The true health benefits of extra virgin olive oil

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Olive oil and health - Epidemiology

Lower rate of heart disease and cancers in countries consuming a traditional Mediterranean diet

The traditional Mediterranean diet is:

- extra virgin olive oil
- plant-based (vegetables, fruits, grains)
- red wine

The Seven Countries Study was the 1st to show benefit (1)

Newer definition of Mediterranean diet: Meddiet Score –

uses ratio monounsaturated fat: saturated fat in the diet

US government – health claim due to monounsaturated fat content

Does the literature support this?

studies comparing refined olive oil to extra virgin show health benefits are only from extra virgin

What has not yet been studied:

canola oil v extra virgin olive oil

Flynn: extra virgin olive oil is a **key component** of the Mediterranean diet

Risk factors for chronic diseases that extra virgin olive oil can improve:

- excessive oxidation
- lipids (cholesterol, triglycerides) and lipoproteins (HDL, LDL)
- blood pressure
- blood levels of glucose and insulin
- inflammation

Also: cancer

Extra virgin olive oil

Juice of the olive fruit

phenol content – mg/kg

Phenol type and amount depends on: olive, growing/ harvesting conditions

Oxidation

vegetable seed oils (soybean, safflower, corn) →
readily oxidize due to polyunsaturated fat content

Oxidation of DNA → cancer initiation (2)

Oxidation of cell membranes → cancer promotion

Oxidation of LDL → atherosclerosis

Oxidation and extra virgin olive oil

Olive oil:

- primarily monounsaturated fat (which does not oxidize)
- highest content of alpha tocopherol (vitamin E), which is an antioxidant (3)
- phenolic content

  (366 v 164 mg/kg) decrease LDL oxidation (4)

  (592 v 147 mg/kg) decrease DNA oxidation (5)

Blood lipids/ lipoproteins

LDL: level is not as important as oxidation

Compared to vegetable oil:

extra virgin olive oil may or may not decrease level

but : it does **decrease oxidation** of LDL

Phenolic content: some evidence higher phenolic (> 300/400 mg/kg) may lower LDL

Linear increase in HDL with increasing phenolic content (4)

extra virgin olive oil is the only food shown to increase HDL

Blood pressure

Compared to sunflower oil:

2 to 3 tablespoons of olive oil for 6 months:
significant decrease in systolic and diastolic (6)

(84 yrs old men and women): 4 tablespoons/ day 4 weeks
decrease in systolic BP (7)

Blood pressure

Phenolic content:

Men (161 mg/kg v refined) at 4.3 tablespoons/day for 3 weeks:
lowered systolic BP (8)

Women (564 mg/kg v refined) at 4 tablespoons/day for 8 weeks
lowered systolic and diastolic (9)

Blood levels of insulin and glucose

Higher (but within normal range) levels of both insulin and glucose have been related to:

increase risk of heart disease and cancers (breast, prostate, colon, leukemia)

2 tablespoons/day for 2 weeks v sunflower oil:

significant decrease in fasting glucose and insulin (10)

Olive oil enriched diet v vegetable oils for 8 weeks:

improved insulin sensitivity (so insulin works better) (11)

Pasta and eggplant fried in 3 tbs of olive oil v adding to the food:

fried in olive oil led to lower blood glucose and insulin (12)

** healthiest to cook food into olive oil

Inflammation

Response to disease, level of disease

Oleocanthal – inhibits COX 2 (13)

- COX2 leads to inflammatory pathway
- same action as ibuprofen (NSAID)

Olive oil and cancer protection

Oleocanthal: selectively induces cancer (breast and prostate) cell death (14)

Squalene – tumor inhibitor (15)

decreases cancer risk (16, 17)

Most of squalene to the skin → UV protection (17)

Oleuropein (in test tube) inhibited cancer cell invasion and regressed tumors (18)

Body weight

Concern: olive oil is a fat so adding it to the diet means you will gain weight

- Higher Mediterranean diet adherence = lower body mass index (BMI) in Spain (19) and Greece (20)
- SUN Study (Spain): higher baseline consumption of olive oil reported= lower likelihood of gaining weight (not significant, but a trend) (21)
- women had better weight loss with olive oil-rich diet v low-fat diet (22, 23)

Vegetables and olive oil

Carotenoids – give pigment to vegetables
powerful cancer fighting properties in the body
** need dietary fat to absorb (24)
** cooking in fat increases absorption (25)

Glucosinolates – cruciferous family
(cauliflower, cabbage, broccoli, Brussel sprouts, kale)
cancer protective, especially breast and prostate
** water soluble, preserved with fat (26)

Olive oil makes vegetables taste better, increases intake

Cost of olive oil

Consider at price per tablespoon

Comparison of 7 days of my plant-based, olive oil diet (3 tbs/day) to the USDA most economical diet:

plant-based, olive oil diet was $14.36 less per week or $746.46 / year (27).

Should be an "every day food" for health benefits

Benefits start at 2 tablespoons (30 ml)/ day

Flynn: 1 tablespoon EVoo per cup of vegetables

Cooking with extra virgin olive oil

- can use to cook, but some decrease in phenols due to:

  light, heat, oxygen

Oxygen seems to cause greatest loss (28)

cooking vegetables in extra virgin olive oil:

- conserves and increases the phenolic compounds of vegetables (29)
- cooking in water decreases phenols

Conclusions:

Consistent use of 2 tablespoons per day of extra virgin olive oil will:

- improve health by lowering oxidation, blood pressure, blood glucose and insulin, inflammation.
- improve health and level of blood lipids (LDL, HDL)
- lowering body weight and decrease risk of weight gain
- lower food costs and improve diet (likely increase vegetable intake)

www.medfooddiet.com

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