

**STATE OF CALIFORNIA**  
**DEPARTMENT OF FOOD AND AGRICULTURE**



**Grade and Labeling Standards**  
**for Olive Oil, Refined-Olive Oil and**  
**Olive-Pomace Oil**

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# CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

## Grade and Labeling Standards for Olive Oil, Refined-Olive Oil and Olive-Pomace Oil

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## 1.0 SCOPE

Pursuant to Chapter 29, Part 2, Division 22 of the California Food and Agricultural Code (section 79800 et seq.) these standards apply to California handlers of olives that are processed into olive oils, refined-olive oils and olive-pomace oils in the amount of 5,000 gallons or more during the period beginning July 1 through June 30 of any year and who sell their oils into the commercial channels of trade. Handlers who process and/or market less than 5,000 gallons of olive oil during any year defined above are deemed to be engaged in casual sales of olive oil and are not subject to these standards.

These standards:

- (a) define grades of olive oils, refined-olive oils and olive-pomace oils;
- (b) specify purity parameters and quality parameters for these grades;
- (c) establishes requirements for labeling and packaging; and
- (d) list acceptable methods of analysis.

## 2.0 OBJECTIVE

The purpose of these standards are to:

- (a) ensure the quality of oil produced from olives in California,
- (b) enhance the continued growth of olive oil production through greater consumer and trade confidence in the consistent, high quality of California olive oils, and
- (c) provide the producers, handlers, buyers and consumers of California oil with reliable and trustworthy information concerning the quality and grade of the product.

## 3.0 PRODUCT DESCRIPTION AND DEFINITIONS

### 3.1 OLIVE OIL

Olive oil is the oil obtained solely from the fruit of the olive tree (*Olea europaea L.*), solely by mechanical or other physical means under conditions, including thermal conditions, that do not lead to alterations in the oil, and which has not undergone any treatment other than washing, crushing, malaxing, decantation, pressing, centrifugation, and filtration and to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds.

### 3.2 REFINED-OLIVE OIL

Refined-olive oil is oil obtained from olive oil by refining methods including but not limited to; degumming, neutralization, bleaching, and/or deodorization that do not lead to alterations in the initial glyceridic structure (basic glycerin-fatty acid structure) and to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds.

### 3.3 OLIVE-POMACE OIL

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 or by re-esterification processes and mixture with oils of other kinds.

### 3.4 REFINED OLIVE-POMACE OIL

Refined olive-pomace oil is the oil obtained from crude olive-pomace oil by refining methods including but not limited to; degumming, neutralization, bleaching, and/or deodorization that do not lead to alterations in the initial glyceridic structure (basic glycerin-fatty structure) and to the exclusion of oils obtained by synthetic processes or by re-esterification processes any mixture with oils of other kinds.

## 4.0 GRADES OF OLIVE OIL, REFINED-OLIVE OIL, AND OLIVE-POMACE OIL

### 4.1 GRADES OF OLIVE OIL

Olive oils are graded based on the criteria outlined in these standards, as appropriate. The hierarchy for grades of olive oil is extra virgin olive oil, virgin olive oil, and crude olive oil.

**4.1.1 Extra Virgin Olive Oil** is olive oil that has a free acidity, expressed as free oleic acid, of not more than 0.5 grams per 100 grams, a median of defects equal to 0, and the other characteristics which correspond to the limits fixed for this grade in these standards. Extra Virgin olive oil is fit for consumption without further processing.

**4.1.2 Virgin Olive Oil** is olive oil that has a free acidity, expressed as free oleic acid, of not more than 1.0 grams per 100 grams, a median of defects equal to or less than 2.5, and the other characteristics which correspond to the limits fixed for this grade in these standards. Virgin olive oil is fit for consumption without further processing.

**4.1.3 Crude Olive Oil** is olive oil that has a free acidity, expressed as free oleic acid, of more than 1.0 grams per 100 grams or a median of defects greater than 2.5 and other characteristics which correspond to those fixed for this grade in these standards. Crude olive oil is not fit for human consumption without further processing and is intended to be used for refining or for technical use. **NOTE: These criteria are not required to be concurrent for crude olive oil, one is sufficient.**

## 4.2 GRADES OF REFINED-OLIVE OIL

Refined-olive oils are graded based on the criteria outlined in these standards as appropriate. The hierarchy of grades from highest to lowest is refined-olive oil blend and refined-olive oil. Refined-olive oil blend and refined-olive oil fall below the olive oil category but above the olive-pomace category in terms of hierarchy.

**4.2.1 Refined-Olive Oil Blend Composed of refined-olive oil and virgin (or extra virgin) olive oil** is composed of refined-olive oil and olive oil fit for consumption without further processing. It has a free acidity, expressed as free oleic acid, of not more than 0.8 grams per 100 grams, a median of defects equal to or less than 2.5, and its other characteristics correspond to those fixed for this grade in these standards. Refined-olive oil blend shall not be labeled as “olive oil”. The addition of alpha-tocopherol is permitted.

**4.2.2 Refined-Olive Oil** is oil obtained from olive oil by refining methods including deodorization that do not lead to alterations in the initial glyceridic structure. Refined-olive oils have a free acidity, expressed as free oleic acid, of not more than 0.3 grams per 100 grams, and other characteristics that correspond to those fixed for this grade in these standards.

## 4.3 GRADES OF OLIVE-POMACE OIL

Olive-pomace oils are graded below the quality of olive oil and refined-olive oil. Olive-pomace oils are graded based on the minimum criteria outlined in table 1, as appropriate. The hierarchy for grades from highest to lowest is refined olive-pomace oil blend, refined olive-pomace oil, and crude olive-pomace oil. Crude olive-pomace oil must be refined before consumption. Olive-pomace oils shall not be labeled as “olive oil”. Olive-pomace oils fall below both olive oil and refined olive oil in terms of hierarchy.

**4.3.1 Refined Olive-Pomace Oil Blend Composed of refined olive-pomace oil and virgin (or extra virgin) olive oils** is the oil composed of a blend of refined olive-pomace oil and olive oils fit for consumption without further processing. It has a free acidity, expressed as oleic acid of not more than 0.8 grams per 100 grams, a median of defects equal to or less than 2.5, and its other characteristics correspond to those fixed for this grade in these standards.

**4.3.2 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 acidity expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other characteristics correspond to those fixed for this grade in these standards.

**4.3.3 Crude Olive-Pomace Oil** is the olive-pomace oil whose characteristics correspond to those fixed in these standards. Olive pomace-oil that falls into this classification shall not be graded above “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.

## 5.0 DEFINITIONS OF TERMS

For the purpose of these standards the following definitions apply.

- 5.1 Absorbency in Ultraviolet (UV).** Spectrophotometric test which examines the oil and measures the absorption under ultraviolet light. These absorptions are expressed as K (extinction coefficient) for the specified wavelength. The wave regions examined, 232 nanometers (nm) to calculate K<sub>232</sub> and 270 nm to calculate K<sub>270</sub> and 264-274 to calculate delta K ( $\Delta K$ ). This test provides information on the quality of the oil, state of preservation, and changes brought through processing.
- 5.2 Apparent  $\beta$ -sitosterol.** The sum of the concentrations of  $\beta$ -sitosterol,  $\Delta$ -5avenasterol,  $\Delta$ -5,23-stigmastadienol,  $\Delta$ -5,24-stigmastadienol, clerosterol, and sitostanol.
- 5.3 Aroma.** A volatilized chemical compound that is perceived by olfaction.
- 5.4 Cold pressed.** Olive oil obtained by pressing crushed olives with a mechanical, hydraulic, or centrifugal press at a temperatures that does not lead to significant thermal alterations.
- 5.5 Cold extracted.** Olive oil obtained by separating the oil by any mechanical or other physical means at a temperature that does not lead to significant thermal alterations.
- 5.6 Desmethylsterol Composition.** A test used to indicate the origin and purity of the Oil, reported as Total Sterols.
- 5.7 Diacylglycerol (DAG).** A glyceride consisting of two fatty acids chains covalently bonded to a glycerol molecule through ester linkages. In mechanically extracted olive oils, DAGs are present in a range of 1% to 3% and they are found as 1,2- and 1,3- isomers.
- 5.8 Equivalent Carbon Number 42 (ECN 42).** The determination of the difference between the actual Equivalent Carbon Number triacylglycerol content of the oil molecules determined by High Performance Liquid Chromatography (HPLC) and the theoretical amount of ECN 42 triacylglycerol using fatty acid composition. It is used for the detection of seed oils and verifies authenticity and origin of oils.
- 5.9 Erythrodiol and Uvaol.** Two triterpene dialcohol components found in olive oil and olive-pomace oil. The levels present differentiate oils that were physically extracted from oils that were produced by solvent extraction.
- 5.10 First extraction.** First mechanical process to separate the oil from the olive paste by centrifugation, decantation, or pressing. This does not include the second mechanical extraction or solvent extraction used to chemically separate the oil remaining in the pomace.
- 5.11 Flavor.** The sensory impression of oil, determined mainly by the senses of taste and smell. Refers to the typical flavor of olive oil produced from olives and the degree of positive or negative attributes as listed in sections 5.17-5.23.

- 5.12 Free fatty acid content/free acidity.** Expressed as a percentage by weight of grams per 100 grams, as free 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 the quality of the in-coming fruit.
- 5.13 Handler.** A “Handler” is a person who engages, in this state, in the operation of marketing olive oil that he or she has produced, or purchased or acquired from an olive producer, or that he or she is marketing on behalf of an olive producer, whether as an owner, agent, employee, broker, or otherwise.
- 5.14 Initial glyceridic structure.** The pattern of mono-, di-, and tri-glycerides present in olive oils or crude olive-pomace oils as extracted prior to any refining process.
- 5.15 Lot.** A lot is a quantity of oil contained in one or more vessels that is declared by the handler to have uniform characteristics and that is marked in accordance with section 11.3.8 of these standards.
- 5.16 Malaxing.** Malaxing is the mechanical mixing of the olive paste after crushing of the olives. Malaxing serves to break down emulsions and cell walls in order to facilitate the extraction of the oil.
- 5.17 Median of defects. (Md).** A calculation of the median score of the oils negative flavor and aroma attributes according to the method in section 9.12 or an equivalent method according to section 9.1.
- 5.18 Median of defects-Fusty.** A flavor defect attributable to poor storage conditions usually promoting the bacterial growth of the *Clostridium* and *Pseudomonas* genera.
- 5.19 Median of defects-Muddy-sediment.** A flavor defect caused by the storage of olives in contact with oil sediment for long periods of time giving the oil a putrid flavor and aroma. The resulting oil has moldy aroma.
- 5.20 Median of defects-Musty.** A flavor defect occurring when low temperatures and high humidity promote mold growth, mainly of the *Aspergillus* and *Penicilium* genera.
- 5.21 Median of defects-Rancid.** A flavor defect caused by the oxidation of the oil and subsequent formation of aldehydes during the production process or during storage giving the oil an oxidized flavor and aroma.
- 5.22 Median of defects-Winey-vinegary.** A flavor defect caused by storage condition of the olives that causes aerobic fermentation by the growth of yeasts that produce ethanol, acetic acid, and ethyl acetate.
- 5.23 Median of Fruity (Mf).** A calculation of the median score of the intensity of the positive fruity characteristics of the oil according to the method in section 9.12 or an equivalent method according to section 9.1.
- 5.24 Monopalmitate (2-Glyceryl) content determination.** A test used to determine if oil has been re-esterified by synthetic means or by the addition of animal fat.

- 5.25 Organoleptic analysis.** An analysis based on flavor and aroma characteristics.
- 5.26 Peroxide value.** A measure of the oxidation of oil expressed as milliequivalents of active oxygen per kilogram of oil.
- 5.27 Pressing.** An oil extraction method consisting of pressing the malaxed paste utilizing a hydraulic or centrifugal press.
- 5.28 Producer.** A “Producer” is any person that produces or causes to be produced olives that are processed into olive oil in the amount of 5,000 gallons or more during the marketing season and that shall upon request of the commission provide proof of commodity sale.
- 5.29 Pyropheophytin a.** A degradation product of Chlorophyll a that results from the thermal or age related degradation of the oil.
- 5.30 Refining.** A process in which oil undergoes treatment using but not limited to the following, heat (typically stripping steam) or chemicals (typically caustic soda or sodium carbonate) in combination with heat. Soft Column refining, also sometimes known as deodorization, is a type of refining using lower temperatures under vacuum often used to neutralize flavor and aroma.
- 5.31 Shelf Life.** A date on the container that signifies the end of the period during which the intact package of oil, if stored in accordance with stated storage conditions, will retain any specified qualities for which express or implied claims have been made. Terminology used on packaging can appear as “Best Before”, “Best By”, “Best if Used By”, etc.
- 5.32 Sterols.** A subgroup of steroids with a hydroxyl group at the 3-position of the A-ring. Sterols comprise one of many minor constituents of oils that are characteristic indicators of impurity.
- 5.33 Trans fatty acid.** A group of compounds consisting of all the geometrical isomers of monounsaturated and polyunsaturated fatty acids having one or more non-conjugated carbon-carbon double bond in the trans configuration interrupted by at least one methylene group. As they are not present in olive oil in its natural state their presence indicates if processing such as deodorization or de-coloring has taken place.
- 5.34 Triglyceride.** A major component of oil comprised of an ester of three fatty acids and glycerol, also known as triacylglycerol.
- 5.35 Wax content.** A minor component of olive oil that is found in the skin of the olive fruit.

## 6.0 QUALITY AND PURITY PARAMETERS

- 6.1** The quality parameters and limits for grades of olive oil, refined-olive oil, and olive-pomace oil shall be as set out in Table 1.
- 6.2** The purity parameters of olive oils, refined-olive oils, and olive-pomace oils shall be set out in Tables 2-5.
- 6.3** The limits established for each parameter take account of the precision values of the respective recommended methods of determination specified in section 9.