Communicating About EVOO and Health: What You Need to Know

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A QUICK
OVERVIEW

This talk will present:

- Some of the health benefits you should expect to see from using extra virgin olive.
- The science behind other popular fats.
- What is needed to move the case for recognizing the health benefits of extra virgin olive oil forward.

Extra virgin olive oil will:

- Decrease blood pressure[1-4]
- Increase HDL-c[5-9]
- Improve HDL function
- Higher phenol content can decrease LDL levels [8,10,11]
- Decrease LDL oxidation [4,5,7,9,12,13]
- Decrease blood clotting [14,15]
- Decrease Oxidation [16-18]
- Decrease inflammation [4,19,20]
- Decrease blood levels of insulin [21,22]
- Decrease blood glucose [20,23]

SYNOPSIS

Extra virgin olive oil is the only known food (or medicine) that can provide so many health benefits.

Primer on fats

Saturated v unsaturated –refers to chemical bonds

Saturated = no double bonds
Unsaturated = at least one double bond

Monounsaturated : main fatty acid = oleic acid

Food sources: olive oil, canola oil, (high oleic soybean oil)

Polyunsaturated fats: main fatty acid = linoleic acid

Food sources: vegetable seed oils – soybean oil, previously safflower oil (1980's), 1960-70's – corn oil

Red meat also have PUFA – arachidonic acid

Blood lipids (fats) and lipoproteins

Clinical labs give you:

- Lipids – cholesterol and triglyceride

- Lipids are carried in the blood (mainly water) by **lipoproteins** (let the fat stay in the fluid)

LDL – low density lipoprotein

- Main carrier of blood cholesterol
- Higher levels thought to increase risk of heart disease
- Not all LDL are unhealthy
- LDL that is **oxidized** increases risk of heart disease

HDL – high density lipoprotein

- Role is actually not known, but higher levels related to lower risk of heart disease

- Your level of HDL is **primarily** inherited (it typically does not change very much)

*** Extra virgin olive oil is the only food or medicine that will increases HDL levels

Effect of diet fats on lipoproteins:

Polyunsaturated fats:

Vegetable seed oils will decrease LDL more than olive oil [24]

Why is this?

- Vegetable seed oils have phytosterols that block dietary cholesterol absorption.

- Olive oil contains squalene – one of the compounds in the cholesterol synthesis?

Effect of fats on lipoproteins:

Monounsaturated fat

- **May** increase HDL – depends on fat source
- Extra virgin olive oil increases HDL
- Canola oil does not change HDL

No study has compared canola oil to extra virgin olive oil for effects on lipids and lipoproteins

VS

CORN OIL

EXTRA VIRGIN OLIVE OIL

WHICH IS BETTER AT LOWERING CHOLESTEROL?

Thanks to the Mediterranean diet, extra virgin olive oil often gets the kudos for being the healthiest oil. But a new study reveals that **corn oil lowers the "bad" LDL and total cholesterol more than EVOO.**[1]

Corn oil study [25]:

- Compared 4 tablespoons a day of corn oil to 4 tablespoons a day of extra virgin olive oil
- Measured lipids and lipoproteins, blood pressure

What we know about extra virgin olive oil

- does not typically lower the level of LDL
- will lower blood pressure
- will increase HDL

What they found:
Corn oil lowered LDL more than olive oil
No difference in HDL or blood pressure

- The ad is correct: corn oil **will** lower LDL more than olive oil. But:

- All polyunsaturated fats **increase oxidation** in the body, including **oxidization of LDL** [27-30]

- Polyunsaturated fats will sometimes **lower** HDL and do not change blood pressure
- Olive oil used in this study did not change HDL or blood pressure

Conclusion:

- If you are just interested in the effect of oils on LDL, vegetable seed oils decrease LDL more than olive oil.
- did they use extra virgin olive oil due to no changes in HDL or blood pressure?

Coconut oil

- health claims mainly related to literature on medium chain triglycerides (8-10 carbons)
- Coconut oil has minimal 8-10 carbon fatty, mainly 12 carbon – which does not have health benefits
- Only known benefit: topical application improves atopic dermatitis [31]

Omega 3 fatty acids

- One of 2 fatty acid families humans don't make so we need to get from the diet
- Omega 6 fatty acids – the other family

Food sources of omega 3:

- Marine: fish oil; plant: walnuts, flaxseed **oil**, small amount in canola oil

Food sources of omega 6:

- vegetable seed oils and meat

American diet: rich omega 6, low in omega 3

Relationship to health:

- Omega 3 and omega 6 make compounds (eicosanoids) that control a number of functions
- The compounds made by omega 3 are opposite to the functions of compounds made by omega 6

For example:
omega 3 compounds can decrease inflammation, omega 6 increase
blood ratio of omega 3 to omega 6 determines which are made

Health officials in US recommend: dump omega 3 on the system

Issues:

- humans don't readily convert plant sources of omega 3 to the form we need
- So plant sources of omega 3 do not improve health
- Fish oil pills have never been shown to have health benefits [32]
- Both families are mainly polyunsaturated fats – so both will oxidize
- Fish oils pills contribute to oxidation!!

Flynn advice:

- improve the ratio of omega 3 to omega 6 by eliminating or greatly reducing major sources of omega 6 (eat less vegetable seed oils and meat) which is the denominator
- use only extra virgin olive oil !!

Definition of "The Mediterranean diet"

traditional diet v Med diet score

Traditional diet of countries or parts of countries around the Mediterranean Sea = plant-based, extra virgin olive oil the main fat (as that was the dietary fat available)

Med diet score: foods typical of the Mediterranean diet (fruits, vegetables, legumes, nuts, grains) are given points

But for fat content, uses the **ratio of monounsaturated fat to saturated fat** in the diet

In the US:

- Up to 2004, the major source of MFA in the US diet was meat [33]
- In 2005, "salad cooking oil" caught up with meat, supplying 23.9% of the MFA to 21.4% from meat
- In 2005, soybean oil represented close to 80% of the cooking oil [34] ; since then, decrease in soybean oil with an increase contribution of canola and palm oil.
- In 2010 meat still supplied 21.5% of the MFA (salad cooking oils = 32.3%)

- Conclusion: studies using the Med diet score outside the Mediterranean countries have a better chance of showing no health benefit, if the MFA is from canola, and very likely harm if the MFA is from meat.

Extra virgin v "olive oil" studies

- Benefits are with total phenol, starting at 150 mg/kg [7]
- Higher phenols (approximately 200 mg/kg) v < 50 mg/kg have more health benefits [4,5,7,9,12,35]
- If the health benefits were the same, that would give support to monounsaturated fat being the reason for health benefits.
- Since there is a difference – this gives support to phenols.
- FDA and US health officials – give health claim of olive oil to MFA content

Conclusion:
we need to get the word to consumers that **phenols are important**

Flynn work with CA olive oil

- low-income, type 2 diabetics provided with California Olive Ranch
- 6 week cooking program taught by medical and nursing students
- Asked to use the plant-based, olive oil recipes for 2-3 dinners a week

2 month FU: 35% decrease in fasting blood glucose
Decrease in body weight.

Funding : RI Foundation Strategy Grant

Food Service protocol using plant-based, olive oil recipes:

- N=15 (nurses, nurse practitioner, physician assistant, physician).
- 3 meals a week for 4 weeks provided by hospital cafeteria
- Corto Olive Oil was used; 1-2 tbs. per meal.

Results:

- No change in body weight
- Glucose (mg/dl) base: 99.6±10.3 v FU 95.2±11.8; p=0.008
- Insulin mU/L base 7.4±2.5 v FU 6.4±2.3l; p=0.12
- HOMA base 1.8±0.6 v FU 1.5±0.7; p=0.09.
- Average days/ week afternoon snacking:
  base 2.8±0.8 v FU 1.5±0.7; p=0.001 [36]

Funding: Nursing Education Grant

What is needed to move forward the case for recognizing the health benefits of extra virgin olive oil:

1. **Educating the consumer that phenols are important**

   Consider:

   - analyzing extra virgin olive oil at time of production – posting it on your website with education around phenols
   - Include: analyze done (date and where), olives used
   - Mention phenol on labels
   - Educate consumer that phenols are lost due to oxygen, heat, light, with oxygen being the worst offender.

What is needed to move forward the case for recognizing the health benefits of extra virgin olive oil:

2. **Funding for a study comparing California extra virgin olive oil to at least canola oil.** *Consider adding a corn oil arm?*

- Test for: blood pressure, lipids, lipoprotein, insulin, glucose
- Testing for oxidation is more difficult and expensive

Cost for 20-25 participants – under 30k?
University connections?

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