CODEX ALIMENTARIUS COMMISSION

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World Health Organization

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Agenda Item 3 **CX/MAS 19/40/3 Add.3**

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING

40th Session

Budapest, Hungary, 27 -31 May 2019

REVIEW OF FATS AND OILS METHODS (FATS AND OILS WORKABLE PACKAGE)

(Prepared by AOCS)

INTRODUCTION

At its 39th session, CCMAS agreed to continue efforts on the workable packages for the review and update of CODEX STAN 234-1999 (CXS 234-1999). The Committee also agreed to pilot this effort through an update of all methods related to fats and oils with the assistance of AOCS.

AOCS welcomes the opportunity to present to CCMAS their review of the fats and oils methods. AOCS has coordinated the review of all of the methods relating to fats and oils products and have identified some issues that require attention by the Committee. We understand that some of these issues may already be under consideration by the Committee, and AOCS apologizes for any recommendations that may be redundant.

For commodity/provisions in the Table with no comments, AOCS confirms that the current information is correct (Appendix I).

RECOMMENDATIONS

CCMAS is requested to:

- Clarify the definitions of Technically Identical and Technically Equivalent.
    - For methods that are Technically Identical, but do not share the same validation data and are listed as Type I. To classify them as Technically Equivalent would mean the methods would have to be other than Type I according to current Codex definitions of equivalency or typing.
    - For methods that share validation data and should be Technically Identical, but had differences in chemicals usage, amounts and sample sizes that were also listed as Type I. To classify them as Technically Equivalent would mean that the methods would have to be other than Type I according to current Codex definitions of equivalency or typing.
- Clarify if a Type II method can be changed to a Type III method (Example 1).
    - The method does not test for or is not validated for certain commodities.
    - The method is not an official method for the provision or commodity, but is listed as a “recommended practice”.

EXAMPLE 1

Commodity	Provision	Method	Principle	Type
Olive Oils and Olive Pomace Oils	*Trans* fatty acids content	COI/T.20/Doc no. 17; or ISO 15304; or AOCS Ch 2a-94	Gas chromatography of methyl esters	II
Comments: STAN 33-1981 lists AOCS Ce 1f-96 as a method for trans fatty acids, but it is not listed here. IOC members state that COI/T.20/Doc. No. 17 is no longer used and replaced by COI/T.20/Doc. No. 33.; Doc. No. 33 was reviewed. The methods are Technically Equivalent. It is recommended that ISO 15304 be changed to Type III instead of Type II, due to the validation study does not include olive pomace oils and that method COI/T.20/Doc. No. 33 is a better fit for trans fatty acid measurement. It is also recommended that AOCS Ch 2a-94 be changed to Type III instead of Type II, due to the method being "recommended practice" and not an official method and that the validation data does not				

contain virgin or olive pomace oils. It is also recommended that AOCS 2a-94 be replaced with AOCS 1h-05 as a Type III method for fatty acid analysis.

- Clarify a situation where two methods could be Complimentary and Technically Identical to a third method (Example 2).
    - A situation with three methods listed and separated by a semi-colon, where two of those methods, if used together would be Technically Identical to the third method, but is not already listed as Complimentary and Technically Identical in the method box.

EXAMPLE 2

Commodity	Provision	Method	Principle	Type
Named Vegetable Oils	Slip point	ISO 6321 for all oils; AOCS Cc 3b-92 for all oils except palm oils; AOCS Cc 3-25 for palm oils only	Open ended capillary tube	I
Comments: ISO 6321 Annex A is Technically Identical to AOCS Cc 3-25. AOCS Cc 3b-92 is Technically Identical to ISO 6321. Method box could be written as AOCS Cc 3-25 and AOCS Cc 3b-92 / ISO 6321				

APPENDIX I

RECOMMENDED METHODS OF ANALYSIS AND SAMPLING				
CODEX STAN 234-1999[1]				
Adopted in 1999				
[1] The most updated version of the method should be used, in application of ISO/IEC 17025. The present list of methods reflects the amendments adopted by the 39th Session of the Codex Alimentarius Commission in 2016.				
PART A – METHODS OF ANALYSIS BY COMMODITY CATEGORIES AND NAMES				
Commodity	Provision	Method	Principle	Type
Fats and Oils and Related Products				
Fats and Oils (all)	Arsenic	AOAC 952.13	Colorimetry (diethyldithiocarbamate)	II
Fats and Oils (all)	Arsenic	AOAC 942.17	Colorimetry (molybdenum blue)	III
Fats and Oils (all)	Arsenic	AOAC 986.15	Atomic absorption spectrophotometry	III
Fats and oils	Butylhydroxyanisole, butylhydroxytoluene, tert-butylhydroquinone, & propyl gallate	AOAC 983.15; or AOCS Ce 6-86	Liquid chromatography	II
Comments: AOCS Ce 6-86 Reference # 2 should be Page, B.D., J. Assoc. Off. Anal. Chem. 66:729 (1983), not From Page, B.D., J. Assoc. Off. Anal. Chem. 66:729 (1983) and Reference # 3 should be Horwitz, W., J. Assoc. Off. Anal. Chem. 67:432 (1984), not Horwitz, W., *Ibid.* 67:432 (1984).				
Fats and Oils (all)	Insoluble impurities	ISO 663	Gravimetry	I
Fats and Oils (all)	Lead	AOAC 994.02; or ISO 12193; or AOCS Ca 18c-91	Atomic absorption spectrophotometry (direct graphite furnace)	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.632) and they are based on the same set of validation data. The method syntax will need to be updated to contain a forward slash (/) between the methods instead of "or" in the methods box.				
Fats and Oils (all)	Matter volatile at 105°C	ISO 662	Gravimetry (open-drying)	I
Comments: Reference ISO 5725:1986 has since been updated to ISO 5725:1994/1998.				
Fats and Oils (all)	Soap content	BS EN ISO 10539 or AOCS Cc 17-95	Gravimetry	I
Comments: AOCS method Cc 17-95 is only applicable to refined oils and not crude oils. AOCS method Cc 17-95 does not have validation data but does reference Codex Alimentarius method CAC/RM 13-1969 which could not be located. The methods are Technically Equivalent, as they do not share validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				

Fats and Oils not covered by individual standards	Acid value	ISO 660 or AOCS Cd 3d-63	Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Fats and Oils not covered by individual standards	Copper and Iron	AOAC 990.05; or ISO 8294; or AOCS Ca 18b-91	Atomic absorption spectrophotometry (direct graphite furnace)	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.631) and they are based on the same set of validation data. If this is indeed the case than the method syntax will need to be updated to contain a forward slash (/) between the methods instead of "or" in the methods box.				
Fats and Oils not covered by individual standards	Peroxide value	AOCS Cd 8b-90 ISO 3960	Titrimetry using *iso*-octane	I
Comments: For AOCS Cd 8b-90, define "normal fats and oils" in scope of the method. The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing. If Technically Equivalent, "or" would need to be used to separate the methods in the method box.				
Fat spreads and blended spreads	Fat content	ISO 17189 | IDF 194	Gravimetry	I
Fish oils	Fatty acid composition	ISO 5508	Gas chromatography	III
Fish oils	Fatty acid composition	ISO 12966-2	Gas chromatography	III
Fish oils	Fatty acid composition	AOCS Ce 1b-89	GLC	III
Fish oils	Fatty acid composition	AOCS Ce 1-07	Capillary GLC	III
Comments: AOCS Ce 1-07 should be listed as Ce 1i-07.				
Fish oils	Fatty acid composition	AOCS Ce 2b-11	Alkali hydrolysis	III
Comments: Reference #5 should be listed J. Chromatogr. Sci. not J. Chromat. Sci.				
Fish oils	Fatty acid composition	AOCS Ce 1a-13	Capillary GLC	III
Comments: Reference 7 is actually 2014: ISO 12966-1:2014 and not 2013, ISO/DIS 12966-1.				
Fish oils	Fatty acid composition	AOCS Ce 2-66	Preparation of methyl esters by fatty acids	III
Fish oils	Acid value	AOCS Ca 5a-40 AOCS Cd 3d-63 ISO 3960 NMKL 38	Titration	I
Comments: Method ISO 3960 tests for peroxide value not acid value. ISO 660 tests for acid value and is reviewed here. The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have				

to be other than Type I, according to current Codex definitions of equivalency and typing. If Technically Equivalent, "or" would need to be used to separate the methods in the method box.				
Fish oils	Peroxide value	AOCS Cd 8b-90 ISO 3960 NMKL 158	Titration	I
Comments: For AOCS Cd 8b-90, define "normal fats and oils" in scope of the method. The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing. If Technically Equivalent, "or" would need to be used to separate the methods in the method box.				
Fish oils	Peroxide value	European Pharmacopoeia 2.5.5 (Part B Iso-octane as solvent)	Titration	I
Fish oils	Phospholipids	USP-FCC 10 2S (Krill oil): Phospholipids Nuclear Magnetic Resonance, Appendix IIC	NMR Spectroscopy	I
Comments: Method as received by USP is listed as USP-FCC 11 1S not USP-FCC 10 2S. Method does not contain validation or precision data.				
Fish oils	P-Anisidine	European Pharmacopeia 2.5.36/AOCS Cd 18-90/ISO 6885	Spectrophotometry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing. If Technically Equivalent, "or" would need to be used to separate the methods in the method box. AOCS Cd 18-90 reference #3 should be listed as 51:I7, not 51:17.				
Fish oils	Triglycerides	USP 40-NF35 (Omega-3 Acid Triglycerides):Content of oligomers and partial glyceride	HPLC-RI	III
Fish oils	Triglycerides	European Pharmacopoeia 1352 (Omega-3 acid triglycerides): Oligomers and partial glycerides	HPLC-RI	III
Fish oils	Triglycerides	AOCS Cd 11d-96	HPLC-ELSD	III
Comments: Method tests for mono and diglycerides and not triglycerides. Method also does not specifically mention that the test is for fish oils.				
Fish oils	Vitamin A	European Pharmacopoeia Monograph on Cod Liver Oil (Type A), monograph 01/2005:1192, with LC end-point 2.2.29	LC	III

Fish oils	Vitamin A	EN 12823-1 (Determination of vitamin A by high performance liquid chromatography – Part 1: Measurement of all-E-retinol and 13-Z-retinol	LC	III
Fish oils	Vitamin D	EN 12821 (Determination of vitamin D by high performance liquid chromatography – Measurement of cholecalciferol (D3) or ergocalciferol (D2))	LC	III
Fish oils	Vitamin D	NMKL 167 (Cholecalciferol (vitamin D3) and Ergocalciferol (vitamin D2)). Determination by HPLC in foodstuffs	LC	III
Named Animal Fats	Acidity	ISO 660; or AOCS Cd 3d-63	Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Animal Fats	Copper and Iron	AOAC 990.05; or ISO 8294; or AOCS Ca 18b-91	Atomic absorption Spectrophotometry (direct graphite furnace)	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.631) and they are based on the same set of validation data. If this is indeed the case than the method syntax will need to be updated to contain a forward slash (/) between the methods instead of "or" in the methods box.				
Named Animal Fats	GLC ranges of fatty acid composition	ISO 5508 and ISO 12966-2; or AOCS Ce 2-66 and Ce 1e-91 or Ce 1f-96	Gas chromatography of methyl esters	II
Comments: ISO 5508 references ISO 5509 for the preparation of methyl esters, not ISO 12966-2.				
Named Animal Fats	Iodine value (IV)	ISO 3961; or AOAC 993.20; or AOCS Cd 1d-92	Wijs-Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Animal Fats	Peroxide value	AOCS Cd 8b-90; or ISO 3960	Titrimetry using *iso*-octane	I

Comments: For AOCS Cd 8b-90, define "normal fats and oils" in scope of the method. The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Animal Fats	Relative density	ISO 6883, with the appropriate conversion factor; or AOCS Cc 10c-95	Pycnometry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Animal Fats	Refractive index	ISO 6320; or AOCS Cc 7-25	Refractometry	II
Named Animal Fats	Saponification value	ISO 3657; or AOCS Cd 3-25	Titrimetry	I
Comments: The methods are Technically Identical, so the method syntax needs to be updated to forward slash (/) instead of "or" in the method box.				
Named Animal Fats	Unsaponifiable matter	ISO 3596; or ISO 18609; or AOCS Ca 6b-53	Titrimetry after extraction with diethyl ether	I
Comments: The methods are Technically Equivalent. ISO 3596 and AOCS Ca 6b-53 have differences in sample weight and extraction volumes. ISO 18609 differs in extraction solvent. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Animal Fats	Titre	ISO 935; or AOCS Cc 12-59	Thermometry	I
Comments: The methods are Technically Equivalent because they do not share validation data and use different chemicals and preparations. To classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Acidity	ISO 660; or AOCS Cd 3d-63	Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Apparent density	ISO 6883, with the appropriate conversion factor; or AOCS Cc 10c-95	Pycnometry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Baudouin test (modified Villavecchia or sesameseed oil test)	AOCS Cb 2-40	Colour reaction	I
Named Vegetable Oils	Carotenoids, total	BS 684 Section 2.20	Spectrophotometry	II

Named Vegetable Oils	Copper and iron	ISO 8294; or AOAC 990.05; or AOCS Ca 18b-91	AAS	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.631) and they are based on the same set of validation data. If this is indeed the case than the method syntax will need to be updated to contain a forward slash (/) between the methods instead of "or" in the methods box.				
Named Vegetable Oils	Crismer value	AOCS Cb 4-35 and AOCS Ca 5a-40	Turbidity	I
Named Vegetable Oils	GLC ranges of fatty acid composition	ISO 5508 and ISO 12966-2; or AOCS Ce 2-66 and Ce 1-62 or Ce 1h-05	Gas chromatography of methyl esters	II
Comments: ISO 5508 references ISO 5509 for the preparation of methyl esters, not ISO 12966-2.				
Named Vegetable Oils	Halphen test	AOCS Cb 1-25	Colorimetry	I
Named Vegetable Oils	Insoluble impurities	ISO 663	Gravimetry	I
Named Vegetable Oils	Iodine value (IV)	ISO 3961; or AOAC 993.20; or AOCS Cd 1d-92; or NMKL 39	Wijs-Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Lead	AOAC 994.02; or ISO 12193; or AOCS Ca 18c-91	Atomic Absorption	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.632) and they are based on the same set of validation data. The method syntax will need to be updated to contain a forward slash (/) between the methods instead of "or" in the methods box.				
Named Vegetable Oils	Moisture & volatile matter at 105°C	ISO 662	Gravimetry	I
Comments: Reference ISO 5725:1986 has since been updated to 5725:1994/1998.				
Named Vegetable Oils	Peroxide value (PV)	AOCS Cd 8b-90; or ISO 3960	Titrimetry	I
Comments: For AOCS Cd 8b-90, define "normal fats and oils" in scope of the method. The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Refractive index	ISO 6320; or AOCS Cc 7-25	Refractometry	II
Named Vegetable Oils	Reichert value and Polenske value	AOCS Cd 5-40	Titrimetry	I
Named Vegetable Oils	Relative density	ISO 6883, with the appropriate conversion factor; or AOCS Cc 10c-95	Pycnometry	I

Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Saponification value (SV)	ISO 3657; or AOCS Cd 3-25	Titrimetry	I
Comments: The methods are Technically Identical, so the method syntax needs to be updated to forward slash (/) instead of "or" in the method box.				
Named Vegetable Oils	Slip point	ISO 6321 for all oils; AOCS Cc 3b-92 for all oils except palm oils; AOCS Cc 3-25 for palm oils only	Open ended capillary tube	I
Comments: ISO 6321 Annex A is Technically Identical to AOCS Cc 3-25. AOCS Cc 3b-92 is Technically Identical to ISO 6321. Method box could be written as AOCS Cc 3-25 and AOCS Cc 3b-92 / ISO 6321.				
Named Vegetable Oils	Soap content	BS 684 Section 2.5 withdrawn for BS EN ISO 10539 or AOCS Cc 17-95	Gravimetry	I
Comments: AOCS method Cc 17-95 is only applicable to refined oils and not crude oils. AOCS method Cc 17-95 does not have validation data but does reference Codex Alimentarius method CAC/RM 13-1969 which could not be located. The methods are Technically Equivalent, as they do not share validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Named Vegetable Oils	Sterol content	ISO 12228; or AOCS Ch 6-91	Gas chromatography	II
Named Vegetable Oils	Tocopherol content	ISO 9936; or AOCS Ce 8-89	HPLC	II
Named Vegetable Oils	Unsaponifiable matter	ISO 3596; or ISO 18609; or AOCS Ca 6b-53	Gravimetry	I
Comments: The methods are Technically Equivalent. ISO 3596 and AOCS Ca 6b-53 have differences in sample weight and extraction volumes. ISO 18609 differs in extraction solvent. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Absorbency in ultra-violet	COI/T.20/Doc. No. 19; or ISO 3656; or AOCS Ch 5-91	Absorption in ultra violet	II
Olive Oils and Olive Pomace Oils	Acidity, free (acid value)	ISO 660; or AOCS Cd 3d-63	Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Alpha-tocopherol	ISO 9936	HPLC	II

Olive Oils and Olive Pomace Oils	Difference between the actual and theoretical ECN 42 triglyceride content	COI/T.20/Doc. no. 20; or AOCS Ce 5b-89	Analysis of triglycerides of HPLC and calculation	I
Comments: The methods are Technically Equivalent as they do not share validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Erythrodiol + uvaol	COI/T.20/Doc.no. 30	Gas chromatography	II
Comments: Reference ISO 5725-5 is listed as 1994 but has since been updated to 1998.				
Olive Oils and Olive Pomace Oils	Halogenated solvents, traces	COI/T.20/Doc. no. 8	Gas chromatography	II
Olive Oils and Olive Pomace Oils	Insoluble impurities in light petroleum	ISO 663	Gravimetry	I
Comments: Specific usage of light petroleum for olive oils and olive pomace oils is not mentioned in the method.				
Olive Oils and Olive Pomace Oils	Iodine value	ISO 3961; or AOAC 993.20; or AOCS Cd 1d-92; or NMKL 39	Wijs-Titrimetry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Iron and copper	ISO 8294; or AOAC 990.05	AAS	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.631) and they are based on the same set of validation data. If Technically Identical then the method syntax will need to be updated to contain a forward slash (/) between the methods instead or "or" in the methods box.				
Olive Oils and Olive Pomace Oils	Lead	AOAC 994.02; or ISO 12193; or AOCS Ca 18c-91	AAS	II
Comments: The methods are Technically Identical as they all derivate from same initial method (IUPAC2.632) and they are based on the same set of validation data. The method syntax will need to be updated to contain a forward slash (/) between the methods instead of "or" in the methods box.				
Olive Oils and Olive Pomace Oils	Moisture and volatile matter	ISO 662	Gravimetry	I
Comments: Reference ISO 5725:1986 has since been updated to 5725:1994/1998.				
Olive Oils and Olive Pomace Oils	Organoleptic characteristics	COI/T.20/Doc. no. 15	Panel test	I
Comments: Method is only for VIRGIN olive oils. Reference COI/T.28/Doc. No. 1 September 2007 has since been revised to COI/T.28/Doc. No.1 Rev. 3 2018. Reference COI/T.20/Doc. No.14 Rev.3 November 2011 has since been revised to COI/T.20/Doc. No. 14 Rev. 5 June 2018. Reference ISO/IEC 17025:05 has since been revised to ISO/IEC 17025:2017.				
Olive Oils and Olive Pomace Oils	Peroxide value	ISO 3960; or AOCS Cd 8b-90	Titrimetry	I

Comments: For AOCS Cd 8b-90, define "normal fats and oils" in scope of the method. The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Relative density	ISO 6883, with the appropriate conversion factor; or AOCS Cc 10c-95	Pycnometry	I
Comments: The methods are Technically Equivalent as they do not share the same validation data. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Refractive index	ISO 6320; or AOCS Cc 7-25	Refractometry	II
Olive Oils and Olive Pomace Oils	Saponification value	ISO 3657; or AOCS Cd 3-25	Titrimetry	I
Comments: The methods are Technically Identical, so the method syntax needs to be updated to forward slash (/) instead of "or" in the method box.				
Olive Oils and Olive Pomace Oils	Sterol composition and total sterols	COI/T.20/Doc. no. 30; or ISO 12228-2; or AOCS Ch 6-91	Gas chromatography	II
Comments: STAN 33 lists COI/T.20/Doc.no. 10 as method for sterols, but COI/T.20/Doc. No. 30 is listed above. IOC members have doc.No.10 and doc. No. 30 are no longer used and replaced by COI/T.20/Doc.no. 26. Doc.no.26 was reviewed.				
Olive Oils and Olive Pomace Oils	Stigmastadienes	COI/T.20/Doc. no. 11; or ISO 15788-1; or AOCS Cd 26-96	Gas chromatography	II
Comments: All methods are Technically Identical so syntax needs to be updated to forward slash (/) between methods instead of "or" in the method box. AOCS Cd 26-96 reference to COI/T.20/Doc. No. 11 rev.2 2001 has since been updated to rev.3 2017. COI/T.20/Doc. No.11 reference to ISO 5725-5 is listed as 1994 but has since been updated to 1998.				
Olive Oils and Olive Pomace Oils	Stigmastadienes	ISO 15788-2	HPLC	III
Olive Oils and Olive Pomace Oils	*Trans* fatty acids content	COI/T.20/Doc no. 17; or ISO 15304; or AOCS Ch 2a-94	Gas chromatography of methyl esters	II
Comments: STAN 33-1981 lists AOCS Ce 1f-96 as a method for trans fatty acids, but it is not listed here. IOC members state that COI/T.20/Doc. No. 17 is no longer used and replaced by COI/T.20/Doc. No. 33.; Doc. No. 33 was reviewed. The methods are Technically Equivalent. It is recommended that ISO 15304 be changed to Type III instead of Type II, due to the validation study does not include olive pomace oils and that method COI/T.20/Doc. No. 33 is a better fit for trans fatty acid measurement. It is also recommended that AOCS Ch 2a-94 be changed to Type III instead of Type II, due to the method being "recommended practice" and not an official method and that the validation data does not contain virgin or olive pomace oils. It is also recommended that AOCS 2a-94 be replaced with AOCS 1h-05 as a Type III method for fatty acid analysis.				

Olive Oils and Olive Pomace Oils	Unsaponifiable matter	ISO 3596; or ISO 18609; or AOCS Ca 6b-53	Gravimetry	I
Comments: The methods are Technically Equivalent. ISO 3596 and AOCS Ca 6b-53 have differences in sample weight and extraction volumes. ISO 18609 differs in extraction solvent. However, to classify them as Technically Equivalent would mean the methods would have to be other than Type I, according to current Codex definitions of equivalency and typing.				
Olive Oils and Olive Pomace Oils	Wax content	COI/T.20/Doc. no. 18; or AOCS Ch 8-02	Gas chromatography	II
Comments: Methods are Technically Identical so syntax needs to be updated with a forward slash (/) instead of "or" in the method box. COI/T.20/Doc. No.18 reference ISO 5725-5 is listed as 1994 but has since been updated to 1998.				