AVOCADO OIL MONOGRAPH

Persea americana Mill.



This monograph is published by the **School for Aromatic Studies**. No part of this publication may be reproduced in whole or in part, or stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission of the author.

Disclaimer: The information in this monograph is for educational purposes only. The information within is not intended as a substitute for the advice provided by your physician or other medical professional. If you have or suspect that you have a serious health problem, promptly contact your health care provider.

Written by: Jade Shutes ©, Chapel Hill, NC Botanical description & Ethnobotany by: Camille Charlier Image by: ID 31340108 © Rozenn Leard | Dreamstime.com

Avocado

Persea americana Mill.



BOTANICAL INFORMATION

Common names: Avocado Scientific name: Persea americana Mill. Synonym: Persea gratissima Gaertn. Botanical family: Lauraceae Conservation status: Least concern¹

Description: Avocado is a broadleaf evergreen tree in the Lauraceae family native to Mexico, Central America, and South America. *Persea americana* typically grows 30-60 feet tall. Leaves are 4-8 inches long, elliptic-to-ovate, glossy, and dark green. Small greenish-yellow flowers grow on panicles; green-skinned pear-shaped fruits succeed these flowers. Each fruit contains a large central seed or pit enveloped by an edible pulp. Mature fruits ripen off the tree, and the flesh turns buttery and yellow.

P. americana grows best in rich, loose, evenly moist, well-drained soils and full sun. The trees thrive in warm and sunny climates and are somewhat tolerant of light shade but not of frost.

Avocados are vitamin-rich and commonly eaten as a vegetable in salads and guacamole. The genus name comes to us from the Greek name *persea* for an Egyptian tree (*Cordia myxa*), and the specific epithet *americana* means

"of the Americas." The word "avocado" reportedly arises from the Aztec word for "testicles," an apparent riff on the fruit's shape.²

Ethnobotany: Avocados are a dietary staple across Mexico and Central America. According to archaeological records, avocados are one of Mexico's most ancient food plants, dating back to 8000 BCE.

Likewise, avocado leaves, seed oil, seeds, and fruit pulp, have a long history of traditional medicine use. A 16thcentury codex describes avocado's medicinal applications based on observations and interviews with indigenous Aztecs. Tea made from the leaves treated coughs and colds, relieved diarrhea, promoted menstrual flow, and treated hypertension. Topically, leaves were applied to heal bruises. The seed oil was used as an astringent treatment to heal sores, skin eruptions, and scars. The powdered seed was a topical remedy for infected teeth, dandruff, and arthritic pain. Both the Aztecs and the Maya thought the avocado affected reproductive health, either to promote fertility or as an aphrodisiac. The avocado fruit was also eaten for spiritual protection.

In Nigeria, people eat avocado fruit pulp to ease hypertension, body aches, inflammation, and infection. They also eat the ground seed to treat dysentery and whitlows.³

EXTRACTION INFORMATION

Country of origin: Mexico, South America, United States, South Africa, and Austria
Part of plant: Fleshy fruit/pericarp of the fruit
Oil content: 25 - 50%
Extraction method: Solvent extraction, Cold pressing

While most producers have used solvent extraction and high temperatures to extract avocado oil, recent, twentyfirst-century producers have developed a cold-pressing process like that used in olive oil production. Much of the cosmetic industry avocado oil is also refined.⁴

MANUFACTURING INFORMATION

CAS number: 8024-32-6 EC number: 232-428-0 INCI Name: Persea Gratissima (Avocado) Oil CosIng (functions): Skin conditioning

SHELF LIFE & STORAGE

Shelf life: For unrefined avocado oil: Once opened, 6-9 months dependent upon the storage conditions. Can add mixed tocopherols or Rosemary CO2 extract antioxidant to extend shelf life. For refined avocado oil: up to 12 months, dependent upon the storage conditions.

Storage: Store in cool/dark location in dark bottles. Protect from exposure to light, air, moisture, and pests. Avoid extreme temperatures and keep tightly sealed. Solidifies when refrigerated.

NUTRIENT PROFILE

Avocado oil is a monounsaturated oil rich in oleic acid. It also contains appreciable quantities of the saturated fatty acid palmitic acid and the polyunsaturated fatty acid linoleic acid. The green color of the unrefined oil is due to the presence of chlorophyll, which degrades when exposed to sunlight, turning the oil a brown color. The fatty acid composition can vary tremendously depending on the variety and age of the avocado used to produce the oil.⁵

Avocado Oil ^{6, 7, 8, 9}	
Saturated fatty acids	
Palmitic acid (C16:0)	12.16 – 28.21%
Stearic acid (C18:0)	0.24 - 0.98%
Monounsaturated fatty acids	
Oleic acid (C18:1 n-9)	47.20 - 67.69 %
Palmitoleic acid (C16:1 n-7)	1.60 - 12%
Gondoic acid (C20:1 n-9)	0.16 - 1.29%
Polyunsaturated fatty acids	
Linoleic acid (C18:2 n-6)	10.6 - 18.7%
Alpha-linolenic acid (C18:3 n-3)	0.72 - 2.14%
Unsaponifiable fraction 2-11%	
Sterols 2906 - 5955 mg/kg	Beta-sitosterol (73.9 - 3280 mg/kg), campesterol (200 - 770 mg/kg), delta-5-avenasterol (67 - 339 mg/kg), stigmasterol (n.d 496 mg/kg)
Tocopherols 49 – 130 mg/kg	Alpha-tocopherol (40.05 - 130 mg/kg), gamma-tocopherol (3.84 - 20.35 mg/kg), beta-tocopherol (0.82 - 1.57 mg/kg), delta-tocopherol (0.04 - 5 mg/kg)
Pigments	Chlorophyll (13.3 - 73.8 mg/kg), carotenoids (1.9 - 48.7 mg/kg)
Squalene	190 – 1327.33 mg/kg ¹⁰

Formulating with Avocado Oil

Sensory info: Dark green to light green to almost colorless, depending on the processing and refining process. Thick, heavy oil, but very penetrating, easily absorbed.

Absorption rate: Dry – readily absorbs into skin

Dilution: Can be used 5 - 25% in a blend of other carrier oils.

Research

- Dermal application of avocado oil increased collagen synthesis and reduced inflammation during wound healing (*in vivo*).^{11,12}
- Skin readily absorbs refined avocado oil.¹³
- Dermal application of avocado oil can reduce itchiness in the skin.¹⁴



Therapeutic actions: moisturizing, antibacterial, antiwrinkle, antioxidant, cell regenerating

Therapeutic applications:

Avocado is moisturizing, emollient, and penetrates the skin easily. Repeated massage applications with avocado and sesame oils reveal an increase in hydration of the upper layers of the skin and an improvement in the skin's elastic properties.¹⁵

The cosmetic industry values avocado for its skin-penetrating, antibacterial, antiwrinkle, revitalizing, antioxidant, and cell-regenerating properties. It is suitable for all skin types, especially post-menopausal, dry, dehydrated, fragile, mature skin, or skin experiencing premature aging. Avocado oil is also helpful for dry eczema or psoriasis.

The unsaponifiable fraction of avocado oil contributes significantly to its therapeutic properties through its sterol content and other lesser-known molecules. The high chlorophyll and carotenoid content in cold-pressed avocado oil produce its bright or emerald green color, which turns yellow or brown when it oxidizes. Avocado oil can oxidize quickly, so it is vital to protect it from light and oxygen by storing it in dark glass or stainless-steel bottles.¹⁶

References

¹ Wegier, A., Lorea Hernández, F., Contreras, A., Tobón, W. & Mastretta-Yanes, A. (2017). *Persea americana* (errata version published in 2018). The IUCN Red List of Threatened Species 2017: e.T96986556A129765464. Retrieved November 13, 2020, from https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T96986556A96986588.en

² Missouri Botanical Garden. (n.d.). *Persea americana*. Retrieved October 17, 2020, from http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=281661

³ Bauman, H., & Moyer, T. (2017). Food as medicine: Avocado (*Persea americana*, Lauraceae). *HerbalEGram*, *14*(6). Retrieved March 3, 2022, from http://cms.herbalgram.org/heg/volume14/06June/FoodasMedicine_Avocado.html

⁴ Woolf, A., Wong, M., Eyres, L., McGhie, T., Lund, C., Olsson, S, Wang, Y., Bulley, C., Wang, M., Friel, E., & Requejo-Jackman, C. (2009). Avocado oil. In Moreau, R.A. & Kamal-Eldin, A. (Eds.), *Gourmet and health-promoting specialty oils* (pp. 73-125). AOCS Press. https://doi.org/10.1016/B978-1-893997-97-4.50008-5

⁵ Kusmirek, J. (2002). *Liquid sunshine*. Foramicus.

⁶ Flores, M., Saravia, C., Vergara, C.E., Avila, F., Valdés, H., & Ortiz-Viedma, J. (2019). Avocado oil: Characteristics, properties, and applications. *Molecules*, *24*(11), 2172. https://doi.org/10.3390/molecules24112172

⁷ Flores, M.A., Perez-Camino, M.D.C., & Troca, J. (2014). Preliminary studies on composition, quality and oxidative stability of commercial avocado oil produced in Chile. *Journal of Food Science and Engineering, 4*, 21-26.

⁸ Woolf, A., Wong, M., Eyres, L., McGhie, T., Lund, C., Olsson, S, Wang, Y., Bulley, C., Wang, M., Friel, E., & Requejo-Jackman, C. (2009). Avocado oil. In Moreau, R.A. & Kamal-Eldin, A. (Eds.), *Gourmet and health-promoting specialty oils* (pp. 73-125). AOCS Press. https://doi.org/10.1016/B978-1-893997-97-4.50008-5

⁹ de Oliveira A.P., Franco, E. de S., Barreto, R.R., Cordeiro, D.P., de Melo, R.G., de Aquino, C.M., E Silva, A.A.R., de Medeiros, P.L., da Silva, T.G., Góes, A.J., & Maia, M.B. (2013). Effect of semisolid formulation of Persea americana Mill (avocado) oil on wound healing in rats. *Evidence-Based Complementary and Alternative Medicine*, *2013* (472382), 8 pages. DOI: 10.1155/2013/472382

¹⁰ Fernandes, G.D, Gomez-Coca, R.B., Perez-Camino, M.C., Moreda, W., & Barrera-Arellano, D. (2018). Chemical characterization of commercial and single-variety avocado oils. *Grasas Aceites*, *69*(2), 256. DOI:

characterization of commercial and single-variety avocado oils. *Grasas Aceites*, 69(2), 256. DOI: https://doi.org/10.3989/gya.0110181

¹¹ de Oliveira A.P., Franco, E. de S., Barreto, R.R., Cordeiro, D.P., de Melo, R.G., de Aquino, C.M., E Silva, A.A.R., de Medeiros, P.L., da Silva, T.G., Góes, A.J., & Maia, M.B. Effect of semisolid formulation of Persea americana Mill (avocado) oil on wound healing in rats. *Evidence-Based Complementary and Alternative Medicine*, *2013*. DOI: 10.1155/2013/472382

¹² Nayak, B.S., Raju, S.S., & Chalapathi Rao, A.V. (2008). Wound healing activity of Persea americana (avocado) fruit: A preclinical study on rats. *Journal of Wound Care*, *17*(3), 123–126. https://doi.org/10.12968/jowc.2008.17.3.28670

¹³ Gunstone, F. (2005) Vegetable oils. In F. Shahidi (Ed.), Bailey's Industrial Oils and Fat Products (6th

ed.). John Wiley & Sons, Inc.

¹⁴ Dweck, A. (2003). *The role of natural ingredients in anti-aging of the skin*. Australian Society of Cosmetic Chemists Annual Congress, Hamilton Island.

¹⁵ Kusmirek, J. (2002). *Liquid sunshine*. Foramicus.

¹⁶ Finau, K.A. (2011). Literature review on avocado oil for SROS technological purposes. *Scientific Research Organization of Samoa*