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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING

43rd Session
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(Comments of IOC)

Agenda Item 3.1: Endorsement of methods of analysis and sampling plans for provisions in Codex standards

Report of the international Olive Council Executive Secretariat to include the IOC methods in the Codex Standard for olive oils and olive-pomace oils

(Codex Stand 33-1981)

The International Olive Council (IOC) is the intergovernmental organization dedicated to olive oil and table olives, created under the auspices of the United Nations in 1959. Headquartered in Madrid, Spain, the IOC is tasked with administering the UN international agreement negotiated over the past 65 years, with the aim of defending and promoting olive growing and olive products. The sixth agreement, the International Agreement on Olive Oil and Table Olives 2015, was adopted in Geneva at the United Nations Conference on Trade and Development (UNCTAD) and came into force on 1 January 2017.

At present, the IOC has 21 members (47 countries): Albania, Algeria, Argentina, Azerbaijan, Bosnia-Herzegovina, Egypt, Georgia, European Union (with its 27 Member States: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden), Iran (Islamic Republic), Israel, Jordan, Lebanon, Libya, Montenegro, Morocco, Saudi Arabia, State of Palestine, Tunisia, Türkiye, Uruguay and Uzbekistan. These countries represent the 95% of the world production and 92% of the international trade of olive products.

One of the activities assigned to the IOC to expand international trade is to draw up and adopt trade standards for olive oils, olive pomace oils and table olives, and to devise methods for testing their physico–chemical and organoleptic characteristics. Regarding the regulation of international trade, the IOC established the definitions and analytical characteristics of each of the denominations of olive oils, olive pomace oils and table olives traded, as mentioned in the trade standards adopted by the IOC's members, which are mandatory in international trade. Moreover, the IOC methods and standards are universally used by laboratories worldwide specialized in olive oil products. These resources are free and can be readily accessed and implemented.

Furthermore, the IOC organizes a proficiency test for physico-chemical and two for sensory analysis laboratories on a yearly basis with a view to their recognition by the IOC, open to laboratories from both member and non-member countries. Actually, the IOC has 119 physico-chemical laboratories (20 countries) and 115 sensory laboratories (24 countries) from Asia, Africa, North America, South America, Europe and Oceania. The list recognized laboratories is available on the IOC's website. In the current proficiency test for IOC recognition for the period 2024/2025, 165 physico-chemical from 25 countries and 139 sensory laboratories from 33 countries are participating.

The IOC's methods are continuously reviewed by its groups of experts and observers from the 5 continents and drafted based on scientific studies. Each IOC method includes validation data determined meaning collaborative trials in collaboration with IOC recognized laboratories from the 5 continents.

From the beginning of standardization of olive oil products, the IOC collaborated with the Codex Alimentarius for 60 years for the harmonization of international standards to improve quality and authenticity, facilitate the international trade and protect consumer. In light of the list of testing methods that the CCFO submitted to the CCMAS for updating the CXS 234 standard, the IOC would like to propose including the attached list of IOC methods in the Codex standard.

Provision	Method
Acidity	COI/T.20/Doc.No34
Fatty acid composition	COI/T.20/Doc.No23
Fatty acid ethyl esters	COI/T.20/Doc.No28
Sterol composition and total sterols	COI/T.20/Doc.No26
Peroxide value	COI/T.20/Doc.No35
Trans fatty acids content	COI/T.20/Doc.No23

For each of these methods, we present the validation data:

1. **Acidity Method: COI/T.20/Doc.No34, Determination of free fatty acids, cold methods**

	A	B	C	D	E	F	G	H
n	22	22	22	22	22	20	20	20
outliers	1	1	2	2	0	2	3	2
mean	6,3	0,11	0,07	0,13	0,15	1,4	0,50	0,69
r	0,144	0,019	0,018	0,011	0,021	0,015	0,018	0,022
S_r	0,052	0,007	0,006	0,004	0,007	0,005	0,006	0,008
$RSD_r(\%)$	0,8	6,1	9,3	3,2	4,8	0,4	1,3	1,1
R	0,535	0,074	0,043	0,053	0,100	0,121	0,074	0,085
S_R	0,191	0,027	0,015	0,019	0,036	0,043	0,026	0,030
$RSD_R(\%)$	3,0	24,2	22,7	14,7	23,3	3,1	5,3	4,4

2. **Fatty acid composition. Method: COI/T.20/Doc.No33, Determination of fatty acid methyl esters by gas chromatography**

   - **Table 1. Myristic acid C14:0**

	A	B	C	D	E
n	15	15	15	15	15
outliers	0	0	1	1	3
mean	0.01	0.01	0.01	0.01	0.02
r	0.005	0.007	0.012	0.011	0.006
Sr	0.002	0.003	0.004	0.004	0.002
RSDr(%)	20	20	36	38	11
R	0.011	0.017	0.017	0.013	0.016
SR	0.004	0.006	0.006	0.005	0.006
RSDR(%)	45	47	52	42	32

   - **Table 2. Palmitic acid C16:0**

	A	B	C	D	E
n	15	15	15	15	15
outliers	2	3	1	0	0
mean	7.96	10.32	10.35	10.51	9.67
r	0.12	0.18	0.42	0.29	0.38

Sr	0.04	0.06	0.15	0.1	0.14
RSDr(%)	0.5	0.6	1.5	1.000	1.4
R	0.68	0.44	0.93	1.3	1.3
SR	0.24	0.16	0.33	0.46	0.45
RSDR(%)	3.0	1.5	3.2	4.4	4.7

- **Table 3. Palmitoleic acid C16:1**

	A	**B**	**C**	**D**	**E**
n	15	15	15	15	15
outliers	0	2	0	1	1
mean	0.50	0.68	0.74	0.91	0.64
r	0.041	0.027	0.074	0.034	0.040
Sr	0.014	0.01	0.026	0.012	0.014
RSDr(%)	2.9	1.4	3.6	1.3	2.3
R	0.966	0.077	0.132	0.123	0.128
SR	0.034	0.027	0.047	0.44	0.046
RSDR(%)	6.8	4.1	6.4	4.9	7.2

- **Table 4. Heptadecanoic acid C17:0**

	A	**B**	**C**	**D**	**E**
n	25	25	25	25	25
outliers	1	1	1	2	2
mean	0.18	0.06	0.11	0.14	0.12
r	0.013	0.011	0.010	0.009	0.009
Sr	0.005	0.004	0.004	0.003	0.003
RSDr(%)	2.7	6.9	3.1	2.3	2.7
R	0.020	0.021	0.024	0.021	0.027
SR	0.007	0.007	0.009	0.008	0.010
RSDR(%)	4.1	12.6	7.7	5.2	7.8

- **Table 5. Heptadecenoic acid C17:1**

	A	**B**	**C**	**D**	**E**
n	29	29	29	29	29
outliers	3	2	2	3	2
mean	0.26	0.09	0.24	0.22	0.19
R	0.010	0.010	0.014	0.013	0.012
Sr	0.004	0.004	0.005	0.005	0.004
RSDr(%)	1.4	3.8	2	2.2	2.2
R	0.031	0.027	0.041	0.030	0.031
SR	0.011	0.010	0.015	0.011	0.011
RSDR(%)	29	29	29	29	29

- **Table 6. Stearic acid C18:0**

	A	B	C	D	E
N	15	15	15	15	15
Outliers	2	0	0	0	1
Mean	2.88	2.49	2.62	3.49	3.12
R	0.089	0.034	0.084	0.094	0.107
Sr	0.032	0.012	0.030	0.034	0.038
RSDr(%)	1.1	0.5	1.1	1.0	1.2
R	0.171	0.259	0.246	0.367	0.328
SR	0.061	0.092	0.088	0.131	0.117
RSDR(%)	2.1	3.7	3.4	3.8	3.8

- **Table 7. Oleic acid C18:1**

	A	B	C	D	E
N	15	15	15	15	15
Outliers	0	0	1	1	0
Mean	79.42	74.55	75.55	76.14	75.8
r	0.42	0.30	0.39	0.23	0.46
Sr	0.15	0.11	0.14	0.08	0.16
RSDr(%)	0.2	0.2	0.2	0.1	0.2
R	1.37	1.26	1.26	1.33	1.80
SR	0.49	0.45	0.45	0.47	0.64
RSDR(%)	0.6	0.6	0.6	0.6	0.9

- **Table 8. Linoleic acid C18:2**

	A	B	C	D	E
N	15	15	15	15	15
Outliers	2	1	0	1	0
Mean	7.33	9.66	8.52	7.18	8.75
R	0.07	0.08	0.17	0.12	0.13
Sr	0.02	0.03	0.06	0.04	0.05
RSDr(%)	0.3	0.3	0.7	0.6	0.6
R	0.34	0.52	0.50	0.45	0.59
SR	0.12	0.19	0.18	0.16	0.21
RSDR(%)	1.7	1.9	2.1	2.2	2.4

- **Table 9. Linolenic acid C18:3**

	A	B	C	D	E
n	15	15	15	15	15
outliers	2	0	0	0	4
mean	0.73	0.90	0.86	0.74	0.75
r	0.036	0.049	0.029	0.039	0.055

Sr	0.013	0.017	0.010	0.014	0.020
RSDr(%)	1.8	1.9	1.2	1.9	2.6
R	0.08	0.1	0.101	0.079	0.115
SR	0.029	0.041	0.036	0.028	0.041
RSDR(%)	3.9	4.6	4.2	3.8	5.4

- **Table 10. Arachidic acid C20:0**

	A	B	C	D	E
n	15	15	15	15	15
outliers	1	0	0	1	0
mean	0.39	0.44	0.44	0.42	0.43
r	0.041	0.050	0.037	0.037	0.053
Sr	0.015	0.018	0.013	0.013	0.019
RSDr(%)	3.8	4	3	3.1	4.4
R	0.080	0.089	0.086	0.117	0.102
SR	0.029	0.032	0.031	0.042	0.036
RSDR(%)	7.3	7.2	7	9.8	8.6

- **Table 11. Eicosenoic acid C20:1**

	A	B	C	D	E
n	15	15	15	15	15
outliers	1	1	1	0	1
mean	0.37	0.39	0.37	0.28	0.30
r	0.026	0.032	0.036	0.047	0.073
Sr	0.009	0.011	0.013	0.017	0.026
RSDr(%)	7.8	3.0	3.5	6.0	8.9
R	0.082	0.095	0.064	0.079	0.077
SR	0.029	0.034	0.023	0.028	0.027
RSDR(%)	7.9	8.7	6.2	10.0	9.3

- **Table 12. Behenic acid C22:0**

	A	B	C	D	E
n	15	15	15	15	15
outliers	0	1	1	1	3
mean	0.11	0.14	0.14	0.12	0.19
r	0.022	0.036	0.039	0.045	0.036
Sr	0.008	0.013	0.014	0.016	0.013
RSDr(%)	7.0	9.6	10.0	14.0	6.9
R	0.038	0.044	0.050	0.056	0.043
SR	0.014	0.016	0.018	0.020	0.015
RSDR(%)	12.0	12.0	13.0	17.0	8.3

- **Table 13. Lignoceric acid C24:0**

	A	B	C	D	E
n	15	15	15	15	15
outliers	1	0	0	0	3
mean	0.04	0.06	0.06	0.05	0.08
r	0.017	0.015	0.033	0.033	0.040
Sr	0.006	0.005	0.012	0.012	0.014
RSDr(%)	15.0	8.9	20.0	24.0	19.0
R	0.055	0.073	0.072	0.054	0.04
SR	0.020	0.026	0.026	0.019	0.014
RSDR(%)	49.0	42.0	45.0	39.0	19.0

- **Table 14. C18:1 trans**

	A	B	C	D	E
n	15	15	15	15	15
outliers	1	1	1	1	2
mean	0.01	0.01	0.01	0.01	0.12
r	0.011	0.013	0.008	0.013	0.044
Sr	0.004	0.005	0.003	0.005	0.016
RSDr(%)	38.0	46.0	27.0	45.0	13.2
R	0.027	0.028	0.030	0.032	0.157
SR	0.010	0.010	0.011	0.011	0.056
RSDR(%)	96.0	86.0	100.0	89.0	48.0

- **Table 15. C18:2 trans + C18:3 trans**

	A	B	C	D	E
n	15	15	15	15	15
outliers	3	3	4	2	3
mean	0.01	0.01	0.01	0.01	0.03
r	0.013	0.014	0.006	0.029	0.017
Sr	0.005	0.005	0.002	0.010	0.006
RSDr(%)	84.0	50.0	28.0	115.0	24.0
R	0.019	0.022	0.018	0.032	0.059
SR	0.007	0.008	0.006	0.012	0.021
RSDR(%)	123.0	79.0	81.0	130.0	83.0

3. **Fatty acid ethyl esters. COI/T.20/Doc.No28, Determination of the content of waxes and fatty acid ethyl esters by capillary gas chromatography**

Ethyl esters (mg/kg) – Method A 15 g of silica				
Sample	**M1**	**M2**	**M3**	**M4**
Mean	10	8.21	36.97	50.83
n	16	16	16	16
outliers	3	2	0	0
Sr	0.574	0.330	1.316	1.934
RSDr (%)	5.74	4.02	3.56	3.80
r	1.61	0.92	3.68	5.41
SR	0.759	0.915	3.720	6.736
RSDR (%)	7.59	11.15	10.06	13.25
R	2.12	2.56	10.42	18.86

4. **Sterol Composition and total sterols, COI/T.20/Doc.No26, Determination of sterols, triterpenic dialcohols and aliphatic alcohols by capillary column gas chromatography**

Table A.1— Cholesterol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	1	0	0
mean (%)	0.1	0.3	0.1	0.1	0.1
r	0.03	0.10	0.05	0.07	0.03
Sr	0.01	0.04	0.02	0.03	0.01
RSDr(%)	8.3	13.6	14.2	20.2	8.6
R	0.06	0.28	0.09	0.14	0.07
SR	0.02	0.10	0.03	0.05	0.02
RSDR(%)	15.9	37.5	22.5	40.3	23.4

Table A.2— Cholesterol (% total sterols) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	0	0	0
mean (%)	0.1	0.3	0.1	0.1	0.1
r	0.03	0.10	0.07	0.03	0.04
Sr	0.01	0.04	0.02	0.01	0.01
RSDr(%)	7.6	15.0	17.7	9.3	10.8
R	0.06	0.24	0.09	0.11	0.06
SR	0.02	0.08	0.03	0.04	0.02
RSDR(%)	16.5	34.3	23.2	35.4	16.7

Table A.3— Brassicasterol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	1	0	0	1	1
mean (%)	0.0	0.0	0.0	0.0	0.1
r	0.02	0.03	0.03	0.02	0.02
Sr	0.01	0.01	0.01	0.01	0.01
RSDr(%)	68.1	23.6	39.3	25.3	14.7
R	0.03	0.11	0.09	0.07	0.15
SR	0.01	0.04	0.03	0.03	0.05
RSDR(%)	103.7	90.5	105.3	94.5	90.7

Table A.4— Brassicasterol (% total sterols) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	1	0	1	0
mean (%)	0.0	0.0	0.0	0.0	0.0
r	0.01	0.02	0.02	0.02	0.03
Sr	0.004	0.01	0.01	0.01	0.01
RSDr(%)	23.9	19.9	30.0	35.6	22.5
R	0.04	0.06	0.05	0.04	0.09
SR	0.02	0.02	0.02	0.01	0.03
RSDR(%)	90.3	68.0	88.7	83.3	79.8

Table A.5— Campesterol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	2	0	0	0	1
mean (%)	3.1	3.2	3.9	8.3	3.1
r	0.22	0.15	0.26	0.18	0.15
Sr	0.08	0.06	0.09	0.06	0.05
RSDr(%)	2.6	1.7	2.4	0.8	1.7
R	0.25	0.39	0.45	0.78	0.27
SR	0.09	0.13	0.16	0.28	0.10
RSDR(%)	2.9	4.3	4.1	3.4	3.1

Table A.6— Campesterol (% total sterols) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	1	0	0	0
mean (%)	3.0	3.3	3.9	8.4	3.2
r	0.12	0.13	0.18	0.22	0.11

Sr	0.04	0.05	0.06	0.08	0.04
RSDr(%)	1.5	1.4	1.6	0.9	1.3
R	0.48	0.59	0.37	0.52	0.28
SR	0.17	0.21	0.13	0.18	0.10
RSDR(%)	5.7	6.5	3.4	2.2	3.2

Table A.7— Stigmasterol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	0	1	0
mean (%)	1.1	2.4	2.0	7.2	1.3
r	0.07	0.16	0.25	0.12	0.09
Sr	0.02	0.06	0.09	0.04	0.03
RSDr(%)	2.1	2.4	4.5	0.6	2.5
R	0.18	0.29	0.41	0.62	0.11
SR	0.06	0.10	0.15	0.22	0.04
RSDR(%)	5.9	4.3	7.4	3.1	3.0

Table A.8— Stigmasterol (% total sterols) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	0	1	0
mean (%)	1.1	2.4	2.0	7.2	1.3
r	0.07	0.14	0.08	0.21	0.16
Sr	0.03	0.05	0.03	0.08	0.06
RSDr(%)	2.3	2.1	1.5	1.1	4.4
R	0.15	0.22	0.11	0.45	0.19
SR	0.06	0.08	0.04	0.16	0.07
RSDR(%)	5.1	3.3	2.0	2.2	5.3

Table A.9— Apparent β-Sitosterol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	1	1	1
mean (%)	94.4	92.6	89.0	61.1	94.0
r	0.45	0.37	1.43	1.43	0.33
Sr	0.16	0.13	0.51	0.51	0.12
RSDr(%)	0.17	0.14	0.57	0.84	0.13
R	0.76	1.31	1.79	4.00	0.63
SR	0.27	0.47	0.63	1.43	0.23
RSDR(%)	0.29	0.51	0.72	2.34	0.24

Table A.10 — Apparent β-Sitosterol (% total sterols) by HPLC

Sample	A	B	C	D	E
n	15	15	15	15	14
outliers	0	0	1	1	1
mean (%)	94.4	92.5	88.7	60.7	94.1
r	0.38	0.45	1.15	1.08	0.50
Sr	0.13	0.16	0.41	0.39	0.18
RSDr(%)	0.14	0.17	0.46	0.63	0.19
R	0.81	1.11	1.41	4.04	0.99
SR	0.29	0.40	0.51	1.44	0.35
RSDR(%)	0.31	0.43	0.57	2.38	0.38

Table A.14 — Total Sterols content (mg/kg) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	1	1	1	1	0
mean (%)	1583	1754	1730	2897	3216
r	74.0	93.5	95.0	59.01	181.9
Sr	264.4	33.4	33.9	21.1	65.0
RSDr(%)	1.7	1.9	2.0	0.7	2.0
R	315.0	190.2	156.6	230.2	480.2
SR	112.5	67.9	55.9	82.2	171.5
RSDR(%)	7.1	3.9	3.2	2.8	5.

Table A.15 — Erythrodiol + uvaol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	1	0	1	0	0
mean (%)	2.1	3.8	1.2	2.5	17.2
r	0.32	0.34	0.19	0.27	0.76
Sr	0.12	0.12	0.07	0.10	0.27
RSDr(%)	5.4	3.2	5.4	3.9	1.6
R	0.80	0.85	0.53	1.09	4.68
SR	0.29	0.30	0.19	0.39	1.67
RSDR(%)	13.3	8.0	15.3	15.5	9.7

Table A.16 — Erythrodiol + uvaol (% total sterols) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	0	0	0
mean (%)	2.2	3.8	1.4	2.0	17.2
r	0.40	0.32	0.24	0.16	0.73

Sr	0.14	0.11	0.09	0.06	0.26
RSDr(%)	6.5	3.0	6.1	2.8	1.5
R	0.52	0.57	0.46	0.62	3.66
SR	0.19	0.20	0.17	0.22	1.31
RSDR(%)	8.4	5.3	11.8	10.9	7.6

Table A.17 — Erythrodiol content (mg/kg) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	1	1	1	1	1
mean (%)	31	61	17	52	598
r	2.8	4.4	1.5	4.0	71.0
Sr	1.0	1.6	0.5	1.4	25.3
RSDr(%)	3.3	2.6	3.1	2.7	4.2
R	6.0	21.0	10.2	9.4	148.3
SR	2.1	2.6	3.6	3.3	53.0
RSDR(%)	7.0	12.4	20.8	6.5	8.9

Table A.18 — Uvaol content (mg/kg) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	2	1	1	1	2
mean (%)	3.0	8	4	20	65
r	0.83	1.5	3.3	3.5	12.5
Sr	0.30	0.55	1.2	1.2	4.5
RSDr(%)	10.1	6.8	27.8	6.2	6.8
R	4.6	9.0	4.1	3.5	23.1
SR	1.6	3.2	1.5	1.2	8.3
RSDR(%)	55.6	40.0	34.0	6.2	12.7

Table A.19 — Erythrodiol content (mg/kg) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	1	1	0	0	1
mean (%)	32	60	18	51	605
r	3.0	8.8	2.5	5.6	36.5
Sr	1.1	3.1	0.9	2.0	13.0
RSDr(%)	3.3	5.2	5.1	4.0	2.2
R	7.3	23.1	5.6	5.8	152.5
SR	2.6	8.2	2.0	2.0	54.5
RSDR(%)	8.1	13.7	11.4	4.1	9.0

Table A.20 — Uvaol content (mg/kg) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	1	1	0	1
mean (%)	5	8	5	20.0	65
r	1.6	1.3	0.80	2.8	6.5
Sr	0.55	0.48	0.29	1.0	2.3
RSDr(%)	10.2	5.7	5.7	5.2	3.6
R	4.2	6.8	3.4	3.5	15.5
SR	1.5	2.4	1.2	1.3	5.5
RSDR(%)	27.3	28.6	24.0	6.4	8.5

Table A.21 — Aliphatic alcohols content (mg/kg) by Reference Method (TLC)

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	1	0	0	0
mean (%)	143	420	62	78	1512
r	5.5	23	4.5	5.1	70
Sr	1.9	8.2	1.6	1.8	24.9
RSDr(%)	1.4	2.0	2.6	2.3	1.7
R	25	67	10	10	95
SR	8.9	23.8	3.7	3.6	34.7
RSDR(%)	6.2	5.7	6.1	4.7	2.3

Table A.22 — Aliphatic alcohols content (mg/kg) by HPLC

Sample	A	B	C	D	E
n	14	14	14	14	14
outliers	0	0	0	0	1
mean (mg/kg)	139	423	62	78	1495
r	6.9	15	6.2	5.9	46
Sr	2.5	5.3	2.2	2.1	16.2
RSDr(%)	1.8	1.3	3.6	2.7	1.1
R	23	36	9.0	11	86
SR	8.4	12.9	3.2	3.8	30.8
RSDR(%)	6.0	3.1	5.2	4.9	2.1

Table B.1 Erythrodiol + uvaol (% total sterols) by Reference Method (TLC)

Sample	A	B	C	D	E
n	17	17	17	17	17
outliers	1	3	3	2	3
mean (%)	3.3	4.3	3.5	22.8	22.7

r	0.3	0.7	0.2	1.5	1.5
Sr	0.1	0.2	0.1	0.5	0.5
RSDr(%)	3.1	5.7	2.3	2.3	2.4
R	2.6	1.1	0.7	3.0	3.3
SR	0.9	0.4	0.2	1.1	1.2
RSDR(%)	28.5	9.0	7.0	4.7	5.1

Table B.2 Erythrodiol + uvaol content (mg/kg) by Reference Method (TLC)

	A	B	C	D	E
n	16	16	17	16	16
outliers	3	4	3	2	3
mean (mg/kg)	59	50	52	772	745
r	6.5	6.7	4.7	40	100
Sr	2.3	2.4	1.7	14	36
RSDr(%)	3.9	4.8	3.3	1.8	4.8
R	9.9	14	31	146	183
SR	3.5	4.8	11	52	65
RSDR(%)	6.0	9.8	21.5	6.8	8.8

Table B.3 Erythrodiol (% total sterols) by Reference Method (TLC)

	A	B	C	D	E
n	17	17	16	17	17
outliers	1	3	1	2	3
mean (%)	3.1	3.9	3.4	18.8	18.7
r	0.3	0.6	0.2	1.2	1.5
Sr	0.1	0.2	0.1	0.4	0.5
RSDr(%)	3.1	5.3	2.4	2.3	2.9
R	0.8	1.0	0.6	2.8	2.8
SR	0.3	0.4	0.2	1.0	1.0
RSDR(%)	8.9	9.1	6.6	5.3	5.3

Table B.4: Erythrodiol content (mg/kg) by Reference Method (TLC)

	A	B	C	D	E
n	16	16	16	16	16
outliers	1	3	2	0	2
mean (%)	53	46	48	638	635
r	5.1	13	4.1	41	78
Sr	1.8	4.6	1.5	15	28
RSDr(%)	3.4	9.9	3.1	2.3	4.4
R	13	16	12	125	130
SR	4.7	5.7	4.1	45	46
RSDR(%)	8.8	12.2	8.6	7.0	7.3

Table B.5 Uvaol (% total sterols) by Reference Method (TLC)

	A	B	C	D	E
n	16	16	16	16	16
outliers	1	1	3	1	0
mean (%)	0.4	0.4	0.1	4.0	4.1
r	0.1	0.3	0.1	0.4	0.3
Sr	0.0	0.1	0.0	0.1	0.1
RSDr(%)	11.4	23.3	35.8	3.4	2.4
R	0.7	0.2	0.1	0.6	0.7
SR	0.2	0.1	0.0	0.2	0.3
RSDR(%)	55.4	22.5	86.9	5.5	6.2

Table B.6 Uvaol content (mg/kg) by Reference Method (TLC)

	A	B	C	D	E
n	15	14	15	14	13
outliers	2	1	3	0	1
mean (mg/kg)	7.6	4.6	0.8	136	138
r	2.5	2.6	1.0	12	22
Sr	0.9	0.9	0.3	4.4	8.0
RSDr(%)	11.6	20.0	43.3	3.2	5.8
R	11	3.3	2.2	31	36
SR	3.9	1.2	0.8	11.0	12.8
RSDR(%)	51.6	25.8	99.0	8.1	9.2

5.   Peroxide value. COI/T.20/Doc.No35. Determination of peroxide value

	A	B	C	D	E	F	G
n	16	20	15	14	14	19	15
outliers	0	0	0	0	0	0	0
mean	11,7	24	7,8	2,8	4,9	14,3	8,2
r	0,26	1,31	0,41	0,27	0,19	0,52	0,33
S_r	0,09	0,47	0,15	0,1	0,07	0,18	0,12
$RSD_r(\%)$	0,8	1,9	1,9	3,4	1,4	1,3	1,4
R	1,86	4,00	1,55	1,09	1,19	3,18	2,81
S_R	0,66	1,43	0,55	0,39	0,43	1,14	1,0
$RSD_R(\%)$	5,7	5,9	7,1	13,8	8,6	8,0	12,3

*All the samples used for the validation of methods correspond to olive oil, olive pomace oil and blends including them.

All the details and the type of samples used for the validation are available in each method.

*The matrixes A, B, C, etc. are described in each corresponding method that are all olive oils in its different types.