

OLIVE OIL STANDARDS AND QUALIFICATIONS

Product Descriptions

Olive oil is the oil obtained solely from the fruit of the olive tree (*Olea europaea* L.), to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds and shall meet the minimum requirements of Table I, found in §52.1539 of these grade standards.

Virgin olive oils are the oils obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions, including thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decantation, centrifugation, and filtration and shall meet the minimum requirements of Table I, found in §52.1539 of these grade standards. No additives of any kind are permitted.

Olive-pomace oil is the oil obtained by treating olive pomace (the product remaining after the mechanical extraction of olive oil) with solvents or other physical treatments, to the exclusion of oils obtained by synthetic processes and mixture with oils of other kinds and shall meet the minimum requirements of Table I, found in §52.1539 of these grade standards. Alpha-tocopherol is permitted to restore natural tocopherol lost in the refining process for refined olive pomace and olive-pomace oil. Maximum level: 200 mg/kg of total alpha-tocopherol is permitted in the final product.

Grades of Olive Oil

Olive oils are graded based on the minimum criteria outlined in Table I, as appropriate. The hierarchy for grades of virgin olive oil is extra-virgin olive oil, virgin olive oil, and virgin olive oil not fit for human consumption (lampante virgin olive oil). Lampante virgin olive oil is the lowest level of quality among the virgin olive oils and must be refined before consumption. Olive oil and refined olive oil fall below the virgin olive oil category in terms of hierarchy.

- (a) **“U.S. Extra Virgin Olive Oil”** is virgin olive oil which has excellent flavor and odor (median of defects equal to zero and median of fruitiness greater than zero) and a free fatty acid content, expressed as oleic acid, of not more than 0.8 grams per 100 grams, and meets the additional requirements as outlined in §52.1539, as appropriate.
- (b) **“U.S. Virgin Olive Oil”** is virgin olive oil which has reasonably good flavor and odor (median of defects between zero and 2.5 and median of fruitiness greater than zero) and a free fatty acid content, expressed as oleic acid, of not more than 2.0 grams per 100 grams, and meets the additional requirements as outlined in §52.1539 as

appropriate. Olive oil that falls into this classification shall not be graded above “U.S. Virgin Olive Oil” (this is a limiting rule).

(c) “U.S. Virgin Olive Oil Not Fit For Human Consumption Without Further Processing”

sometimes designated as “**U.S. Lampante Virgin Olive Oil,**” is virgin olive oil which has poor flavor and odor (median of defects between 2.5 and 6.0 or when the median of defects is less than or equal to 2.5 and the median of fruit is zero), a free fatty acid content, expressed as oleic acid, of more than 2.0 grams per 100 grams, and meets the additional requirements as outlined §52.1539 as appropriate. Olive oil that falls into this classification shall not be graded above “U.S. Virgin Olive Oil Not Fit for Human Consumption Without Further Processing” (this is a limiting rule). It is intended for refining or for purposes other than food use.

(d) “U.S. Olive Oil” is the oil consisting of a blend of refined olive oil and virgin olive oils

fit for consumption **without further processing**. It has a free fatty acid content, expressed as oleic acid, of not more than 1.0 gram per 100 grams, has acceptable odor and flavor characteristic of “virgin olive oil,” and meets the additional requirements as outlined in §52.1539 as appropriate. Olive oil that falls into this classification shall not be graded above “U.S. Olive Oil” (this is a limiting rule). The maximum level permitted of total alpha-tocopherol in the final product is 200 mg/kg.

(e) “U.S. Refined Olive Oil” is the olive oil obtained from virgin olive oils by refining

methods that do not lead to alterations in the initial glyceridic structure (basic glycerin-fatty acid structure). It has a free fatty acid content, expressed as oleic acid, of not more than 0.3 grams per 100 grams, is flavorless and odorless and meets the additional requirements as outlined in §52.1539 as appropriate. Olive oil that falls into this classification shall not be graded above “U.S. Refined Olive Oil” (this is a limiting rule). The addition of alpha-tocopherol is permitted to restore natural tocopherol lost in the refining process. The maximum level is 200 mg/kg of total alpha-tocopherol in the final product.

Grades of Olive-Pomace Oil

Olive-pomace oils are graded based on the minimum criteria outlined in [Table I](#), as appropriate. The hierarchy for grades from highest to lowest is olive-pomace oil, refined olive-pomace oil, and crude olive-pomace oil. Crude olive-pomace oil is the lowest level of quality among the olive- pomace oils and must be refined before consumption. **Olive-pomace oils shall not be labeled as “olive oil.”**

- (a) **“U.S. Olive-pomace Oil”** is the oil comprising a blend of refined olive-pomace oil and virgin olive oils fit for consumption without further processing. It has a free fatty acid content, expressed as oleic acid, of not more than 1.0 gram per 100 grams, acceptable flavor and odor slightly characteristic of olive oil, and meets the additional requirements as outlined in §52.1539, as appropriate. Olive pomace oil that falls into this classification shall not be graded above “U.S. Olive-pomace Oil” (this is a limiting rule).
- (b) **“U.S. Refined Olive-pomace Oil”** is the oil obtained from crude olive-pomace oil by refining methods that do not lead to alterations in the initial glyceridic structure. It has a free fatty acid content, expressed as oleic acid, of not more than 0.3 grams per 100 grams, acceptable flavor and odor, and meets the additional requirements as outlined in §52.1539, as appropriate. Olive-pomace oil that falls into this classification shall not be graded above “U.S. Refined Olive-pomace Oil” (this is a limiting rule).
- (c) **“U.S. Crude Olive-pomace Oil”** is olive-pomace oil that meets the requirements as outlined in §52.1539, as appropriate. Olive oil that falls into this classification shall not be graded above “U.S. Crude Olive-pomace Oil” (this is a limiting rule). It is intended for refining for use for human consumption or for purposes other than food use.

Definition of Terms

- (a) **Fatty Acid Composition.** Fatty acids are the molecular components of fats and oils. Basic percentages of fatty acid types are documented for each oil within a certain range. This determination distinguishes between seed oils and olive oil.
- (b) **Free Fatty Acid Content.** The percent by weight expressed in grams per 100 grams, as oleic acid. The free fatty acid is a measure of the quality of the oil, and reflects the care taken in producing the oil and quality of the in-going fruit.

(C) Peroxide Value. A measure of the oxidation of olive oil expressed as milliequivalents of active oxygen per kilogram of oil.

(D) Absorbency in Ultraviolet (UV). Spectrophotometric test which examines the olive oil and measures the absorption under ultraviolet light. These absorptions are expressed as K (extinction coefficient) for the specified wavelength. The two wave length regions are examined, 232 nanometers (nm) to calculate K232 and 270 nm to calculate K270 and 264-274 nm to calculate delta K (ΔK). This test provides information on the quality of the oil, state of preservation, and changes brought about through processing

(E) Trans Fatty Acid. When oil is partially hydrogenated or refined, *trans* fatty acids form in which hydrogen atoms arrange on opposite sides of the double bond. Olive oil in its natural state does not consist of *trans* fatty acids. This test is used to determine if any processing has taken place such as, deodorization or de-coloring.

Quality Criteria	US Extra Virgin Olive Oil	US Virgin Olive Oil	Lampante Virgin Olive Oil ^{1/}	US Refined Olive Oil	US Olive Oil	US Olive-pomace Oil	US Refined Olive-pomace Oil	US Crude Olive-pomace Oil
(a) Organoleptic Characteristics								
- Odor And Flavor	Excellent	Good	Poor	Acceptable	Good	Good	Acceptable	N/A
- Odor And Flavor (On A Continuous Scale):								
• Median Of Defect (M_d)	$M_d = 0$	$0 < M_d \leq 2.5$	$M_d > 2.5$ ^{2/}	N/A	N/A	N/A	N/A	N/A
• Median Of The Fruity (M_f)	$M_f > 0$	$M_f > 0$	N/A	N/A	N/A	N/A	N/A	N/A
• Color	Yellow To Green	Yellow To Green	Yellow To Green	Light Yellow	Light Yellow To Green	Light Yellow To Green	Light Yellow To Brownish Yellow	Dark Green, Brown, Or Black
(b) Free Fatty Acid Content, % m/m Expressed As Oleic Acid	≤ 0.8	≤ 2.0	> 2.0	≤ 0.3	≤ 1.0	≤ 1.0	≤ 0.3	No limit
(c) Peroxide Value, In Milleq, Peroxide Oxygen Per kg/oil	≤ 20	≤ 20	No Limit	≤ 5	≤ 15	≤ 15	≤ 5	No limit

	US Extra Virgin Olive Oil	US Virgin Olive Oil	Lampante Virgin Olive Oil	US Refined Olive Oil	US Olive Oil	US Olive-pomace Oil	US Refined Olive-pomace Oil	US Crude Olive-pomace Oil
Quality Criteria								
(d) Absorbency In Ultraviolet (UV) (K% 1cm)								
- 270 nm	≤ 0.22	≤ 0.25	N/A	≤ 1.10	≤ 0.90	≤ 1.70	≤ 2.00	N/A
- ΔK	≤ 0.01	≤ 0.01	N/A	≤ 0.16	≤ 0.15	≤ 0.18	≤ 0.20	N/A
- 232 nm	≤ 2.50 ^{6/}	≤ 2.60 ^{6/}	N/A	N/A	N/A	N/A	N/A	N/A
Purity Criteria								
(e) Fatty Acid Composition As Determined By Gas Chromatography (% m/m Methyl Esters)	<ul style="list-style-type: none"> -Arachidic Acid (C20:0) ≤ 0.6^{3/} -Behenic Acid (C22:0) ≤ 0.2^{3/} -Gadoleic Acid (Eicosenoic) (C20:1) ≤ 0.4 -Heptadecanoic Acid (C17:0) ≤ 0.3 -Heptadecenoic Acid (C17:1) ≤ 0.3 -Lignoceric Acid (C24:0) ≤ 0.2 -Linoleic Acid (C18:2) 3.5 – 21.0 -Linolenic Acid (C18:3) ≤ 1.5^{4/} -Myristic Acid (C14:0) ≤ 0.05 -Oleic Acid (C18:1) 55.0 – 83.0 -Palmitoleic Acid (C16:1) 0.3 – 3.5 -Palmitic Acid (C16:0) 7.5 – 20.0 -Stearic Acid (C18:0) 0.5 – 5.0 							
(f) Trans Fatty Acid (T) Content (%) C18:1T ^{5/}	≤ 0.05	≤ 0.05	≤ 0.10	≤ 0.20	≤ 0.20	≤ 0.40	≤ 0.40	≤ 0.20
(g) Trans Fatty Acid Content (%) C18:2T+C18:3T	≤ 0.05	≤ 0.05	≤ 0.10	≤ 0.30	≤ 0.30	≤ 0.35	≤ 0.35	≤ 0.10

Sources: <https://www.ams.usda.gov/grades-standards/olive-oil-and-olive-pomace-oil-grades-and-standards>