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# SUMMER BREAK

SPECIAL OHIO NEWSLETTER

## DYSLIPIDEMIA & OLIVE OIL

### *Why is it significant?*

Dyslipidemia is one of the factors within metabolic syndrome that arises from obesity due to the elevated energy intake and decreased energy expenditure. It is characterized by elevated total cholesterol and triglyceride concentrations, in addition to decreased high density lipoprotein (HDL) measurements. The combination of these conditions leads to elevated inflammatory markers, establishing of a pro-atherosclerotic status and a worsening of the metabolic impairment.

The current treatment of dyslipidemia and metabolic syndrome focuses heavily on dietary recommendations due to the multi-target properties attributed to various food products. The Mediterranean diet (MedDiet) is known for its metabolic benefits and includes olive oil as a key source of monounsaturated fatty acids (MUFAs) and high polyphenol content. Other food items include rosemary, liquorice, and hazelnut, among others.

In comparison to other vegetable oils, olive oil increases HDL cholesterol to a greater extent. Data from 27 randomized clinical trials resulted in increased HDL concentrations (1.37 mg/dl (95% CI: 0.4, 2.36)) among interventions longer than 30 days. Across all studies, major benefits were observed in healthy subjects, since the use of statins resulted in non-significant improvements in lipid profiles across all vegetable oil trials.

Apart from the benefits of high MUFA content in EVOO, its high polyphenol concentrations have been associated with CVD protection. Overall, high polyphenol EVOO improved total cholesterol (-4.47 mg/dL (95%CI: -6.54, -2.39) and HDL cholesterol (2.37 mg/dL (95%CI: 0.41, 5.04)). The authors concluded a minimum of 12 weeks are necessary for clear clinical improvements.

The composition and functionality of HDL are key in the prevention of major cardiovascular complications secondary to dyslipidemia. HDL activity consists of three main elements: oxidative status of the HDL molecule, HDL composition, and molecule size. These improvements were determined by phenolic content: 63.78 (0–585.3) vs 14.41 (0–144.5), oleic acid content: 20.78 ± 7.15 vs 19.61±7.26, and APO A1 concentrations: 0.66 ± 0.17 vs 0.63 ± 0.16 after the intervention.

### *Key readings on this topic*

*"Mediterranean Products as Promising Source of Multi-Target Agents in the Treatment of Metabolic Syndrome"*  
Federica Moraca

*"Comparison of blood lipid-lowering effects of olive oil and other plant oils: A systematic review and meta-analysis of 27 randomized placebo-controlled clinical trials"*  
Shiva Faghih

*"The effect of high-polyphenol extra virgin olive oil on cardiovascular risk factors: A systematic review and meta-analysis"*  
Wolfgang Marx

*"Determinants of HDL cholesterol efflux capacity after virgin olive oil ingestion: Interrelationships with fluidity of HDL monolayer"*  
Anna Pedret