A Spoonful of Olive Oil Makes the Vegetables Go Down: The Health Benefits of Cooking with EVOO

October 18, 2022

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About Oldways

- Nutrition nonprofit founded in 1990
- **Mission**: To inspire people to embrace the healthy and sustainable joys of the old ways of cooking and eating
- Visit us online at **oldwayspt.org**


Source: Kelly LeBlanc for Oldways

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Join Us for an Upcoming Webinar

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Housekeeping

- Attendees will receive an email within ONE WEEK with **CPEU certificate**, **slides**, and **recording**
- Visit **oldwayspt.org/CPEU** to register for upcoming webinars or view recordings of previous webinars
- Please submit any questions using the CHAT function in Zoom
- THANK YOU to NAOOA for sponsoring this session!

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Olive Oil 101: Three Basic Issues

Joseph R. Profaci
Executive Director
North American Olive Oil Association

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A Spoonful of Olive Oil Helps the Vegetables Go Down

Oldways Preservation & Exchange Trust

Webinar, October 18, 2022

Our Purpose

The North American Olive Oil Association (NAOOA) is a trade association of producers, marketers, packagers and importers of olive oil in the United States and Canada and their respective suppliers abroad.

What We Do:

Strengthen demand for olive oil across North America

How We Do It:

Promote the category, defend it from attack, ensure product quality and engage with the government on behalf of the industry

Why We Do It:

Share the health, taste and joy of olive oil with as many people as possible

Overarching Goals

The NAOOA focuses on the following core objectives:

- Increase consumption of all olive oil grades across the entire category — retail, foodservice and bulk
- Serve as a uniting force for the industry, including outside our membership
- Be viewed as an authoritative and trusted voice for olive oil
- Tell the unique story of olive oil
- Create a more inclusive association that reflects the breadth of the industry

Operational Functions

The association operates in five key functions, and specific tactics fall under each. These functions form the core of NAOOA's work. They are:

- Promotion - Educating a variety of audiences about olive oil
- Defense - Protecting the category from attack
- Quality Assurance - Ensuring quality products are available in the marketplace
- Government Affairs - Engaging with lawmakers and policymakers on key subjects
- Association Leadership - Expanding membership and building external relationships

NORTH AMERICAN OLIVE OIL ASSOCIATION

NAOOA

OLIVE OIL 101:

Three Basic Issues

1. Cultivation of Olives for Olive Oils
2. The Production of Olive Oils
3. Olive Oil Standards

1. Cultivation of Olives for Olive Oil

A. Basic Facts

- Grown primarily in Mediterranean countries, but also North and South America, China, South Africa, Japan
- Requires climate that has cool or cold winters (but not sustained freezing)
- Drought resistant, though fruit production depends on water
- Approximately 1,000 varieties
- World's largest permanent crop

1. Cultivation of Olives for Olive Oil

B. Three Cultivation Methods

- Traditional (50-100 trees/acre)
- High Density (150-300 trees/acre)
- Super High-Density (500-900 trees/acre)

https://www.youtube.com/watch?v=Orwi0ZwUAvo&t=13s

OLIVE OIL 101

How Olive Oil is Made

2. Production of Olive Oils

A. Modern Techniques Vastly Improve Quality

- Enclosed steel crushers and malaxers replace mill stones
- Hemp mats are eliminated altogether
- Screw presses replaced by “centrifugal presses”

https://www.youtube.com/watch?v=Orwi0ZwUAvo&t=13s

2. Production of Olive Oils

B. "First Cold Pressed": Statement of Three White Lies

#1. With EVOO, there is never a second pressing, so "first" is redundant.

#2. All olive oil production is done without chemicals or high heat. Temperature is controlled at below 80°F-- not hot, but also not "cold."

#3. Not "pressed" in traditional sense anymore: screw presses replaced by "centrifugal presses."

3. Standards for Olive Oils

A. International Olive Council, Codex, USDA, States

- The International Olive Council (IOC) is a U.N.-chartered organization whose members are countries
- IOC chemistry experts sets standards to define what can be labeled and sold as olive oil, and which oils can be called extra virgin.
- Countries around the world and the Codex Alimentarius base their olive oil standards on the IOC standards.
- USDA adopted voluntary standards based on the IOC standards.
- Four U.S. states have mandatory olive oil standards (California, New York, Connecticut and Oregon.)
- Olive oil industry recently petitioned FDA to create mandatory national standards

https://www.youtube.com/watch?v=Orwi0ZwUAvo&t=13s

3. Standards for Olive Oils

B. What Does "Extra Virgin" Really Mean

- To qualify as "extra virgin" an olive oil must:
  - Be unrefined (no processing other than filtration)
  - Meet strict chemical quality parameters
  - Be free of sensory defects as determined by expert taste panels.

- The term "extra" means "special." It does NOT mean the oil is more virgin than other virgin olive oils.

- As with wines, in the extra virgin olive oil category you will find good, better and best qualities.

3. Standards for Olive Oils

C. What's with the blue glass?

Among the many biases that can affect an olive oil taste panel is "color." There is a natural bias towards thinking that dark green is good and yellow is bad, when in fact color has nothing to do with the flavor or aromas of the oil. The blue (or red) glass neutralizes the color of the oil to the taster.

3. Standards for Olive Oils

D. What Happens to Oils that Don't Meet the Standards for Extra Virgin Olive Oil?

- "Virgin" olive oil (e.g., minor taste defects) is often sold in other countries labeled simply as "virgin," and it is excellent for cooking. Not common in the U.S., however.
- If the defects are major, the oil is refined, an industrial process that removes flavor and color defects to create a neutral oil. Under olive oil standards, the process must preserve the natural healthy fatty acid profile of olive oils.
- All the most commonly used cooking oils in the U.S. are refined: canola, corn, soybean, grapeseed, sunflower, and the vast majority of avocado oil.

https://www.youtube.com/watch?v=Orwi0ZwUAvo&t=13s

3. Standards for Olive Oils

E. Harvest Dates and Best-Before Dates

- No U.S. standards require “harvest dates” or “best-before” dates.
- Harvest dates can be confusing. Large companies may blend oils from multiple dates in the same harvest, or even a different harvest, including oils from northern and southern hemispheres. Just putting the year and not the month can mean a swing of more than several months.

3. Standards for Olive Oils

F. Harvest Dates and Best-Before Dates

- That said, ”harvest date” is good information if it is provided in a clear fashion. For instance, if you are buying a “best quality” extra virgin olive oil for dipping or condiment use, the most recent harvest date is more important than if you are buying EVOO for everyday cooking.

- A best-before date is always important. IOC recommends olive oils include a “best-before” date of no more than 2 years from bottling and include a label statement to protect the oil from heat, light and oxygen. NAOOA members have voluntarily agreed to follow that guideline.

OLIVE OIL 101

Presented by the North American Olive Oil Association (NAOOA)

ABOUT EXTRA VIRGIN OLIVE OIL (EVOO)

- High in heart-healthy monounsaturated fat, has full complement of naturally occurring antioxidants and polyphenols
- Produced through natural crushing of olives without heat or chemicals
- 100% extra virgin olive oil
- Broad range of fruity flavors and aromas

USES

- Sautéing, grilling, roasting, baking, pan frying, deep frying
- Drizzling, dipping, dressings and marinades

TIP

Delicious used raw as a condiment or in cooking, versatile extra virgin olive oil makes food taste better. Pair different EVOOs with dishes to explore what you like best.

ABOUT OLIVE OIL

- High in heart-healthy monounsaturated fat, has some antioxidants and polyphenols
- Produced through natural crushing of olives and then refined; no solvents used
- A blend of refined olive oil and extra virgin/ virgin olive oil
- Mild, neutral flavors, more like vegetable oils; 'light-tasting' is most neutral

USES

- Sautéing, grilling, roasting, baking, pan frying, deep frying
- Dressings and marinades

TIP

Perfect for meal preparation when more neutral flavors are preferred. Excellent substitute for butter, margarine and other more highly-processed neutral oils.

STORING OLIVE OIL? REMEMBER HOLA: Heat, Oxygen, Light, Age

HEAT

Store olive oil away from heat sources, like the stove or oven.

OXYGEN

Always store olive oil in a bottle with a cap or seal, as air exposure can affect taste.

LIGHT

Store olive oil away from windows and fluorescent lighting.

AGE

Shelf life for olive oil is no more than two years from bottling. Look for best-before dates on label.

Bottom Line: Pay attention to best-before dates when purchasing olive oil. Store in a dark, cool place and use within a few months of opening the bottle. Harvest date, if available, also provides useful information, especially for raw uses.

Thank You!

Joseph R. Profaci
Executive Director
North American Olive Oil Assn.

About Olive Oil

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A Spoonful of Olive Oil Makes the Vegetables Go Down: The Health Benefits of Cooking with EVOO

Rosa M Lamuela-Raventós

October 18th 2022

UNIVERSITAT DE BARCELONA

ciberobn
Centro de Investigación Biomédica en Red
Fisiopatología de la Obesidad y la Nutrición

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Extra Virgin Olive Oil (EVOO)

Extra Virgin Olive Oil (EVOO)

Traditional food product with years of history

Mediterranean diet

Distinguished by its high content of nutritional and antioxidant compounds compared to other vegetable oils

EVOO composition

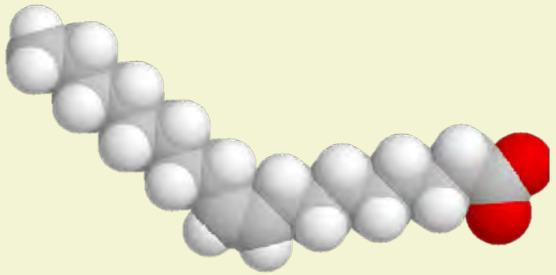
Major fraction

Triglycerides

95-98%

Monounsaturated fatty acids

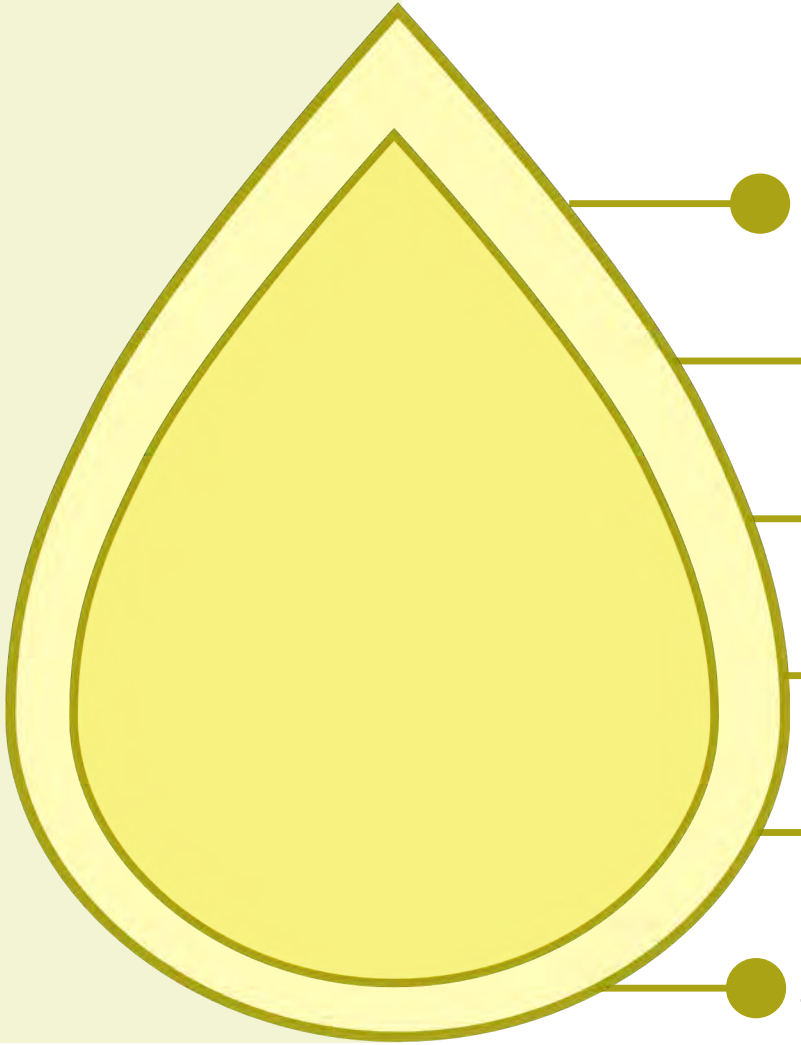
55-83%



Oleic acid

Minor fraction

2–5%



- **Phenolic compounds**
- Triterpenic compounds
- Tocopherols
- Hydrocarbons
- Pigments (chlorophylls and carotenoids)
- Sterols

POLYPHENOL RESEARCH

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EVOO claims

POLYPHENOL RESEARCH

U.S. FOOD & DRUG ADMINISTRATION

According to MUFA's levels

efsa European Food Safety Authority

According to polyphenols levels

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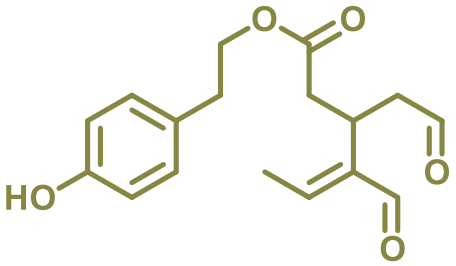
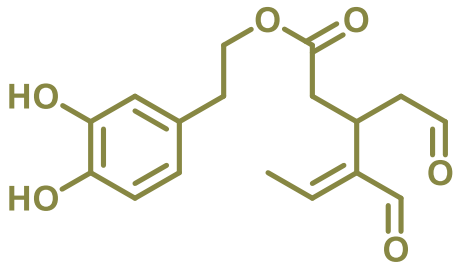
Health-promoting properties of EVOO

Oleocanthal (OLC)



Oleacein (OLEA)



Health-promoting properties

- Neuro-protective effects
- Anti-inflammatory effects
- Anticancer properties
- Antimicrobial properties
- Protection against CVD

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Cooking with EVOO

EVOO serves as heat transfer medium

EVOO is transformed due to temperature and oxygen

Both major and minor fraction change

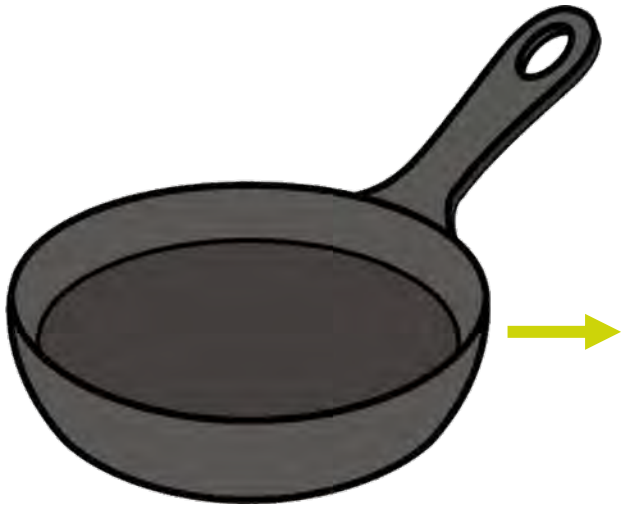
EVOO interacts with food

Methodology

30 min

60 min

120 ºC



170 ºC

15 min

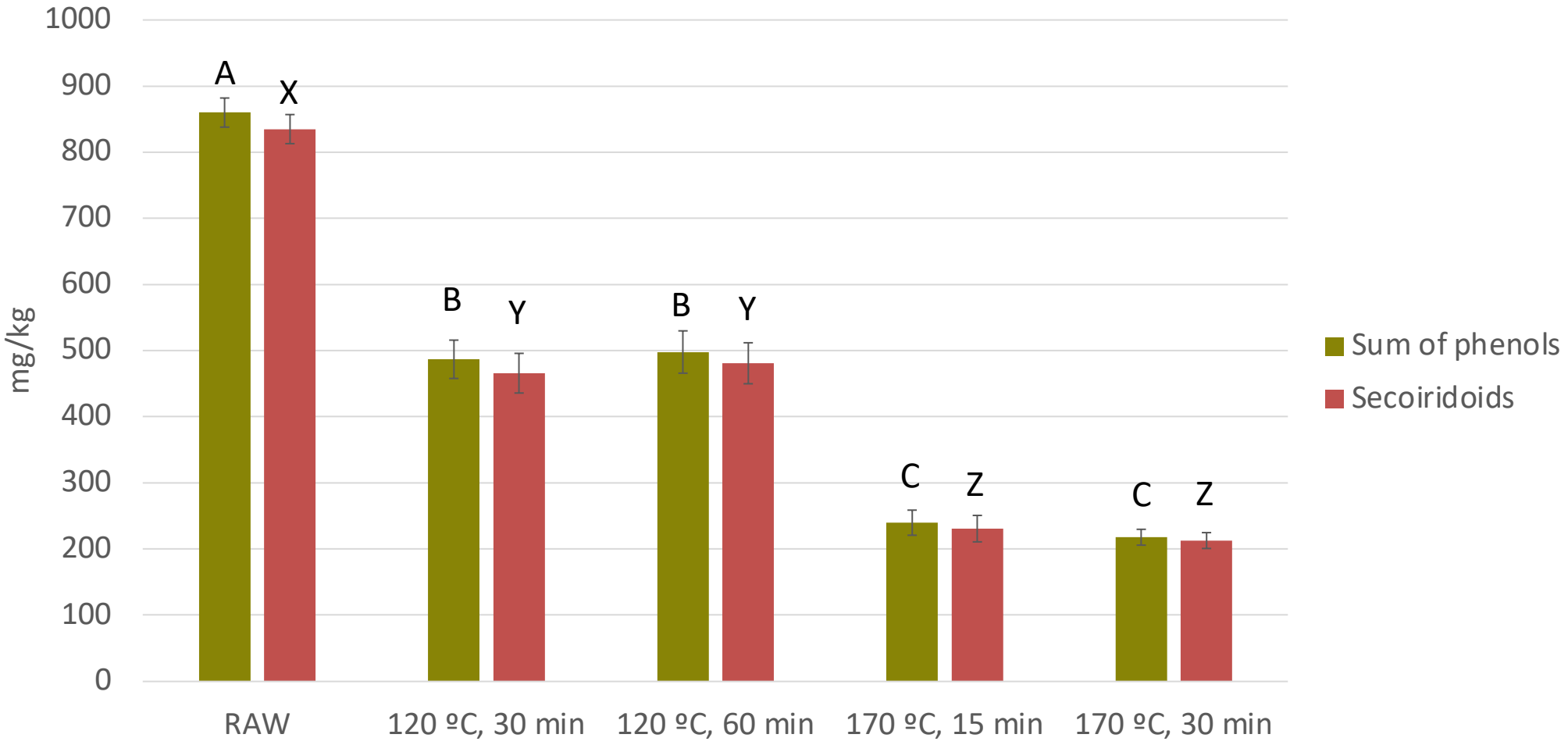
30 min

liquid-liquid extraction

+

Lozano-Castellón J, *et al*. *Antioxidants* (2020)

Results



Different letters mean significant differences between samples

Results

Olive oil polyphenols contribute to the protection of blood lipids from oxidative stress

> 250 mg/kg of hydroxytyrosol and its derivatives (e.g. oleuropein complex and tyrosol)

120 ºC

Cooking with EVOO

During the cooking process, the content of polyphenols decrease by **40% to 120ºC** and by **75% at 170ºC**, compared to the levels of antioxidants in raw oil (860 mg/Kg).

Nevertheless, the levels of antioxidants **keep fulfilling the parameters stated as healthy by the European Union**.

Lozano-Castellón J, *et al*. *Antioxidants* (2020)

Processing and matrix affect of polyphenols

40
healthy

PROSPECTIVE
RANDOMIZED
CROSS-OVER
OPEN
CONTROLLED

500 g TOMATO

250 g
TOMATO SAUCE

250 g
TOMATO SAUCE + OLIVE OIL

HPLC-Orbitrap-MS/MS

PROCESSING AND OIL

- NARINGENIN
- NARINGENIN GLUCURONIDE
- QUERCETIN

10 POLYPHENOLS

93 POLYPHENOLS (Microbiota)

PROCESSING AND MATRIX AFFECT
BIOAVAILABILITY

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Tomato sauce elaboration

TOMATO LISO ROJO RAMA

WASHING

BREAKING

COOKING (99°C)

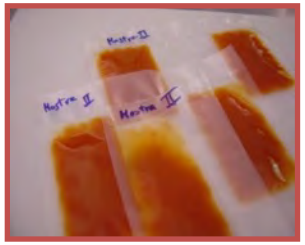
HEAT OLIVE OIL (110°C)

TS+OIL

TOMATO SAUCE

FINISHING

WEIGHTING AND PACKAGING



COLD STORAGE

Phenolic Composition Tomato and Sauces

POLYPHENOL RESEARCH

Compound	RAW TOMATO ng/g FW	TOMATO SAUCE ng/g FW	TS+OIL ng/g FW
Coumaric hexose 1	35,2 ± 0,6	29,7 ± 2,5	20,2 ± 2,1
Protocatechuic	23,9 ± 3,0	137,4 ± 9,3	77,4 ± 8,5
Caffeic hexose 1	**1641,0 ± 108,8**	**1545,5 ± 175,5**	**1088,4 ± 55,0**
Coumaric hexose 2	235,3 ± 4,8	51,7 ± 4,1	53,6 ± 6,7
3-Caffeoylquinic acid	135,7 ± 1,0	189,5 ± 12,2	298,2 ± 14,8
Ferulic hexose	**1437,2 ± 54,2**	**822,3 ± 12,1**	**832,6 ± 8,0**
Caffeic hexose 2	**647,8 ± 20,9**	**722,5 ± 49,8**	**675,8 ± 19,8**
Homovanillic hexose 1	**4525,1 ± 361,6**	**6985,3 ± 445,0**	**8312,9 ± 524,1**
Homovanillic hexose 2	**636,6 ± 54,5**	**738,7 ± 43,0**	**923,6 ± 55,3**
5-Caffeoylquinic acid	**385,5 ± 10,6**	**899,1 ± 39,9**	**704,6 ± 78,9**
Coumaric hexose 3	201,4 ± 1,8	374,2 ± 6,6	380,3 ± 8,6
Caffeic acid	379,5 ± 18,1	498,6 ± 18,7	527,7 ± 16,9
4-Caffeoylquinic acid	832,5 ± 7,1	533,8 ± 38,6	542,7 ± 12,4
3-Hydroxybenzoic acid	40,8 ± 3,6	13,3 ± 1,0	1,6 ± 0,2
Rutin	**1889,4 ± 9,1**	**3849,9 ± 74,7**	**3628,5 ± 63,9**
Naringenin chalcone	185,7 ± 2,6	207,5 ± 14,0	223,5 ± 1,1
Ferulic acid	48,2 ± 4,9	n.d.	n.d.
Dicaffeoylquinic acid	57,8 ± 0,3	48,0 ± 0,3	50,0 ± 0,5
Apigenin-7-glucoside	77,0 ± 2,4	97,9 ± 2,3	88,7 ± 11,0
Naringenin-O-hexoside	62,5 ± 4,1	60,0 ± 9,0	71,0 ± 6,6
Tricaffeoylquinic acid	116,3 ± 3,8	65,3 ± 5,7	63,1 ± 1,7
p-Coumaric acid	21,0 ± 1,8	26,8 ± 3,0	12,4 ± 1,6
Naringenin	**3499,9 ± 379,2**	**3349,3 ± 38,7**	**3746,8 ± 102,2**

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Foods without phenolics

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Processing and matrix affect experiment

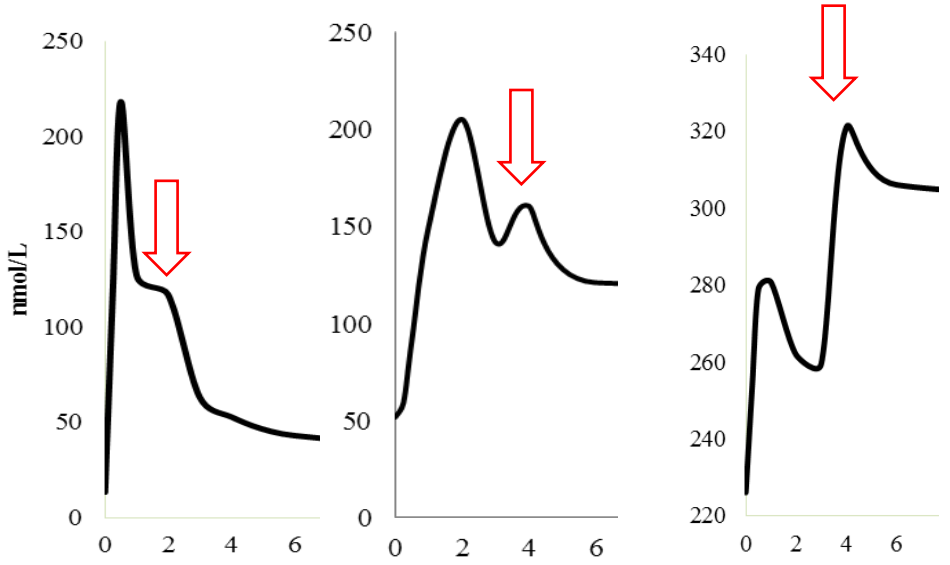
1578 DOI 10.1002/mnfr.201500820 *Mol. Nutr. Food Res.* 2016, *60*, 1578–1589

RESEARCH ARTICLE

Bioavailability of tomato polyphenols is enhanced by processing and fat addition: Evidence from a randomized feeding trial

Miriam Martínez-Huélamo[1,2], Anna Vallverdú-Queralt[2,3], Giuseppe Di Lecce[1], Palmira Valderas-Martínez[2,4], Sara Tulipani[5], Olga Jáuregui[6], Elvira Escribano-Ferrer[2,7], Ramón Estruch[2,4], Montse Illan[1] and Rosa M. Lamuela-Raventós[1,2]

OIL → ENTEROHEPATIC CIRCULATION

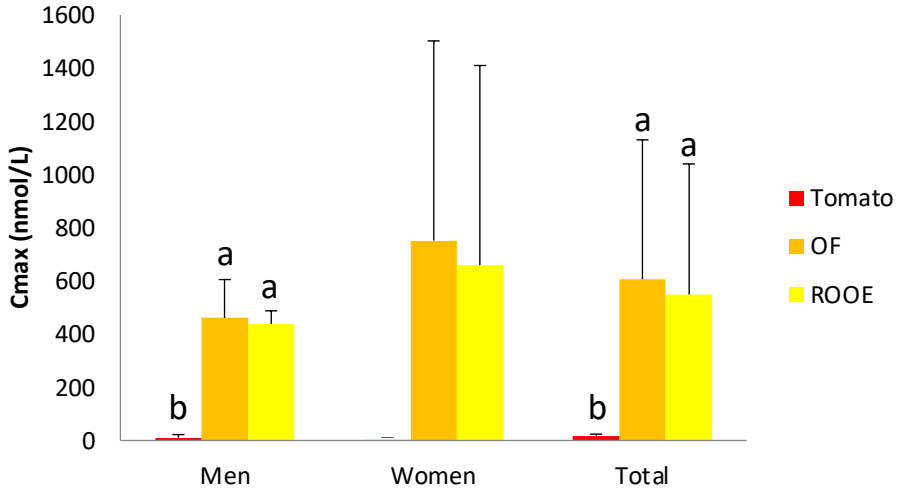


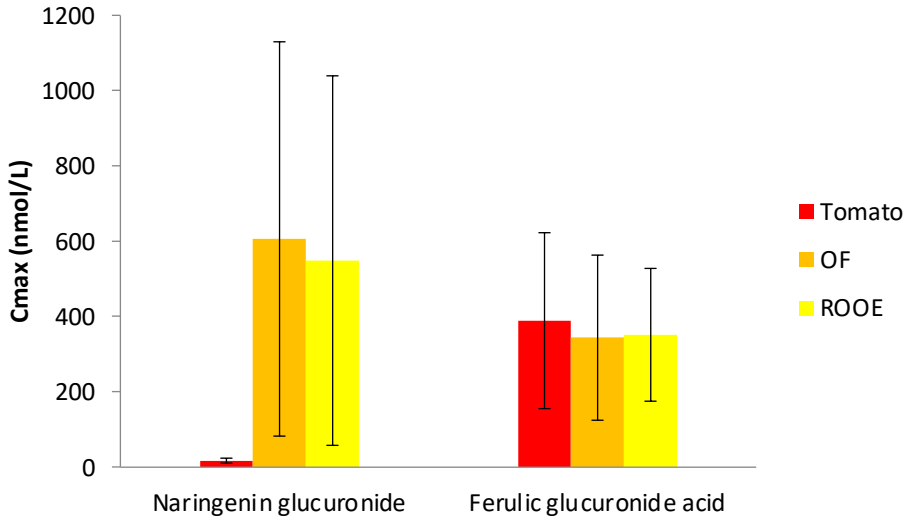
NARINGENIN GLUCURONIDE

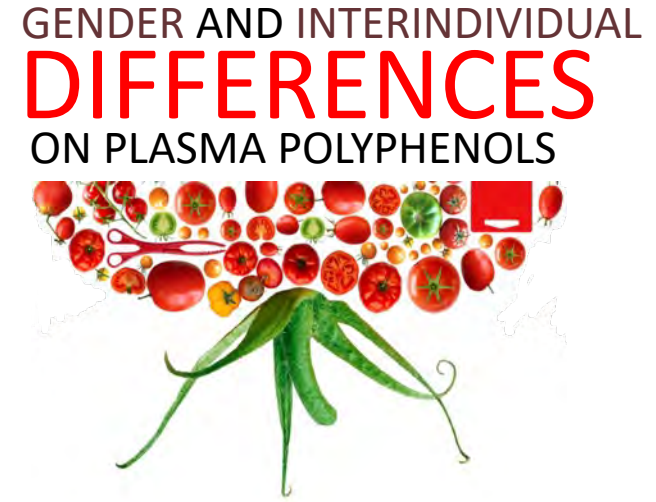
FERULIC ACID GLUCURONIDE

QUERCETIN

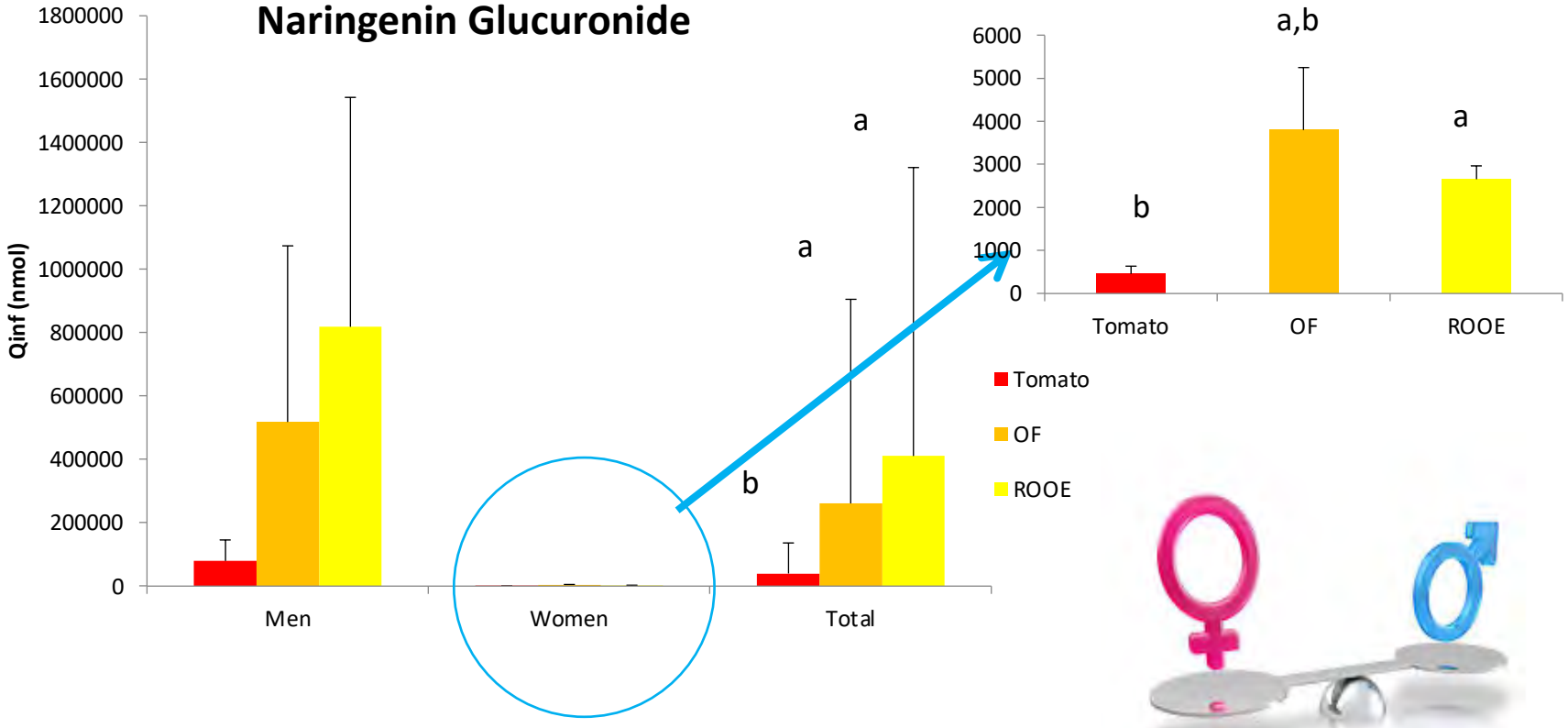
Gender and interindividual differences







Naringenin glucuronide results



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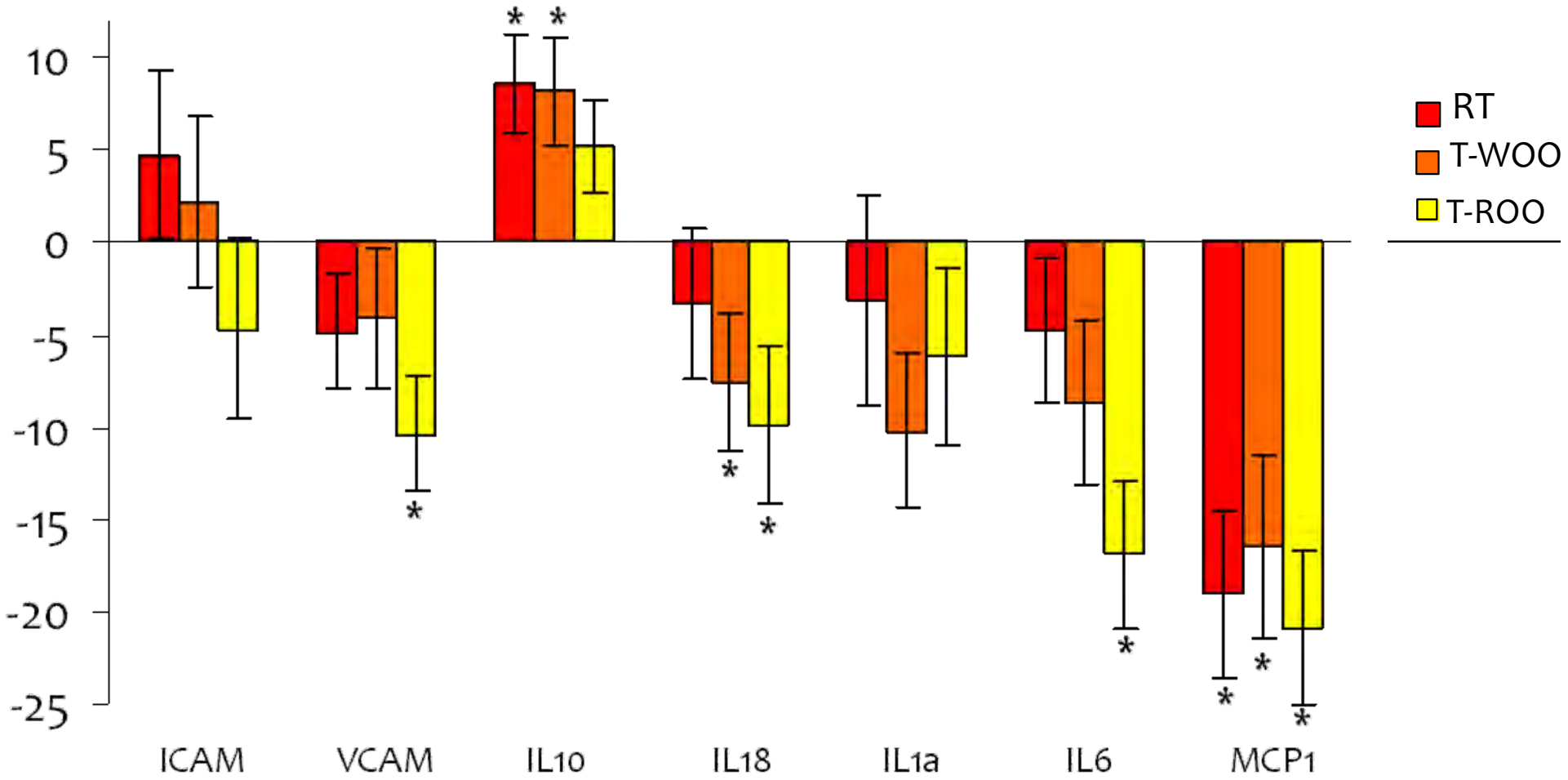
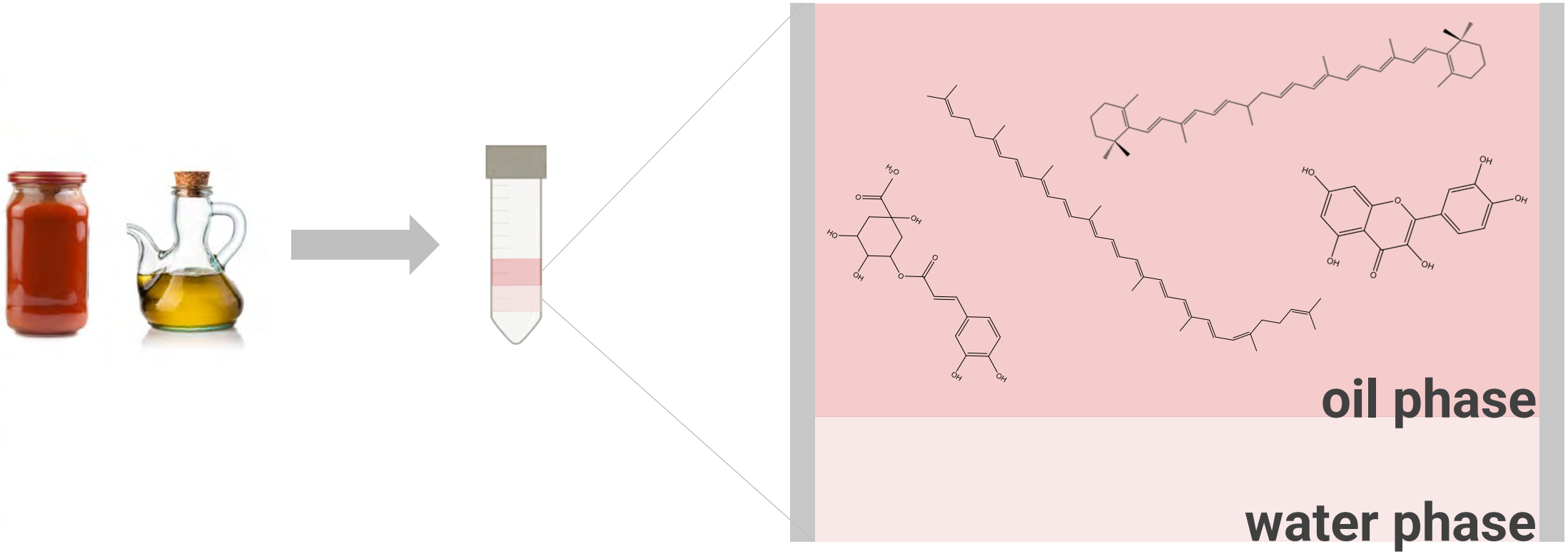
Changes of Circulating Inflammatory Markers



Valderas-Martínez et al. Nutrients. 2016 Mar 16;8(3):170.

Oil/water phase distribution



Rinaldi J, et al. **Molecules**. (2019)

More complex food?

POLYPHENOL RESEARCH

MORE COMPLEX FOOD?

The sofrito is a typical technique of lightly frying onion and garlic in EVOO.

Is an ingredient used to prepare many Mediterranean dishes and recipes.

The tomato sofrito sauce has been reported to contain 40 different phenolic compounds and a high content of carotenoids.

Sofrito

A Mediterranean sauce

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Bioactive compounds in the Mediterranean sofrito

Food Chemistry 141 (2013) 3365–3372

Contents lists available at SciVerse ScienceDirect

Food Chemistry

journal homepage: www.elsevier.com/locate/foodchem

Bioactive compounds present in the Mediterranean *sofrito*

Anna Vallverdú-Queralt [a,b], José Fernando Rinaldi de Alvarenga [c], Ramon Estruch [d], Rosa M. Lamuela-Raventos [a,b,*]

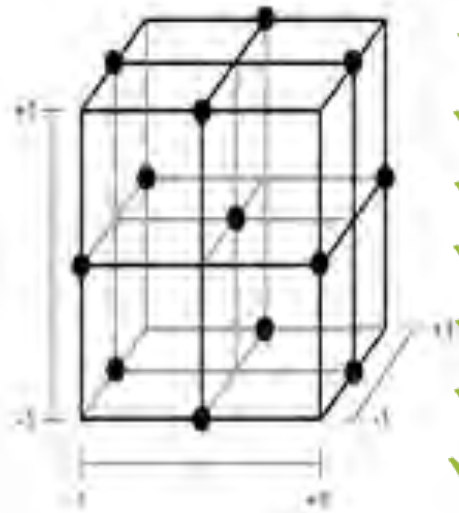
[a] Nutrition and Food Science Department, XaRTA, INSA Pharmacy University of Barcelona, Spain
[b] CIBER Fisiopatología de la Obesidad y la Nutrición (CIBERobn), Instituto de Salud Carlos III, Spain
[c] Department of Food Science and Nutrition, School of Pharmaceutical Science, São Paulo State University – UNESP, 14801 902 Araraquara, São Paulo, Brazil
[d] Department of Internal Medicine, Hospital Clinic, IDIBAPS, University of Barcelona, Spain

Influenced by ingredients such as:

- ↑ EVOO
- ↓ Sunflower oil
- ↑ Onion

Home cooking sofritos

Factorial design



- ✓ Full factorial design 2^4
- ✓ Performed independently
- ✓ Triplicate
- ✓ Randomized
- ✓ 48 experiments
- ✓ Better reproducibility
- ✓ Estimate pure error and lack of fit

Treatment	Olive Oil	Onion	Garlic	Time
1	5 %	20 %	2 %	30 min
2	10 %	20 %	2 %	30 min
3	5 %	40 %	2 %	30 min
4	10 %	40 %	2 %	30 min
5	5 %	20 %	4 %	30 min
6	10 %	20 %	4 %	30 min
7	5 %	40 %	4 %	30 min
8	10 %	40 %	4 %	30 min
9	5 %	20 %	2 %	60 min
10	10 %	20 %	2 %	60 min
11	5 %	40 %	2 %	60 min
12	10 %	40 %	2 %	60 min
13	5 %	20 %	4 %	60 min
14	10 %	20 %	4 %	60 min
15	5 %	40 %	4 %	60 min
16	10 %	40 %	4 %	60 min

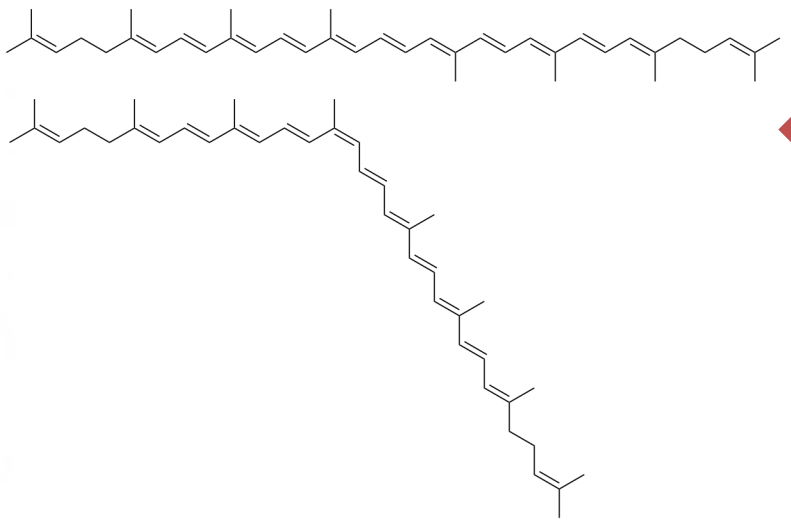
Table 1. Experimental level of the factors used in the Full Factorial Design (FDD).

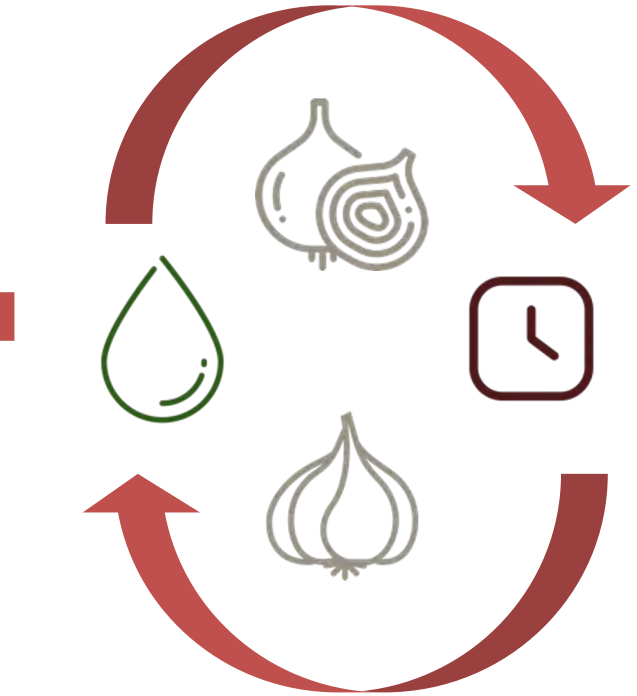
Rinaldi J, et al. Food Res. Int. (2017)

Synergism effect

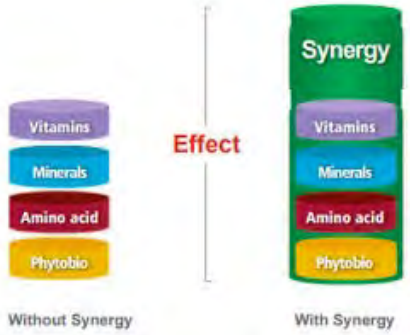
Lycopene

Isomerization





Synergism Effect

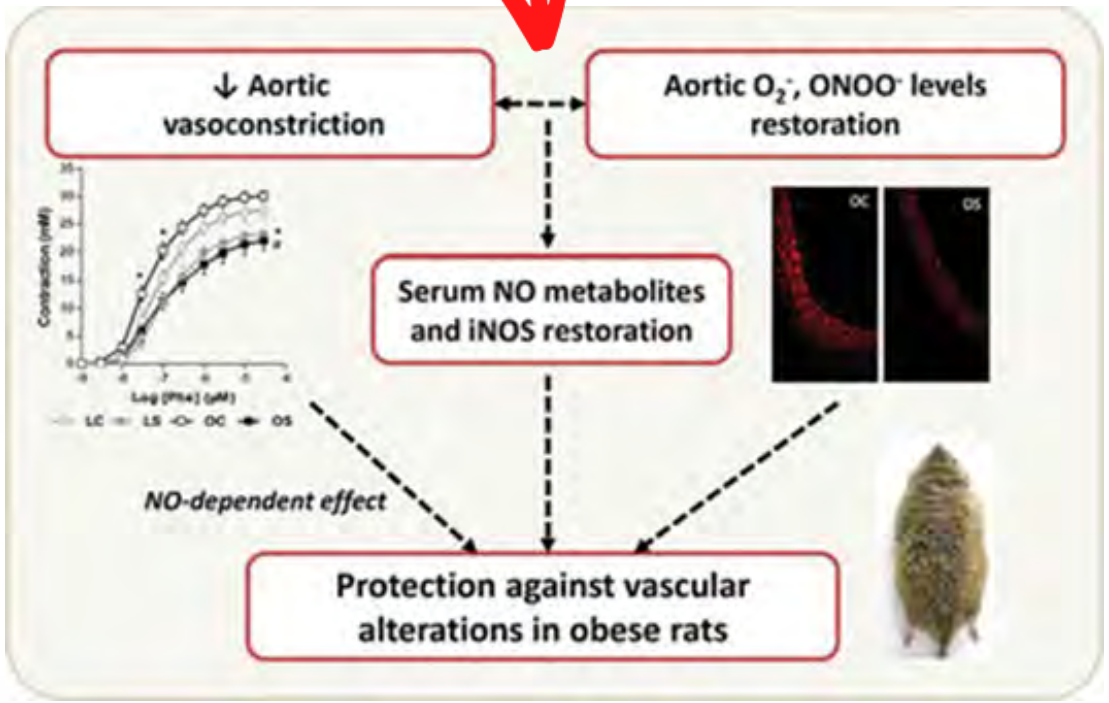


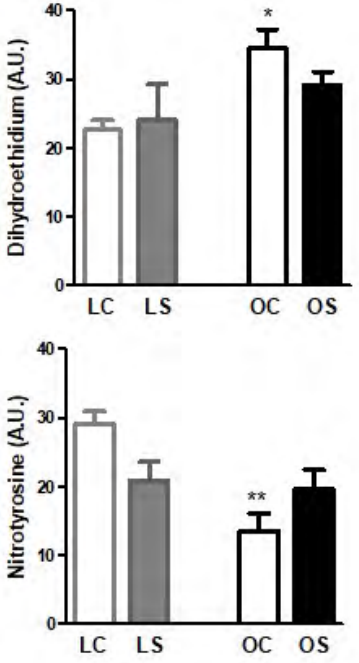
Rinaldi J, et al. Food Res. Int. (2017)

Sofrito and Vascular Function

Tomato-based sofrito

8 weeks administration
Obese Zucker rats





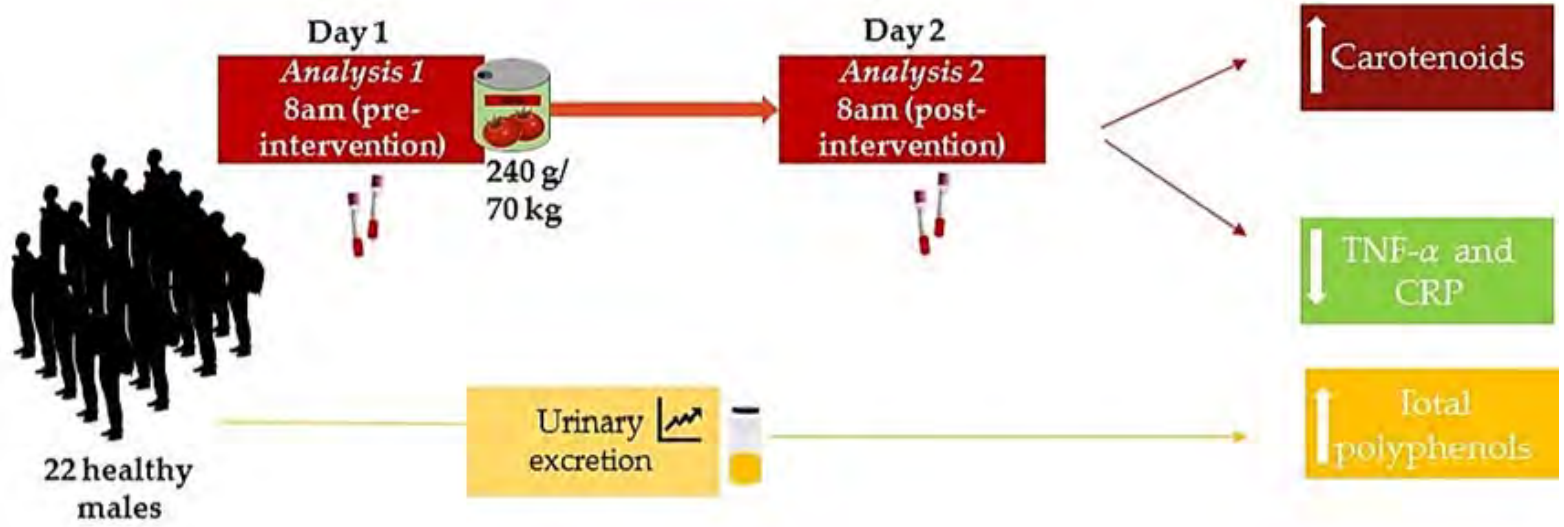
Rodríguez-Rodríguez R, et al. Mol. Nutr. Food Res. (2017)

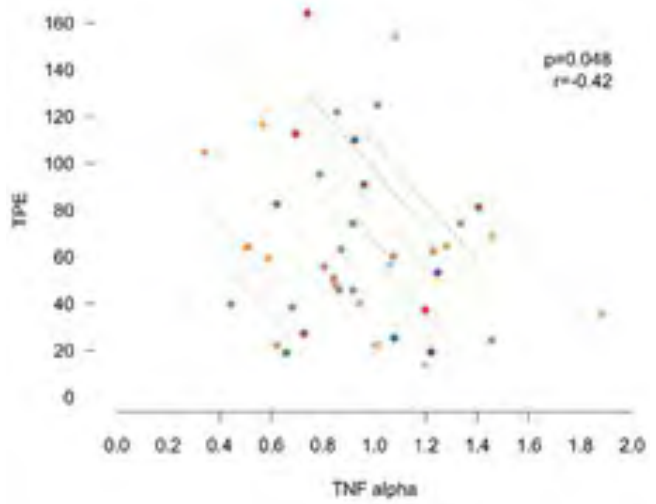
Sofrito and body weight

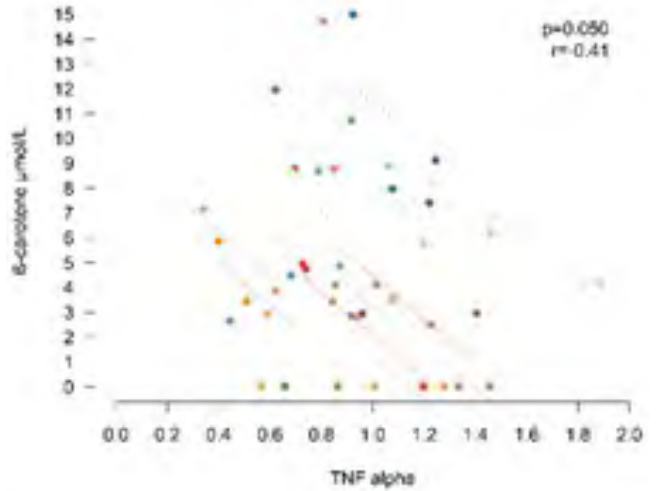
	LC	LS	OC	OS
Body weight (g)	383.6 ± 28.7	378.4 ± 20.7	**518.3 ± 49.6***	**517.3 ± 46.1⁺**
Food intake (g/day/rat)	20.00 ± 3	23.61 ± 4.43	28.64 ± 5.32*	34.44 ± 3.39⁺
Caloric intake (Kcal)	61.99 ± 11.50	73.71 ± 13.80	**88.79 ± 16.50***	**107.55 ± 10.57⁺ #**

Rodríguez-Rodríguez R, et al. Mol. Nutr. Food Res. (2017)

Effect of sofrito on healthy volunteers







Hurtado-Barroso S, et al. Nutrients (2019)

Take home message

- The presence of EVOO enhances the bioavailability of bioactive compounds in foods (tomato sauce, tomato sofrito sauce).

- The tomato sofrito sauce made with EVOO has shown the ability to improve the vascular function and weight in animal models, and to decrease inflammatory status in healthy individuals.

Take home message

- Minor compounds are transferred to food enriching it and diminishing its oxidation.
- Phytochemicals migrate to EVOO, increasing its bioavailability and stability.
- Phenolic compounds prevent formation of undesired compounds as acrylamide.

Lozano-Castellón, 2022 Trends in Food Science & Technology

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lamuela@ub.edu

OLIVE OIL, BODY WEIGHT, AND LONGEVITY

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Department of Nutrition

HARVARD MEDICAL SCHOOL

BWH BRIGHAM AND WOMEN'S HOSPITAL

Mediterranean diet as a healthy dietary pat

High intake of plant-based foods (fruits and vegetables, legumes, nuts, and OLIVE OIL)

Moderate intake of dairy, fish, poultry

Low in red meat, sweets and highly processed food

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 26, 2003 VOL. 348 NO. 26

9-item

Adherence to a Mediterranean Diet and Survival in a Greek Population

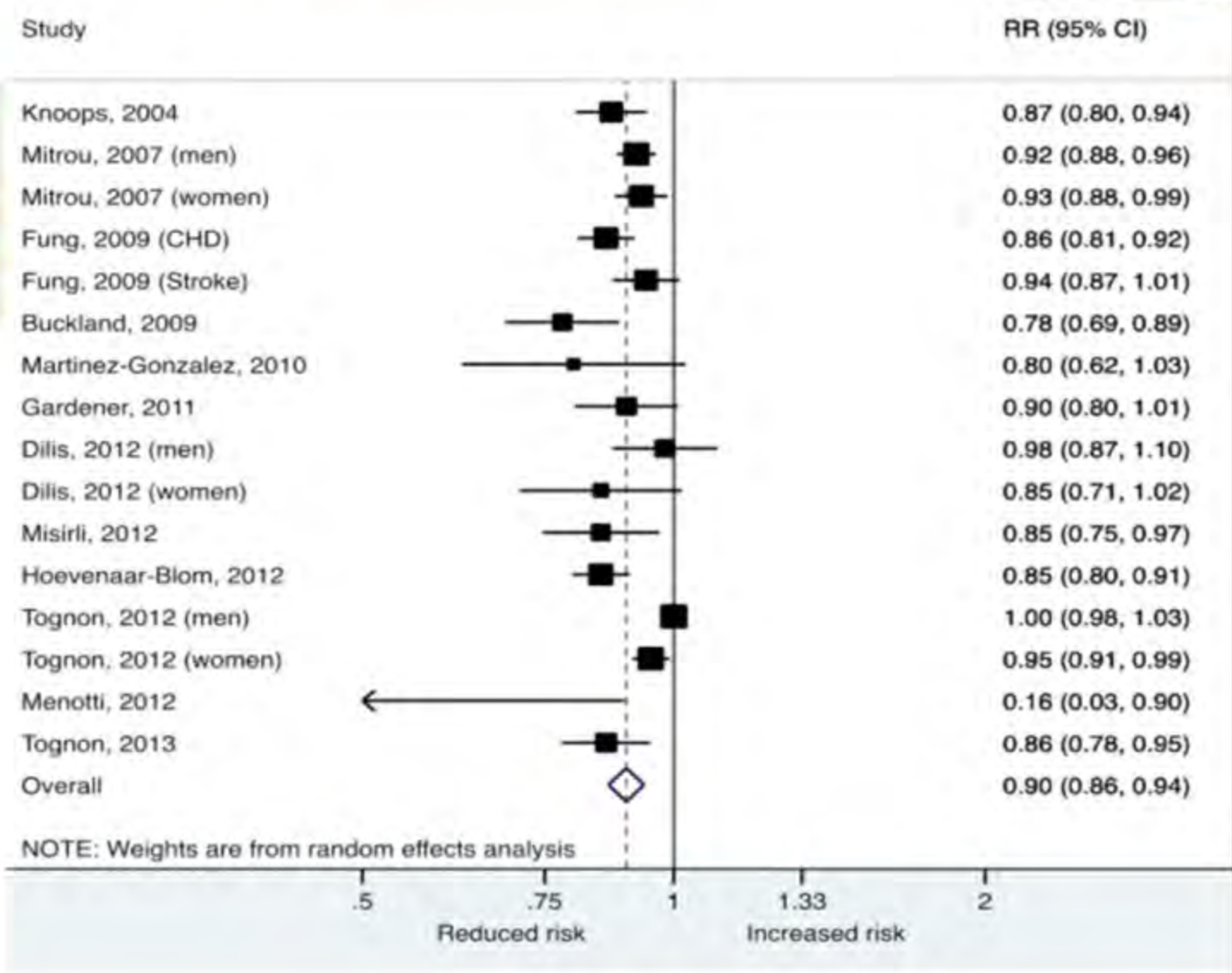
Antonia Trichopoulou, M.D., Tina Costacou, Ph.D., Christina Bamia, Ph.D., and Dimitrios Trichopoulos, M.D.

- **1 point if >= sex-specific Median**
  1. MUFA/SFA ratio
  2. Fruits & nuts
  3. Vegetables
  4. Cereals
  5. Legumes
  6. Fish
- **1 point if <= sex-specific Median**
  7. Meat/meat products
  8. Dairy
9. **Alcohol: 1 point if**
   - Men: between 10-50 g/d
   - Women: between 5-25 g/d

Dietary patterns, Mediterranean diet, and cardiovascular disease

Martinez-Gonzalez MA, Bes-Rastrollo M.
Curr Opin Lipidol 2014;25:20-6.

For every +2 points increment in the MEDdiet score, there was 13% reduction in CVD risk



Olive oil as a good source of MUFA

A hallmark of traditional Mediterranean diets

Known as the liquid gold since the ancient times

The oldest olive tree still produces high-quality olives: A gift to humanity and the environment (preservation of natural resources and biodiversity)

https://greekreporter.com/2022/05/18/3000-year-old-olive-tree-in-crete/

Global producers of olive oil

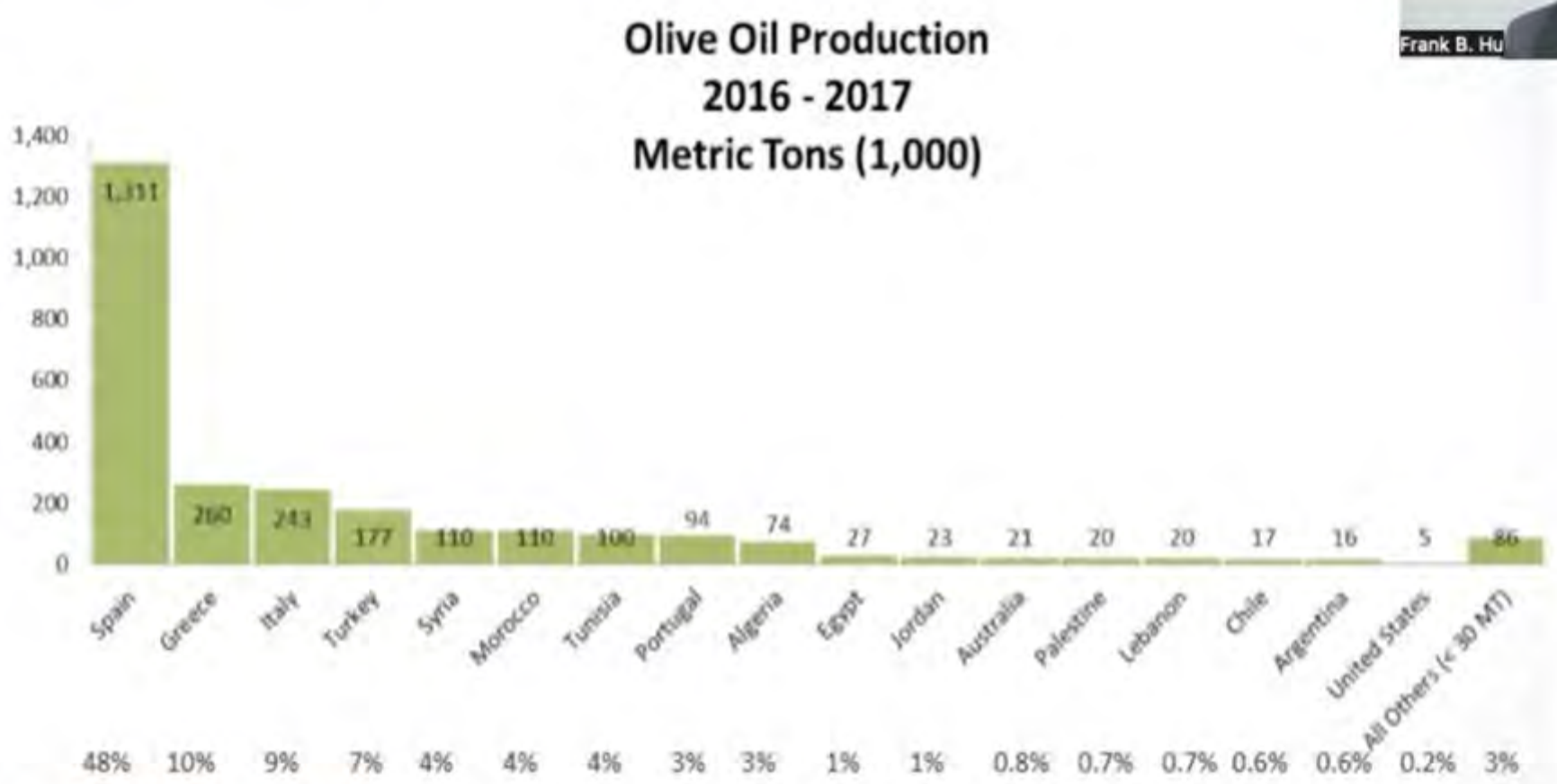
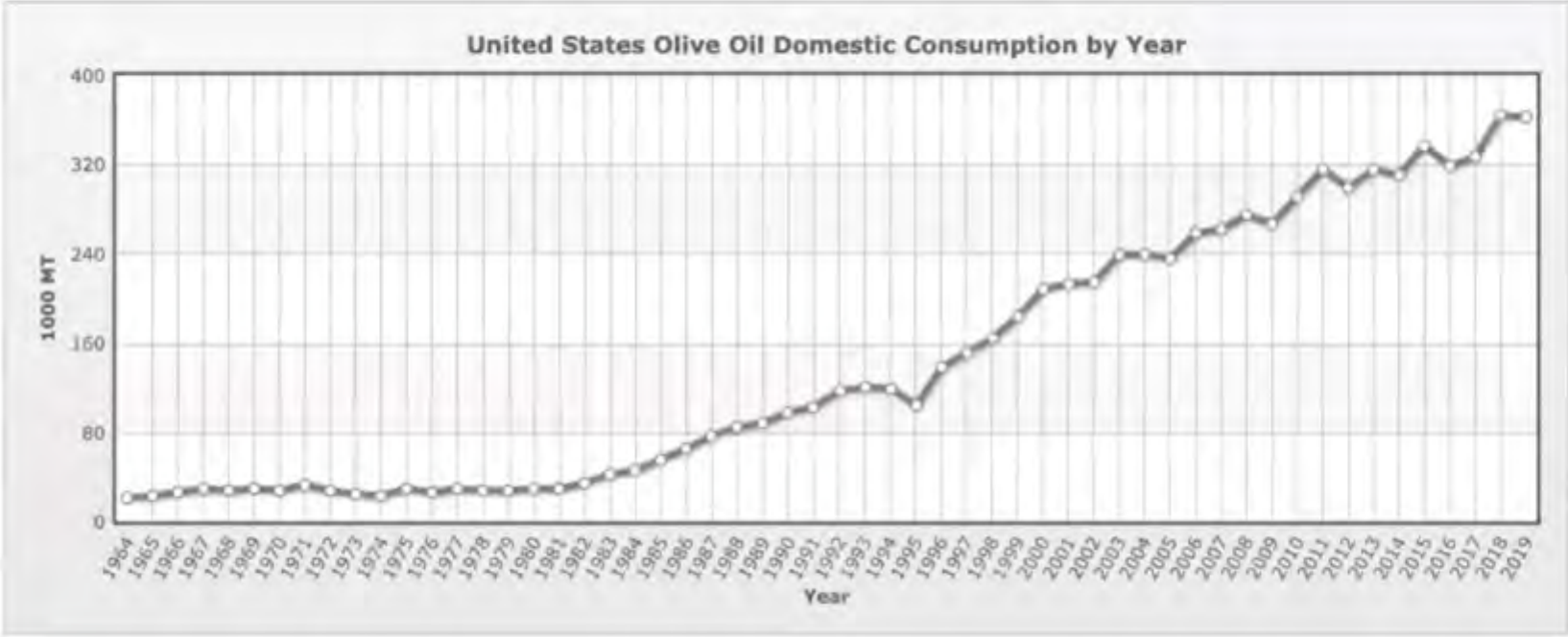


Fig. 2: Olive oil production 2016-2017 metric tons (1,000)
Source: IOC forecast reports November 2016

Time trends of olive oil consumption in the U.S



Source: United States Department of Agriculture

Types of olive oil

- **EXTRA VIRGIN OLIVE OIL**

  Extracted directly from mechanically pressing ripe olives.

EXTRA-VIRGIN OO
best quality, most intense flavour
MULTIPLE BIOACTIVE AND ANTIOXIDANT COMPONENTS
(polyphenols, phytosterols, vitamin E)

VIRGIN OO
Not mixed and not refined

- **REFINED OLIVE OIL**

  Blend of virgin and refined olive oil.

Less flavour, colour, arome
Fewer amount of vitamins and antioxidants
Very little vitamin E contain

Olive Oil and Health

VIRGIN OLIVE OIL

- MUFA
- Phenolic compounds (hydroxytyrosol, oleuropein, ...)
- Lipid derivate molecules (squalene, tocopherols, ...)

- Less susceptible to oxidation
- Anti-inflammatory and anti-atherogenic
- Oxidative stress
- Endothelial function
- Lipid profile
- Insulin sensitivity and glycaemic control
- Blood pressure

RCT: Effects of a Mediterranean-type diet on the Primary Prevention of Cardiovascular Disease (PREDIMED Study)

www.

Prediimed
Prevención con Dieta Mediterránea

14-point score

1. Olive oil main culinary fat
2. Olive oil >=4 tablespoons/d
3. Vegs>=2 serv./d
4. Fruits>=3 serv./d
5. Red meats<1/d
6. Butter, marg, cream<1/d
7. Soda drinks<1/d
8. Wine >=7 glasses/wk
9. Legumes >=3/wk
10. Fish & seafood >=3/wk
11. Cakes, sweets <3/wk
12. Nuts >=3/wk
13. Poultry > red meats
14. Sofrito

Zazpe et al for the PREDIMED group,

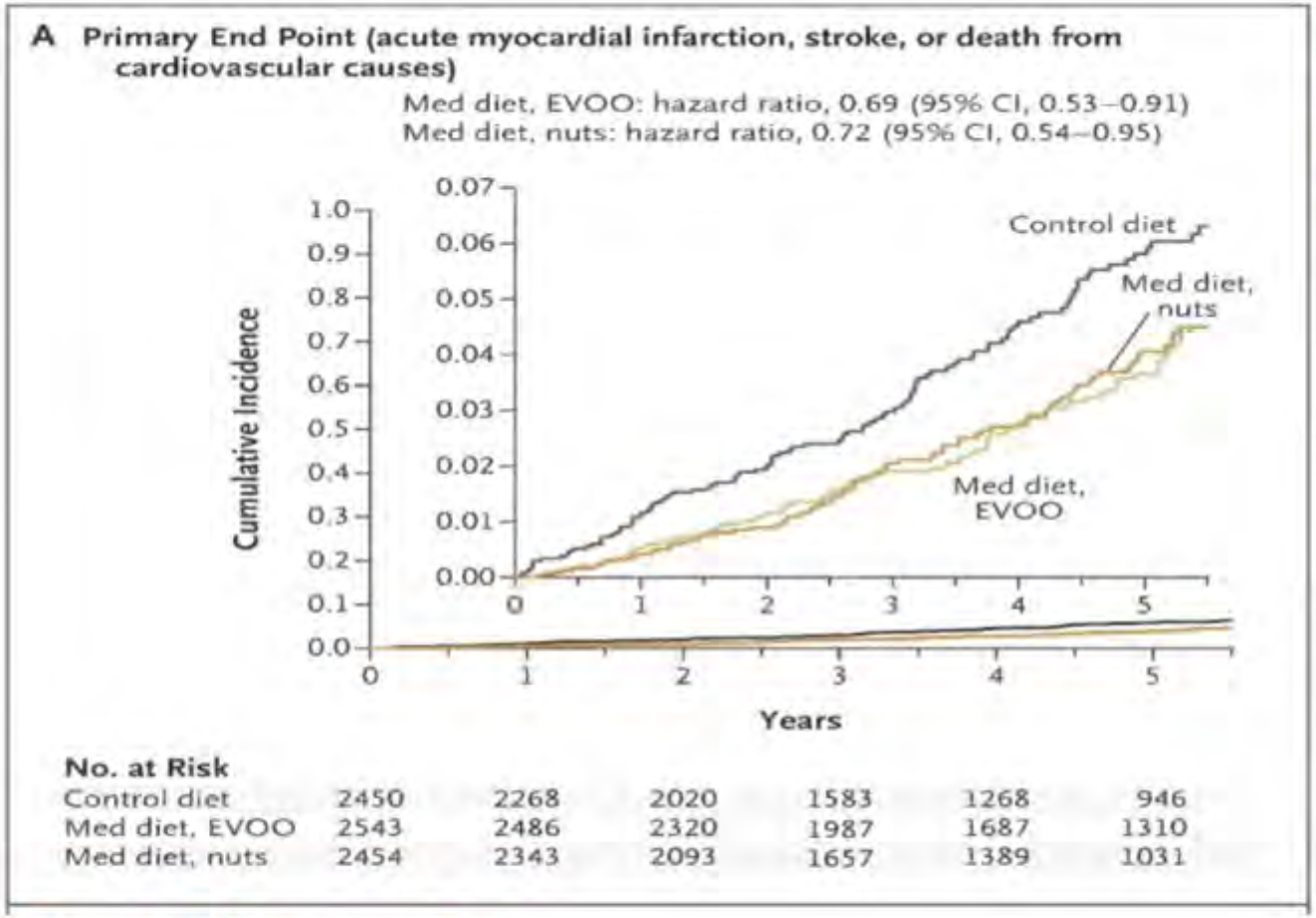
J Am Diet Assoc 2008;108:1134-44

www.predimed.es

Mediterranean diet and CVD: The PREDIME

31%

28%



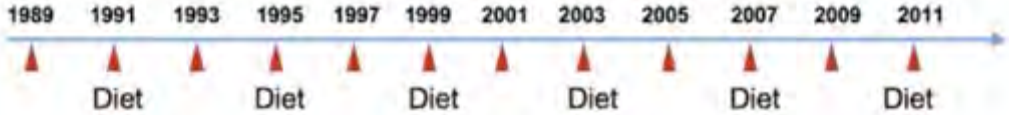
Mean follow-up: 4.8y

- The incidence of major **cardiovascular events was lower** among those assigned to a **Mediterranean diet** supplemented with extra-virgin olive oil or nuts than among those assigned to a reduced-fat diet.

Estruch et al. NEJM 2018

Nurses' Health Study (n=121,700, age 30-55)

Nurses' Health Study II (n=116,000, age 25-42)



Health Professionals Follow-up Study (n=51,529, age 40-75)

Every two years: weight, physical activity, smoking, CVD risk factors, diseases
Every four years: detailed dietary habits.

Olive Oil Consumption and Cardiovascular Risk in U.S. Adults

Marta Guasch-Ferré, PhD,[a,b] Gang Liu, PhD,[c] Yanping Li, PhD,[a] Laura Sampson, RD,[a] JoAnn E. Manson, MD, DrPH,[b,d,e] Jordi Salas-Salvadó, MD, PhD,[f,g] Miguel A. Martínez-González, MD, PhD,[a,g,h] Meir J. Stampfer, MD, PhD,[b,d] Walter C. Willett, MD, DrPH,[a,b,d] Qi Sun, MD, PhD,[a,b] Frank B. Hu, MD, PhD[a,b,d]

- Higher olive oil intake was associated with a lower risk of total CVD in our cohort studies (compared with non-consumers, those with higher olive oil intake (>1/2 tablespoon/d or >7g/d) had 14% lower risk of CVD)

- Higher olive oil intake was associated with lower levels of circulating inflammatory biomarkers and a better lipid profile.

- Replacing 5g/d of margarine, butter, mayonnaise, or dairy fat with the equivalent amount of olive oil was associated with 5-7% lower risk of CVD.

The American Journal of CLINICAL NUTRITION

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Am J Clin Nutr. 2015 Aug; 102(2): 479–486.
Published online 2015 Jul 8. doi: 10.3945/ajcn.115.112029

PMCID: PMC4515873
PMID: 26156740

Olive oil consumption and risk of type 2 diabetes in US women[1,2,3]

Marta Guasch-Ferré,[4,5] Adela Hruby,[5] Jordi Salas-Salvadó,[4] Miguel A Martínez-González,[7] Qi Sun,[5,6,8] Walter C Willett,[5,6,8] and Frank B Hu[5,6,8,*]

- The pooled HR (95% CI) of T2D in those who consumed >1/2 tablespoon (>8 g) of total olive oil per day compared with those who never consumed olive oil was 0.90 (0.82, 0.99).

- Substituting olive oil (8 g/d) for stick margarine, butter, or mayonnaise was associated with 5%, 8%, and 15% lower risk of T2D.

ELSEVIER

Journal of the American College of Cardiology

Volume 79, Issue 2, 18 January 2022, Pages 101-112

Original Investigation

Consumption of Olive Oil and Risk of Total and Cause-Specific Mortality Among U.S. Adults

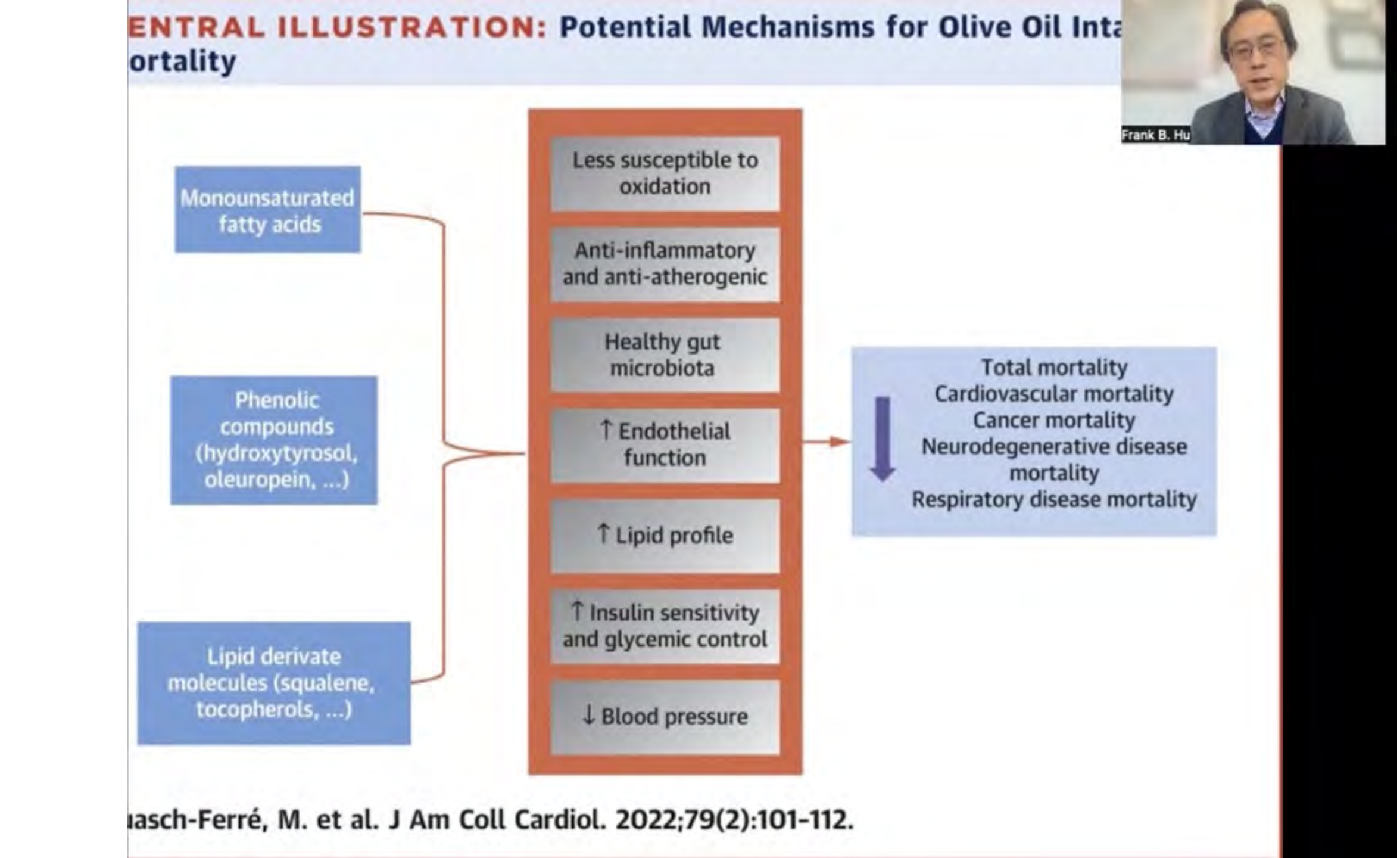
Marta Guasch-Ferré PhD [a, b], Yanping Li PhD [a], Walter C. Willett MD, DrPH [a, b, c], Qi Sun MD, ScD [a, b, c, d], Laura Sampson RD [a], Jordi Salas-Salvadó MD [e, f], Miguel A. Martínez-González MD [a, e, g], Meir J. Stampfer MD, DrPH [a, b, c], Frank B. Hu MD, PhD [a, b, c]

- Compared with those who never or rarely consume olive oil, those in the highest category of olive oil consumption (>7 g/d) had 19% lower risk of total and CVD mortality, 17% lower risk of cancer mortality, 29% lower risk of neurodegenerative mortality, and 18% lower risk of respiratory mortality.

- Substituting 10 g/d of other fats, including margarine, butter, mayonnaise, and dairy fat, with olive oil was associated with reductions in the risk of total and cause-specific mortality.

- Olive oil consumption in the US population is very low compared to European populations and our study did not distinguish extra-virgin olive oil from refined olive oil,

ENTRAL ILLUSTRATION: Potential Mechanisms for Olive Oil Inta
ortality



uasch-Ferré, M. et al. J Am Coll Cardiol. 2022;79(2):101-112.

Does Eating Fat Make You Fat?

NEWS · BIOLOGY · 16 NOVEMBER 2016

Fat or no fat? More research needed, doctors say

Medicos call for more light and less heat in the diet debate. Samantha Page reports.

The Keto Diet Is Popular, but Is It Good for You?

Low-carb, high-fat eating can lead to weight loss, but scientists debate the long-term effects on health.


MYTH:
OLIVE OIL PROMOTES WEIGHT GAIN
Frank B. Hu

Effect of a high-fat Mediterranean diet on bodyweight and waist circumference: a prespecified secondary outcomes analysis of the PREDIMED randomised controlled trial

Ramon Estruch, Miguel Angel Martínez-González, Dolores Corella, Jordi Salas-Salvadó, Montserrat Fitó, Gemma Chiva-Blanch, Miquel Fiol, Enrique Gómez-Gracia, Fernando Arós, José Lapetra, Lluis Serra-Majem, Xavier Pintó, Pilar Buil-Cosiales, José V Sorlí, Miguel A Muñoz, Josep Basora-Gallisá, Rosa María Lamuela-Raventós, Mercè Serra-Mir, Emilio Ros*, for the PREDIMED Study Investigators†*

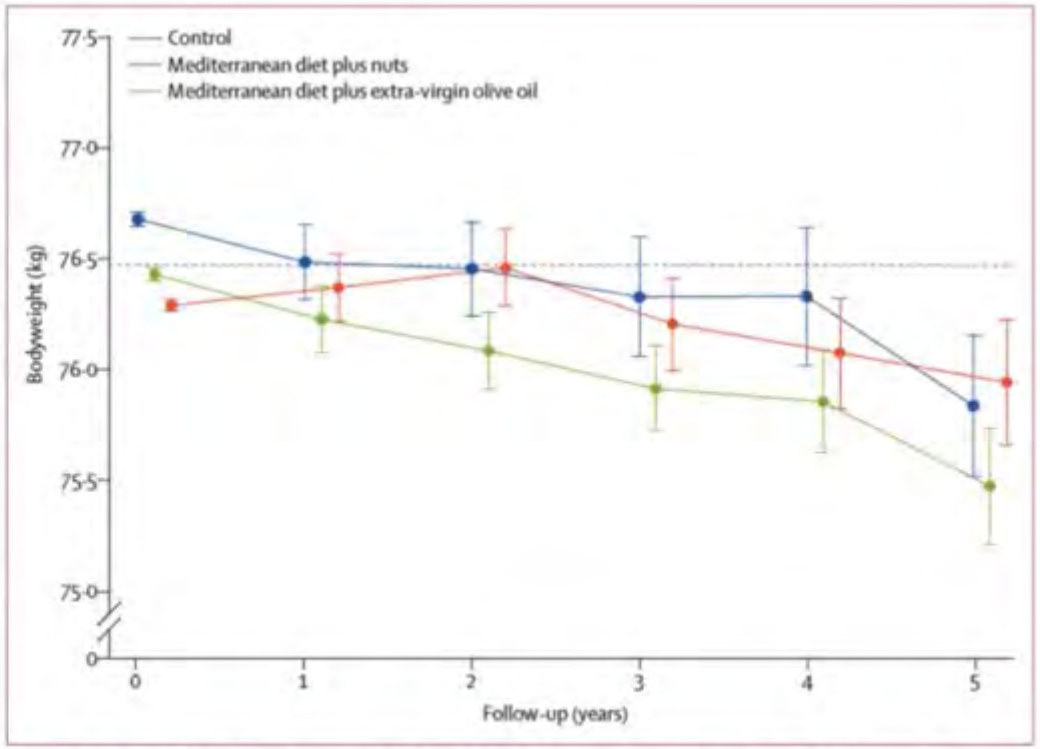


Figure 2: Multivariable-adjusted average bodyweight of PREDIMED participants during follow-up, by intervention group

Participants in all three groups reduced body weight.

Compared to the control group, adjusted differences in 5-year changes in **body weight (kg)**:

- MeDiet + EVOO: -0.43 (95% CI, -0.86 to -0.01) kg
- MeDiet +nuts: **-0.08** (95% CI, -0.50 to +0.35) kg

Diff. in 5-y changes in **waist circumference (cm)**:

- MeDiet + EVOO: -0.55 (95% CI, -1.16 to -0.06) cm
- MeDiet +nuts: -0.94 (95% CI, -1.60 to -0.27) cm

> Lipids. 2006 Mar;41(3):249-56. doi: 10.1007/s11745-006-5094-6.

Olive oil consumption and weight change: the SUN prospective cohort study

M Bes-Rastrollo [1], A Sánchez-Villegas, C de la Fuente, J de Irala, J A Martínez, M A Martínez-González

- A higher baseline consumption of olive oil was associated with a lower likelihood of weight gain.

Journal of the American College of Cardiology

Volume 79, Issue 2, 18 January 2022, Pages 101-112

Original Investigation

Consumption of Olive Oil and Risk of Total and Cause-Specific Mortality Among U.S. Adults

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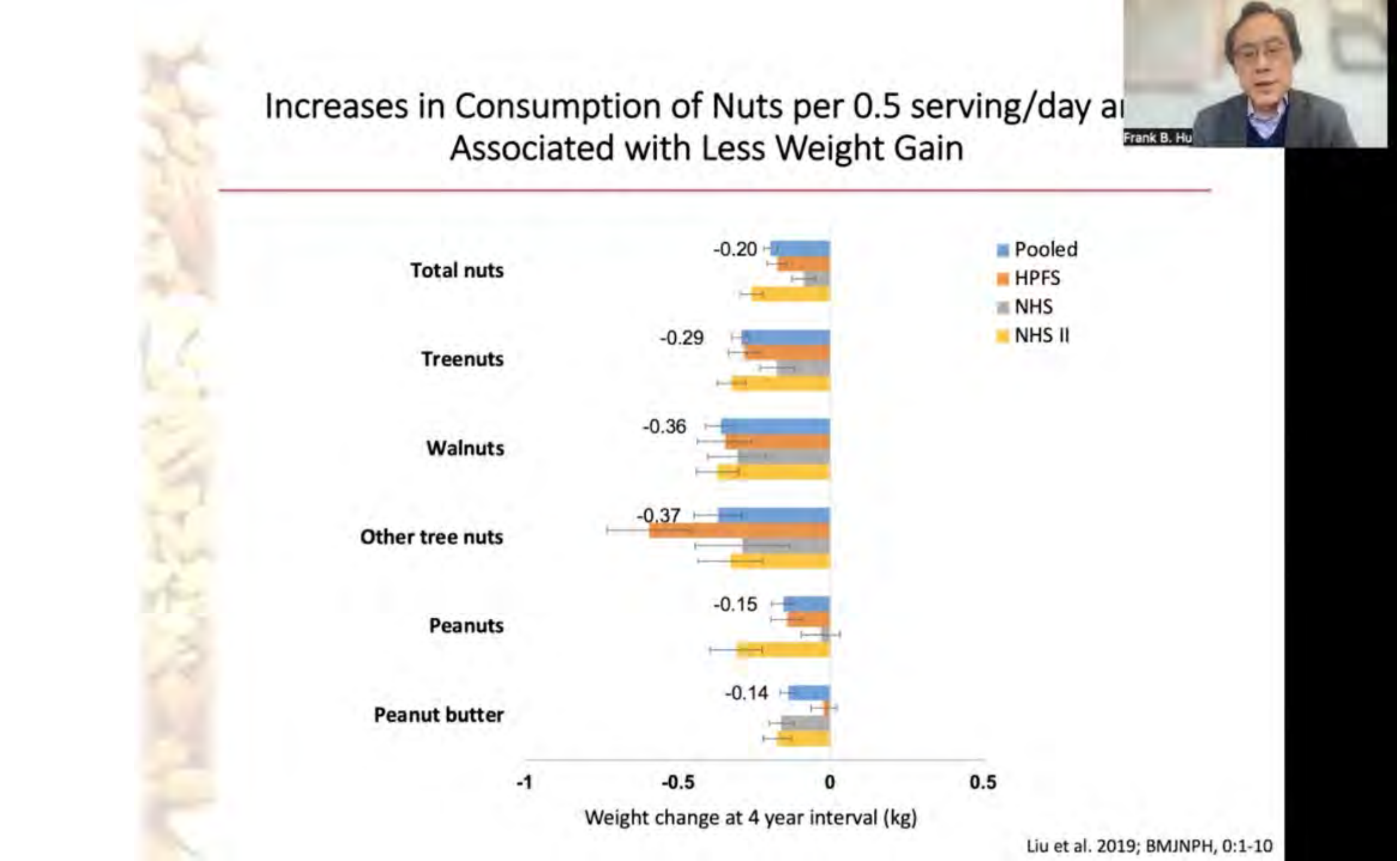
Participants with higher olive oil intake had lower BMI levels than those who rarely or never consumed olive oil

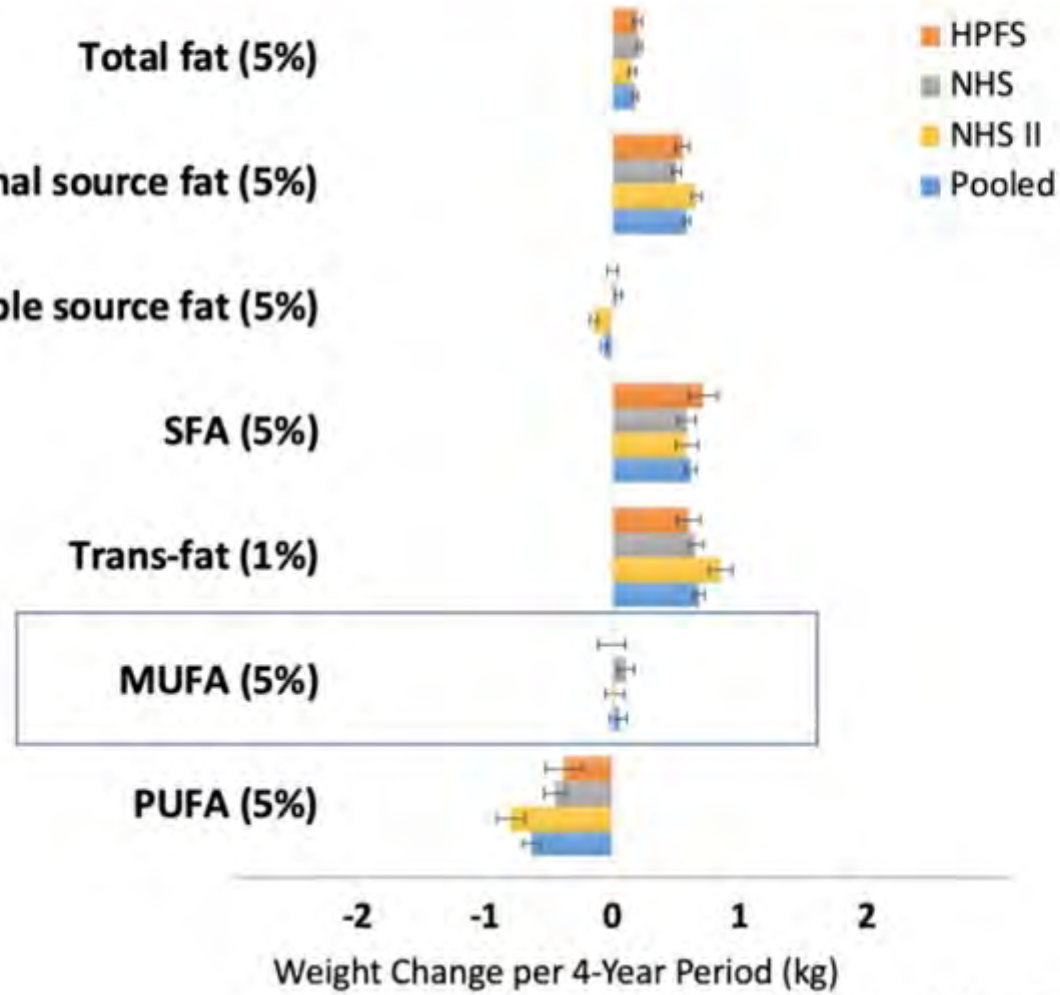
Increases in Consumption of Nuts per 0.5 serving/day a
Associated with Less Weight Gain



Liu et al. 2019; BMJNPH, 0:1-10

Changes in Types of Dietary Fats Influence Long-term Weight Change in US Women and Men

Xiaoran Liu,[1] Yanping Li,[1] Deirdre K Tobias,[1,3] Dong D Wang,[1] JoAnn E Manson,[2,3,4] Walter C Willett,[1,2,4] and Frank B Hu[1,2,4]



Liu et al. 2018; Journal of Nutrition, 148(11) 1821-29

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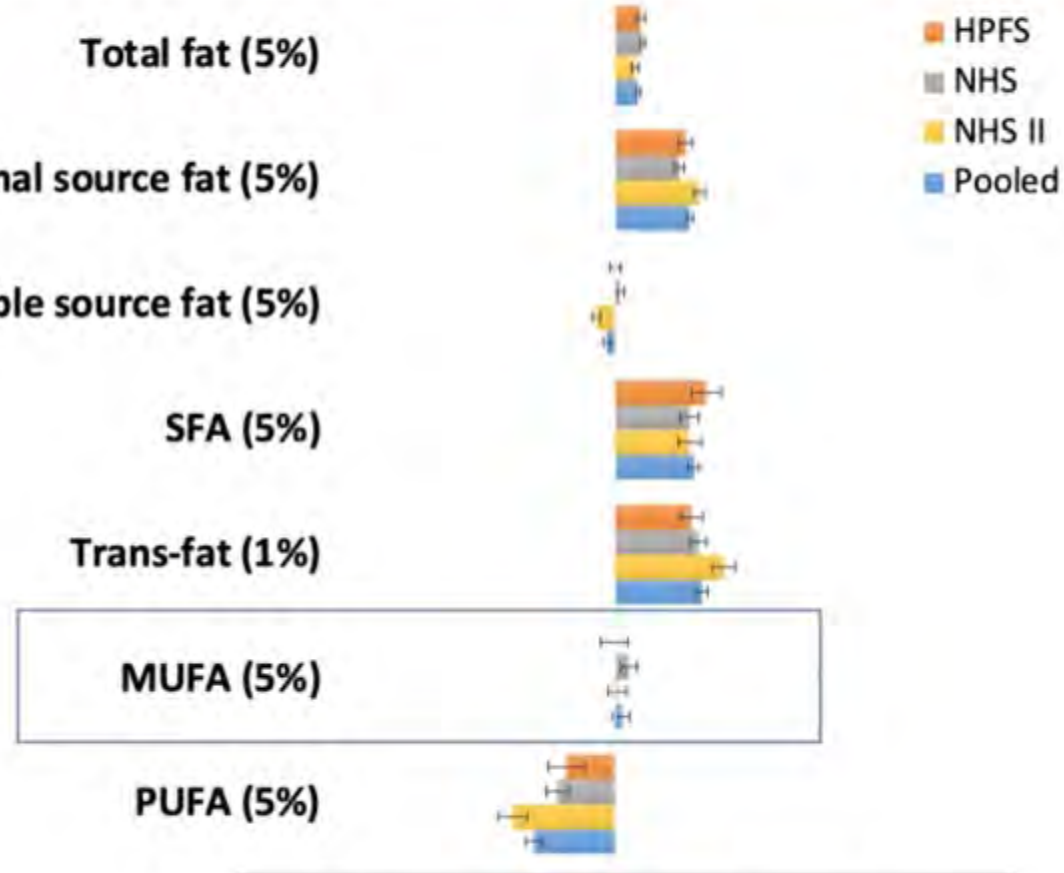
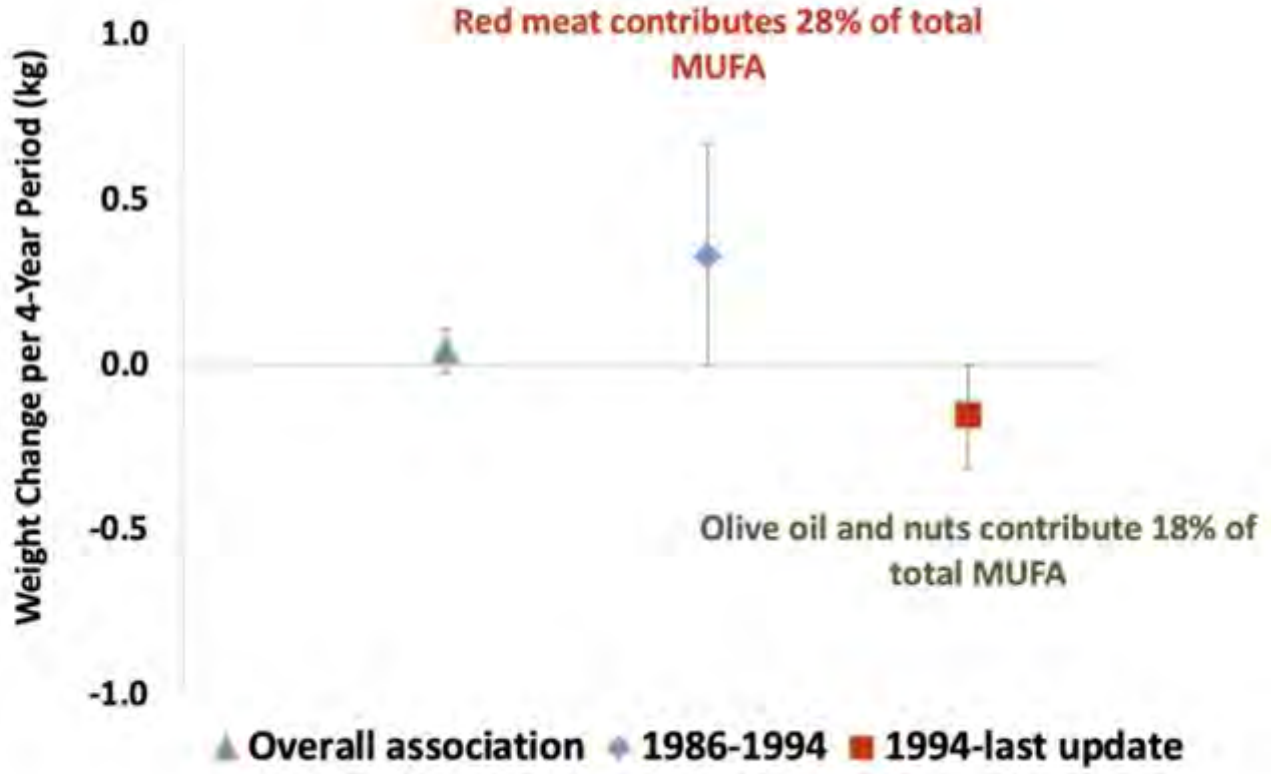


Liu et al. 2018; Journal of Nutrition, 148(11) 1821-29

Association between weight changes and changes in MUFA

- Food sources contributing to MUFA shifted from animal sources to plant sources



Conclusions

- Higher olive oil intake was associated with lower risk of type 2 diabetes, CVD, and mortality in large prospective cohorts of U.S. men and women, consistent with results from European populations.

- The substitution of margarine, butter, mayonnaise, and dairy fat with olive oil could lead to lower risk of CVD and mortality.

- There is no evidence that increasing olive oil consumption is associated with weight gain. On the contrary, higher consumption of plant-based MUFA such as olive oil and nuts may prevent weight gain and help weight control.

Acknowledgements

Dr. Marta Guash-Ferre
Dr. Yanping Li
Laura Sampson
Dr. JoAnn E. Manson
Dr. Jordi Salas-Salvado
Dr. Miguel A Martinez-Gonzalez
Dr. Meir J Stampfer
Dr. Walter C Willett
Dr. Qi Sun

NHS/NHS2/HPFS Study Investigators