Recent Studies and Publications on Functional Foods

STUDIES

1. A Comprehensive Review Of The Preventive Action Of Natural Nutraceutical Ingredients In Reducing Chemotherapy – Induced Side Effects

The main purpose of this review is to combine conventional medical practices with nutritionally enhanced autonomous human body recovery using natural ingredients in cancer patients. It provides an overview on how natural ingredients, including bioactive components, enriched fractions, and extracts in both raw and pristine form, act as preventive measures for the treatment of cancer.

Source: Rajashri Gutte, Research Scholar, Institute Of Management And Research, Mgm University, Aurangabad, Mh, India. A Comprehensive Review Of The Preventive Action Of Natural Nutraceutical Ingredients In Reducing Chemotherapy – Induced Side Effects. Functional Food Science 2023; 3(2):1-14.
DOI: https://www.doi.org/10.31989/ffs.v3i2.1051.

2. Effect Of Anthocyanins On Gut Health Markers, Firmicutes Bacteroidetes Ratio And Short-Chain Fatty Acids: A Systematic Review Via Meta-Analysis

Researchers discovered that diets rich in anthocyanin-rich fruits and vegetables significantly impact gut flora.

This comprehensive review and meta-analysis examined the influence of dietary anthocyanins on Firmicutes/Bacteroide (Fir/Bac) and short-chain fatty acids (SCFAs) content. The current meta-analysis followed the guidelines of PRISMA—the preferred reporting items for systematic reviews and meta-analyses.

Diets high in anthocyanins substantially reduced the Fir/Bac ratio in the assessed trials. Among three SCFAs, the highest impact was observed on acetic acid, followed by propionic acid, and then butanoic acid.

The meta-analysis results also obtained sufficient heterogeneity, as indicated by I2 values. There is strong evidence that anthocyanin supplementation improves rodent gut health biomarkers (Fir/Bac and SCFAs), reducing obesity-induced gut dysbiosis, as revealed in this systematic review/meta-analysis. Anthocyanin intervention duration and dosage significantly influenced the Fir/Bac ratio and SCFA. Anthocyanin-rich diets were more effective when consumed over an extended period and at a high dosage.

Source: Monika Garg, National Agri-Food Biotechnology Institute, Mohali, Punjab, India. Effect Of Anthocyanins On Gut Health Markers, Firmicutes Bacteroidetes Ratio And Short-Chain Fatty Acids: A Systematic Review Via Meta-Analysis. Sci Rep 13, 1729 (2023).
DOI: https://doi.org/10.1038/s41598-023-28764-0.

3. The Effects Of Nigella Sativa (Black Cumin) On Anthropometric Indices: A GRADE-Assessed Systematic Review And Dose–Response Meta-Analysis Of Controlled Trials

This systematic review and meta-analysis shows that there was a significant reduction in body weight, body mass index, waist circumference, and hip circumference following supplementation with N. sativa.

Source: Gholamreza Askari, Department Of Community Nutrition, School Of Nutrition And Food Science, Nutrition And Food Security Research Center, Isfahan University Of Medical Science, Isfahan, Iran. The Effects Of Nigella Sativa (Black Cumin) On Anthropometric Indices: A GRADE-Assessed Systematic Review And Dose–Response Meta-Analysis Of Controlled Trials. Journal Of Functional Foods, Volume 103, April 2023, 105472.
DOI: https://doi.org/10.1016/j.jff.2023.105472

4. A Red Wine Intervention Does Not Modify Plasma Trimethylamine N-Oxide But Is Associated With Broad Shifts In The Plasma Metabolome And Gut Microbiota Composition

This study investigated the effects of red wine (RW) consumption on the gut microbiota, plasma Trimethylamine N-Oxide (TMAO), and the plasma metabolome in men with documented coronary artery disease (CAD) using a multiomics assessment in a crossover trial.

Study results show that modulation of the gut microbiota may contribute to the putative cardiovascular benefits of moderate RW consumption. The low intraindividual concordance of TMAO presents challenges regarding its role as a cardiovascular risk biomarker at the individual level.

Source: Protasio L Da Luz, Instituto Do Coracao (Incor), Hospital Das Clinicas HCFMUSP, Faculdade De Medicina, Universidade De São Paulo, São Paulo, SP, Brazil. A Red Wine Intervention Does Not Modify Plasma Trimethylamine N-Oxide But Is Associated With Broad Shifts In The Plasma Metabolome And Gut Microbiota Composition. The American Journal of Clinical Nutrition, Volume 116, Issue 6, December 2022, Pages 1515-1529.
DOI: https://doi.org/10.1093/ajcn/nqac286.

5. Critical Review Of Therapeutic Potential Of Silymarin In Cancer: A Bioactive Polyphenolic Flavonoid

Silymarin, an extract from milk thistle seeds, has been used for the treatment of several disorders.

This review focuses on the silymarin in vivo and in vitro effects in a variety of cancers, and explores signaling pathways that are modulated by this compound.

Source: Nasrin Amiri-Dashatan, Zanjan Metabolic Diseases Research Center, Zanjan University Of Medical Sciences, Zanjan, Iran. Critical Review Of Therapeutic Potential Of Silymarin In Cancer: A Bioactive Polyphenolic Flavonoi. Journal of Functional Foods, Volume 104, May 2023, 105502. DOI: https://doi.org/10.1016/j.jff.2023.105502.

6. Red Yeast Rice Preparations For Dyslipidemia: An Overview Of Systematic Reviews And Network Meta-Analysis

This review shows the efficacy and safety ranking of Red Yeast Rice (RYR) preparations for dyslipidemia, and it is recommended that future trials should focus on MACE and Lp(a).

Source: Keji Chen, University Of Chinese Medicine And Xiyuan Hospital, China Academy Of Chinese Medical Sciences, National Clinical Research Center For Chinese Medicine Cardiology, Beijing, China. Red Yeast Rice Preparations For Dyslipidemia: An Overview Of Systematic Reviews And Network Meta-Analysis. Journal of Functional Foods, Volume 104, May 2023, 105508. DOI: https://doi.org/10.1016/j.jff.2023.105508.

7. Phenolic Compounds In Hypertension: Targeting Gut-Brain Interactions And Endothelial Dysfunction

Phenolic compounds targeting the gut microbiota stimulate beneficial strains of bacteria and increase the production of metabolites capable of influencing the gut-brain axis, reducing inflammation and improving metabolic outcomes.

The reviewed literature suggests that several phenolic compounds and phenolic-rich extracts may modulate the gut microbiota and lower BP through the reduction of inflammation and increased short chain fatty acid (SCFA) production.

Phenolic compounds could also exert neuroprotective effects with attenuation or even prevention of the development of hypertensive diseases. These compounds could also protect the nervous system from oxidative stress and neuroinflammation due to their stimulatory effect on the production of derived active microbial colonic metabolites with low molecular weight, greater bioaccessibility, and ability to cross the blood–brain barrier to reach brain tissue.

Further studies should focus on the development of nutraceuticals containing phenolic compounds to elucidate their effects on gut microbiota composition and metabolite production and the repercussions on hypertensive diseases.

Source: José Luiz De Brito Alves, Department Of Nutrition, Health Sciences Center, Federal University Of Paraíba, João Pessoa, PB, Brazil. Phenolic Compounds In Hypertension: Targeting Gut-Brain Interactions And Endothelial Dysfunction. Journal of Functional Foods, Volume 104, May 2023, 105531. DOI: https://doi.org/10.1016/j.jff.2023.105531.

8. Bioactive Lignans From Flaxseed: Biological Properties And Patented Recovery Technologies

This review analyzes the biological effects of lignans as anticancer, antioxidants, and modulators of estrogen activity. It also focuses on the most recent articles on lignan extraction methods that are sustainable and suitable as products for human consumption. Furthermore, the most up to date and relevant patents for lignan recovery are examined.

Source: Paola Sangiorgio, ENEA, Italian National Agency For New Technologies, Energy And Sustainable Economic Development, Trisaia Research Centre, Rotondella, MT, Italy. Bioactive Lignans From Flaxseed: Biological Properties And Patented Recovery Technologies. Nutraceuticals 2023, 3(1), 58-74. DOI: https://doi.org/10.3390/nutraceuticals3010005.

9. Melanin: A Promising Source Of Functional Food Ingredient

This article focuses on melanin's source classification, health benefits, extraction technology and applications in food products to explore the potential of it as a functional food ingredient.

Sources: Junmin Zhang, Institute Of Animal Sciences Of Chinese Academy Of Agricultural Sciences, No.2 Yuan Ming Yuan West Road, Haidian District, Beijing, China. Melanin: A Promising Source Of Functional Food Ingredient. Journal of Functional Foods, Volume 105, June 2023, 105574. DOI: https://doi.org/10.1016/j.jff.2023.105574.

10. Interplay Between Phytochemicals And The Colonic Microbiota

In this review, the interactions of phytochemicals with the gut microbiota and their impact on human diseases are reviewed.

Source: Somi Kim Cho, Department Of Environmental Biotechnology, Graduate School Of Industry Ands Interdisciplinary Graduate Program In Advanced Convergence Technology And Science, Jeju National University, Jeju, Republic Of Korea. Interplay Between Phytochemicals And The Colonic Microbiota. Nutrients 2023, 15(8), 1989, DOI: https://doi.org/10.3390/nu15081989.

11. Influence Of Grape Consumption On The Human Microbiome

This study shows the potential of grapes to modulate the human microbiome. Microbiome composition as well as urinary and plasma metabolites were sequentially assessed in 29 healthy free-living male (age 24–55 years) and female subjects (age 29–53 years) following two-weeks of a restricted diet (Day 15), two-weeks of a restricted diet with grape consumption (equivalent to three servings per day) (Day 30), and four-weeks of restricted diet without grape consumption (Day 60).

Based on alpha-diversity indices, grape consumption did not alter the overall composition of the microbial community, other than with the female subset based on the Chao index. Similarly, based on beta-diversity analyses, the diversity of species was not significantly altered.

However, following 2 weeks of grape consumption, taxonomic abundance was altered (e.g., decreased ***Holdemania spp***. and increased ***Streptococcus thermophiles***), as were various enzyme levels and KEGG pathways. Further, taxonomic, enzyme and pathway shifts were observed 30 days following the termination of grape consumption, some of which returned to baseline and some of which suggest a delayed effect of grape consumption.

Metabolomic analyses supported the functional significance of these alterations wherein, for example, 2′-deoxyribonic acid, glutaconic acid, and 3-hydroxyphenylacetic acid were elevated following grape consumption and returned to baseline following the washout period.

Source: John M. Pezzuto, College Of Pharmacy And Health Sciences, Western New England University And Department Of Medicine, Umass Chan Medical School—Baystate, Springfield, MA, USA. Influence Of Grape Consumption On The Human Microbiome. Sci Rep 13, 7706 (2023). DOI: https://doi.org/10.1038/s41598-023-34813-5.

12. Carotenoids Diet: Digestion, Gut Microbiota Modulation, And Inflammatory Diseases

This review provides an overview of the carotenoids' absorption mechanisms and variables that can affect the stability and functionality of carotenoids. Further, it also highlights the importance of intestinal microbiota on the absorption and metabolism of carotenoids.

Source: Manuela E. Pintado, CBQF–Centro De Biotecnologia E Química Fina–Laboratório Associado, Escola Superior De Biotecnologia, Universidade Católica Portuguesa, Rua Diogo Botelho, Portugal. Carotenoids Diet: Digestion, Gut Microbiota Modulation, And Inflammatory Diseases. Nutrients 2023, 15(10), 2265. DOI: https://doi.org/10.3390/nu15102265.

13. Carotenoids And Their Health Benefits As Derived Via Their Interactions With Gut Microbiota

This review highlights potential gut-related health-beneficial effects of carotenoids and emphasizes the current research gaps regarding carotenoid—gut microbiota (GM) interactions.

Source: Abdulkerim Eroglu, Department Of Molecular And Structural Biochemistry, College Of Agriculture And Life Sciences And Plants For Human Health Institute, North Carolina Research Campus, North Carolina State University, Kannapolis, NC, USA. Carotenoids And Their Health Benefits As Derived Via Their Interactions With Gut Microbiota. Advances in Nutrition, Volume 14, Issue 2, March 2023, Pages 238-255. DOI: https://doi.org/10.1016/j.advnut.2022.10.007

14. Short-Chain Fatty-Acid-Producing Bacteria: Key Components Of The Human Gut Microbiota

This Review explains microbiological characteristics and taxonomy to the biochemical process that lead to the release of Short-chain fatty acids' (SCFAs) by SCFA producing bacteria and provides an overview of (SCFAs') roles and functions.

Further, the authors also describe the potential therapeutic approaches to boost the levels of SCFAs in the human gut and treat different diseases.

Source: Gianluca Ianiro, Department Of Medical And Surgical Sciences, Digestive Disease Center, Universitary Policlinic Agostino Gemelli Foundation And Department Of Translational Medicine And Surgery, Catholic University Of The Sacred Heart, Rome, Italy. Short-Chain Fatty-Acid-Producing Bacteria: Key Components Of The Human Gut Microbiota. Nutrients 2023, 15(9), 2211. DOI: https://doi.org/10.3390/nu15092211.

15. Regulation Of Gut Microbiota By Vitamin C, Vitamin E And B-Carotene

Vitamin C (VC), vitamin E (VE) and β-carotene (βC) are representative dietary antioxidants, which exist in daily diet and can increase the antioxidant capacity of body fluids, cells and tissues.

This article reviews the effects of VC, VE and βC on the gut microbiota. Total, 19 studies were included, of which eight were related to VC, nine to VE, and six to βC.

Overall, VC, VE and βC can provide health benefits to the host by modulating the composition and metabolic activity of the gut microbiota, improving intestinal barrier function and maintaining the normal function of the immune system.

Source: Hong-Fang Ji, Institute Of Biomedical Research, School Of Life Sciences And Medicine, Shandong University Of Technology, Zibo, Shandong And School Of Life Sciences, Ludong University, Yantai, People's Republic Of China. Regulation Of Gut Microbiota By Vitamin C, Vitamin E And B-Carotene. Food Research International, Volume 169, July 2023, 112749. DOI: https://doi.org/10.1016/j.foodres.2023.112749.

16. Effect Of Honey On Cardiometabolic Risk Factors: A Systematic Review And Meta-Analysis

The effect of honey on cardiometabolic risk factors was assessed via a systematic review and meta-analysis of controlled trials using the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) approach. A total of 18 controlled trials (33 trial comparisons, N = 1105 participants) were included.

Researchers found that overall, honey reduced fasting glucose, total cholesterol, low-density lipoprotein cholesterol, fasting triglycerides and alanine aminotransferase and increased high-density lipoprotein cholesterol. There were significant subgroup differences by floral source and by honey processing, with robinia honey, clover honey, and raw honey showing beneficial effects on fasting glucose and total cholesterol.

Source: Tauseef A Khan, Department Of Nutritional Sciences, Temerty Faculty Of Medicine, University Of Toronto; Toronto 3D Knowledge Synthesis And Clinical Trials Unit, Clinical Nutrition, St Michael's Hospital And Clinical Nutrition And Risk Factor Modification Centre, St Michael's Hospital, Toronto, Ontario, Canada. Effect Of Honey On Cardiometabolic Risk Factors: A Systematic Review And Meta-Analysis. Nutrition Reviews, Volume 81, Issue 7, July 2023, Pages 758–774. DOI: https://doi.org/10.1093/nutrit/nuac086.

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