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**PRECISION VALUES OF THE METHODS OF ANALYSIS ADOPTED BY THE  
INTERNATIONAL OLIVE COUNCIL**

In compliance with the proposal of the group of chemical experts of the International Olive Council (IOC), the Executive Secretariat set up a electronic working group which was given the brief of reviewing expression of results and the precision values of the physico-chemical testing methods drawn up and adopted by the IOC and inserted in the trade standard for olive oils and olive-pomace oils..

The electronic working group drew up this document for approval at the 106th IOC session to be held in Madrid, Spain, on 21-24 November 2017.

The document reports the precision values for the following methods bearing the reference COI/T.20:

Reference	Method
COI/T.20/Doc. no 18/ Rev.3	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
COI/T.20/Doc. n° 20/ Rev.4	Determination of the difference between actual and theoretical content of triacylglycerols with ECN42
COI/T.20/Doc. n° 11/ Rev.3	Determination of stigmastadienes in vegetable oils
COI/T.20/Doc. n° 16/ Rev.2	Determination of sterenes in refined vegetable oils
COI/T.20/Doc. n° 26/ Rev.3	Determination of the sterol content and alcoholic compounds
COI/T.20/Doc. n° 19/ Rev.4	Spectrophotometric analysis in the ultraviolet
COI/T.20/Doc. n° 23/ Rev.1	Determination of the percentage of 2-glyceryl monopalmitate
COI/T.20/Doc. n° 29/ Rev.1	Determination of biophenols in olive oils by HPLC
COI/T.20/Doc. n° 34/ Rev.1	Determination of free acidity, cold method
COI/T.20/Doc. n° 35/ Rev.1	Determination of the peroxide value
COI/T.20/Doc. n° 33/ Rev.1	Determination of fatty acid methyl esters by gas chromatography

The precision values for the following methods :

- COI/T.20/Doc. no. 16 – Determination of sterenes in refined vegetable oils;
- COI/T.20/Doc. no. 33 – Determination of fatty acid methyl esters by gas chromatography (relative solely to heptadecanoic acid and heptadecenoic acid)

have been calculated from the data for 2000–2017 supplied by the laboratories of many countries for earning entitlement under the IOC recognition scheme. The results underwent statistical analysis according to ISO 5725 “Accuracy (trueness and precision) of measurement methods and results” and with the aid of the AOAC Statistical Manual (W.J. Youden, E.H. Steiner). Outliers were detected by applying the Ranking, Cochran and Grubbs tests to the laboratory results for all the samples (replicates a and b).

The tables on the next pages report the following data for each parameter studied:

<b>n</b>	number of laboratories which participated in the test
<b>outliers</b>	number of laboratories with outlying values
<b>mean</b>	mean of the accepted results
<b>r</b>	repeatability
<b>S<sub>r</sub></b>	repeatability standard deviation
<b>RSD<sub>r</sub>(%)</b>	repeatability coefficient of variation ( $S_r \times 100 / \text{mean}$ )
<b>R</b>	reproducibility
<b>S<sub>R</sub></b>	reproducibility standard deviation
<b>RSD<sub>R</sub>(%)</b>	reproducibility coefficient of variation ( $S_R \times 100 / \text{mean}$ )

<b>Table</b>	<b>1</b>
Analysis	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
Method	COI/T.20/Doc.n°18/Rev.3
Parameter	Waxes - Ring Test COI 1999
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil

B: virgin olive oil + refined sunflower oil

C: virgin olive oil + refined olive-pomace oil

D: virgin olive oil + refined soybean oil + refined sunflower oil

E: refined olive oil + refined olive-pomace oil + refined soybean oil + lampante virgin olive oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	19	19	19	19	19
<b>outliers</b>	5	5	4	3	5
<b>mean</b>	120	123	222	174	346
<b>r</b>	9,5	12,6	10,5	12,2	14,9
<b>S<sub>r</sub></b>	3,4	4,5	3,8	4,7	5,3
<b>RSD<sub>r</sub>(%)</b>	2,8	3,6	1,7	2,7	1,5
<b>R</b>	38,8	48,9	58,9	25,7	44,4
<b>S<sub>R</sub></b>	13,9	17,5	21,0	9,2	15,9
<b>RSD<sub>R</sub>(%)</b>	11,5	14,2	9,5	5,3	4,6

<b>Table</b>	<b>2</b>
Analysis	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
Method	COI/T.20/Doc.n°18/Rev.3
Parameter	Waxes - Ring Test COI 2008
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive retail Italy

D: extra virgin olive oil + lampante

B: extra virgin olive retail Italy

E: extra virgin olive oil + retail Germany

C: extra virgin olive retail + refined

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	20	18	19	18	18
<b>outliers</b>	2	1	0	0	0
<b>mean</b>	125	181	199	142	174
<b>r</b>	9,8	13,0	20,1	17,6	12,2
<b>S<sub>r</sub></b>	3,3	4,4	6,8	5,9	4,1
<b>RSD<sub>r</sub>(%)</b>	2,7	2,4	3,4	4,2	2,4
<b>R</b>	87,3	75,4	67,9	82,7	44,0
<b>S<sub>R</sub></b>	29,5	25,6	23,0	27,8	14,8
<b>RSD<sub>R</sub>(%)</b>	23,7	11,8	11,6	19,6	8,5

<b>Table</b>	<b>3</b>
Analysis	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
Method	COI/T.20/Doc.n°18/Rev.3
Parameter	FAEE (Ethyl C16+C18) - Ring Test COI 2010
Unit	mg/kg
Final result rounded to	no decimal

A: high quality extra virgin

year 2001

D: extra virgin supermarket

year 2010

B: high quality extra virgin

year 1991

E: extra virgin supermarket

year 2010

C: extra virgin supermarket

year 2010

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	17	17	17	17
<b>outliers</b>	1	2	1	2	2
<b>mean</b>	5	137	276	96	28
<b>r</b>	2,14	5,36	7,6	6,66	2,66
<b>S<sub>r</sub></b>	0,76	1,91	2,71	2,38	0,95
<b>RSD<sub>r</sub>(%)</b>	14,8	1,4	1,0	2,5	3,4
<b>R</b>	6,71	38,82	95,91	29,23	15,50
<b>S<sub>R</sub></b>	2,40	13,86	34,25	10,44	5,54
<b>RSD<sub>R</sub>(%)</b>	46,5	10,1	12,4	10,9	19,7

<b>Table</b>	<b>4</b>
Analysis	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
Method	COI/T.20/Doc.n°18/Rev.3
Parameter	FAME (Methyl C16+C18) - Ring Test COI 2010
Unit	mg/kg
Final result rounded to	no decimal

A: high quality extra virgin

year 2001

D: extra virgin supermarket

year 2010

B: high quality extra virgin

year 1991

E: extra virgin supermarket

year 2010

C: extra virgin supermarket

year 2010

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	17	17	17	17
<b>outliers</b>	2	2	1	1	3
<b>mean</b>	33	69	74	44	16
<b>r</b>	5,67	10,1	5,09	7,69	2,71
<b>S<sub>r</sub></b>	2,02	3,61	1,82	2,75	0,97
<b>RSD<sub>r</sub>(%)</b>	6,1	5,2	2,5	6,2	6,1
<b>R</b>	13,38	26,85	29,48	18,44	10,52
<b>S<sub>R</sub></b>	4,78	9,59	10,53	6,58	3,76
<b>RSD<sub>R</sub>(%)</b>	14,3	13,8	14,2	14,9	23,6

<b>Table</b>	<b>5</b>
Analysis	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
Method	COI/T.20/Doc.n°18/Rev.3
Parameter	FAAE (SUM Methyl + Ethyl) - Ring Test COI 2010
Unit	mg/kg
Final result rounded to	no decimal

A: high quality extra virgin

year 2001

D: extra virgin supermarket

year 2010

B: high quality extra virgin

year 1991

E: extra virgin supermarket

year 2010

C: extra virgin supermarket

year 2010

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	17	17	17	17
<b>outliers</b>	2	1	2	2	2
<b>mean</b>	38	212	350	139	43
<b>r</b>	6,80	16,83	6,29	7,21	4,09
<b>S<sub>r</sub></b>	2,43	6,01	2,25	2,58	1,46
<b>RSD<sub>r</sub>(%)</b>	6,3	2,8	0,6	1,9	3,4
<b>R</b>	17,91	77,26	112,95	38,47	14,12
<b>S<sub>R</sub></b>	6,39	27,59	40,34	13,74	5,04
<b>RSD<sub>R</sub>(%)</b>	16,6	13,0	11,5	9,9	11,7

<b>Table</b>	<b>6</b>
Analysis	Determination of the content of waxes, fatty acid methyl esters and fatty acid ethyl esters by capillary gas chromatography
Method	COI/T.20/Doc.n°18/Rev.3
Parameter	RATIO (FAEE/FAME) - Ring Test COI 2010
Unit	-
Final result rounded to	1 decimal place

A: high quality extra virgin  
B: high quality extra virgin  
C: extra virgin supermarket

year 2001  
year 1991  
year 2010

D: extra virgin supermarket  
E: extra virgin supermarket

year 2010  
year 2010

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	17	17	17	17
<b>outliers</b>	0	1	1	1	1
<b>mean</b>	0,2	2,0	3,8	2,2	1,8
<b>r</b>	0,08	0,21	0,30	0,35	0,42
<b>S<sub>r</sub></b>	0,03	0,08	0,11	0,13	0,15
<b>RSD<sub>r</sub>(%)</b>	18,2	3,8	2,8	5,7	8,5
<b>R</b>	0,23	0,57	1,56	0,68	1,38
<b>S<sub>R</sub></b>	0,08	0,20	0,56	0,24	0,49
<b>RSD<sub>R</sub>(%)</b>	51,5	10,1	14,7	11,0	28,2

<b>Table</b>	<b>7</b>
Analysis	Determination of the difference between actual and theoretical content of triacylglycerols with ECN42
Method	COI/T.20/Doc.n°20/Rev.4
Parameter	ΔECN42 determined with acetone and acetonitrile - Ring Test COI 1999
Unit	%
Final result rounded to	2 decimal place

A: extra virgin olive oil

B: virgin olive oil + refined sunflower oil

C: virgin olive oil + refined olive-pomace oil

D: virgin olive oil + refined soybean oil + refined sunflower oil

E: refined olive oil + refined olive-pomace oil + refined soybean oil + lampante virgin olive oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	19	19	19	19	19
<b>outliers</b>	1	0	0	0	3
<b>mean</b>	0,04	1,66	0,04	0,18	0,82
<b>r</b>	0,08	0,12	0,09	0,11	0,11
<b>S<sub>r</sub></b>	0,02	0,04	0,03	0,04	0,04
<b>RSD<sub>r</sub>(%)</b>	82,2 <sub>(not sig.)</sub>	2,8	76,1 <sub>(not sig.)</sub>	22,5	5,1
<b>R</b>	0,12	0,25	0,16	0,22	0,24
<b>S<sub>R</sub></b>	0,05	0,09	0,05	0,08	0,08
<b>RSD<sub>R</sub>(%)</b>	127,6 <sub>(not sig.)</sub>	5,4	132,2 <sub>(not sig.)</sub>	46,2	10,9

<b>Table</b>	<b>8</b>
Analysis	Determination of the difference between actual and theoretical content of triacylglycerols with ECN42
Method	COI/T.20/Doc.n°20/Rev.4
Parameter	$\Delta$ ECN42 determined with propionitrile
Unit	%
Final result rounded to	2 decimal place

A: 70% virgin olive oil + 10% refined olive-pomace oil + 20% high oleic sunflower oil

B: 80% high campesterol virgin olive oil + 20% palm olein

C: 100% virgin olive oil

D: 70% virgin olive oil + 15% refined olive-pomace oil + 15% high oleic sunflower oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>n</b>	16	16	11	11
<b>outliers</b>	0	2	0	0
<b>mean</b>	1,07	0,10	0,06	0,84
<b>r</b>	0,05	0,02	0,06	0,06
<b>S<sub>r</sub></b>	0,02	0,01	0,02	0,02
<b>RSD<sub>r</sub>(%)</b>	1,6	7,9	36,6	2,7
<b>R</b>	0,33	0,11	0,12	0,35
<b>S<sub>R</sub></b>	0,12	0,04	0,04	0,12
<b>RSD<sub>R</sub>(%)</b>	11,2	36,8	78,6 <sub>(not sig.)</sub>	14,8

<b>Table</b>	<b>9</b>
Analysis	Determination of stigmastadienes in vegetable oils
Method	COI/T.20/Doc.n°11/Rev.3
Parameter	Stigmastadienes - Ring Test COI 1999
Unit	mg/kg
Final result rounded to	2 decimal place

A: extra virgin olive oil

B: virgin olive oil + refined sunflower oil

C: virgin olive oil + refined olive-pomace oil

D: virgin olive oil + refined soybean oil + refined sunflower oil

E: refined olive oil + refined olive-pomace oil + refined soybean oil + lampante virgin olive oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	19	19	19	19	19
<b>outliers</b>	3	5	7	2	5
<b>mean</b>	0,01	0,80	9,49	0,22	7,55
<b>r</b>	0,01	0,08	0,39	0,05	0,48
<b>S<sub>r</sub></b>	0,00	0,03	0,14	0,01	0,17
<b>RSD<sub>r</sub>(%)</b>	32,4 <sub>(not sig.)</sub>	3,7	1,5	8,4	2,3
<b>R</b>	0,03	0,15	1,66	0,06	1,59
<b>S<sub>R</sub></b>	0,01	0,05	0,59	0,03	0,57
<b>RSD<sub>R</sub>(%)</b>	98,6 <sub>(not sig.)</sub>	6,7	6,3	11,5	7,6

<b>Table</b>	<b>10</b>
Analysis	Determination of sterenes in refined vegetable oils
Method	COI/T.20/Doc.n°16/Rev.2
Parameter	Sterenes - Results from recognition 2000-2006
Unit	mg/kg
Final result rounded to	1 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	31	31	31	31	31
<b>outliers</b>	4	4	5	4	4
<b>mean</b>	9,5	31,0	46,0	9,0	11,4
<b>r</b>	0,2	1,0	1,0	0,3	0,5
<b>S<sub>r</sub></b>	0,1	0,3	0,4	0,1	0,2
<b>RSD<sub>r</sub>(%)</b>	0,8	1,0	0,9	1,1	1,6
<b>R</b>	2,0	5,0	12,0	1,0	1,0
<b>S<sub>R</sub></b>	0,6	1,7	4,2	0,5	0,5
<b>RSD<sub>R</sub>(%)</b>	6,1	5,3	9,1	5,9	4,4

<b>Table</b>	<b>11</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Total sterols - Ring Test COI 2016-1 – Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	0	0	1	1
<b>mean</b>	1572	1742	1679	2830	3181
<b>r</b>	84,9	134,8	144,7	246,2	307,3
<b>S<sub>r</sub></b>	30,3	48,1	51,7	87,9	109,7
<b>RSD<sub>r</sub>(%)</b>	1,9	2,8	3,1	3,1	3,5
<b>R</b>	291,3	495,9	321,6	346,4	610,4
<b>S<sub>R</sub></b>	104,0	177,1	114,8	123,7	218,0
<b>RSD<sub>R</sub>(%)</b>	6,6	10,2	6,8	4,4	6,9

<b>Table</b>	<b>12</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Total sterols - Ring Test COI 2016-1 – Separation by HPLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	1	1	1	0
<b>mean</b>	1583	1754	1730	2897	3216
<b>r</b>	74,0	93,5	95,0	59,01	181,9
<b>S<sub>r</sub></b>	264,4	33,4	33,9	21,1	65,0
<b>RSD<sub>r</sub>(%)</b>	1,7	1,9	2,0	0,7	2,0
<b>R</b>	315,0	190,2	156,6	230,2	480,2
<b>S<sub>R</sub></b>	112,5	67,9	55,9	82,2	171,5
<b>RSD<sub>R</sub>(%)</b>	7,1	3,9	3,2	2,8	5,3

<b>Table</b>	<b>13</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Cholesterol - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	1	0	0
<b>mean</b>	0,1	0,3	0,1	0,1	0,1
<b>r</b>	0,03	0,10	0,05	0,07	0,03
<b>S<sub>r</sub></b>	0,01	0,04	0,02	0,03	0,01
<b>RSD<sub>r</sub>(%)</b>	8,3	13,6	14,2	20,2	8,6
<b>R</b>	0,06	0,28	0,09	0,14	0,07
<b>S<sub>R</sub></b>	0,02	0,10	0,03	0,05	0,02
<b>RSD<sub>R</sub>(%)</b>	15,9	37,5	22,5	40,3	23,4

<b>Table</b>	<b>14</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Cholesterol - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	0	0
<b>mean</b>	0,1	0,3	0,1	0,1	0,1
<b>r</b>	0,03	0,10	0,07	0,03	0,04
<b>S<sub>r</sub></b>	0,01	0,04	0,02	0,01	0,01
<b>RSD<sub>r</sub>(%)</b>	7,6	15,0	17,7	9,3	10,8
<b>R</b>	0,06	0,24	0,09	0,11	0,06
<b>S<sub>R</sub></b>	0,02	0,08	0,03	0,04	0,02
<b>RSD<sub>R</sub>(%)</b>	16,5	34,3	23,2	35,4	16,7

<b>Table</b>	<b>15</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Brassicasterol - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	0	0	1	1
<b>mean</b>	0,0	0,0	0,0	0,0	0,1
<b>r</b>	0,02	0,03	0,03	0,02	0,02
<b>S<sub>r</sub></b>	0,01	0,01	0,01	0,01	0,01
<b>RSD<sub>r</sub>(%)</b>	68,1	23,6	39,3	25,3	14,7
<b>R</b>	0,03	0,11	0,09	0,07	0,15
<b>S<sub>R</sub></b>	0,01	0,04	0,03	0,03	0,05
<b>RSD<sub>R</sub>(%)</b>	103,7	90,5	105,3	94,5	90,7

<b>Table</b>	<b>16</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Brassicasterol - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	0	0
<b>mean</b>	0,1	0,3	0,1	0,1	0,1
<b>r</b>	0,03	0,10	0,07	0,03	0,04
<b>S<sub>r</sub></b>	0,01	0,04	0,02	0,01	0,01
<b>RSD<sub>r</sub>(%)</b>	7,6	15,0	17,7	9,3	10,8
<b>R</b>	0,06	0,24	0,09	0,11	0,06
<b>S<sub>R</sub></b>	0,02	0,08	0,03	0,04	0,02
<b>RSD<sub>R</sub>(%)</b>	16,5	34,3	23,2	35,4	16,7

<b>Table</b>	<b>17</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Campesterol - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	2	0	0	0	1
<b>mean</b>	3,1	3,2	3,9	8,3	3,1
<b>r</b>	0,22	0,15	0,26	0,18	0,15
<b>S<sub>r</sub></b>	0,08	0,06	0,09	0,06	0,05
<b>RSD<sub>r</sub>(%)</b>	2,6	1,7	2,4	0,8	1,7
<b>R</b>	0,25	0,39	0,45	0,78	0,27
<b>S<sub>R</sub></b>	0,09	0,13	0,16	0,28	0,10
<b>RSD<sub>R</sub>(%)</b>	2,9	4,3	4,1	3,4	3,1

<b>Table</b>	<b>18</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Campesterol - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	1	0	0	0
<b>mean</b>	3,0	3,3	3,9	8,4	3,2
<b>r</b>	0,12	0,13	0,18	0,22	0,11
<b>S<sub>r</sub></b>	0,04	0,05	0,06	0,09	0,04
<b>RSD<sub>r</sub>(%)</b>	1,5	1,4	1,6	0,9	1,3
<b>R</b>	0,48	0,59	0,37	0,52	0,28
<b>S<sub>R</sub></b>	0,17	0,21	0,13	0,18	0,10
<b>RSD<sub>R</sub>(%)</b>	5,7	6,5	3,4	2,2	3,2

<b>Table</b>	<b>19</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Stigmasterol - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	1	0
<b>mean</b>	1,1	2,4	2,0	7,2	1,3
<b>r</b>	0,07	0,16	0,25	0,12	0,09
<b>S<sub>r</sub></b>	0,02	0,06	0,09	0,04	0,03
<b>RSD<sub>r</sub>(%)</b>	2,1	2,4	4,5	0,6	2,5
<b>R</b>	0,18	0,29	0,41	0,62	0,11
<b>S<sub>R</sub></b>	0,06	0,10	0,15	0,22	0,04
<b>RSD<sub>R</sub>(%)</b>	5,9	4,3	7,4	3,1	3,0

<b>Table</b>	<b>20</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Stigmasterol - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	1	0
<b>mean</b>	1,1	2,4	2,0	7,2	1,3
<b>r</b>	0,07	0,14	0,08	0,21	0,16
<b>S<sub>r</sub></b>	0,03	0,05	0,03	0,08	0,06
<b>RSD<sub>r</sub>(%)</b>	2,3	2,1	1,5	1,1	4,4
<b>R</b>	0,15	0,22	0,11	0,45	0,19
<b>S<sub>R</sub></b>	0,06	0,08	0,04	0,16	0,07
<b>RSD<sub>R</sub>(%)</b>	5,1	3,3	2,0	2,2	5,3

<b>Table</b>	<b>21</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Δ7 Stigmastenol - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	0	1
<b>mean</b>	0,3	0,4	3,2	16,0	0,5
<b>r</b>	0,06	0,08	0,53	1,08	0,06
<b>S<sub>r</sub></b>	0,02	0,03	0,19	0,39	0,02
<b>RSD<sub>r</sub>(%)</b>	7,5	6,4	5,9	2,4	4,4
<b>R</b>	0,15	0,19	0,83	1,52	0,19
<b>S<sub>R</sub></b>	0,05	0,07	0,30	0,54	0,07
<b>RSD<sub>R</sub>(%)</b>	18,7	16,0	9,4	3,4	13,5

<b>Table</b>	<b>22</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	$\Delta 7$ Stigmastenol - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	0	0	0	0
<b>mean</b>	0,32	0,46	3,22	16,09	0,52
<b>r</b>	0,10	0,12	0,38	0,75	0,08
<b>S<sub>r</sub></b>	0,037	0,041	0,13	0,267	0,029
<b>RSD<sub>r</sub>(%)</b>	11,4	9,0	4,2	1,7	5,6
<b>R</b>	0,13	0,24	0,75	1,95	0,16
<b>S<sub>R</sub></b>	0,045	0,087	0,269	0,696	0,058
<b>RSD<sub>R</sub>(%)</b>	14,2	18,8	8,3	4,3	11,0

<b>Table</b>	<b>23</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Apparent $\beta$ -sitosterol - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	1	1	1
<b>mean</b>	94,4	92,6	89,0	61,1	94,0
<b>r</b>	0,45	0,37	1,43	1,43	0,33
<b>S<sub>r</sub></b>	0,16	0,13	0,51	0,51	0,12
<b>RSD<sub>r</sub>(%)</b>	0,17	0,14	0,57	0,84	0,13
<b>R</b>	0,76	1,31	1,79	4,00	0,63
<b>S<sub>R</sub></b>	0,27	0,47	0,63	1,43	0,23
<b>RSD<sub>R</sub>(%)</b>	0,29	0,51	0,72	2,34	0,24

<b>Table</b>	<b>24</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Apparent $\beta$ -sitosterol - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	14
<b>outliers</b>	0	0	1	1	1
<b>mean</b>	94,4	92,5	88,7	60,7	94,1
<b>r</b>	0,38	0,45	1,15	1,08	0,50
<b>S<sub>r</sub></b>	0,13	0,16	0,41	0,39	0,18
<b>RSD<sub>r</sub>(%)</b>	0,14	0,17	0,46	0,63	0,19
<b>R</b>	0,81	1,11	1,41	4,04	0,99
<b>S<sub>R</sub></b>	0,29	0,40	0,51	1,44	0,35
<b>RSD<sub>R</sub>(%)</b>	0,31	0,43	0,57	2,38	0,38

<b>Table</b>	<b>25</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol + uvaol (% total sterols) - Ring Test COI 2016-1 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	0	1	0	0
<b>mean</b>	2,1	3,8	1,2	2,5	17,2
<b>r</b>	0,32	0,34	0,19	0,27	0,76
<b>S<sub>r</sub></b>	0,12	0,12	0,07	0,10	0,27
<b>RSD<sub>r</sub>(%)</b>	5,4	3,2	5,4	3,9	1,6
<b>R</b>	0,80	0,85	0,53	1,09	4,68
<b>S<sub>R</sub></b>	0,29	0,30	0,19	0,39	1,67
<b>RSD<sub>R</sub>(%)</b>	13,3	8,0	15,3	15,5	9,7

<b>Table</b>	<b>26</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol + uvaol (% total sterols) - Ring Test COI 2016-1 – Separation by HPLC
Unit	%
Final result rounded to	1 decimal place

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	0	0
<b>mean</b>	2,2	3,8	1,4	2,0	17,2
<b>r</b>	0,40	0,32	0,24	0,16	0,73
<b>S<sub>r</sub></b>	0,14	0,11	0,09	0,06	0,26
<b>RSD<sub>r</sub>(%)</b>	6,5	3,0	6,1	2,8	1,5
<b>R</b>	0,52	0,57	0,46	0,62	3,66
<b>S<sub>R</sub></b>	0,19	0,20	0,17	0,22	1,31
<b>RSD<sub>R</sub>(%)</b>	8,4	5,3	11,8	10,9	7,6

<b>Table</b>	<b>27</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol absolute - Ring Test COI 2016-1 – Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	1	1	1	1
<b>mean</b>	31	61	17	52	598
<b>r</b>	2,8	4,4	1,5	4,0	71,0
<b>S<sub>r</sub></b>	1,0	1,6	0,5	1,4	25,3
<b>RSD<sub>r</sub>(%)</b>	3,3	2,6	3,1	2,7	4,2
<b>R</b>	6,0	21,0	10,2	9,4	148,3
<b>S<sub>R</sub></b>	2,1	2,6	3,6	3,3	53,0
<b>RSD<sub>R</sub>(%)</b>	7,0	12,4	20,8	6,5	8,9

<b>Table</b>	<b>28</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol absolute - Ring Test COI 2016-1 – Separation by HPLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	1	1	0	0	1
<b>mean</b>	32	60	18	51	605
<b>r</b>	3,0	8,8	2,5	5,6	36,5
<b>S<sub>r</sub></b>	1,1	3,1	0,9	2,0	13,0
<b>RSD<sub>r</sub>(%)</b>	3,3	5,2	5,1	4,0	2,2
<b>R</b>	7,3	23,1	5,6	5,8	152,5
<b>S<sub>R</sub></b>	2,6	8,2	2,0	2,0	54,5
<b>RSD<sub>R</sub>(%)</b>	8,1	13,7	11,4	4,1	9,0

<b>Table</b>	<b>29</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Uvaol absolute - Ring Test COI 2016-1 – Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	2	1	1	1	2
<b>mean</b>	3,0	8	4	20	65
<b>r</b>	0,83	1,5	3,3	3,5	12,5
<b>S<sub>r</sub></b>	0,30	0,55	1,2	1,2	4,5
<b>RSD<sub>r</sub>(%)</b>	10,1	6,8	27,8	6,2	6,8
<b>R</b>	4,6	9,0	4,1	3,5	23,1
<b>S<sub>R</sub></b>	1,6	3,2	1,5	1,2	8,3
<b>RSD<sub>R</sub>(%)</b>	55,6	40,0	34,0	6,2	12,7

<b>Table</b>	<b>30</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Uvaol absolute - Ring Test COI 2016-1 – Separation by HPLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	1	1	0	1
<b>mean</b>	5	8	5	20,0	65
<b>r</b>	1,6	1,3	0,80	2,8	6,5
<b>S<sub>r</sub></b>	0,55	0,48	0,29	1,0	2,3
<b>RSD<sub>r</sub>(%)</b>	10,2	5,7	5,7	5,2	3,6
<b>R</b>	4,2	6,8	3,4	3,5	15,5
<b>S<sub>R</sub></b>	1,5	2,4	1,2	1,3	5,5
<b>RSD<sub>R</sub>(%)</b>	27,3	28,6	24,0	6,4	8,5

<b>Table</b>	<b>31</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Total aliphatic alcohols (C22 + C24 + C26 + C28 ) - Ring Test COI 2016-1– Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	1	0	0	0
<b>mean</b>	143	420	62	78	1512
<b>r</b>	5,5	23	4,5	5,1	70
<b>S<sub>r</sub></b>	1,9	8,2	1,6	1,8	24,9
<b>RSD<sub>r</sub>(%)</b>	1,4	2,0	2,6	2,3	1,7
<b>R</b>	25	67	10	10	95
<b>S<sub>R</sub></b>	8,9	23,8	3,7	3,6	34,7
<b>RSD<sub>R</sub>(%)</b>	6,2	5,7	6,1	4,7	2,3

<b>Table</b>	<b>32</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Total aliphatic alcohols (C22 + C24 + C26 + C28 ) - Ring Test COI 2016-1 – Separation by HPLC
Unit	mg/kg
Final result rounded to	no decimal

A: extra virgin olive oil from picual variety

B: lampante olive oil

C: olive oil + 10% sunflower oil

D: high oleic sunflower + 50 mg/kg erythrodiol + 20 mg/kg uvaol

E: virgin olive oil + refined olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	14	14	14	14	14
<b>outliers</b>	0	0	0	0	1
<b>mean</b>	139	423	62	78	1495
<b>r</b>	6,9	15	6,2	5,9	46
<b>S<sub>r</sub></b>	2,5	5,3	2,2	2,1	16,2
<b>RSD<sub>r</sub>(%)</b>	1,8	1,3	3,6	2,7	1,1
<b>R</b>	23	36	9,0	11	86
<b>S<sub>R</sub></b>	8,4	12,9	3,2	3,8	30,8
<b>RSD<sub>R</sub>(%)</b>	6,0	3,1	5,2	4,9	2,1

<b>Table</b>	<b>33</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol + uvaol (% total sterols) - Ring Test COI 2016-2 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: Lampante olive oil

B: refined olive oil (from sample 1)

C: Desterolysed high oleic sunflower oil + 3,13% / 49,26 mg/kg of standard erythrodiol

D: Pomace Olive oil (traded)

E: Pomace Olive oil (traded)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	17	17	17	17	17
<b>outliers</b>	1	3	3	2	3
<b>mean</b>	3,3	4,3	3,5	22,8	22,7
<b>r</b>	0,30	0,70	0,20	1,5	1,5
<b>S<sub>r</sub></b>	0,10	0,20	0,10	0,50	0,50
<b>RSD<sub>r</sub>(%)</b>	6,5	3,0	6,1	2,8	1,5
<b>R</b>	3,1	5,7	2,3	2,3	2,4
<b>S<sub>R</sub></b>	2,6	1,1	0,70	3,0	3,3
<b>RSD<sub>R</sub>(%)</b>	0,9	0,4	0,2	1,1	1,2

<b>Table</b>	<b>34</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol + Uvaol content - Ring Test COI 2016-2 – Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: Lampante olive oil

B: refined olive oil (from sample 1)

C: Desterolysed high oleic sunflower oil + 3,13% / 49,26 mg/kg of standard erythrodiol

D: Pomace Olive oil (traded)

E: Pomace Olive oil (traded)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	16	16	17	16	16
<b>outliers</b>	3	4	3	2	3
<b>mean</b>	59	50	52	772	745
<b>r</b>	6,5	6,7	4,7	40	100
<b>S<sub>r</sub></b>	2,3	2,4	1,7	14,2	35,6
<b>RSD<sub>r</sub>(%)</b>	3,9	4,8	3,3	1,8	4,8
<b>R</b>	9,9	14	31	146	183
<b>S<sub>R</sub></b>	3,5	4,8	11,1	52,1	65,4
<b>RSD<sub>R</sub>(%)</b>	6,0	9,8	21,5	6,8	8,8

<b>Table</b>	<b>35</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol (% total sterols) - Ring Test COI 2016-2 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: Lampante olive oil

B: refined olive oil (from sample 1)

C: Desterolysed high oleic sunflower oil + 3,13% / 49,26 mg/kg of standard erythrodiol

D: Pomace Olive oil (traded)

E: Pomace Olive oil (traded)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	17	17	16	17	17
<b>outliers</b>	1	3	1	2	3
<b>mean</b>	3,1	3,9	3,4	18,8	18,7
<b>r</b>	0,30	0,60	0,20	1,2	1,5
<b>S<sub>r</sub></b>	0,10	0,20	0,10	0,40	0,50
<b>RSD<sub>r</sub>(%)</b>	3,1	5,3	2,4	2,3	2,9
<b>R</b>	0,80	1,0	0,60	2,8	2,8
<b>S<sub>R</sub></b>	0,30	0,40	0,20	1,0	1,0
<b>RSD<sub>R</sub>(%)</b>	8,9	9,1	6,6	5,3	5,3

<b>Table</b>	<b>36</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Erythrodiol content - Ring Test COI 2016-2 – Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: Lampante olive oil

B: refined olive oil (from sample 1)

C: Desterolysed high oleic sunflower oil + 3,13% / 49,26 mg/kg of standard erythrodiol

D: Pomace Olive oil (traded)

E: Pomace Olive oil (traded)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	16	16	16	16	16
<b>outliers</b>	1	3	2	0	2
<b>mean</b>	53	46	48	638	635
<b>r</b>	5,1	13	4,1	41	78
<b>S<sub>r</sub></b>	1,8	4,6	1,5	14,5	27,7
<b>RSD<sub>r</sub>(%)</b>	3,4	9,9	3,1	2,3	4,4
<b>R</b>	13	16	12	125	130
<b>S<sub>R</sub></b>	4,7	5,7	4,1	44,6	46,4
<b>RSD<sub>R</sub>(%)</b>	8,8	12,2	8,6	7,0	7,3

<b>Table</b>	<b>37</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Uvaol (% total sterols) - Ring Test COI 2016-2 – Separation by TLC
Unit	%
Final result rounded to	1 decimal place

A: Lampante olive oil

B: refined olive oil (from sample 1)

C: Desterolysed high oleic sunflower oil + 3,13% / 49,26 mg/kg of standard erythrodiol

D: Pomace Olive oil (traded)

E: Pomace Olive oil (traded)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	16	16	16	16	16
<b>outliers</b>	1	1	3	1	0
<b>mean</b>	0,4	0,4	0,1	4,0	4,1
<b>r</b>	0,10	0,30	0,10	0,40	0,30
<b>S<sub>r</sub></b>	0,00	0,10	0,00	0,10	0,10
<b>RSD<sub>r</sub>(%)</b>	11,4	23,3	35,8	3,4	2,4
<b>R</b>	0,70	0,20	0,10	0,60	0,70
<b>S<sub>R</sub></b>	0,20	0,10	0,00	0,20	0,30
<b>RSD<sub>R</sub>(%)</b>	55,4	22,5	86,9	5,5	6,2

<b>Table</b>	<b>38</b>
Analysis	Determination of the sterol content and alcoholic compounds
Method	COI/T.20/Doc.n°26/Rev.3
Parameter	Uvaol content - Ring Test COI 2016-2 – Separation by TLC
Unit	mg/kg
Final result rounded to	no decimal

A: Lampante olive oil

B: refined olive oil (from sample 1)

C: Desterolysed high oleic sunflower oil + 3,13% / 49,26 mg/kg of standard erythrodiol

D: Pomace Olive oil (traded)

E: Pomace Olive oil (traded)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	14	15	14	13
<b>outliers</b>	2	1	3	0	1
<b>mean</b>	8	5	1	136	138
<b>r</b>	2,5	2,6	1,0	12	22
<b>S<sub>r</sub></b>	0,90	0,90	0,30	4,4	8,0
<b>RSD<sub>r</sub>(%)</b>	11,6	20,0	43,3	3,2	5,8
<b>R</b>	11	3,3	2,2	31	36
<b>S<sub>R</sub></b>	3,9	1,2	0,80	11,0	12,8
<b>RSD<sub>R</sub>(%)</b>	51,6	25,8	99,0	8,1	9,2

<b>Table</b>	<b>39</b>
Analysis	Spectrophotometric analysis in the ultraviolet
Method	COI/T.20/Doc.n°19/Rev.4
Parameter	K270 using cyclohexane - Ring Test COI 2009
Unit	-
Final result rounded to	2 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	21	21	21	21	21
<b>outliers</b>	1	2	1	1	4
<b>mean</b>	0,13	0,43	1,12	0,45	0,59
<b>r</b>	0,014	0,023	0,029	0,033	0,018
<b>S<sub>r</sub></b>	0,005	0,008	0,010	0,012	0,006
<b>RSD<sub>r</sub>(%)</b>	4,0	1,9	0,9	2,6	1,1
<b>R</b>	0,031	0,044	0,074	0,04	0,042
<b>S<sub>R</sub></b>	0,011	0,016	0,027	0,014	0,015
<b>RSD<sub>R</sub>(%)</b>	8,5	3,7	2,4	3,2	2,5

<b>Table</b>	<b>40</b>
Analysis	Spectrophotometric analysis in the ultraviolet
Method	COI/T.20/Doc.n°19/Rev.4
Parameter	K268 using isoctane - Ring Test COI 2009
Unit	-
Final result rounded to	2 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	21	22	22	22	22
<b>outliers</b>	1	4	2	5	2
<b>mean</b>	0,12	0,43	1,14	0,45	0,60
<b>r</b>	0,014	0,014	0,043	0,018	0,018
<b>S<sub>r</sub></b>	0,005	0,005	0,016	0,007	0,007
<b>RSD<sub>r</sub>(%)</b>	4,0	1,2	1,4	1,5	1,1
<b>R</b>	0,028	0,045	0,083	0,038	0,094
<b>S<sub>R</sub></b>	0,010	0,016	0,030	0,013	0,034
<b>RSD<sub>R</sub>(%)</b>	8,0	3,8	2,6	3,0	5,6

<b>Table</b>	<b>41</b>
Analysis	Spectrophotometric analysis in the ultraviolet
Method	COI/T.20/Doc.n°19/Rev.4
Parameter	K232 using cyclohexane - Ring Test COI 2009
Unit	-
Final result rounded to	2 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	21	21	21	21	21
<b>outliers</b>	3	1	1	0	0
<b>mean</b>	1,76	2,12	3,83	3,86	2,79
<b>r</b>	0,070	0,060	0,119	0,113	0,093
<b>S<sub>r</sub></b>	0,025	0,0216	0,0423	0,0405	0,0332
<b>RSD<sub>r</sub>(%)</b>	1,4	1,0	1,1	1,1	1,2
<b>R</b>	0,138	0,204	0,424	0,386	0,279
<b>S<sub>R</sub></b>	0,049	0,073	0,151	0,138	0,100
<b>RSD<sub>R</sub>(%)</b>	2,8	3,4	4,0	3,6	3,6

<b>Table</b>	<b>42</b>
Analysis	Spectrophotometric analysis in the ultraviolet
Method	COI/T.20/Doc.n°19/Rev.4
Parameter	K232 using isoctane - Ring Test COI 2009
Unit	-
Final result rounded to	2 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	21	22	22	22	22
<b>outliers</b>	1	4	4	1	5
<b>mean</b>	1,76	2,10	3,81	3,85	2,82
<b>r</b>	0,072	0,035	0,043	0,101	0,054
<b>S<sub>r</sub></b>	0,026	0,013	0,016	0,036	0,019
<b>RSD<sub>r</sub>(%)</b>	1,5	0,6	0,4	0,9	0,7
<b>R</b>	0,216	0,194	0,488	0,582	0,194
<b>S<sub>R</sub></b>	0,077	0,069	0,174	0,211	0,069
<b>RSD<sub>R</sub>(%)</b>	4,4	3,3	4,6	5,5	2,5

<b>Table</b>	<b>43</b>
Analysis	Spectrophotometric analysis in the ultraviolet
Method	COI/T.20/Doc.n°19/Rev.4
Parameter	ΔK using cyclohexane - Ring Test COI 2009
Unit	-
Final result rounded to	2 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	20	21	21	21	21
<b>outliers</b>	1	1	2	1	3
<b>Mean</b>	-0,00	0,00	0,09	0,04	0,05
<b>r</b>	0,002	0,002	0,003	0,003	0,004
<b>S<sub>r</sub></b>	0,001	0,001	0,001	0,001	0,001
<b>RSD<sub>r</sub>(%)</b>	28,9	21,6	1,1	2,9	2,9
<b>R</b>	0,008	0,004	0,012	0,007	0,011
<b>S<sub>R</sub></b>	0,003	0,001	0,004	0,003	0,004
<b>RSD<sub>R</sub>(%)</b>	147,5	52,0	5,1	7,6	8,1

<b>Table</b>	<b>44</b>
Analysis	Spectrophotometric analysis in the ultraviolet
Method	COI/T.20/Doc.n°19/Rev.4
Parameter	ΔK using isoctane - Ring Test COI 2009
Unit	-
Final result rounded to	2 decimal place

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	21	21	22	22	22
<b>outliers</b>	0	3	1	2	2
<b>mean</b>	-0,00	0,00	0,08	0,03	0,04
<b>r</b>	0,003	0,001	0,005	0,004	0,002
<b>S<sub>r</sub></b>	0,001	0,001	0,002	0,001	0,001
<b>RSD<sub>r</sub>(%)</b>	36,4	121,1	2,3	4,4	1,7
<b>R</b>	0,011	0,003	0,023	0,011	0,013
<b>S<sub>R</sub></b>	0,004	0,001	0,008	0,004	0,005
<b>RSD<sub>R</sub>(%)</b>	148,2	234,8	10,0	12,6	10,6

<b>Table</b>	<b>45</b>
Analysis	Determination of the percentage of 2-glyceryl monopalmitate
Method	COI/T.20/Doc.n°23/Rev.1
Parameter	2-glyceryl monopalmitate
Unit	%
Final result rounded to	1 decimal place

A: Extra virgin olive oil

B: Lampante virgin olive oil

C: Refined olive oil

D: Refined olive oil + re-esterified oil (90:10)

E: Refined olive oil + re-esterified oil (80:20)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	12	12	12	12	12
<b>outliers</b>	0	0	0	0	0
<b>mean</b>	0,5	0,8	0,9	1,8	2,8
<b>r</b>	0,11	0,11	0,17	0,10	0,26
<b>S<sub>r</sub></b>	0,04	0,04	0,06	0,04	0,09
<b>RSD<sub>r</sub>(%)</b>	8,9	5,4	6,8	2,0	3,3
<b>R</b>	0,14	0,27	0,26	0,56	0,86
<b>S<sub>R</sub></b>	0,05	0,10	0,09	0,20	0,31
<b>RSD<sub>R</sub>(%)</b>	11,1	12,7	10,2	11,1	10,9

<b>Table</b>	<b>46</b>
Analysis	Determination of biophenols in olive oils by HPLC
Method	COI/T.20/Doc.n°29/Rev.1
Parameter	Biophenols - Ring Test COI 2008
Unit	mg/kg
Final result rounded to	no decimal

A: Extra virgin olive oil (Italy)

B : Extra virgin olive oil (Spain)

C : Extra virgin olive oil (Tunisia)

D : Extra virgin olive oil (Slovenia)

E : Extra virgin olive oil (Greece)

R : Extra virgin olive oil (Italy)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>R</b>
<b>n</b>	17	17	17	17	17	17
<b>outliers</b>	3	3	1	2	2	2
<b>mean</b>	694	573	153	343	297	301
<b>r</b>	29	36	18	24	22	17
<b>S<sub>r</sub></b>	10,4	12,7	6,4	8,7	7,7	6,2
<b>RSD<sub>r</sub>(%)</b>	1,5	2,2	4,2	2,5	2,6	2,1
<b>R</b>	100,8	83,7	59,6	62,7	77,0	32,2
<b>S<sub>R</sub></b>	36,0	29,9	21,3	22,4	27,5	11,5
<b>RSD<sub>R</sub>(%)</b>	5,2	5,2	14,0	6,5	9,3	3,8

<b>Table</b>	<b>47</b>
Analysis	Determination of free acidity, cold method
Method	COI/T.20/Doc.n°34/Rev.1
Parameter	Acidity - Ring Test COI 2014-2015
Unit	% of oleic acid
Final result rounded to	2 decimal place if $\leq 1$ ; 1 decimal place if $> 1$

A: Crude olive pomace oil

B : Refined olive pomace oil

C : Refined olive oil

D : Extra virgin olive oil (Mario Solinas 2011)

E : Extra virgin olive oil (Mario Solinas 2014)

F : 70% Lampante olive oil + 30% Grape Seed oil

G : Extra virgin olive oil from late harvest

H : 90% Lampante olive oil + 10% palm olein

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

Table	<b>48</b>
Analysis	Determination of the peroxide value
Method	COI/T.20/Doc.n°35/Rev.1
Parameter	Peroxide value - Ring Test COI 2016
Unit	meqO <sub>2</sub> /kg
Final result rounded to	1 decimal place if ≤ 20 ; no decimal if > 20

A: 70% Lampante Olive Oil + 30% Grape Seed Oil      E : 50% Extra virgin olive oil + 10% refined sunflower oil

B : 90% Lampante olive oil + 10% palm olein

C : Extra virgin olive oil

D : Olive oil

E : Extra virgin olive oil (ripe fruitiness)

F : Extra virgin olive oil

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

Table	<b>49</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Myristic acid C14:0 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	0	0	1	1	3
<b>mean</b>	0,01	0,01	0,01	0,01	0,02
<b>r</b>	0,005	0,007	0,012	0,011	0,006
<b>S<sub>r</sub></b>	0,002	0,003	0,004	0,004	0,002
<b>RSD<sub>r</sub>(%)</b>	20	20	36	38	11
<b>R</b>	0,011	0,017	0,017	0,013	0,016
<b>S<sub>R</sub></b>	0,004	0,006	0,006	0,005	0,006
<b>RSD<sub>R</sub>(%)</b>	45	47	52	42	32

<b>Table</b>	<b>50</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Palmitic acid C16:0 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

- A: Extra virgin olive oil  
 B: Virgin olive oil  
 C: Lampante olive oil  
 D: Olive oil  
 E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	2	3	1	0	0
<b>mean</b>	7,96	10,32	10,35	10,51	9,67
<b>r</b>	0,12	0,18	0,42	0,29	0,38
<b>S<sub>r</sub></b>	0,04	0,06	0,15	0,1	0,14
<b>RSD<sub>r</sub>(%)</b>	0,5	0,6	1,5	1,000	1,4
<b>R</b>	0,68	0,44	0,93	1,3	1,3
<b>S<sub>R</sub></b>	0,24	0,16	0,33	0,46	0,45
<b>RSD<sub>R</sub>(%)</b>	3,0	1,5	3,2	4,4	4,7

<b>Table</b>	<b>51</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Palmitoleic acid C16:1- Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

- A: Extra virgin olive oil  
 B: Virgin olive oil  
 C: Lampante olive oil  
 D: Olive oil  
 E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	0	2	0	1	1
<b>mean</b>	0,50	0,68	0,74	0,91	0,64
<b>r</b>	0,041	0,027	0,074	0,034	0,040
<b>S<sub>r</sub></b>	0,014	0,01	0,026	0,012	0,014
<b>RSD<sub>r</sub>(%)</b>	2,9	1,4	3,6	1,3	2,3
<b>R</b>	0,966	0,077	0,132	0,123	0,128
<b>S<sub>R</sub></b>	0,034	0,027	0,047	0,44	0,046
<b>RSD<sub>R</sub>(%)</b>	6,8	4,1	6,4	4,9	7,2

<b>Table</b>	<b>52</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Heptadecanoic acid C17:0 - from 2000-2006 recognition data
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	25	25	25	25	25
<b>outliers</b>	1	1	1	2	2
<b>mean</b>	0,18	0,06	0,11	0,14	0,12
<b>r</b>	0,013	0,011	0,010	0,009	0,009
<b>S<sub>r</sub></b>	0,005	0,004	0,004	0,003	0,003
<b>RSD<sub>r</sub>(%)</b>	2,7	6,9	3,1	2,3	2,7
<b>R</b>	0,020	0,021	0,024	0,021	0,027
<b>S<sub>R</sub></b>	0,007	0,007	0,009	0,008	0,010
<b>RSD<sub>R</sub>(%)</b>	4,1	12,6	7,7	5,2	7,8

<b>Table</b>	<b>53</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Heptadecenoic acid C17:1 - from 2000-2006 recognition data
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	29	29	29	29	29
<b>outliers</b>	3	2	2	3	2
<b>mean</b>	0,26	0,09	0,24	0,22	0,19
<b>r</b>	0,010	0,010	0,014	0,013	0,012
<b>S<sub>r</sub></b>	0,004	0,004	0,005	0,005	0,004
<b>RSD<sub>r</sub>(%)</b>	1,4	3,8	2,0	2,2	2,2
<b>R</b>	0,031	0,027	0,041	0,030	0,031
<b>S<sub>R</sub></b>	0,011	0,010	0,015	0,011	0,011
<b>RSD<sub>R</sub>(%)</b>	4,2	10,6	6,1	4,9	5,8

<b>Table</b>	<b>54</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Stearic acid C18:0 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

- A: Extra virgin olive oil  
 B: Virgin olive oil  
 C: Lampante olive oil  
 D: Olive oil  
 E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	2	0	0	0	1
<b>mean</b>	2,88	2,49	2,62	3,49	3,12
<b>r</b>	0,089	0,034	0,084	0,094	0,107
<b>S<sub>r</sub></b>	0,032	0,012	0,030	0,034	0,038
<b>RSD<sub>r</sub>(%)</b>	1,1	0,5	1,1	1,0	1,2
<b>R</b>	0,171	0,259	0,246	0,367	0,328
<b>S<sub>R</sub></b>	0,061	0,092	0,088	0,131	0,117
<b>RSD<sub>R</sub>(%)</b>	2,1	3,7	3,4	3,8	3,8

<b>Table</b>	<b>55</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Oleic acid C18:1 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

- A: Extra virgin olive oil  
 B: Virgin olive oil  
 C: Lampante olive oil  
 D: Olive oil  
 E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	0	0	1	1	0
<b>mean</b>	79,42	74,55	75,55	76,14	75,8
<b>r</b>	0,42	0,30	0,39	0,23	0,46
<b>S<sub>r</sub></b>	0,15	0,11	0,14	0,08	0,16
<b>RSD<sub>r</sub>(%)</b>	0,2	0,2	0,2	0,1	0,2
<b>R</b>	1,37	1,26	1,26	1,33	1,80
<b>S<sub>R</sub></b>	0,49	0,45	0,45	0,47	0,64
<b>RSD<sub>R</sub>(%)</b>	0,6	0,6	0,6	0,6	0,9

<b>Table</b>	<b>56</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Linoleic acid C18:2 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>N</b>	15	15	15	15	15
<b>Outliers</b>	2	1	0	1	0
<b>Mean</b>	7,33	9,66	8,52	7,18	8,75
<b>r</b>	0,07	0,08	0,17	0,12	0,13
<b>S<sub>r</sub></b>	0,02	0,03	0,06	0,04	0,05
<b>RSD<sub>r</sub>(%)</b>	0,3	0,3	0,7	0,6	0,6
<b>R</b>	0,34	0,52	0,50	0,45	0,59
<b>S<sub>R</sub></b>	0,12	0,19	0,18	0,16	0,21
<b>RSD<sub>R</sub>(%)</b>	1,7	1,9	2,1	2,2	2,4

<b>Table</b>	<b>57</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Linolenic acid C18:3 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	2	0	0	0	4
<b>mean</b>	0,73	0,90	0,86	0,74	0,75
<b>r</b>	0,036	0,049	0,029	0,039	0,055
<b>S<sub>r</sub></b>	0,013	0,017	0,010	0,014	0,020
<b>RSD<sub>r</sub>(%)</b>	1,8	1,9	1,2	1,9	2,6
<b>R</b>	0,08	0,1	0,101	0,079	0,115
<b>S<sub>R</sub></b>	0,029	0,041	0,036	0,028	0,041
<b>RSD<sub>R</sub>(%)</b>	3,9	4,6	4,2	3,8	5,4

<b>Table</b>	<b>58</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Arachidic acid C20:0 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

- A: Extra virgin olive oil  
 B: Virgin olive oil  
 C: Lampante olive oil  
 D: Olive oil  
 E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	1	0	0	1	0
<b>mean</b>	0,39	0,44	0,44	0,42	0,43
<b>r</b>	0,041	0,050	0,037	0,037	0,053
<b>S<sub>r</sub></b>	0,015	0,018	0,013	0,013	0,019
<b>RSD<sub>r</sub>(%)</b>	3,8	4,0	3,0	3,1	4,4
<b>R</b>	0,080	0,089	0,086	0,117	0,102
<b>S<sub>R</sub></b>	0,029	0,032	0,031	0,042	0,036
<b>RSD<sub>R</sub>(%)</b>	7,3	7,2	7,0	9,8	8,6

<b>Table</b>	<b>59</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Eicosenoic acid C20:1 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

- A: Extra virgin olive oil  
 B: Virgin olive oil  
 C: Lampante olive oil  
 D: Olive oil  
 E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	1	1	1	0	1
<b>mean</b>	0,37	0,39	0,37	0,28	0,30
<b>r</b>	0,026	0,032	0,036	0,047	0,073
<b>S<sub>r</sub></b>	0,009	0,011	0,013	0,017	0,026
<b>RSD<sub>r</sub>(%)</b>	7,8	3,0	3,5	6,0	8,9
<b>R</b>	0,082	0,095	0,064	0,079	0,077
<b>S<sub>R</sub></b>	0,029	0,034	0,023	0,028	0,027
<b>RSD<sub>R</sub>(%)</b>	7,9	8,7	6,2	10,0	9,3

<b>Table</b>	<b>60</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Behenic acid C22:0 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	0	1	1	1	3
<b>mean</b>	0,11	0,14	0,14	0,12	0,19
<b>r</b>	0,022	0,036	0,039	0,045	0,036
<b>S<sub>r</sub></b>	0,008	0,013	0,014	0,016	0,013
<b>RSD<sub>r</sub>(%)</b>	7,0	9,6	10,0	14,0	6,9
<b>R</b>	0,038	0,044	0,050	0,056	0,043
<b>S<sub>R</sub></b>	0,014	0,016	0,018	0,020	0,015
<b>RSD<sub>R</sub>(%)</b>	12,0	12,0	13,0	17,0	8,3

<b>Table</b>	<b>61</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	Lignoceric acid C24:0 - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	1	0	0	0	3
<b>mean</b>	0,04	0,06	0,06	0,05	0,08
<b>r</b>	0,017	0,015	0,033	0,033	0,040
<b>S<sub>r</sub></b>	0,006	0,005	0,012	0,012	0,014
<b>RSD<sub>r</sub>(%)</b>	15,0	8,9	20,0	24,0	19,0
<b>R</b>	0,055	0,073	0,072	0,054	0,04
<b>S<sub>R</sub></b>	0,020	0,026	0,026	0,019	0,014
<b>RSD<sub>R</sub>(%)</b>	49,0	42,0	45,0	39,0	19,0

<b>Table</b>	<b>62</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	C18:1 trans - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	1	1	1	1	2
<b>mean</b>	0,01	0,01	0,01	0,01	0,12
<b>r</b>	0,011	0,013	0,008	0,013	0,044
<b>S<sub>r</sub></b>	0,004	0,005	0,003	0,005	0,016
<b>RSD<sub>r</sub>(%)</b>	38,0	46,0	27,0	45,0	13,2
<b>R</b>	0,027	0,028	0,030	0,032	0,157
<b>S<sub>R</sub></b>	0,010	0,010	0,011	0,011	0,056
<b>RSD<sub>R</sub>(%)</b>	96,0	86,0	100,0	89,0	48,0

<b>Table</b>	<b>63</b>
Analysis	Determination of fatty acid methyl esters by gas chromatography
Method	COI/T.20/Doc. n° 33/ Rev.1
Parameter	C18:2 trans + C18:3 trans - Ring Test COI 2015
Unit	%
Final result rounded to	2 decimal place

A: Extra virgin olive oil

B: Virgin olive oil

C: Lampante olive oil

D: Olive oil

E: Crude olive pomace oil

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>n</b>	15	15	15	15	15
<b>outliers</b>	3	3	4	2	3
<b>mean</b>	0,01	0,01	0,01	0,01	0,03
<b>r</b>	0,013	0,014	0,006	0,029	0,017
<b>S<sub>r</sub></b>	0,005	0,005	0,002	0,010	0,006
<b>RSD<sub>r</sub>(%)</b>	84,0	50,0	28,0	115,0	24,0
<b>R</b>	0,019	0,022	0,018	0,032	0,059
<b>S<sub>R</sub></b>	0,007	0,008	0,006	0,012	0,021
<b>RSD<sub>R</sub>(%)</b>	123,0	79,0	81,0	130,0	83,0

**3. References**

ISO 5725 – Accuracy (trueness and precision) of measurement methods and results – Part 1: General principles and definitions.

ISO 5725 - Accuracy (trueness and precision) of measurement methods and results - Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.

ISO 5725 – Accuracy (trueness and precision) of measurement methods and results – Part 5: Alternative methods for the determination of the precision of a standard measurement method.

ISO 5725 – Accuracy (trueness and precision) of measurement methods and results – Part 6: Use in practice of accuracy values.

AOAC - Statistical Manual of the Association of Official Analytical Chemists. W.J. Youden. E.H. Steiner