
NUTRITION
RESEARCH
SEMINAR
LONDON
INC XL WORLD NUT AND
DRIED FRUIT CONGRESS
MAY 22-24, 2023

Panel

Chaired by Prof. Jordi Salas-Salvadó. Chairman of the INC World Forum for Nutrition Research and Dissemination.

Guest Speakers:

- **Dr. Marta Guasch-Ferré**, Associate Professor, Department of Public Health and Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen, Denmark
- **Prof. Gideon Lack**, Professor of Paediatric Allergy, King's College London, UK

Program

Prof. Jordi Salas-Salvadó.

Nuts, dried fruits and health: Major scientific findings over the last year.

Nuts 2022 Conference

New findings on nuts and dried fruit and health

Dr. Marta Guasch-Ferré.

Nut consumption for the prevention of cardiovascular diseases.

Prof. Gideon Lack.

LEAP and beyond


NUTS 2022
Where we are and where we are going in research
20-21 October
2022
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NUTS 2022
Where we are and where we are going in research
20-21 October
2022
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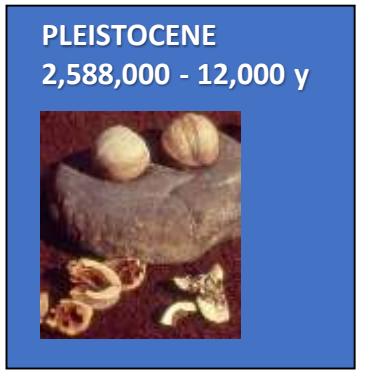
1. **Nuts have been part of the human diet for thousands of years.**



2. **In the last decades, the prevailing belief that dietary fat was harmful was at the basis of nuts being discouraged due to their high fat content.**

3. **However, this perspective started to change following the first scientific studies demonstrating the potential health benefits of nut consumption.**

1992-1993
Loma Linda University

EFFECTS OF WALNUTS ON SERUM LIPID LEVELS AND BLOOD PRESSURE IN NORMAL MEN

JOAN SABATÉ, M.D., DR.P.H., GARY E. FRASER, M.B., CH.B., PH.D., KENNETH BURKE, PH.D., R.D., SYNNØVE F. KNUTSEN, M.D., PH.D., HANNELORE BENNETT, AND KRISTIAN D. LINDSTED, PH.D.

Abstract *Background.* In a recent six-year follow-up study, we found that frequent consumption of nuts was associated with a reduced risk of ischemic heart disease. To explore possible explanations for this finding, we studied the effects of nut consumption on serum lipids and blood pressure.

Methods. We randomly placed 18 healthy men on two mixed natural diets, each diet to be followed for four weeks. Both diets conformed to the National Cholesterol Education Program Step 1 diet and contained identical foods and macronutrients, except that 20 percent of the calories of one diet (the walnut diet) were derived from walnuts (offset by lesser amounts of fatty foods, meat, and visible fat [oils, margarine, and butter]).

Results. With the reference diet, the mean (±SD) serum values for total, low-density lipoprotein (LDL), and high-density lipoprotein (HDL) cholesterol were, respectively, 182±23, 112±16, and 47±11 mg per deciliter (4.71±0.59, 2.90±0.41, and 1.22±0.28 mmol per liter). With the walnut diet, the mean total cholesterol level was 22.4 mg per deciliter (0.58 mmol per liter) lower than the mean level with the reference diet (95 percent confidence interval, 28 to 17 mg per deciliter [0.72 to 0.44 mmol per liter]); the LDL and HDL cholesterol levels were, respectively, 18.2 mg per deciliter (0.47 mmol per liter) ($P<0.001$) and 2.3 mg per deciliter (0.06 mmol per liter) ($P = 0.01$) lower. These lower values represented reductions of 12.4, 16.3, and 4.9 percent in the levels of total, LDL, and HDL cholesterol, respectively. The ratio of LDL cholesterol to HDL cholesterol was also lowered ($P<0.001$) by the walnut diet. Mean blood-pressure values did not change during either dietary period.

Conclusions. Incorporating moderate quantities of walnuts into the recommended cholesterol-lowering diet while maintaining the intake of total dietary fat and calories decreases serum levels of total cholesterol and favorably modifies the lipoprotein profile in normal men. The long-term effects of walnut consumption and the extension of this finding to other population groups deserve further study. (N Engl J Med 1993;328:603-7.)

The NEW ENGLAND JOURNAL of MEDICINE

A Possible Protective Effect of Nut Consumption on Risk of Coronary Heart Disease

The Adventist Health Study

Gary E. Fraser, MB, ChB, PhD, MPH, FRACP; Joan Sabaté, MD, DrPH; W. Lawrence Beeson, MSPH; T. Martin Strahan, MBBS, DrPH, FRACP

• *Background.*—Although dietary factors are suspected to be important determinants of coronary heart disease (CHD) risk, the direct evidence is relatively sparse.

Methods.—The Adventist Health Study is a prospective cohort investigation of 31 208 non-Hispanic white California Seventh-Day Adventists. Extensive dietary information was obtained at baseline, along with the values of traditional coronary risk factors. These were related to risk of definite fatal CHD or definite nonfatal myocardial infarction.

Results.—Subjects who consumed nuts frequently (more than four times per week) experienced substantially fewer definite fatal CHD events (relative risk, 0.52; 95% confidence interval [CI], 0.36 to 0.76) and definite nonfatal myocardial infarctions (relative risk, 0.49; 95% CI, 0.28 to 0.85), when compared with those who consumed nuts less than once per week. These findings persisted on covariate adjustment and were seen in almost all of 16 different subgroups of the population. Subjects who usually consumed whole wheat bread also experienced lower rates of definite nonfatal myocardial infarction (relative risk, 0.56; 95% CI, 0.35 to 0.89) and definite fatal CHD (relative risk, 0.89; 95% CI, 0.60 to 1.33) when compared with those who usually ate white bread. Men who ate beef at least three times each week had a higher risk of definite fatal CHD (relative risk, 2.31; 95% CI, 1.11 to 4.78), but this effect was not seen in women or for the nonfatal myocardial infarction end point.

Conclusion.—Our data strongly suggest that the frequent consumption of nuts may protect against risk of CHD events. The favorable fatty acid profile of many nuts is one possible explanation for such an effect.

(Arch Intern Med. 1992;152:1416-1424)

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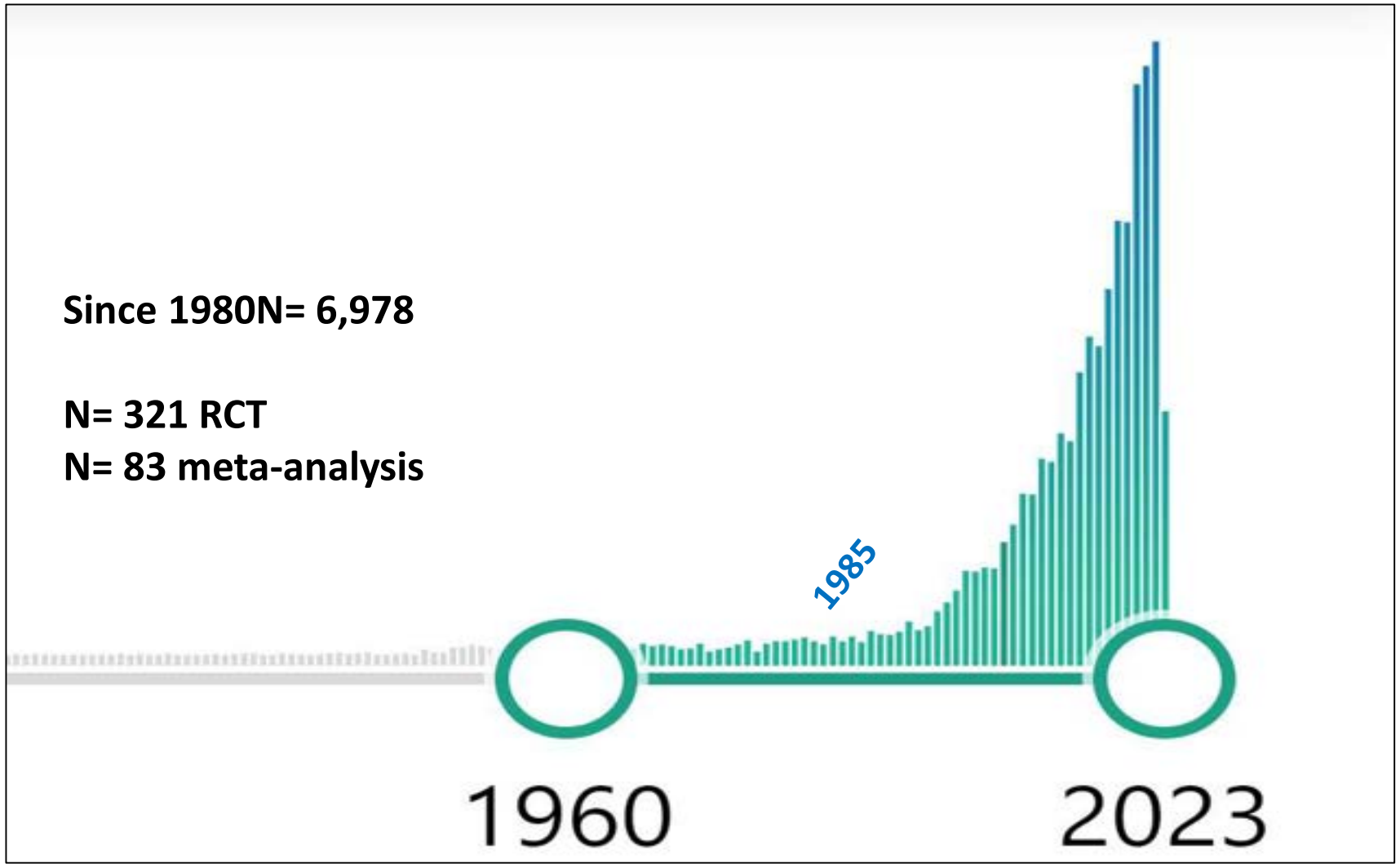
Research on tree nuts and dried fruit evolution



nut*[Title] OR hazelnut*[Title] OR walnut*[Title] OR almond*[Title] OR pistachio*[Title] OR macadamia*[Title] OR cashew*[Title].

Lipid profile
Inflammation
Oxidation processes
Insulin resistance
Gut microbiota
Ageing
Body weight

Obesity
Metabolic syndrome
Diabetes
Cognition/dementia
Cardiovascular disease
Cancer incidence
Cancer prognosis

Endorsed health claims

Nuts 2022

where we are and where we are going in research

Main objective of the conference:

To summarize the available scientific evidence on the effects of nuts on health outcomes, but also to define new topics and emerging opportunities in nut research, to share knowledge with the food industry, and to publish the proceedings in a scientific journal.

Importance:

To summarize the research and discuss future lines of research in the context of a multidisciplinary group of investigators in different fields is extremely useful for:

1) Investigators, since it allows us to interact, share good ideas and establish collaborations in the future.
2) The food industry, because they need to know that we know relatively little and that knowledge needs to be invested.
3) Health agencies, because they need knowledge, to establish public health recommendations.

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Special Issue

"*Nuts: Where We Are and Where We Are Going in Research. Proceedings from the NUTS 2022 International Conference*"

10 Manuscripts published in oppen access
1 Editorial

https://www.mdpi.com/journal/nutrients/special_issues/NUTS_2022

Where We Are and Where We Are Going in Research

1. Effect of Nuts on Gastrointestinal Health

Mandalari, G.; Gervasi, T.; Rosenberg, D.W.; Lapsley, K.G.; Baer, D.J. Effect of Nuts on Gastrointestinal Health. *Nutrients* 2023, 15, 1733.

Evidence suggested an increase in **fecal butyrate** after **almond** consumption, and a beneficial role of **walnuts** on the **prevention of ulcerative colitis** and protection against the development of gastric mucosal lesions.

2. Dried Fruits: Bioactives, Effects on Gut Microbiota, and Possible Health Benefits—An Update

Alasalvar, C., et al. Dried Fruits: Bioactives, Effects on Gut Microbiota, and Possible Health Benefits—An Update. *Nutrients* 2023, 15, 1611.

Clinical trial evidence suggests **prunes** might preserve **bone mineral density** in postmenopausal women.

Consumption of **dried fruits** is associated with **higher-quality diets**.

Where We Are and Where We Are Going in Research

3. Dried Fruits, Nuts, and Cancer Risk and Survival: A Review of the Evidence and Future Research Directions

Bolling, B.W., et al. Dried Fruits, Nuts, and Cancer Risk and Survival: A Review of the Evidence and Future Research Directions. *Nutrients* 2023, 15, 1443.

A daily intake of total **nuts** of **28 g/day** has also been associated with a **21% reduction** in the rate of **cancer mortality**.

The evidence for dried fruits in cancer outcomes is limited, but existing studies have suggested an inverse relationship between total dried fruit consumption and cancer risk.

4. Nuts, Energy Balance and Body Weight

Baer, D.J., et al. Nuts, Energy Balance and Body Weight. *Nutrients* 2023, 15, 1162.

Higher **nut consumption does not cause greater weight gain**; rather, nuts may be beneficial for weight control and prevention of long-term weight gain.

Where We Are and Where We Are Going in Research

5. Effect of Nuts on Markers of Inflammation and Oxidative Stress: A Narrative Review

Rajaram, S., et al. Effect of Nuts on Markers of Inflammation and Oxidative Stress: A Narrative Review. *Nutrients* 2023, 15, 1099.

Almonds and **walnuts** may favorably modify inflammation.
Brazil nuts may favorably influence oxidative stress.



6. Impact of Nut Consumption on Cognition across the Lifespan

Nishi, S.K., et al. Impact of Nut Consumption on Cognition across the Lifespan. *Nutrients* 2023, 15, 1000.

Walnuts, as a rich source of the plant-based polyunsaturated omega-3 fatty acid alpha-linolenic acid, are the nut type most promising for cognitive health.

7. Novel Lines of Research on the Environmental and Human Health Impacts of Nut Consumption

Tapsell, L., et al. Novel Lines of Research on the Environmental and Human Health Impacts of Nut Consumption. *Nutrients* 2023, 15, 955.

Nut consumption have linked components such as MUFA, ω-3, antioxidants and plant sterols to **improved lipoprotein profiles**, **lower blood pressure**, and **reduced cardiovascular disease risk**.

Preliminary research also indicates possible beneficial effects of nut consumption on **reproductive health**.

Where We Are and Where We Are Going in Research

8. Nuts and Cardiovascular Disease Outcomes: A Review of the Evidence and Future Directions

Glenn, A.J., et al. Nuts and Cardiovascular Disease Outcomes: A Review of the Evidence and Future Directions. *Nutrients* 2023, 15, 911.

Higher nut consumption has been associated with a 19% and 25% lower risk of **CVD incidence** and **mortality**, respectively.
A 24% and 27% lower risk of **coronary heart disease** incidence and mortality, respectively.
An 18% lower risk of **stroke mortality**, a 15% lower risk of **atrial fibrillation**, and a 19% lower risk of **total mortality**.

9. Nuts in the Prevention and Management of Type 2 Diabetes

Nishi, S.K., et al. Nuts in the Prevention and Management of Type 2 Diabetes. *Nutrients* 2023, 15, 878.

Inclusion of nuts in the diets of individuals may have a beneficial effect on glycemic control and lower the risk of cardiovascular disease and mortality in those with T2D.

10. Effects of Nut Consumption on Blood Lipids and Lipoproteins: A Comprehensive Literature Update

Guasch-Ferré, M., et al. Effects of Nut Consumption on Blood Lipids and Lipoproteins: A Comprehensive Literature Update. *Nutrients* 2023, 15, 596.

A consistent beneficial effect of most nuts, namely total **nuts and tree nuts** has been reported across meta-analyses ir **decreasing total, LDL-colesterol, and triglycerides**.

FUTURE RESEARCH

Harmonized meta-analysis of prospective studies conducted in different parts of the world analysing the association between Nut and dried fruit consumption and different endpoints.

Multicenter randomized clinical trial in the context diabetes prevention

New findings on nuts and dried fruit and health

New findings on nuts and dried fruit and health

Effect of walnut consumption on neuropsychological development in healthy adolescents: a multi-school randomised controlled trial

Ariadna Pinar-Martí,[a,b,c,n] Florence Gignac,[b,c,g] Silvia Fernández-Barrés,[c,d] Dora Romaguera,[a,c,e,f] Aleix Sala-Vila,[g,h] Iolanda Lázaro,[h] Otavio T. Ranzani,[c] Cecilia Persavento,[c] Anna Delgado,[c] Albert Carol,[c] Jaume Torrent,[c] Judith Gonzalez,[c] Eduard Rosa,[c] Jose Barrera-Gómez,[c] Mónica López-Vicente,[c] Olivier Boucher,[i] Mark Nieuwenhuijsen,[c] Michelle C. Turner,[b,c,j] Miguel Burgaleta,[k] Josefina Canals,[l] Victoria Arija,[l] Xavier Basagaña,[b,c,j] Emilio Ros,[m] Jordi Salas-Salvadó,[f,n,o] Jordi Sunyer,[b,c,j] and Jordi Julvez[a,c,j,p,*]

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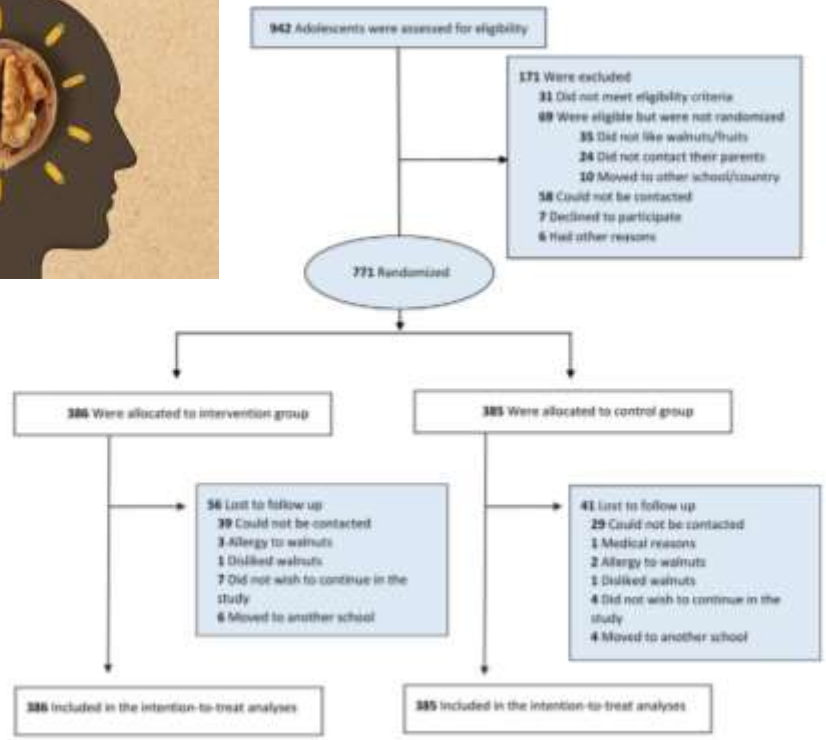


Being prescribed eating walnuts for 6 months did not improve the neuropsychological function of healthy adolescents.

However, improved sustained attention, fluid intelligence, and Attention-Deficit/Hyperactivity Disorder (ADHD) symptoms were observed in participants who better complied with the walnut intervention.

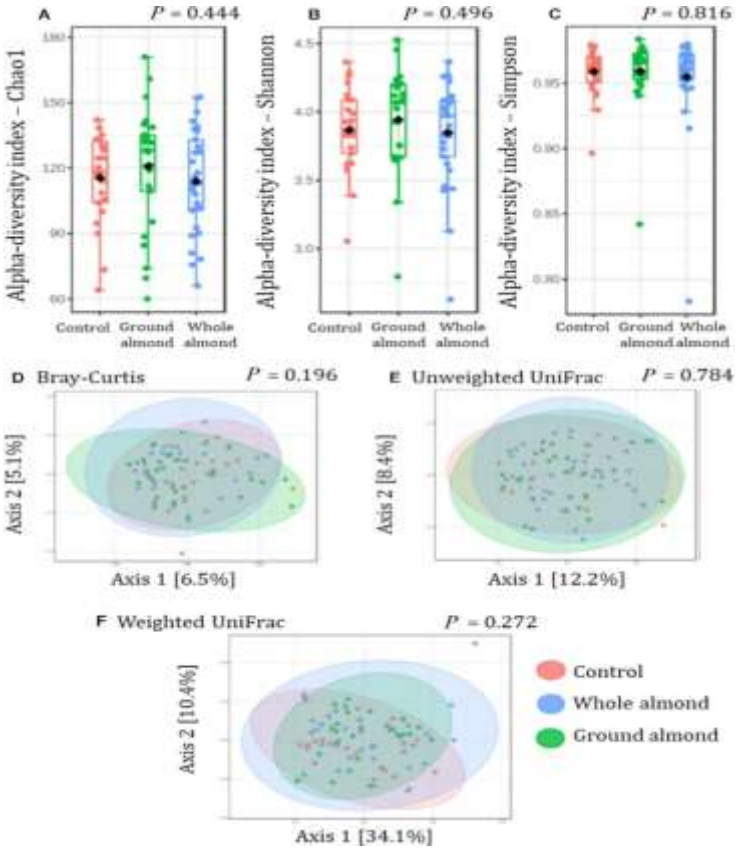
This study provides a foundation for further clinical and epidemiological research on the effect of walnuts and ALA on neurodevelopment in adolescents.

New findings on nuts and dried fruit and health

The impact of almonds and almond processing on gastrointestinal physiology, luminal microbiology, and gastrointestinal symptoms: a RCT trial and mastication study

Creedon AC, Dimidi E, Hung ES, Rossi M, Probert C, Grassby T, Miguens-Blanco J, Marchesi JR, Scott SM, Berry SE, Whelan K.

Healthy adults (*n*= 87)
Parallel, 3-arm RTC
Participants received: - whole almonds (56 g/c
- ground almonds (56 g/d)
- an isocaloric control



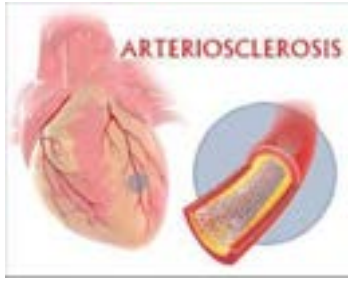
Gut microbiota composition and diversity (16S rRNA gene sequencing), SCFAs (GC), volatile organic compounds (GC-MS), gut transit time (wireless motility capsule), stool output and symptoms.

Almond consumption has limited impact on microbiota composition but increases butyrate in adults, suggesting positive alterations to microbiota functionality. No effect of almonds on gut microbiota at the phylum level or diversity, gut transit time, stool consistency, or gut symptoms.

New findings on nuts and dried fruit and health

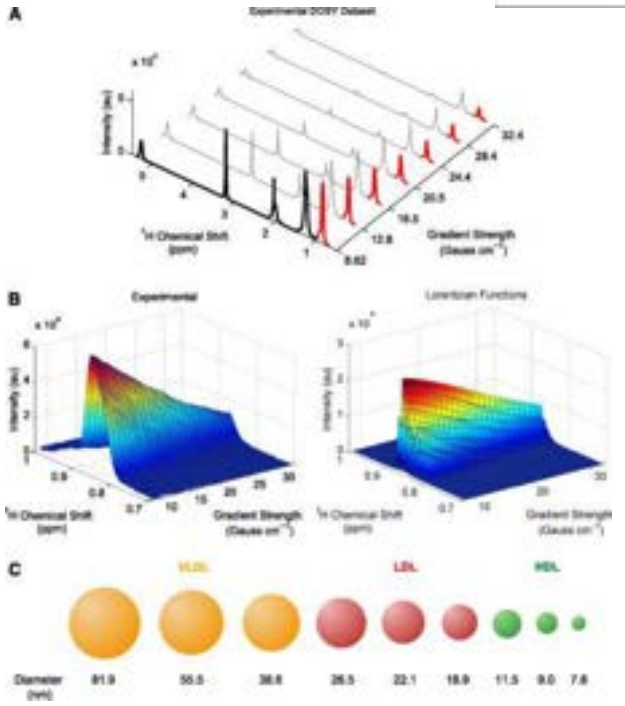
Nut consumption is associated with a shift of the NMR lipoprotein subfraction profile to a less atherogenic pattern among older individuals at high CVD risk

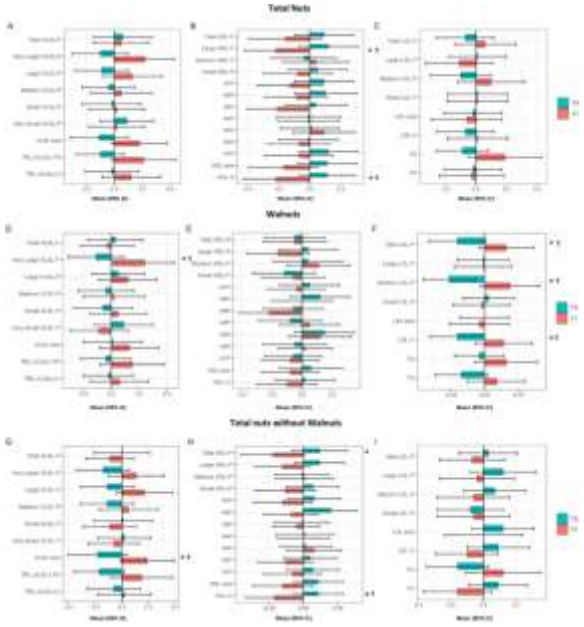
García-Gavilán JF, Connelly MA, Babio N, Mantzoros CS, Ros E, Salas-Salvadó J.



Cross-sectional and longitudinal analyses after 1-year of follow-up were conducted in 196 men and women recruited in the **PREDIMED-Reus** (Spain) center.

Increasing nut consumption was associated with a shift of the NMR lipoprotein subfraction profile to a less atherogenic pattern, as well as lower circulating concentrations of BCAA and decreased insulin resistance. These results provide novel mechanistic insight into the cardiovascular benefit of nut consumption.



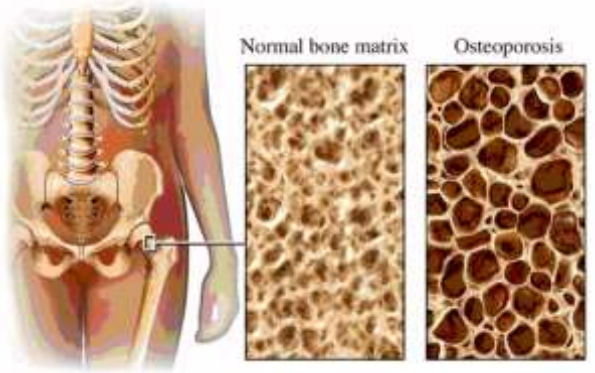


New findings on nuts and dried fruit and health

Prunes preserve hip bone mineral density in a 12-month randomized controlled trial in postmenopausal women: the Prune Study

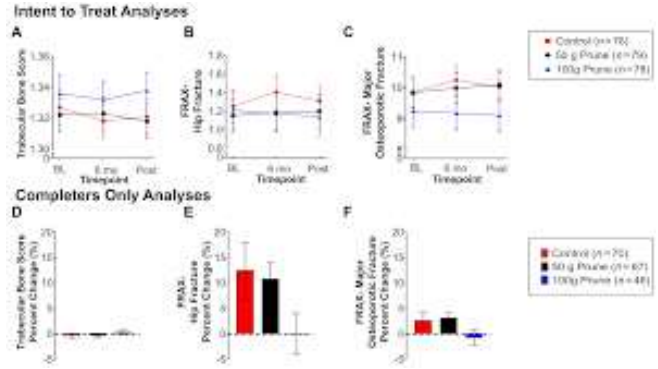
De Souza MJ, Strock NCA, Williams NI, Lee H, Koltur [illegible] su CH, Weaver C.

235 postmenopausal women
RTC: Prunes (50 g or 100 g/d) or cont
12-mo dietary intervention
Bone mineral density (BMD)



A 50-g daily dose of prunes can prevent loss of total hip BMD in postmenopausal women after 6 mo, which persisted for 12 mo.

Given that there was high compliance and retention at the 50-g dosage over 12 mo, we propose that the 50-g dose represents a valuable nonpharmacologic treatment strategy that can be used to preserve hip BMD in postmenopausal women and possibly reduce hip fracture risk.



New findings on nuts and dried fruit and health

Cranberries for preventing urinary tract infections

Williams G, Hahn D, Stephens JH, Craig JC, Hodson EM.

Cochrane Library

Cochrane Database of Systematic Reviews

50 STUDIES with 8857 participants.

CONCLUSIONS:

These **data support the use of cranberry products to reduce the risk of symptomatic, culture-verified urinary tract infections in women with recurrent UTIs, in children, and in people susceptible to UTIs following interventions**.

The evidence currently available does not support its use in the elderly, patients with bladder emptying problems, or pregnant women.

Summary & Conclusion

- **In the last 3 decades an exponential increase in the number of publications in relation to the consumption of nuts and health has been produced.**
- **This has led to an evident appreciation of nuts that has surely contributed to an increase in consumption throughout the world.**
- **The Nuts 2022 Conference has been a great success and has produced a turning point in research.**
- **There are still large gaps in research and important questions about the importance that nuts can have for health that need to be answered.**
- **It is necessary to invest in research since not investing is hunger for tomorrow.**

Key messages

"An investment in knowledge always pays the best int…"

Benjamin Frankli…

Writer, philosopher, scientist, inventor, politician, a patriot, a Founding Father, and publisher.

Invest in knowledge!