

Olive Oil



Impact on Health

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Introduction to Olive Oil



- œ Types of Olive Oil
- œ Dietary Components
- œ Health Benefits
- œ Clinical Trials
- œ Summary
- œ My Experience
- œ Questions



Types of Olive Oil



❧ Extra Virgin Olive Oil (EVOO)

❧ Virgin Olive Oil (VOO)

❧ Olive Oil

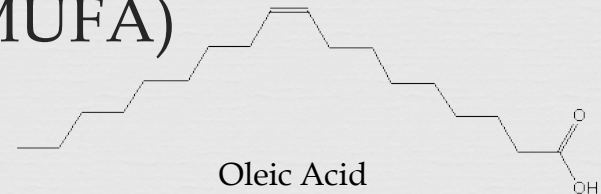


Dietary Components



Monounsaturated fatty acids (MUFA)

Oleic acid (18:1 n-9)

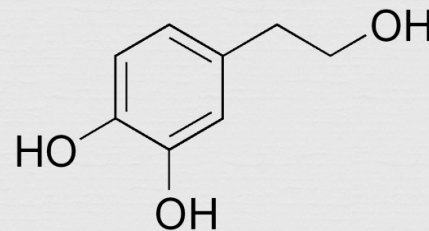


Phenolic constituents

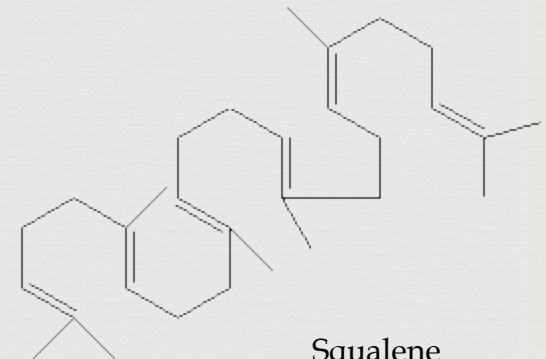
Hydroxytyrosol

Tyrosol

Oleuropein



Hydroxytyrosol

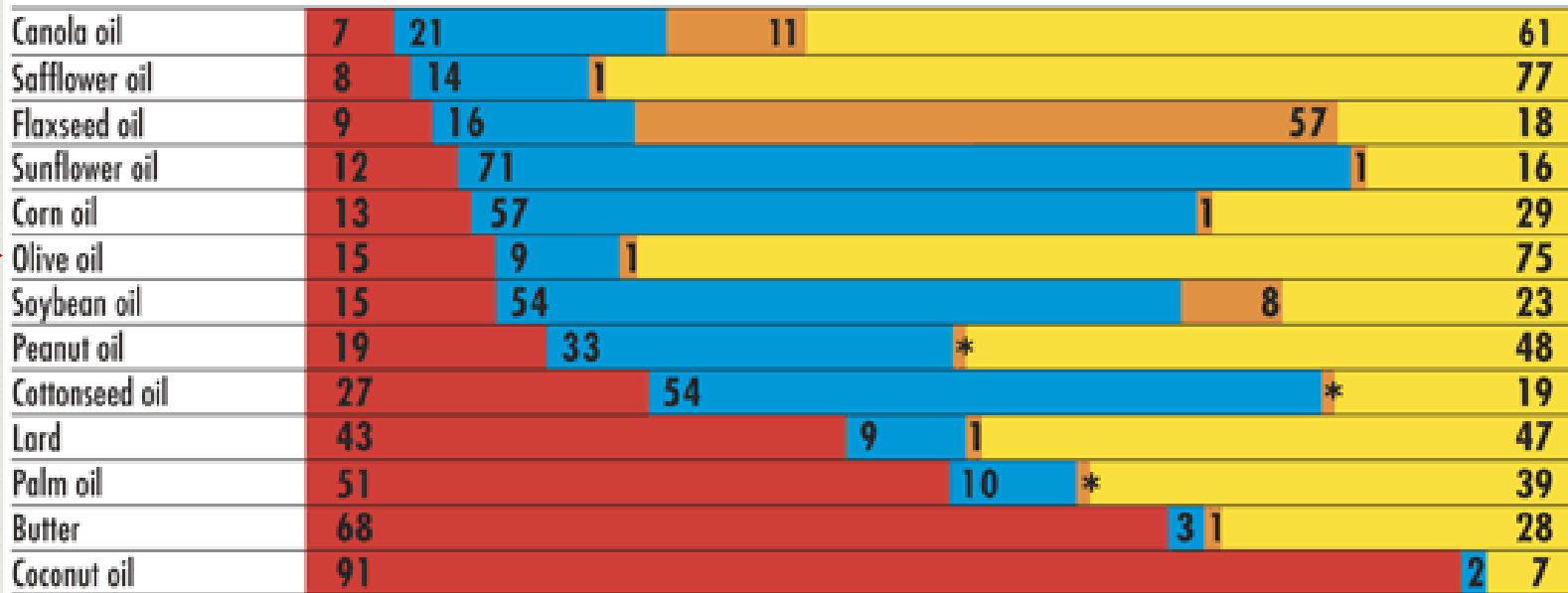


Squalene

Olive Oil vs. Other Oils

Comparison of Dietary Fats

DIETARY FAT



SATURATED FAT



POLYUNSATURATED FAT



linoleic acid
(an omega-6 fatty acid)



alpha-linolenic acid
(an omega-3 fatty acid)

MONOUNSATURATED FAT

oleic acid
(an omega-9 fatty acid)

*Trace

Fatty acid content normalized to 100%

SOURCE: POS PILOT PLANT CORPORATION

Olive Oil in the Mediterranean Diet

- ❧ Olive Oil is the
 - ❧ Primary source of fat
 - ❧ Major source of energy
- ❧ Mediterranean diet associated with
 - ❧ Longevity
 - ❧ Increased quality of life
 - ❧ Decreased risk of certain chronic diseases



What is the difference?

Health Benefits



- ↻ ↓ Incidence of Coronary Heart Disease (CHD)
- ↻ ↓ Blood pressure
- ↻ ↓ Total cholesterol, ↓ LDL cholesterol, ↑ HDL cholesterol
- ↻ Improved glucose metabolism in diabetics
- ↻ Cancer prevention (colon, breast, skin)
- ↻ Antimicrobial effects in respiratory and GI tract
- ↻ ↓ Inflammation in rheumatoid arthritis

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Study #1



Extra Virgin Olive Oil and Blood Pressure

Blood Pressure and Extra Virgin Olive Oil

- ❧ Title: Olive Oil and Reduced Need for Antihypertensive Medications
- ❧ Methods
 - ❧ 23 hypertensive patients
 - ❧ Randomly assigned: 6 months on each diet
 - ❧ MUFA-rich diet: Extra virgin olive oil
 - ❧ PUFA-rich diet: Sunflower oil
- ❧ Results: Amount of hypertensive medication needed dropped significantly during MUFA diet

Blood Pressure and Extra Virgin Olive Oil

Table 2. Variables at the End of MUFA and PUFA Diets*

	Baseline	MUFA Diet	PUFA Diet
Body weight, kg	70.1 (9)	70.0 (9)	70.1 (8)
Body mass index, kg/m ²	26.2 (2)	26.0 (2)	26.0 (2)
Systolic BP, mm Hg	134 (17)	127 (14)†	135 (13)
Diastolic BP, mm Hg	90 (7)	84 (8)†	90 (8)
Heart rate, beats/min	70 (9)	70 (5)	71 (6)
Cholesterol, mmol/L (mg/dL)	4.84 (1.16) (187.3 [44.9])	4.51 (1.09) (174.5 [42.2])	4.61 (1.03) (178.3 [39.8])
Triglycerides, mmol/L (mg/dL)	1.21 (0.68) (107.2 [60.2])	1.00 (0.41) (88.6 [36.3])	1.15 (0.65) (101.9 [57.6])
HDL cholesterol, mmol/L (mg/dL)	1.28 (0.26) (49.5 [10.0])	1.28 (0.31) (49.5 [12.0])	1.30 (0.26) (50.3 [10.0])
Serum glucose, mmol/L (mg/dL)	5.15 (1.00) (92.8 [18.0])	5.34 (0.22) (96.2 [4.0])	5.30 (0.28) (95.5 [5.0])

Table 4. Daily Drug Consumption*

	Baseline	MUFA Diet	PUFA Diet
Atenolol	450	275	500
Nifedipine	420	220	380
Lisinopril	120	70	110
Doxazosin mesylate	8	4	8
Hydrochlorothiazide	75	31.5	75

Study #2



Virgin Olive Oil and Cardiovascular Health

Cardiovascular Health and Virgin Olive Oil

- ❧ Title: Effect of Mediterranean diet on the expression of pro-atherogenic genes in a population at high cardiovascular risk
- ❧ Methods
 - ❧ 49 participants at high cardiovascular risk
 - ❧ Randomly assigned : 3 months
 - ❧ Traditional Mediterranean Diet (TMD) + VOO
 - ❧ TMD + nuts
 - ❧ Control diet
- ❧ Results: TMD + VOO prevented increase in LRP1 and COX-2 and reduced MCP-1 expression

Table 3Changes in inflammatory, lipoprotein receptor and thrombotic gene expression^a.

Variable	TMD + VOO	TMD + nuts	Control
COX-1			
Baseline	1.16 ± 1.03 ^e	1.02 ± 0.94	0.73 ± 0.48
Final	0.80 ± 0.68	1.04 ± 6.87	0.82 ± 0.49
COX-2			
Baseline	1.09 ± 0.81	1.18 ± 0.87	0.88 ± 0.93
Final	1.75 ± 1.29	2.67 ± 1.67 ^f	2.20 ± 1.97 ^g
MCP-1			
Baseline	1.07 ± 1.11	0.52 ± 0.56	0.33 ± 0.40
Final	0.67 ± 0.75 ^f	0.71 ± 0.36	0.54 ± 0.42
LDLR			
Baseline	0.68 ± 0.46	0.68 ± 0.51	0.54 ± 0.47
Final	0.92 ± 0.54	0.97 ± 0.44 ^f	0.90 ± 0.59 ^f
LRP1			
Baseline	0.96 ± 0.60	0.75 ± 0.51	0.52 ± 0.61
Final	1.06 ± 0.65	1.09 ± 0.51 ^f	0.90 ± 0.70 ^f
CD36			
Baseline	0.93 ± 0.57	0.70 ± 0.53	0.61 ± 0.48
Final	0.95 ± 0.49	1.08 ± 0.51 ^f	0.69 ± 0.42
TF			
Baseline	0.68 ± 0.43	0.63 ± 0.55	0.52 ± 0.65
Final	0.86 ± 0.68	0.88 ± 0.72	0.69 ± 0.58
TFPI			
Baseline	0.99 ± 0.60	0.61 ± 0.47	0.72 ± 0.56
Final	0.80 ± 0.63	0.85 ± 0.50 ^j	0.74 ± 0.42

Table 2
Changes in weight, adiposity, blood pressure, and other cardiovascular-risk factors^a.

Variable	TMD+VOO	TMD+nuts	Control	<i>P</i> time ^b	<i>P</i> group ^c	<i>P</i> interaction ^d
Weight, kg						
Baseline	73.6 ± 11.6 ^e	76.9 ± 6.6	74.9 ± 13.1	0.488	0.761	0.373
Final	74.0 ± 11.1	76.0 ± 6.3	74.6 ± 13.5			
BMI, kg/m ²						
Baseline	28.8 ± 2.7	27.7 ± 2.5	29.9 ± 5.5	0.567	0.175	0.539
Final	28.8 ± 2.5	27.4 ± 2.3	29.9 ± 5.4			
Waist, cm						
Baseline	102 ± 10	101 ± 5	105 ± 16	0.007	0.706	0.533
Final	101 ± 8	98 ± 6 ^f	100 ± 10			
Systolic BP, mmHg						
Baseline	153 ± 10	149 ± 18	161 ± 17	0.043	0.006	0.145 ^{g,h}
Final	147 ± 11 ^f	142 ± 15 ⁱ	161 ± 11			
Diastolic BP, mmHg						
Baseline	82 ± 9	83 ± 8	87 ± 12	0.021	0.153	0.743
Final	80 ± 9	80 ± 8 ^f	86 ± 11			
Glucose, mg/dL						
Baseline	156 ± 59	144 ± 47	156 ± 59	0.018	0.418	0.011 ^s
Final	132 ± 40 ⁱ	128 ± 36 ^f	165 ± 79			
Cholesterol, mg/dL						
Baseline	231 ± 31	218 ± 23	205 ± 28	0.014	0.472	0.050 ^s
Final	208 ± 40 ⁱ	205 ± 18	209 ± 43			
LDL-cholesterol, mg/dL						
Baseline	148 ± 28	143 ± 29	125 ± 29	0.003	0.202	0.207
Final	129 ± 41 ⁱ	135 ± 19	121 ± 31			
HDL-cholesterol, mg/dL						
Baseline	52.3 ± 12.9	48.1 ± 11.1	48.5 ± 9.9	0.154	0.252	0.201
Final	56.2 ± 14.1 ^f	48.6 ± 10.0	48.4 ± 10.5			
Triglycerides, mg/dL						
Baseline	147 ± 67	127 ± 78	145 ± 68	0.215	0.275	0.405
Final	126 ± 50	106 ± 38	152 ± 84			
Cholesterol/HDL ratio						
Baseline	4.6 ± 1.0	4.7 ± 1.2	4.1 ± 0.68	0.004	0.682	0.041 ^s
Final	3.9 ± 1.1 ⁱ	4.3 ± 0.8 ^f	4.1 ± 0.73			

Study #3



Extra Virgin Olive Oil and Oxidative DNA Stress

Oxidative DNA Stress and Extra Virgin Olive Oil

☞ Title: Effect of olive oils on biomarkers of oxidative DNA stress in Northern and Southern Europeans

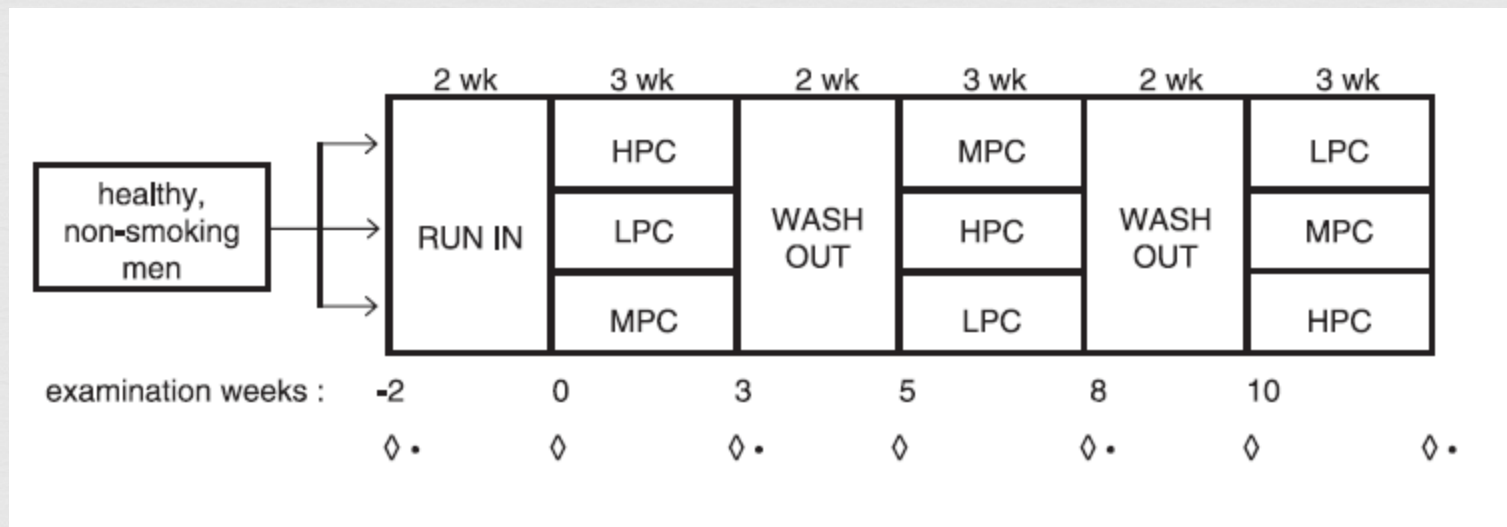
☞ Methods

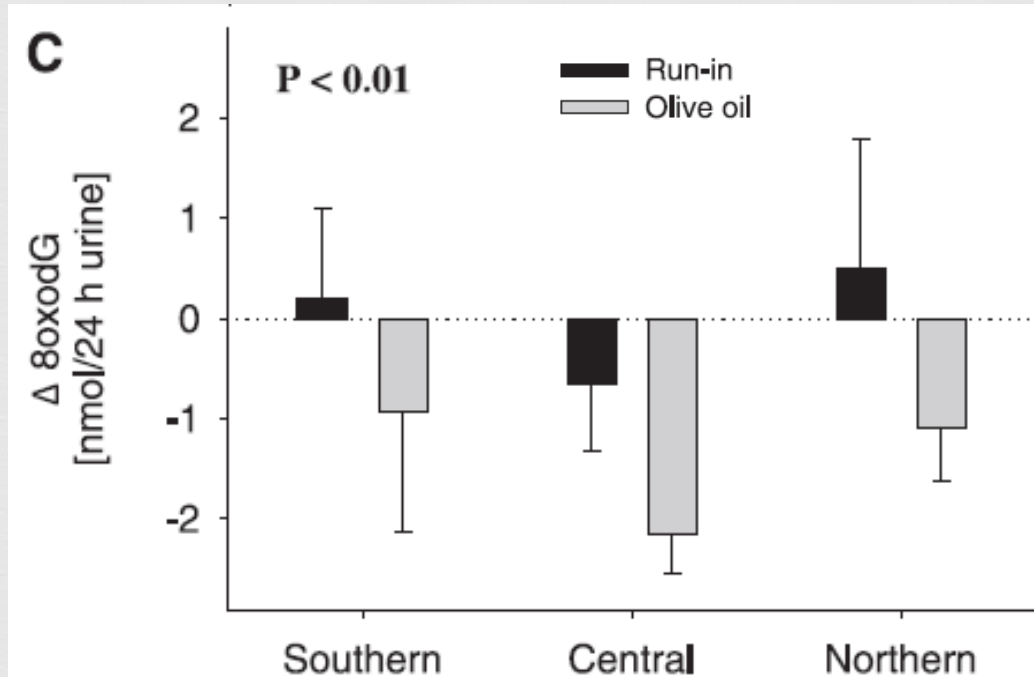
☞ 182 healthy males

☞ Randomly assigned

☞ Olive oil with low, medium, or high phenolic content

Oxidative DNA Stress and Extra Virgin Olive Oil





Results

DNA oxidation decreased by 13%
Not due to phenolic compounds

Summary



❧ Types of Olive Oil

- ❧ Extra virgin olive oil
- ❧ Virgin olive oil
- ❧ Olive oil

❧ Major Active Compounds

- ❧ MUFAs
- ❧ Phenolic compounds
- ❧ Squalene

❧ Health Benefits

- ❧ Coronary Heart Disease
- ❧ Blood pressure
- ❧ Lipid profile
- ❧ Glucose metabolism
- ❧ Cancers (colon, breast, skin)
- ❧ Antimicrobial activity
- ❧ Anti-inflammatory response

Olive Oil Drizzle



Ingredients

- 4 Tbsp. extra virgin olive oil
- 3 toes fresh garlic, minced
- 2 Tbsp. seasoned rice vinegar
- 1 tsp. Kosher salt
- 2 Tbsp. parmesan cheese

Preparation

- Combine ingredients in small food processor and blend.
- Drizzle over a bed of fresh spinach, sliced mushrooms, red onion rings, sweet, mandarin oranges, and walnut halves.



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Questions?

