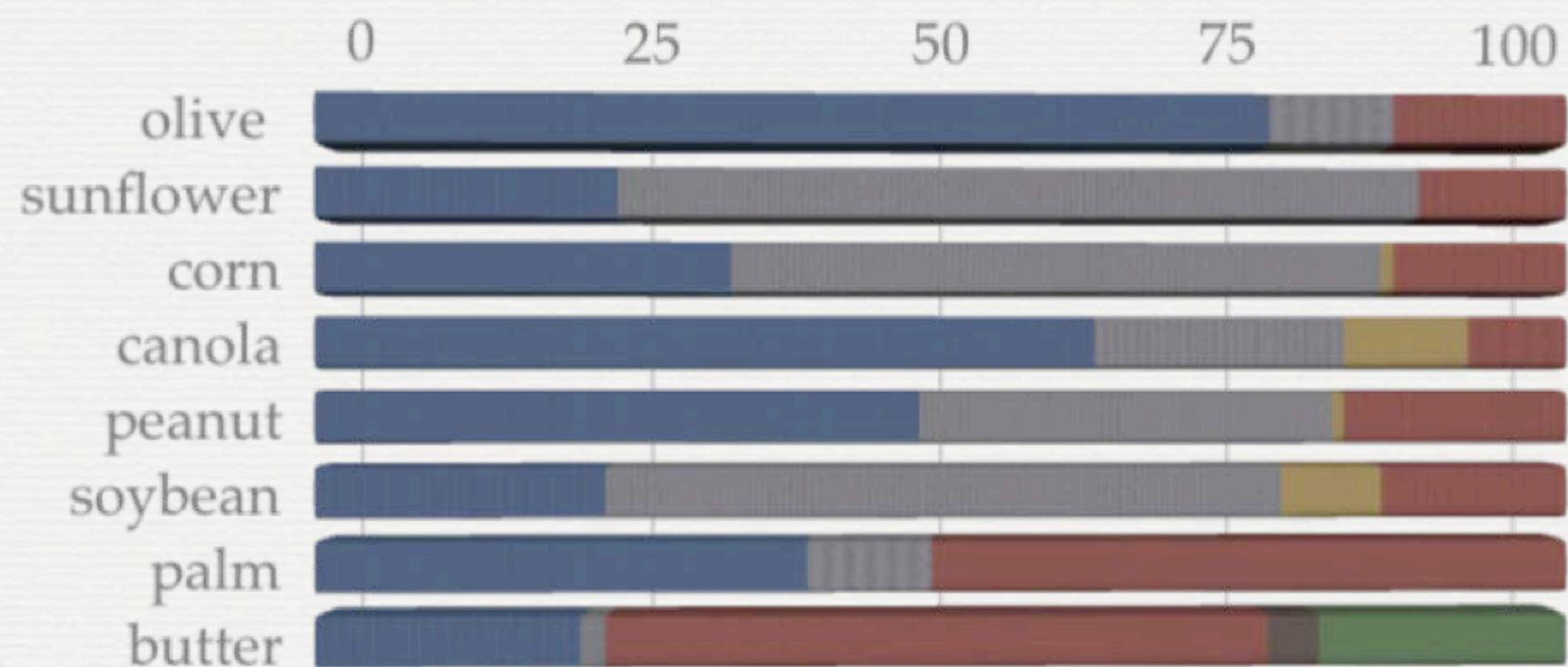


# Nutritional difference between extra virgin and refined olive oils

Dr Joanna McMillan Price

# comparison of oils

oleic acid      omega-6      omega-3      saturated      trans  
other nutrients



# benefits of olive oil

- Mediterranean diet long been touted as one of the world's healthiest
    - high MUFA diets shown to assist in weight loss
    - associated with low risk heart disease & certain cancers
    - reduced systolic bp in Northern European men
- J. Nutr. (2007) 137: 84-7

# what's the difference?

## ■ EVOO

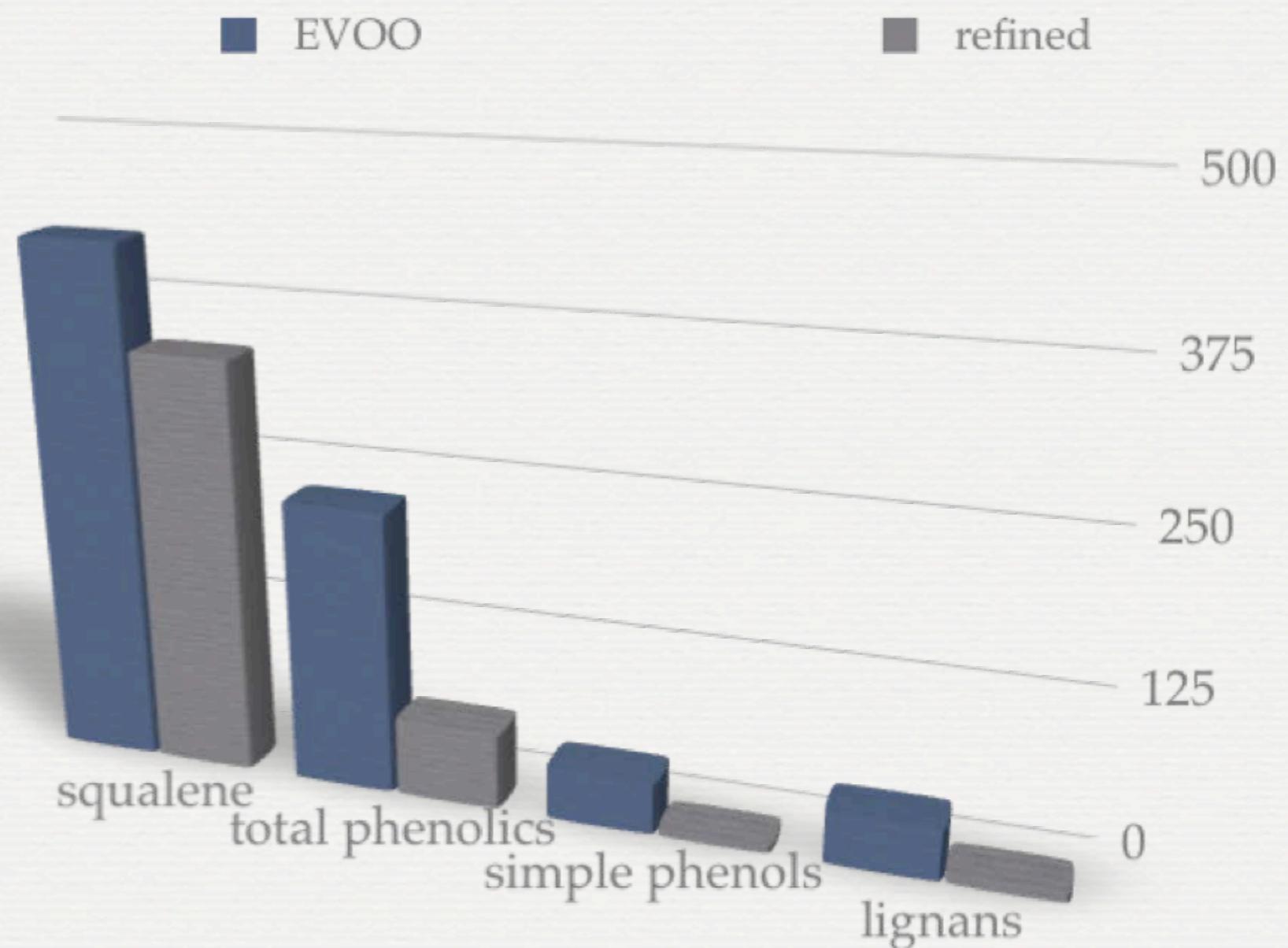
- quality olives crushed soon after harvest - oil removed mechanically without heat or chemicals
- retains the naturally present phytochemicals eg antioxidants, polyphenols

## ■ Refined olive oil

- Heat, pressure, filtration methods and/or chemicals used to extract the oil and refine it
- Removes many of the phytochemicals
- The flavour is noticeably blander as a result



# virgin vs refined



# phytochemicals

## ■ squalene

- major intermediate in biosynthesis of cholesterol
- olive oil ~0.7% (other foods in range .002-.03%)
- in body majority transported to skin where can scavenge free radicals
- chemoprotective effect? high levels of squalene in Mediterranean diet may be factor reducing skin cancer incidence



## ■ phenols

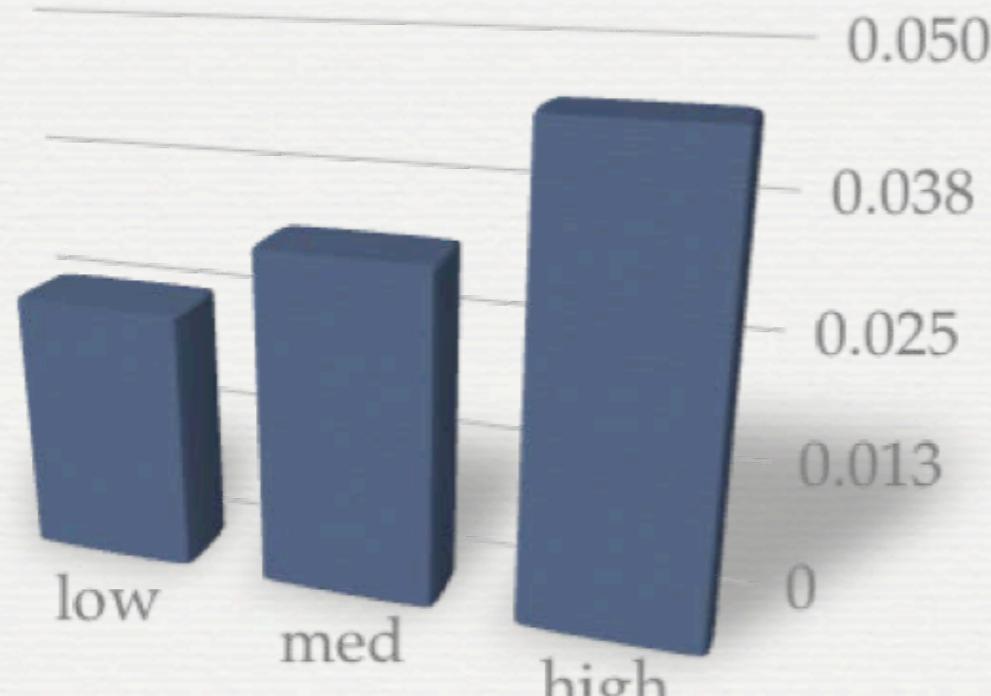
- potent antioxidants, likely to be responsible for reducing levels of oxidised LDL
- antioxidant capacity EVOO > olive oil > seed oils

# EuroLive study

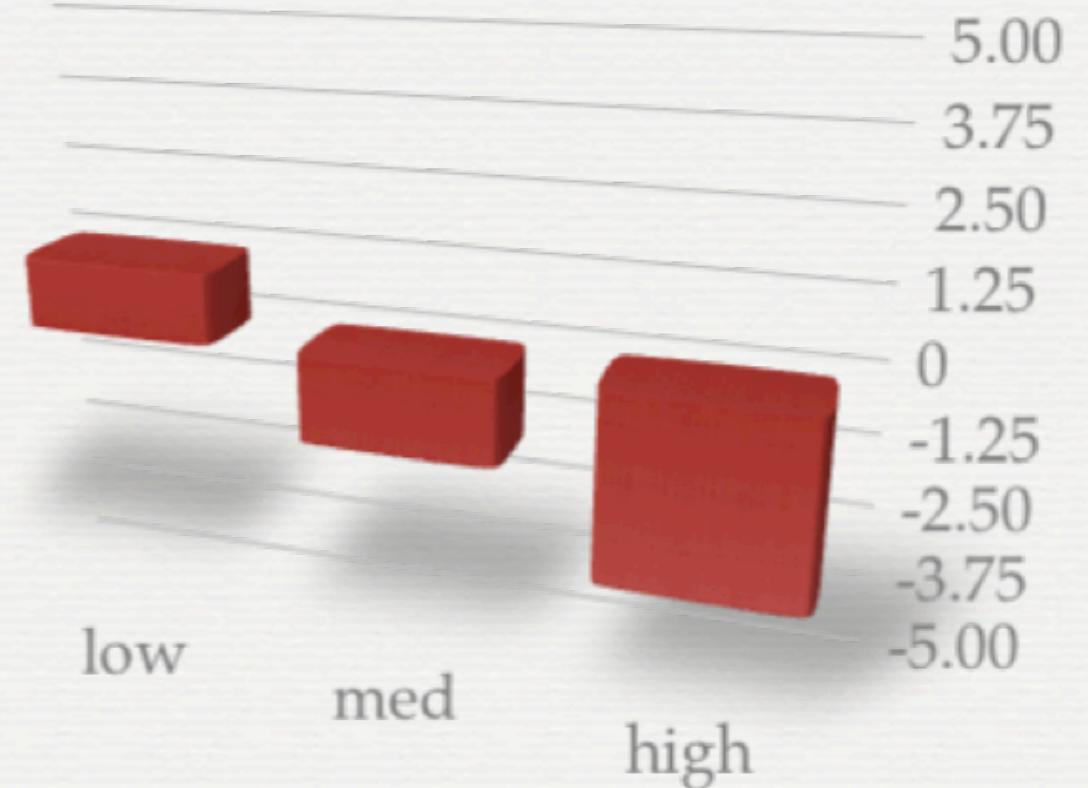
- 200 healthy males
- 6 centres in 5 European countries
- 25ml/d of olive oil varying in polyphenols
  - low 2.7 mg/kg olive oil
  - med 164 mg/kg olive oil
  - high 366 mg/kg olive oil

# key differences

Changes in HDL



Oxidised LDL



HDL & HDL:TC decreased linearly with polyphenol level  
Oxidative stress markers decreased linearly with polyphenol level

# Eurolive conclusions

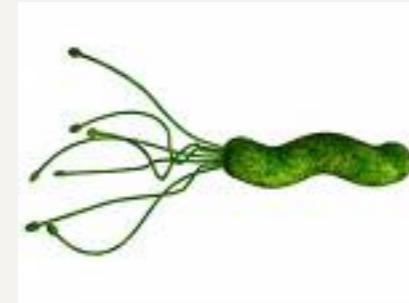
- “..our study shows that olive oil is more than a monounsaturated fat. The polyphenol content of an olive oil can account for further benefits on HDL cholesterol levels and oxidative damage in addition to those from its monounsaturated fatty acid content. Our study provides evidence to recommend the use of polyphenol-rich olive oil, that is virgin olive oil, as a source of fat to achieve additional benefits against cardiovascular risk factors.”



# EVOO & cancer

- EVOO phenols shown in in vitro research to be beneficial in all 3 stages of colon cancer development:
  - reduced DNA damage, increased barrier function, reduced cell invasion of surrounding tissue *Int J Cancer 2005;117:1-7*
- Inverse correlation olive oil consumption & breast cancer incidence *Lancet Oncol 2000;1:107-112*
- EPIC study olive oil intake >30.5g/d 30% less likely to be in high mammographic breast density group (associated with increased breast cancer risk) *Int J Cancer 2006;118:1782-9*

# polyphenols & *H Pylori*



- several of the polyphenols in EVOO are known to be antimicrobial
- 2007 study showed benefit in combating *H Pylori*, the major cause of gastric ulcers, yet to be proven *in vivo* but suggested as preventative treatment *J Agric Food Chem*  
*2007;55:680-6*

# conclusions



- all olive oils provide good source of oleic acid which confers benefit
- but the levels of phytochemicals, particularly polyphenols, are significantly higher in EVOO
- evidence is building to suggest these polyphenols may be beneficial in areas ranging from cancers, heart disease to gut health, rheumatoid arthritis and even in slowing the aging process