to February; consequently, the oil bottled in September-October is at least 9 months old. Considering that the normal shelf-life of olive oil is 12 to 24 months, oils from the early crop can be found in the market. In addition, the storage conditions of the bottled olive oils are normally unknown; therefore, many oils can be over the proposed limit before the end of their shelf life.

The conclusion on the evolution of chlorophyll pigments derivatives depends on the temperature, in higher temperatures the formation of pyropheophytin is lower than the diminution of pheophytin, meaning that there is a parallel process other than the transformation of the pheophytin in pyropheophytin, and that can affect to the value of PPP, depending directly to the diminution of pheophytin than the increment of pyropheophytin.

On the other hand, the free acidity facilitates the increase of the PPP value.

Finally, the value of the ratio is related to the initial concentration of pigments, in oils with low pheophytin concentration, the increase of the ratio is higher, but if the concentration is rather low, the value of the ratio is 0. Therefore, the value of the ratio value will depend on the characteristics of the oil.

The effectiveness of the PPP is scarce with the proposed limit (17%). Regarding the storage conditions, the value of the chlorophyll pigments derivatives is influenced by:

1- The illumination by UV produces in a short period of time, about 1 month, a great increase of the ratio.

2- The illumination by daylight produces an increase of the ratio, but in six-month time.

3- Under darkness, the increase of the ratio it is also produced.

We can conclude that PPP cannot be used to determine the freshness of an already commercialized olive oil may been exposed to illumination, either daylight or UV light, even in dark the PPP increase slowly and the initial concentration of pigments have a great influence in the value and its evolution. Therefore, having in mind, that we do not know the type of storage conditions in which the oil was subjected, the chlorophyll pigment derivatives cannot be used to assess the age of an already commercialized olive oil.

Regarding the reasons exposed by some member about the inclusion in their legislation, the use of the parameter by producers and authorities and the inclusion in the standards of the most recent methods, the reason for not to consider them are the same that the exposed in the 1,2-DAG.

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

CCFO27 agreed to take into account CRD24 and the need to delete the method for 4α-desmethylsterols (see paragraph 132) when finalizing Section 3 of the Appendix-methods of analysis and sampling.

The majority of the EWG members agreed with the list of methods published in CRD24. It was further noted that section for the methods of analysis in CXS 33-1981 should be aligned to the requirements of the Procedural Manual i.e. All methods have to be transferred to the *Recommended Methods of Analysis* CXS 234-1999; and replaced with a standardised text i.e. “For checking the compliance with this standard, the methods of analysis and sampling contained in the Recommended Methods of Analysis and Sampling (CXS 234-1999) relevant to the provisions in this standard, shall be used.”

CONCLUSIONS

The conclusions of the answers of the members participating in the EWG to the issues remained in square brackets from CCFO 27 presented by the chair for consideration were the following.

1. For the issue *"minimum value of oleic acid in 55%"*, from 18 participating members, 14 of them were in favor of maintaining the minimum value for oleic acid in 55% and only 4 of them were against mainly because they have other limit in their national legislation and the change of composition due to climatic conditions and/or cultivation in non-traditional countries. We can consider the majority of the members support the position of the chair.

2. For the issue *"maintain two decimal places for trans fatty acid"*, from the 18 participating members, 17 of them were in favor of the chair proposal and only one against. The *trans* fatty acids are an important authenticity parameter to detect the addition of refined oil to virgin olive oils, the actual limit in virgin olive oils is set in international standards in 0.05%. This limit was set because new refining process produce small amounts of *trans* fatty acids. Even though, the quantitation of trans fatty acid requires skilled personnel that should be the reason to reduce the sensitivity of the parameter by twenty folds by passing from 0.05% to 0.1% with the corresponding consequence of increasing the possibility of fraud. We can consider that the proposal of the chair of maintaining to decimal places in *trans* fatty acid was accepted by consensus.

3. For the issue *"not maintaining the footnote about sterols limits"*, from the 15 members and 1 observer participating, 11 members were in favor of the chair proposal and 4 members, and 1 observer were against. Sterols are one of the most important parameters to guarantee the authenticity of olive oils because there are related to the botanical family allowing the detection of the addition of vegetable/seed oils to virgin olive oils. All sterols are important because each of them is related to a specific detection of an addition of a vegetable/seed oil. The sentence saying, *"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."* is very dangerous because the different possible interpretation make cause big problems in the authenticity of olive oil, because this may cause an increase of fraud with the implication in the consumer protection. In any case, olive oils with campesterol or D7-stigmastenol outside of the established limits are considered authentic if they meet the decisional trees already included in the CX 33 covering oils with content of those sterols outside the established limits. In any case, this sentence was added without consensus or majority in the CCFO 27 session and should not be maintained. We can consider the majority of the members were in favor of the proposal of the chair of not maintaining this sentence in the standard.

4. For the issue *"harmonize median defect in virgin olive oil with IOC with a footnote about include uncertainty"*, from the 15 members and 1 observer participating, 12 members were in favor of the chair proposal and 3 members, and 1 observer were against. The organoleptic assessment is one of the most important parameters to classify the oil in the different categories and the harmonization with other international standards will guarantee fair and barrier-free international trade. Most of the members agrees that the harmonization between CODEX and IOC standards will be beneficial for consumers and international trade. Every single parameter with a limit included in the international standards should have their uncertainty calculated and added to the limit to give legal security to producers and consumers. CODEX standard is not reviewed so often as other international standards and this is the reason of having 2.5 as the limit of the most perceived defect in the virgin category, because it was the limit that IOC have it before, but IOC reviewed the value and added the uncertainty resulting in the new value of 3.5. We must remind that the method to assess the organoleptic characteristic of the olive oil is the IOC method. Reference is also made to the fact that its harmonization is essential since when the ordinary olive oil category is eliminated, the median of the predominant defect among the virgin category will mark the border between edible and non-edible oils and edible virgin olive oils classified using the other international standards would be considered non-edible if the country apply the CODEX standard because ordinary olive oil will disappear in 2025. The consumer protection argument does not seem consistent either since precisely the calculation and application of uncertainty would give greater security to consumers. Finally, the argument of the limit of 2.5 being adopted by many international standards also are not consistent, the main international standards are IOC and EU together with the CODEX and in the earlier ones the limit is set to 3.5. The limit of 2.5 might be in national standards that are not at the level of the internationals. We can consider the majority of the members were in favor of the proposal of the chair of harmonizing the value of the most perceived defect for virgin olive oil category to 3.5 to be in line with other international standards.

5. For the issue *"not retaining PPP and 1, 2-DAG in CXS 33 with the corresponding methods"*, from the 15 members and 1 observer participating, 12 members were in favor of the chair proposal and 3 members, and 1 observer were against. PPP and 1,2-DAG were evaluated long time ago by the IOC

expert chemist group and they did not consider the parameters useful for determining neither the addition of soft deodorized olive oil nor the quality/freshness of the oil because of the many variables that have influences in the final value of the parameter and were not included in the IOC standard. Most of the members of the EWG showed their concern about its inclusion because both parameters did not have scientific consensus for their field of application and the objective of the methods in a study carried out by IOC in 2020. Furthermore, international standards already include many parameters, and the inclusion of new parameters must be sufficiently justified by evaluating the importance of what they provide and the drawbacks of their application. Percentage of 1,2-DAG does not provide any additional quality information over the current parameters and is not related to oxidation and PPP changes over time and is very sensitive to the influence of light and heat, changing even in the supermarket itself. The argument to maintain the parameters because it is possible to know the moment of production/freshness, or even to be more sensitive than free acidity as a quality parameter is not totally certain since in the moment of production there are too many variables to consider for this prediction to be reliable. The reason for not eliminating them from the annex because it is used by producers globally and implemented internationally is not true because, only some countries require it in their national standards, and there are not any international standards that include those parameters. The fact that there is an ISO method for its determination does not imply that it can be considered an international standard because it does not include limits, nor does that mean that it has to be included in a classification standard. We can consider the majority of the members were in favor of the proposal of the chair of not retaining both parameters in the annex and the method should be eliminated from the list in CX 234.

6. For the issue *"inclusion of a sentence to make a reference to CX234 in which the list of methods is compiled"*, from the 15 members and 1 observer participating, 13 members were in favor of the chair proposal and 2 members, and 1 observer were against. The intention of this question was to review the list of methods that are going to be presented to the CCMAS so that they are included in the CX234 standard, since in the CX33 the list will disappear and will only include a sentence that refers to this according to the Procedure manual for drafting CODEX standards. The sentence will be "For checking the compliance with this standard, the methods of analysis and sampling contained in the Recommended Methods of Analysis and Sampling (CXS 234-1999) relevant to the provisions in this standard, shall be used." The majority of the members are in agreement with the list because this list have been widely discussed by the CDR246 together with the CCMAS. Possibly some of the opinions against may have been due to a mistaken argument by the chair who did not adequately explain the meaning of the question, his comments being in the same sense that he wanted to express. On the other hand, one observer who has argued against has not done so in relation to the question asked but in another issue. We can consider that the proposal of the chair of including the sentence "For checking the compliance with this standard, the methods of analysis and sampling contained in the Recommended Methods of Analysis and Sampling (CXS 234-1999) relevant to the provisions in this standard, shall be used." was accepted by consensus.