

Recent Studies and Publications on Functional Foods

STUDIES

1. Bioactive Compounds In Coffee And Their Role In Lowering The Risk Of Major Public Health Consequences: A Review

This article addresses the bioactive components in coffee aroma, their metabolism, and the mechanism of action in lowering the risk of various potential health problems. The main bioactive components involved in the perceived aroma of coffee and its related health benefits are **caffeine, chlorogenic acid (CGA), trigonelline, diterpenes, and melanoids**. These compounds are involved in various physiological activities.

Caffeine has been shown to have anticancer properties, as well as the ability to prevent the onset and progression of hepatocellular carcinoma and to be anti-inflammatory. CGA exhibits antioxidant action and is implicated in gut health, neurodegenerative disease protection, type 2 diabetes, and cardiovascular disease prevention. Furthermore, together with diterpenes, CGA has been linked to anticancer activity. Trigonelline, on the other side, has been found to lower oxidative stress by increasing antioxidant enzyme activity and scavenging reactive oxygen species.

It also prevents the formation of kidney stones. Diterpenes and melanoids possess anti-inflammatory and antioxidant properties, respectively. EFSA recommends 400 mg of caffeine per day for adults. Caffeine consumption should be limited to no more than 200 mg per day for pregnant women.

Consuming three to four cups of filtered coffee per day, depending on an individual's physiological condition and health status, has been linked to a lower risk of several degenerative diseases. Despite their health benefits, excessive coffee intake above the recommended daily allowance, calcium and vitamin D deficiency, and unfiltered coffee consumption all increase the risk of potential health risk including cardiovascular disease. Researchers concluded that moderate coffee consumption lowers the risk of different noncommunicable diseases.

Source: Markos Urugo Makiso, Department Of Food Science And Postharvest Technology, College Of Agricultural Sciences, Wachemo University, PO Box 667, Hosanna, Ethiopia. Bioactive Compounds In Coffee And Their Role In Lowering The Risk Of Major Public Health Consequences: A Review. Food Sci Nutr 2023 Nov 22;12(2):734-764. DOI: 10.1002/fsn3.3848.

2. Antiobesity Effect Of Healthy Food Crops And Functional Foods: A Systematic Review Of Their Mechanisms

In this review sixty-four articles were identified, out of which 41 investigated food crops, while 23 investigated functional products. Food crops, such as **cereals, vegetables, fruits, mushrooms, seaweeds, legumes, herbs, spices, and cocoa seeds**, have antiobesity effects through mechanisms such as altering the metabolism of glucolipids by inhibiting enzymes like α -amylase and α -glucosidase, stimulating the bioenergetics of thermogenic fat, modulating gut microbiota, and inhibiting lipogenesis and storage.

In addition, **developed functional teas, beverages, and yoghurt** have antiobesity effects through similar or different mechanisms, such as enhancing energy expenditure and satiety, suppressing adipogenesis and lipolysis, improving glucose and lipid metabolism, and altering hormonal secretion.

This review shows the significance of food in the control of obesity, and highlights the distinct methods which explore foods that exert antiobesity effects.

Source: Oluwafemi Ayodeji Adebo, Food Innovation Research Group, Department Of Biotechnology & Food Technology, Faculty Of Science, University Of Johannesburg, Johannesburg, South Africa. Antiobesity Effect Of Healthy Food Crops And Functional Foods: A Systematic Review Of Their Mechanisms. Food Science And Nutrition, Volume 12, Issue 3, March 2024, Pages 1380-1398. DOI: <https://doi.org/10.1002/fsn3.3856>

3. Daily Cashew And Brazil Nut Consumption Modifies Intestinal Health In Overweight Women On Energy-Restricted Intervention: A Randomized Controlled Trial (Brazilian Nuts Study)

In this 8-week randomized controlled trial study 40 women with overweight or obesity were assigned to energy-restricted groups (-500 kcal/d): control group (free of nuts) or Brazilian nuts group (BN: 30 g of cashew nuts and 15 g of Brazil nuts per day).

Researchers found that both groups lost weight without statistical differences. Lactulose excretion increased only in the control group. The BN consumption increased fecal propionic acid and potentially beneficial bacteria, such as Ruminococcus, Roseburia, strains NK4A214 and UCG-002 from the Ruminococcaceae family, but also Lachnospiraceae family, Bacteroides, and Lachnospiraceae family, when compared to the control group. Changes in intestinal permeability were correlated to a greater reduction in body fat (kg), and IL-8, and increases in Ruminococcus abundance.

Source: Helen Hermana Miranda Hermsdorff, Laboratory Of Energy Metabolism And Body Composition, Department Of Nutrition And Health, Universidade Federal De Viçosa, Viçosa, Brazil. Daily Cashew And Brazil Nut Consumption Modifies Intestinal Health In Overweight Women On Energy-Restricted Intervention: A Randomized Controlled Trial (Brazilian Nuts Study). The Journal Of Nutrition, Volume 154, Issue 3, March 2024, Pages 962-977. DOI: <https://doi.org/10.1016/j.tjnut.2023.12.022>

4. Evaluation Of Menopausal Syndrome Relief And Anti-Obesity Efficacy Of The Korean Fermented Food Doenjang: A Randomized, Double-Blind Clinical Trial

Doenjang is a traditional Korean fermented soybean food with potential health benefits for menopausal women.

In this clinical trial using Doenjang, researchers compare the effectiveness of traditional Doenjang and commercial Doenjang in menopausal women. Furthermore, scientists also compared whether Doenjang has a better effect if the number of beneficial microbes is higher. The analyses included the following groups: traditional Doenjang containing either a high dose (HDC; n = 18) or low dose (LDC; n = 18) of beneficial microbes and commercial Doenjang (CD; n = 20).

Study result shows that the Kupperman index decreased after Doenjang consumption in all three groups, with the greatest decrease in the LDC group. Only the groups that took traditional Doenjang pills exhibited reduced LDL cholesterol. No changes in obesity and inflammation-related indicators were observed. The number of *Firmicutes*, associated with obesity, decreased in the CD group but the numbers of *Bacteroidetes* increased in the HDC and CD groups. Thus, **the study revealed that traditional Doenjang is more effective in alleviating menopausal syndrome than commercial Doenjang.** Further research is needed.

Source: A Lum Han, Department Of Family Medicine, Wonkwang University Hospital, Iksan, Republic Of Korea. Evaluation Of Menopausal Syndrome Relief And Anti-Obesity Efficacy Of The Korean Fermented Food Doenjang: A Randomized, Double-Blind Clinical Trial. Nutrients, 2024 Apr 17;16(8):1194. DOI: 10.3390/nu16081194.

5. Development Of Germinated-Brown-Rice-Based Novel Functional Beverage Enriched With γ -Aminobutyric Acid: Nutritional And Bio-Functional Characterization

γ -aminobutyric acid (GABA), recognized as a primary inhibitory neurotransmitter within the brain, serves a crucial role in the aging process and in neurodegenerative conditions such as Alzheimer's disease.

This study elucidates the development of a novel functional beverage utilizing germinated brown rice enriched with GABA, offering promising nutritional and bio-functional characteristics for health-conscious consumers.

Source: Baskaran Stephen Inbaraj, Department Of Food Science, Fu Jen Catholic University, New Taipei City, Taiwan. Development Of Germinated-Brown-Rice-Based Novel Functional Beverage Enriched With γ -Aminobutyric Acid: Nutritional And Bio-Functional Characterization. Foods 2024, 13(8), 1282. DOI: <https://doi.org/10.3390/foods13081282>

6. Discovery Of Curcuminoids As Pancreatic Lipase Inhibitors From Medicine-And-Food Homology Plants

This study screened and identified potent pancreatic lipase inhibitors from 20 commonly consumed medicine-and-food homology plants using affinity ultrafiltration combined with spectroscopy and docking simulations.

The results showed that turmeric exhibited the highest pancreatic lipase-inhibitory activity, and curcumin, demethoxycurcumin, and bisdemethoxycurcumin were discovered to be potent pancreatic lipase inhibitors within the turmeric extract, with IC₅₀ values of 0.52 ± 0.04 , 1.12 ± 0.05 , and 3.30 ± 0.08 mg/mL, respectively. In addition, the enzymatic kinetics analyses demonstrated that the inhibition type of the three curcuminoids was the reversible competitive model, and curcumin exhibited a higher binding affinity and greater impact on the secondary structure of pancreatic lipase than found with demethoxycurcumin or bisdemethoxycurcumin, as observed through fluorescence spectroscopy and circular dichroism.

Furthermore, docking simulations supported the above experimental findings, and revealed that the three curcuminoids might interact with amino acid residues in the binding pocket of pancreatic lipase through non-covalent actions, such as hydrogen bonding and π - π stacking, thereby inhibiting the pancreatic lipase. **Collectively, these findings suggest that the bioactive compounds of turmeric, in particular curcumin, can be promising dietary pancreatic lipase inhibitors for the prevention and management of obesity.**

*Source: Ren-You Gan, Singapore Institute Of Food And Biotechnology Innovation (SIFBI), Agency For Science, Technology And Research (A*STAR), Singapore And Department Of Food Science And Nutrition, Faculty Of Science, The Hong Kong Polytechnic University, Kowloon, Hong Kong SAR, China. Discovery Of Curcuminoids As Pancreatic Lipase Inhibitors From Medicine-And-Food Homology Plants. Nutrients, 2024 Aug 5;16(15):2566. DOI: 10.3390/nu16152566.*

7. Bioactive Compounds From Pomegranate Peels - Biological Properties, Structure–Function Relationships, Health Benefits And Food Applications – A Comprehensive Review

Pomegranate (*Punica granatum*) is a popular fruit known for its rich nutritional value and diverse bioactive compounds. While the edible seeds and juice of pomegranates have gained significant attention, pomegranate peels, which are often discarded as waste, have emerged as a promising source of bioactive compounds with numerous health benefits.

This article presents a comprehensive overview of the biological properties, health benefits, and food applications of bioactive compounds derived from pomegranate peels.

Source: Gulzar Ahmad Nayik, Department Of Food Science & Technology, Govt. Degree College Shopian, J&K, India. Bioactive Compounds From Pomegranate Peels - Biological Properties, Structure–Function Relationships, Health Benefits And Food Applications – A Comprehensive Review. Journal Of Functional Foods, Volume 116, May 2024, 106132. DOI: <https://doi.org/10.1016/j.jff.2024.106132>.

8. Fortification Of Dairy Products Using Plant-Derived Bioactive Compounds

In this review, the increasing practice of enriching dairy products such as milk, ice cream, cheese, and yogurt with natural components to improve their nutritional content and effectiveness is examined. **The review specifically delves into the utilization of plant extracts, herbs, spices, and other natural sources, investigating their potential for enrichment while maintaining their sensory properties.** Lastly, the review concentrates on the possible advantages of adding plant-based bioactive compounds to enhance the antioxidant capabilities of dairy products and milk.

Source: Huda Wazzan, Department Of Food And Nutrition, School Of Human Science And Design, King Abdulaziz University, Jeddah, Saudi Arabia. Fortification Of Dairy Products Using Plant-Derived Bioactive Compounds. Nutr Food Sci 2024; 12(2). DOI : <http://dx.doi.org/10.12944/CRNFSJ.12.2.6>

9. Nutritional, Bioactive, And Health Potential Of Pomelo (Citrus Maxima): An Exotic Underutilized Fruit

Pomelo scientifically known as *Citrus maxima* belongs to the family Rutaceae and is one of the largest fruits among citrus varieties. Mainly pomelo comes in different flesh colors such as red, pink, light pink, and white. The principal pomelo fruit polyphenols are phenolic acids, flavonoids, anthocyanins, and tannins. Pomelo fruit generates a large number of wastes including peel, pomace, and seeds which are comprised of bioactive compounds. The bioactive compounds carried in waste improve health functionalities. The hesperidin, narirutin, naringin, and their aglycone (naringenin), which have traditionally been acknowledged to constitute a characteristic component of pomelo, are the fruit's major constituents.

Also, pomelo fruit juice is high in vitamins A and C, and the peel offers high protein, carbohydrate, and mineral content. Pomelo production and processing of different byproducts have become a perfect and long-lasting resource for agriculture and the food industry. The wastes loaded with immense essential components in pomelo have great importance in terms of human health. By offering unique goods with high consumer appeal, pomelo not only contributes to a diverse diet but also provides significant health benefits. **This review highlights the recent advancements in the nutritional benefits, bioactive compounds, and health advantages of pomelo fruit.**

Source: Simple Sharma, Department Of Food Science And Technology, I. K. Gujral Punjab Technical University, Kapurthala, Punjab, India. Nutritional, Bioactive, And Health Potential Of Pomelo (Citrus Maxima): An Exotic Underutilized Fruit. Nutr Food Sci 2024; 12(2). DOI : <http://dx.doi.org/10.12944/CRNFSJ.12.2.35>

10. Functional And Physicochemical Characterization Of A Novel Pearl Millet—Soy Milk-Based Synbiotic Beverage

This study presents the physicochemical and functional characterization of a novel fermented pearl millet–soy milk-based synbiotic beverage. The synbiotic fermented pearl millet beverage was optimized at 40% pearl millet and 10.41% sugar, with hedonic score of more than eight for all the responses, through response surface methodology.

The fermented synbiotic beverage, with *Lactiplantibacillus plantarum* strains exceeding 10⁸ colony-forming units/mL, exhibited superior nutritional and physicochemical qualities when compared with the unfermented counterpart. The viability percent of lactic acid bacteria in the developed beverage was found to be significantly high (87.83%). The survivability of probiotic culture was 76.71% in simulated gastric juice and 73.87% in simulated intestinal juice after sample storage for 25 days.

The result showed that millets stand out as a promising raw material for developing fermented nondairy synbiotic beverages, particularly when combined with microbial strains such as *L. plantarum*.

Source: Pinki Saini, Centre Of Food Technology, Institute Of Professional Studies, University Of Allahabad, Prayagraj, Uttar Pradesh, India. Functional And Physicochemical Characterization Of A Novel Pearl Millet—Soy Milk-Based Synbiotic Beverage. Food Safety And Health Journal, Volume3, Issue1, January 2025, Pages 115-127. DOI: <https://doi.org/10.1002/fsh3.12076>

11. Exploring The Phytochemical, Pharmacological And Nutritional Properties Of Moringa Oleifera: A Comprehensive Review

Moringa oleifera is one of the most nutrient-packed species, commonly known as the drumstick tree or miracle tree, and has garnered substantial popularity for its health benefits, phytochemical profile, and therapeutic potential. Moringa oleifera is a plant that is native to the Indian subcontinent and has been used in traditional medicine for thousands of years owing to its nutritional and therapeutic properties. The leaves, seeds, pods, roots, and flowers of this plant are enriched with a wide range of bioactive compounds such as flavonoids, alkaloids, vitamins, minerals, and essential amino acids. Therefore, it is considered a reservoir crop for both nutritional and medicinal applications.

The recent rediscovery of the plant is at the forefront of changes in nutrition, medicine, and public health. Owing to its varied clinical applications, the plant is a potential candidate for research in new drug development and functional foods. **In this review, various phytochemical extraction techniques, therapeutic properties, and applications are discussed.**

Source: Ayaz Mukarram Shaikh, Doctoral School Of Nutrition And Food Sciences And Faculty Of Agriculture, Food Science And Environmental Management, Institute Of Food Science, University Of Debrecen, Debrecen, Hungary. Exploring The Phytochemical, Pharmacological And Nutritional Properties Of Moringa Oleifera: A Comprehensive Review. Nutrients 2024, 16(19), 3423. DOI: <https://doi.org/10.3390/nu16193423>

12. In Vitro Bioaccessibility Of Phenolic Compounds From The Halophytes Suaeda Edulis And Suaeda Esteroa: Opportunity For The Development Of Novel Foods

Halophytic plants grow in high salinity environments and present phytochemicals with antioxidant properties, such as phenolic compounds; due to the uncertain availability of healthy foods, there is a growing interest in their nutritional potential. However, their bioactive compounds with beneficial health effects are limited in their bioaccessibility. This study evaluates the bioaccessibility and total antioxidant capacity (TAC) of phenolic compounds in *Spondylus edulis* and *Spondylus esteroa* during an in vitro digestion process.

The study shows that total phenols, total flavonoids, and total antioxidant capacity by DPPH and TEAC in the three phases of digestion (oral, gastric, and intestinal) of *S. esteroa* were higher than in *S. edulis*, founding 4.84 % higher in total phenol content, and 0.05 % in total flavonoid content; also, and 28.94 and 23.93 % higher in total antioxidant capacity by '2,2-Diphenyl-1-picrylhydrazyl' (DPPH) and TEAC, respectively in the intestinal digestion phase. *The bioaccessibility of S. edulis was higher than in S. esteroa*; the intestinal was the phase reflecting more bioaccessible compounds. The bioaccessibility percentages of total phenols and flavonoids were 590.16 and 1012.93 %, and the percentage recovery of total antioxidant capacity by DPPH and TEAC were 181.37 and 139.74 %.

Researchers identified phenolic acids ferulic, p-Coumaric, and synaptic (hydroxycinnamic), gallic and protocatechuic (hydroxybenzoic), the flavonoids catechin (flavan-3-oles), myricetin and ruthin (flavonols), naringenin and naringin (flavonones). **S. esteroa presented bioactive compounds in higher concentrations than S. edulis** due to the stress imposed by its habitat; nevertheless, the determined bioactive compounds of *S. edulis* showed a higher bioaccessibility because it was managed under local improvement.

Source: Rosario Maribel Robles-Sánchez, Functional Foods And Nutraceuticals Laboratory, Research Department And Postgraduate In Food (DIPA), University Of Sonora (UNISON), Blvd. Luis Encinas Y Rosales No. SN, Colonia Centro, 83000, Hermosillo, Sonora, Mexico. In Vitro Bioaccessibility Of Phenolic Compounds From The Halophytes Suaeda Edulis And Suaeda Esteroa: Opportunity For The Development Of Novel Foods. Nutr Food Sci 2024; 12(2). DOI : <http://dx.doi.org/10.12944/CRNFSJ.12.2.31>

13. Associations Between Dietary Fibers And Gut Microbiome Composition In The EDIA Longitudinal Infant Cohort

Scientists have explored how the transition from human milk to fibers in complementary foods shapes the taxonomic and functional maturation of the gut microbiome within the first year of life.

In this study researchers identified 176 complementary food fiber-bacterial species associations. First plant-based fibers associated to microbiota compositions similar to breastfeeding, and further associated with aromatic amino acid metabolites, including 5-hydroxyindoleacetic acid. Distinct fibers from different food categories showed unique associations with specific bacterial taxa.

Key species such as *Faecalibacterium prausnitzii*, associated with oat fibers, reflective of maturing microbial communities. Fiber intake during weaning associated with shifts in metabolite profiles, including immunomodulatory metabolites, with fiber effects observed in a source and timing-dependent manner, implicated in gradual microbiome diversification.

Source: Tommi Vatanen, Institute Of Biotechnology, Helsinki Institute Of Life Science, University Of Helsinki, Helsinki, Finland. Associations Between Dietary Fibers And Gut Microbiome Composition In The EDIA Longitudinal Infant Cohort. The American Journal of Clinical Nutrition, Volume 121, Issue 1, January 2025, Pages 83-99. DOI: <https://doi.org/10.1016/j.ajcnut.2024.11.011>

14. Dietary Fiber And Dietary Protein Of Lemongrass (*Cymbopogon Citratus* Stapf.) As Potential Functional Food In Risk Prevention For Diabetes Mellitus And Cardiovascular Disease: An Animal Model

This study determined the glucose-lowering and cholesterol-lowering effects of large molecules, dietary fiber (DF) and protein, of lemongrass in an animal model using completely randomized design. Total DF and protein were extracted; dietary protein (DP) was further digested to obtain protein hydrolyzates (PH).

Sprague-Dawley rats were initially fed with high sugar, high fat and high cholesterol diet for two weeks, then administered with total DF, DP, PH, and a combination of DF and DP for another two weeks while maintained with the diet. Blood samples were obtained for determination of fasting blood sugar (FBS), total cholesterol, high density lipoprotein (HDL) and LDL+VLDL (low density lipoprotein + very low density lipoprotein) levels, and the differences before and after treatments were compared. There were a total of six treatment groups, including Untreated and Acarbose+Pravastatin treatment, which served as controls.

Administration of DF, DP, PH, and DF+DP resulted to lower increase of FBS in comparison with control groups. However, PH treatment led to the greatest decrease in total cholesterol levels among the treatments. HDL cholesterol levels were not affected by the treatments. The rise in LDL+VLDL cholesterol levels was least in rats treated with DP, but the group treated with PH did not increase. Thus among the treatments, protein hydrolyzates exerted the most effective glucose- and cholesterol-lowering effects in rats fed with high sugar, high fat, and high cholesterol diet. Furthermore, the treatments appeared to have reduced the extent of injury on liver and kidney cells caused by the diet.

This study supports the potential of lemongrass as a functional food in mitigating the risk of diabetes mellitus and cardiovascular disease (CVD) through prevention of hyperglycemia and hypercholesterolemia.

Source: Mizpah Cervera Villalobos, Department Of Chemistry, Central Philippine University, Iloilo City, Philippines And The Graduate School, University Of Santo Tomas (UST) España Manila. Dietary Fiber And Dietary Protein Of Lemongrass (*Cymbopogon Citratus* Stapf.) As Potential Functional Food In Risk Prevention For Diabetes Mellitus And Cardiovascular Disease: An Animal Model. *Nutr Food Sci* 2024; 12(3). DOI : <http://dx.doi.org/10.12944/CRNFSJ.12.3.31>

15. Effects Of Kimchi Consumption On Body Fat And Intestinal Microbiota In Overweight Participants: A Randomized, Double-Blind, Placebo-Controlled, Single-Center Clinical Trial

Obesity is caused by an energy imbalance and leads to metabolic syndrome and diseases. The gut microbiota, influenced by diet, crucially impacts obesity. Kimchi, a traditional Korean fermented food rich in lactic acid bacteria, may alter gut microbiota composition.

This randomized, double-blind, placebo-controlled trial enrolled 90 participants (BMI 23–30 kg/m²) to investigate the anti-obesity effects of kimchi. Participants consumed 3000 mg of spontaneously fermented kimchi powder (S-K) or starter-fermented kimchi powder with *Leuconostoc mesenteroides* KCKMo828 (LMS-K) daily for 12 weeks, while the placebo group consumed lactose.

Both the S-K and LMS-K groups exhibited a significant reduction in body fat mass compared to the placebo group. Kimchi consumption also increased the proportion of *Akkermansia muciniphila* while decreasing that of *Proteobacteria*. **These findings suggest that daily kimchi consumption may alleviate obesity symptoms by regulating gut microbiota.**

Source: Sung Wook Hong, Technology Innovation Research Division, World Institute Of Kimchi, 86 Kimchi-Ro, Nam-Gu, Gwangju, South Korea. Effects Of Kimchi Consumption On Body Fat And Intestinal Microbiota In Overweight Participants: A Randomized, Double-Blind, Placebo-Controlled, Single-Center Clinical Trial. *Journal Of Functional Foods*, Volume 121, October 2024, 106401. DOI: <https://doi.org/10.1016/j.jff.2024.106401>

16. A One-Week Elderberry Juice Intervention Augments The Fecal Microbiota And Suggests Improvement In Glucose Tolerance And Fat Oxidation In A Randomized Controlled Trial

This randomized, placebo-controlled study determines if anthocyanin-dense elderberry juice (EBJ) reproduces glucoregulatory and substrate oxidation effects observed with other berries and if this is mediated by the gut microbiota. Eighteen study volunteers completed the study.

At the phylum level, EBJ significantly increased *Firmicutes* and *Actinobacteria*, and decreased *Bacteroidetes*. At the genus level, EBJ increased *Faecalibacterium*, *Ruminococcaceae*, and *Bifidobacterium* and decreased *Bacteroides* and *lactic acid-producing bacteria*, indicating a positive response to EBJ. Supporting the changes to the microbiota, the EBJ treatment significantly reduced blood glucose following the MTT. Fat oxidation also increased significantly both during the MTT and 30 min of moderate physical activity with the EBJ treatment. **These findings confirmed that the bioactivity of EBJ-sourced anthocyanins on outcomes related to gut health and obesity.**

Source: Patrick M. Solverson, Department Of Nutrition And Exercise Physiology, Elson S Floyd College Of Medicine, Washington State University, Spokane, USA. A One-Week Elderberry Juice Intervention Augments The Fecal Microbiota And Suggests Improvement In Glucose Tolerance And Fat Oxidation In A Randomized Controlled Trial. *Nutrients*, 2024 Oct 20;16(20):3555. DOI: 10.3390/nu16203555.

17. Exploring The Bioactive Potential Of Argan Oil Cake: A Comprehensive Physicochemical Comparison With Various Seeds Cakes

The argan oil industry generates a large quantity of argan oil cake. This residue is traditionally used as livestock feed. In order to explore other potential uses for this by-product, a full physico-chemical characterisation was carried out.

The results indicate that potassium (K), phosphorus (P), magnesium (Mg), calcium (Ca) and sodium (Na) are the main mineral elements in the argan oil cake. In terms of protein content, argan oil cake contained the highest content at 45.90 ± 0.10 g/100 g dry weight. The residual oil content was around 12.61 ± 0.8 g/100 g. Oil from argan press cake has high levels of oleic and linoleic acid (47.88 ± 0.20 and 32.10 ± 0.15 %) respectively. In terms of sterol composition, argan cake is the only one to contain Schottenol, Spenasterol and Stigma-8-22-dien-3b-ol. Argan oil cake showed remarkable values for total phenolic compounds (5.11 ± 0.01 mg GAE/g) and DPPH antioxidant activity (8.06 ± 0.08 mg AAE/g).

The results suggest that argan cake could be considered a rich source of nutrients and that its extracts have substantial value-added potential, warranting attention in future research and development.

Source: Angelo Maria Giuffrè, Department AGRARIA, University Of Studies "Mediterranea" Of Reggio Calabria, Reggio Calabria, Italy. Exploring The Bioactive Potential Of Argan Oil Cake: A Comprehensive Physicochemical Comparison With Various Seeds Cakes. Nutr Food Sci 2025; 13(1). <https://tinyurl.com/mwa3yrr3>

18. The Use Of Ginger Bioactive Compounds In Pregnancy: An Evidence Scan And Umbrella Review Of Existing Meta-Analyses

Ginger is a commonly used nonpharmacological treatment of pregnancy-related symptoms including nausea and vomiting, inflammation, and gastrointestinal dysfunction. This umbrella review assessed the extent and quality of the evidence regarding the effectiveness and safety of using dietary preparations of ginger during pregnancy and lactation. They identified 90 articles relevant to ginger use during pregnancy and lactation. Seven meta-analyses (MAs) on ginger for treating nausea in pregnancy included 22 independent studies, with a 49% overlap across studies.

Most MAs reported positive effect of ginger on the improvement of nausea in pregnancy compared with placebo, or equivalence to conventional treatments, and no evidence of significant adverse effects. The quality of the MAs ranged from critically low to low. The evidence suggests that ginger is effective at reducing nausea in pregnancy; however, the included studies contained substantial heterogeneity and were of low quality.

Source: Amanda J Macfarlane, Texas A&M Agriculture, Food And Nutrition Evidence Center, Fort Worth And Department Of Nutrition, Texas A&M University, College Station, TX, United States. The Use Of Ginger Bioactive Compounds In Pregnancy: An Evidence Scan And Umbrella Review Of Existing Meta-Analyses. Advances In Nutrition, Volume 15, Issue 11, November 2024, 100308. DOI: <https://doi.org/10.1016/j.advnut.2024.100308>

19. Exploring The Potential Of Camel Milk As A Functional Food: Physicochemical Characteristics, Bioactive Components, Innovative Therapeutic Applications, And Development Opportunities Analysis

This review highlights the physicochemical characteristics and key bioactive elements, as well as the strengths, weaknesses, opportunities, and threats associated with camel milk. The standard composition components characterizing Camel milk include lipids, total protein, lactose, dry matter, and ash. It contains various bioactive fractions that contribute to human well-being, including lactoperoxidase, hydrogen peroxide, lactoferrin, lysozyme, immunoglobulin, and free fatty acids.

Researchers emphasize the urgent need for enhanced camel milk production. Further, increased research funding is essential to fully explore the biogenic applications of camel milk constituents, paving the way for innovative therapeutic and nutritional uses.

Source: Amro Abdelazez, Institute Of Microbe And Host Health, Faculty Of Agriculture And Forestry, Linyi University, , China And Department Of Dairy Microbiology, Animal Production Research Institute, Agriculture Research Centre, Dokki, Egypt. Exploring The Potential Of Camel Milk As A Functional Food: Physicochemical Characteristics, Bioactive Components, Innovative Therapeutic Applications, And Development Opportunities Analysis. Food Materials Research 4: e031. DOI: 10.48130/fmr-0024-0020.

20. Effects Of Vegetable And Fruit Juicing On Gut And Oral Microbiome Composition

This study explores how juicing impacts gut and oral microbiome composition in an intervention study. **Fourteen participants followed one of three diets—exclusive juice, juice plus food, or plant-based food—for three days.**

The saliva microbiome differed significantly in response to the elimination diet with a significant reduction in *Firmicutes* and a significant increase in *Proteobacteria*.

The juice intervention diets were also associated with changes in the saliva and cheek microbiota, particularly in the **relative abundances of pro-inflammatory bacterial families**, potentially due to the high sugar and low fiber intake of the juice-related products. Although no significant shifts in overall gut microbiota composition were observed, with either the elimination diet or the juice intervention diets, bacterial taxa associated with gut permeability, inflammation, and cognitive decline increased in relative abundance.

These findings suggest that short-term juice consumption may negatively affect the microbiota.

Source: Maria Luisa Savo Sardaro, Department Of Anthropology, Northwestern University, Evanston, USA. 21. Effects Of Vegetable And Fruit Juicing On Gut And Oral Microbiome Composition. Nutrients 2025, 17(3), 458. DOI: <https://doi.org/10.3390/nu17030458>

21. Promotion Of Healthy Aging Through The Nexus Of Gut Microbiota And Dietary Phytochemicals

Aging is associated with the decline of tissue and cellular functions, which can promote the development of age-related diseases like cancer, cardiovascular disease, neurodegeneration, and disorders of the musculoskeletal and immune systems. This review discussed how dietary phytochemicals and gut microbiota can work in concert to promote a healthy gut and healthy aging. It provided an overview of the gut microbiota's role in promoting healthy aging by influencing gut barrier integrity, immune function, mitochondria function and oxidative stress. The mechanisms by which phytochemicals can effect gut health, inflammation, and nurture a diverse and healthy microbial composition have been also discussed.

The Review highlighted how gut microbiota can directly influence health by producing bioactive metabolites from phytochemicals in food like urolithin A, equol, hesperetin and sulforaphane. These microbial metabolites, along with others, have the potential to promote healthspan. Importantly, the review underscored the individual variability in the ability to produce these health-promoting metabolites, which depends on the composition of an individual's gut microbiota. Key dietary sources of these phytochemicals include cruciferous vegetables, berries, nuts, citrus fruits, and soy products.

Source: Emily Ho, Linus Pauling Institute And School Of Nutrition And Public Health, Oregon State University, Corvallis, Oregon, USA. Promotion Of Healthy Aging Through The Nexus Of Gut Microbiota And Dietary Phytochemicals. Advances In Nutrition, Volume 16, Issue 3, March 2025, 100376. DOI: <https://doi.org/10.1016/j.advnut.2025.100376>

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