Olive Oil

Extra virgin olive oil and its concentrated phenolics — hydroxytyrosol, oleuropein, oleocanthal

Olive oil is the only item in this series that is primarily a food, which is the key to reading its evidence. It has one authorized health claim in Europe, a large and consistent body of cohort data, one landmark trial with a complicated history, and a dose-response curve that plateaus at about a tablespoon and a half a day. Its dominant risk is not efficacy but fraud.

SUMMARY TABLE

Attribute	Summary
Primary uses	Protection of blood lipids from oxidative stress (the only EFSA-authorized claim); reduced cardiovascular/all-cause mortality when replacing other dietary fats; modest lipid/insulin improvements from concentrated phenolics.
Evidence strength	Moderate for LDL oxidative protection (regulator-endorsed). Moderate for the dietary pattern in cardiovascular outcomes; lower for oil in isolation. EFSA rejected an HDL claim in 2025 and blood-pressure/anti-inflammatory claims in 2011.
Effective dose	20 g/day (~1.5 tablespoons) — simultaneously the EFSA claim condition and the point at which the cohort dose-response plateaus. A dementia-mortality signal in cohort data appeared at just 7 g/day.
How to take	Extra virgin, high-phenolic, in dark glass or tin, used as a fat replacement (not an addition) — the mechanism in every cohort is substitution for butter, margarine or other fats.
Time to effect	Biomarker changes (oxidized LDL/HDL) within ~3 weeks at 25 mL/day; hard cardiovascular outcomes took years in the landmark trial and cohorts.
Serious risks	Adulteration and fraud is the dominant risk. Europol operations across 29 countries have dismantled networks selling seed oils colored to mimic extra virgin; a 2025 Portuguese seizure involved 16,000+ liters of falsely labeled oil.
Who should avoid it	Essentially no one, excepting rare olive-pollen allergy. Concentrated hydroxytyrosol/oleuropein supplements warrant caution with antidiabetics, antihypertensives, anticoagulants, and in pregnancy (untested).
Quality markers	Harvest date on the bottle; dark glass/tin; polyphenol content stated in mg/kg with method named; third-party certification (e.g., California Olive Oil Council) or traceable origin; a peppery throat sting.

WHAT IS ACTUALLY DOING THE WORK

A 2024 Journal of Nutrition commentary argues much of the observed benefit reflects what olive oil replaced — butter, margarine, refined carbohydrate — rather than an intrinsic property of the oil. What is distinctive is the phenolic fraction: hydroxytyrosol and its derivatives are behind the sole EU-authorized claim (EU 432/2012), requiring at least 5 mg hydroxytyrosol-and-derivatives per 20 g, i.e., roughly 250 mg/kg total phenolics. In 2025 EFSA revisited and again rejected a parallel HDL claim, finding the evidence insufficient.

THE OUTCOME EVIDENCE, WITH CAVEATS

PREDIMED (7,447 adults, olive-oil arm HR 0.69 for major cardiovascular events) is the trial everything rests on, but its 2013 publication was retracted over a randomization violation and republished in 2018 with adjusted analysis. The Moli-sani cohort (22,892 adults, 13.1 years) found high intake associated with all-cause mortality HR 0.80 and cardiovascular mortality HR 0.75; a dose-response meta-analysis of 13 cohorts found the risk-reduction curve plateaus around 20 g/day.

COOKING, STORAGE, AND THE FRAUD PROBLEM

Testing has found extra virgin olive oil produces fewer oxidative byproducts than several higher-smoke-point oils when heated, because stability tracks antioxidant content rather than smoke point — but heat still destroys the phenolics, so reserve high-phenolic oil for raw use. A 2026 analysis of 100 EVOOs found phenolics ranging 43–774 mg/kg, with only 26% meeting

the 250 mg/kg threshold by rigorous LC-MS/MS testing. Europol's Operation OPSON XIII, spanning 29 countries, dismantled 11 criminal networks trafficking adulterated olive oil.

BOTTOM LINE

Roughly 20 g a day of genuine extra virgin oil with at least 250 mg/kg phenolics, used in place of other fats, is supported by an authorized regulatory claim and a large body of cohort data — more is not better, since the cohort curve flattens above about 20 g/day. Be clear about limits: EFSA has twice declined a blood pressure claim and rejected the HDL claim outright. The practical work is all in the purchase: harvest date, dark glass, a stated polyphenol number, and third-party certification.

SOURCES

1. Estruch R, et al. "Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts" (PREDIMED). NEJM, 2018.
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3. "Olive Oil Consumption, Risk Factors, and Diseases: Umbrella Review." Nutrition Reviews, 2025.
4. EFSA. "Olive oil polyphenols and maintenance of normal HDL-cholesterol" (claim rejected). EFSA Journal, 2025.
5. "Phenolic profiling of 100 extra virgin olive oils from the 2024/25 harvest." Antioxidants, 2026.
