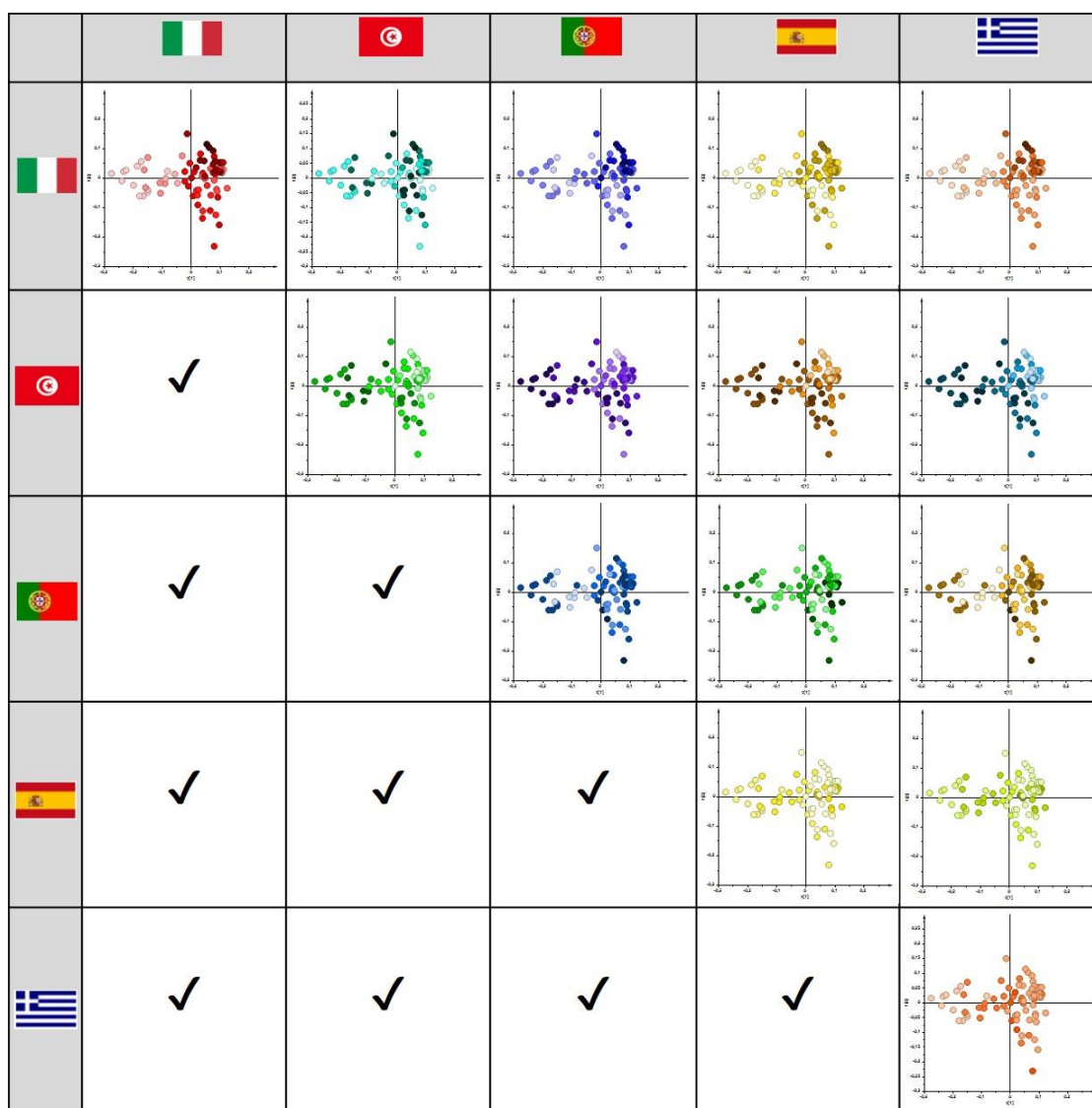


# Supplementary

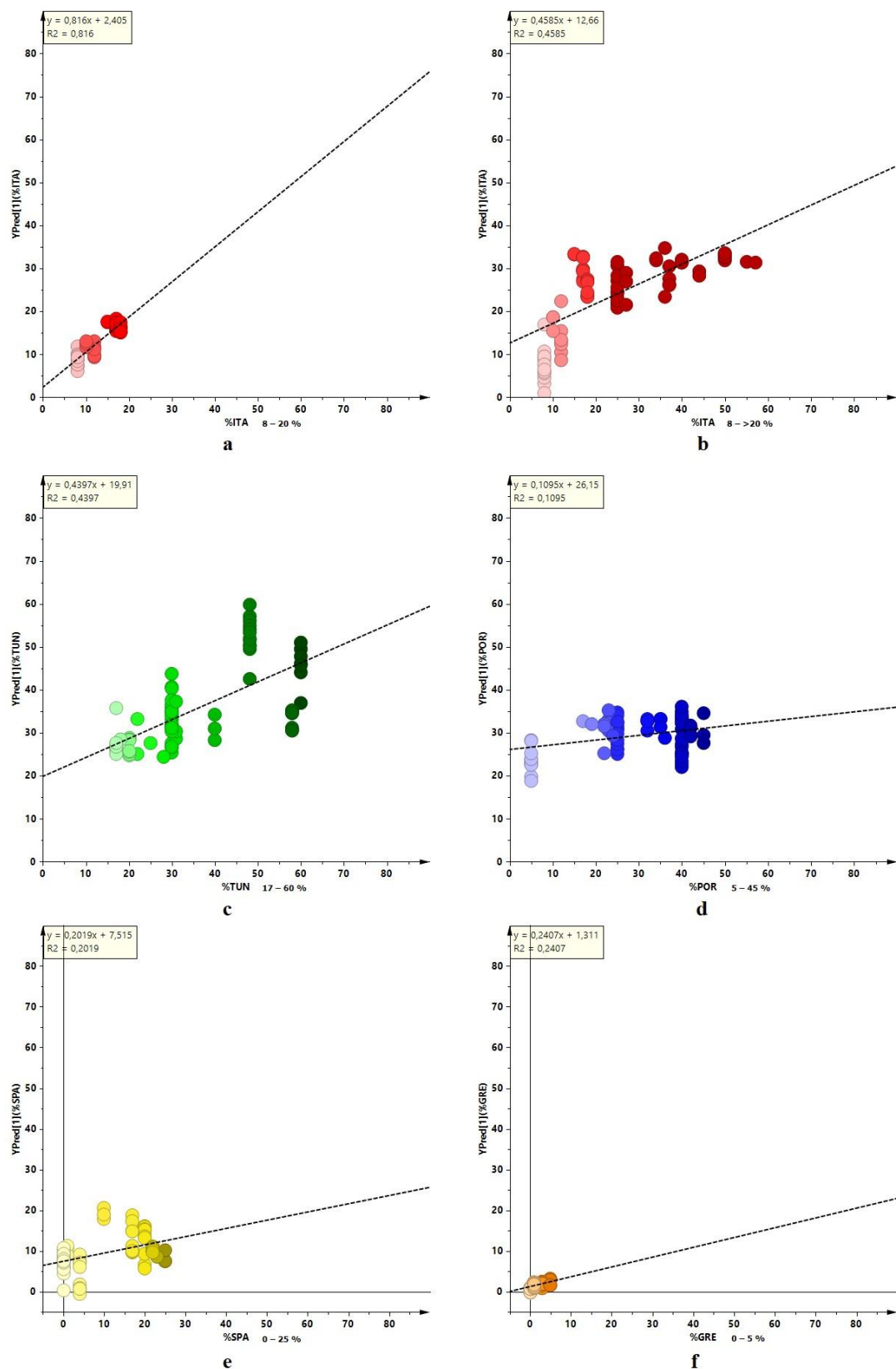
## <sup>1</sup>H-NMR Profiling Shows as Specific Constituents Strongly Affect the International EVOO Blends Characteristics: The Case of the Italian Oil

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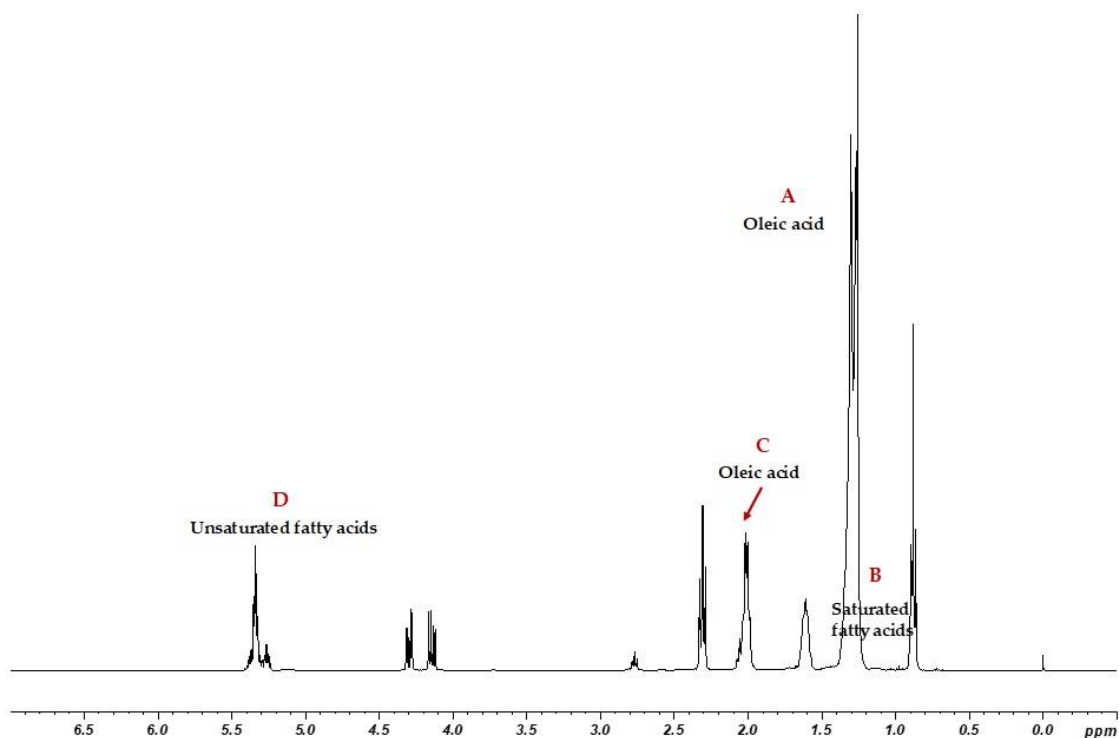
**Figure S1:** Score plot of the PCA model of <sup>1</sup>H-NMR standard experiment data for samples of studied organic EU community and non-community oil showing the samples colour coding according to the increased percentages of the specific considered oil(s); 3 components model R<sup>2</sup>X = 0.854, Q<sup>2</sup> = 0.773.

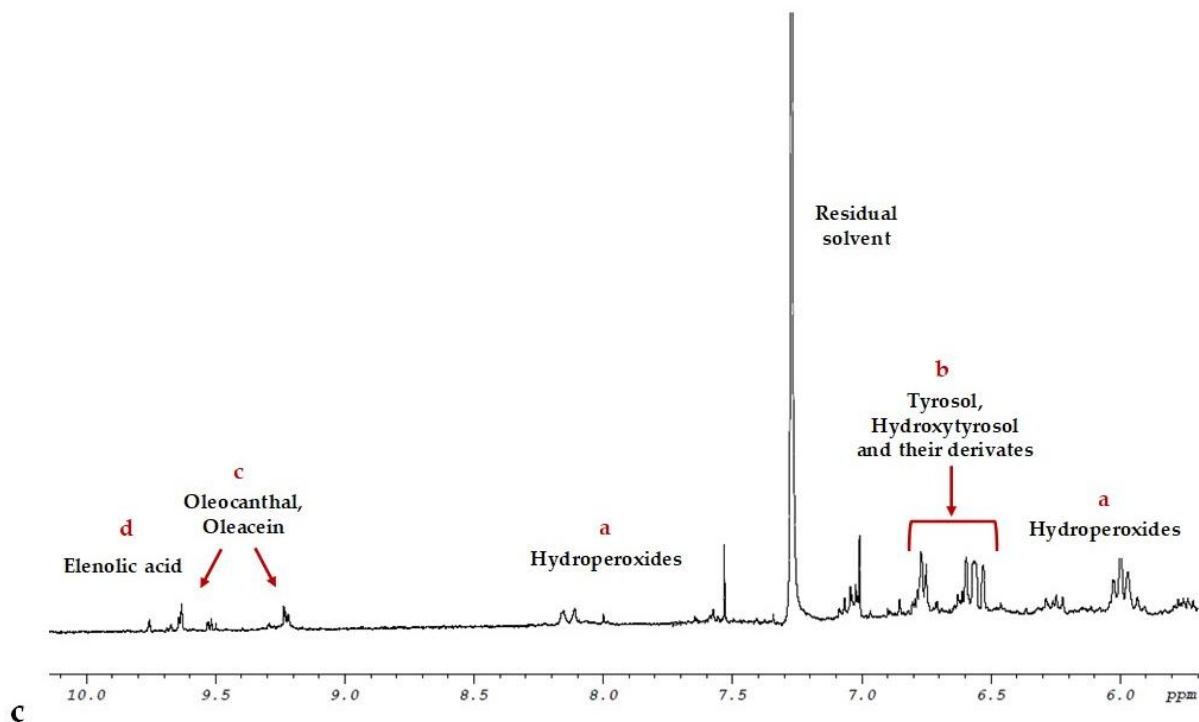


**Figure S2:** Partial least squares regression (PLSR) model for considered organic European community and non-community extra virgin olive oil (EVOO) blend samples as a function of the percentage of Italian oil calculated for the specific range 8-20% (a) and full range (b) ITA, and the correlations observed for all the other countries for full range percentages range: Tunisia (c), Portugal (d), Spain (e), Greece (f).

Signal	Compound	Chemical shift (ppm)	Functional group
<b>Major component</b>			
<b>A</b>	Oleic acid	1.03	$-CH_2-$
<b>B</b>	Saturated fatty acids	1.26	$-CH_2-$
<b>C</b>	Oleic acid	2.02	$-CH_2-CH=CH-$
<b>D</b>	Unsaturated fatty acids	5.34	$-CH=CH-$
<b>Minor component</b>			
<b>a</b>	(Z, E) and (E, E) conjugated double bonds associated with hydroperoxidizers (OOH)	5.7 5.74 6.58	$CH=CH-CH=CH-$
<b>b</b>	Tyrosol, Hydroxytyrosol and their derivatives	6.78	$-CH= (C-7)$
<b>c</b>	Oleocanthal (p-HPEA-EDA)	9.22	$-CHO$
<b>d</b>	Elenolic acid	9.62	$-CHO$

**a**





**Figure S3:** (a) Table of chemical shifts assignment of the <sup>1</sup>H-NMR signals of some compounds considered as major and minor molecular components of studied international EVOOs blends. The signal letters agree with those given in Figure S3 (b) and (c). (b) Representative zg <sup>1</sup>H-NMR spectra of EVOO sample. Main metabolites considered on this work are indicated. (c) Representative noesygpps <sup>1</sup>H-NMR spectra of EVOO sample. Main metabolites considered on this work are indicated.

N°	International EVOO Blends	Harvest Years	Oleic	Linoleic	Linolenic	Saturated
1	8%ITA_48%TUN_40%POR_4%SPA	2017/18	66.3	14.9	0.8	19.3
2	8%ITA_48%TUN_40%POR_4%SPA	2017/18	66.8	14.5	0.8	19.3
3	8%ITA_48%TUN_40%POR_4%SPA	2017/18	69.0	13.7	0.7	18.0
4	8%ITA_48%TUN_40%POR_4%SPA	2017/18	64.8	15.9	0.8	20.0
5	8%ITA_48%TUN_40%POR_4%SPA	2017/18	67.0	14.5	0.8	19.0
6	8%ITA_48%TUN_40%POR_4%SPA	2017/18	68.3	14.1	0.8	18.6
7	8%ITA_48%TUN_40%POR_4%SPA	2017/18	68.1	14.1	0.9	18.6
8	8%ITA_48%TUN_40%POR_4%SPA	2017/18	71.2	12.4	0.8	17.1
9	8%ITA_48%TUN_40%POR_4%SPA	2017/18	68.1	14.1	0.8	18.6
10	8%ITA_48%TUN_40%POR_4%SPA	2018/19	67.7	14.7	0.9	18.4
11	8%ITA_48%TUN_40%POR_4%SPA	2018/19	66.7	14.9	0.9	19.2
12	8%ITA_48%TUN_40%POR_4%SPA	2018/19	67.2	14.3	0.8	19.3
13	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	69.8	13.3	0.9	17.6
14	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	70.4	12.9	0.8	17.3
15	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	69.2	13.7	0.8	17.9
16	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	67.3	14.4	1.0	19.2
17	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	68.8	13.6	0.9	18.5
18	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	73.2	11.1	0.9	16.4
19	12%ITA_60%TUN_5%POR_20%SPA_3%GRE	2018/19	68.8	13.9	0.9	18.0
20	10%ITA_30%TUN_45%POR_10%SPA_5%GRE	2018/19	69.9	13.2	1.0	17.7
21	10%ITA_30%TUN_45%POR_10%SPA_5%GRE	2018/19	71.2	12.4	1.0	17.1
22	10%ITA_30%TUN_45%POR_10%SPA_5%GRE	2018/19	71.2	12.4	0.9	17.1
23	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	71.9	13.5	1.0	15.3
24	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	71.8	13.7	0.9	15.3

25	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	71.8	13.6	0.9	15.4
26	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	71.9	13.5	0.9	15.4
27	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	73.4	11.9	0.9	15.4
28	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	72.3	12.4	0.9	16.1
29	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	73.4	11.8	0.9	15.4
30	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	74.4	11.0	0.9	15.3
31	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	74.4	10.9	1.0	15.3
32	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	72.7	12.1	0.9	16.0
33	17%ITA_30%TUN_25%POR_25%SPA_3%GRE	2018/19	74.3	11.1	0.9	15.3
34	17%ITA_30%TUN_25%POR_25%SPA_3%GRE	2018/19	74.3	11.1	0.9	15.3
35	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	75.4	10.4	0.9	14.7
36	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	75.8	10.5	0.9	14.3
37	25%ITA_30%TUN_25%POR_17%SPA_3%GRE	2018/19	74.9	10.5	0.8	15.4
38	15%ITA_22%TUN_35%POR_25%SPA_3%GRE	2018/19	76.4	9.9	0.9	14.3
39	15%ITA_20%TUN_40%POR_23%SPA_3%GRE	2018/19	77.0	9.4	0.9	14.2
40	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	75.0	10.8	0.9	15.0
41	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	76.5	9.8	0.8	14.4
42	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	76.5	9.9	0.8	14.4
43	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	74.9	11.0	0.8	15.0
44	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	74.9	10.9	0.8	15.0
45	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	75.0	10.9	0.9	15.0
46	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	76.6	9.7	0.9	14.4
47	17%ITA_20%TUN_40%POR_22%SPA_1%GRE	2019/20	76.5	9.8	0.9	14.4
48	27%ITA_31%TUN_40%POR_1%SPA_1%GRE	2019/20	71.5	12.7	0.9	16.5
49	27%ITA_31%TUN_40%POR_1%SPA_1%GRE	2019/20	74.2	11.6	0.9	14.8
50	27%ITA_31%TUN_40%POR_1%SPA_1%GRE	2019/20	74.1	11.4	0.9	15.4
51	18%ITA_58%TUN_23%POR_1%GRE	2019/20	73.7	11.5	0.9	15.4
52	18%ITA_58%TUN_23%POR_1%GRE	2019/20	74.0	11.1	0.9	15.7
53	18%ITA_58%TUN_23%POR_1%GRE	2019/20	73.8	11.4	0.9	15.4
54	18%ITA_58%TUN_23%POR_1%GRE	2019/20	72.2	12.0	0.9	16.3
55	18%ITA_58%TUN_23%POR_1%GRE	2019/20	72.2	12.1	0.8	16.3
56	18%ITA_58%TUN_23%POR_1%GRE	2019/20	72.2	12.1	0.9	16.3
57	18%ITA_58%TUN_23%POR_1%GRE	2019/20	72.2	12.1	0.9	16.3
58	37%ITA_40%TUN_22%POR_1%GRE	2020/21	76.2	10.3	0.8	14.4
59	37%ITA_40%TUN_22%POR_1%GRE	2020/21	76.0	10.2	0.8	14.7
60	37%ITA_40%TUN_22%POR_1%GRE	2020/21	75.0	9.5	0.7	16.5
61	50%ITA_30%POR_17%TUN_1%GRE	2020/21	75.3	10.6	0.8	14.8
62	50%ITA_17%TUN_32%POR_1%GRE	2020/21	74.1	11.8	0.8	14.9
63	50%ITA_17%TUN_32%POR_1%GRE	2020/21	76.2	10.2	0.8	14.4
64	50%ITA_17%TUN_32%POR_1%GRE	2020/21	76.2	10.3	0.8	14.5
65	50%ITA_17%TUN_32%POR_1%GRE	2020/21	76.1	10.4	0.8	14.5
66	34%ITA_30%TUN_35%POR_1%GRE	2020/21	76.5	10.0	0.8	14.3
67	34%ITA_30%TUN_35%POR_1%GRE	2020/21	75.7	10.4	0.8	14.6
68	36%ITA_28%TUN_35%POR_1%GRE	2020/21	76.3	10.3	0.8	14.3
69	44%ITA_30%TUN_25%POR_1%GRE	2020/21	74.3	11.1	0.8	15.4
70	44%ITA_30%TUN_25%POR_1%GRE	2020/21	73.7	11.3	0.7	15.7
71	55%ITA_25%TUN_19%POR_1%GRE	2020/21	76.1	10.2	0.8	14.7
72	57%ITA_18%TUN_24%POR_1%GRE	2020/21	76.5	9.2	0.8	15.2
73	40%ITA_17%TUN_42%POR_1%GRE	2020/21	75.6	10.4	0.8	14.9
74	40%ITA_17%TUN_42%POR_1%GRE	2020/21	76.1	10.3	0.8	14.6
75	40%ITA_17%TUN_42%POR_1%GRE	2020/21	75.7	10.4	0.8	14.8
76	37%ITA_22%TUN_36%POR_5%GRE	2020/21	73.7	11.7	0.8	15.7
77	36%ITA_17%TUN_42%POR_5%GRE	2020/21	72.4	11.9	0.9	16.5

Table S1: Fatty acids content calculated for all the 77 commercial international EVOO blends.