

Recent Studies and Publications on Functional Foods and Health Effects (2017-February 2020)

STUDIES

1. Marine Organisms: The Underexplored Resources To Develop high Value Compounds And Therapeutic Products

The Central Marine Fisheries Research Institute is all set to launch a nutraceutical product from the sea to tackle thyroid disorder after developing nutraceutical products to treat diabetes, arthritis and cholesterol from marine organisms. Marine nutraceutical product developed by the Institute for thyroid dysfunction is in the final stage of clinical trial. The functional foods, enriched with natural ingredients have been proved to provide beneficial action for human health.

CMFRI is the pioneering marine research institute in India to work in the frontier area of bioactive molecule discovery from marine organisms as promising therapeutic agents against various diseases.

Source: A. Gopalakrishnan, Director, ICAR-Central Marine Fisheries Research Institute, Kochi. Marine organisms: the underexplored resources to develop high value compounds and therapeutic products. ICAR sponsored winter school on recent advances in bioactive compounds from marine organisms and development of high value products for health management, 23 January - 12 February 2018. http://eprints.cmfri.org.in/13018/1/Winter%20School_Recent%20Advances_Bioactive%20compounds_Chapter%201.pdf

2. Microbial Fermentation Of Flaxseed Fibers Modulates The Transcriptome Of Gpr41-Expressing Enteroendocrine Cells And Protects Mice Against Diet-Induced Obesity

Study shows that flaxseed fibers ferment in the gut and influence the gastrointestinal microbiota which will help in managing cholesterol and fight inflammation.

Source: Tulika Arora, Wallenberg Laboratory, Department of Molecular and Clinical Medicine, Institute of Medicine, University of Gothenburg, Gothenburg. Microbial fermentation of flaxseed fibers modulates the transcriptome of gpr41-expressing enteroendocrine cells and protects mice against diet-induced obesity. American Journal Of Physiology: Endocrinology And Metabolism, December 2018. <https://doi.org/10.1152/ajpendo.00391.2018> OR <https://www.ncbi.nlm.nih.gov/pubmed/30562060>

3. A Selective Role Of Dietary Anthocyanins And Flavan-3-Ols In Reducing The Risk Of Type 2 Diabetes Mellitus: A Review Of Recent Evidence

Researchers have found that an inverse relationship exists between intake of **dietary anthocyanins, flavan-3-ols** and the incidence of type 2 diabetes. Study shows that foods containing anthocyanins and flavan-3-ols are quite effective in reducing the risk of type 2 diabetes.

Source: Britt Burton-Freeman, Department of Food Science and Nutrition, Center for Nutrition Research, Institute for Food Safety and Health, Illinois Institute of Technology, Chicago, USA. A selective role of dietary anthocyanins and flavan-3-ols in reducing the risk of type 2 diabetes mellitus: a review of recent evidence. Nutrients 2019, 11(4), 841. <https://doi.org/10.3390/nu11040841>

4. Higher Whole-Grain Intake Is Associated With Lower Risk Of Type 2 Diabetes Among Middle-Aged Men And Women: The Danish Diet, Cancer, And Health Cohort

A large study indicates that people who eat whole grains of any kind every day are much less likely to develop type 2 diabetes.

Source: Cecilie Kyrø, Danish Cancer Society Research Center, Copenhagen, Denmark. Higher whole-grain intake is associated with lower risk of type 2 diabetes among middle-aged men and women: the Danish diet, cancer, and health cohort. The Journal of Nutrition, Volume 148, Issue 9, September 2018, Pages 1434-1444. <https://doi.org/10.1093/jn/nxy112>

5. Natural Polyphenols As Sirtuin 6 Modulators

A new study shows anthocyanins' effects on an enzyme implicated in cancer and aging: **sirtuin 6 (SIRT6)**. Sirtuins regulate the expression of genes involved in a number of cellular signaling pathways. The researchers found that one type of anthocyanin, known as **cyanidin**, could be of particular interest. This compound appeared to reduce the activity of cancer-causing genes and boosted the activity of cancer-stopping genes.

Source: *Maija Lahtela-Kakkonen, School of Pharmacy, University of Eastern Finland, Kuopio, Finland. Natural polyphenols as sirtuin 6 modulators Sci Rep 8, 4163 (2018). <https://doi.org/10.1038/s41598-018-22388-5>*

6. Adjunctive Nutrients In First-Episode Psychosis: A Systematic Review Of Efficacy, Tolerability And Neurobiological Mechanisms

A scientific paper has revealed that some nutrients found in food may help reduce the symptoms of psychotic illness, when used in the early stages of treatment. These include: **Taurine, n-acetyl cysteine and vitamin C**.

Source: *Joseph Firth, NICM Health Research Institute, School of Science and Health, University of Western Sydney, Sydney, New South Wales, Australia and Division of Psychology and Mental Health, University of Manchester, Manchester, UK. Adjunctive nutrients in first episode psychosis: a systematic review of efficacy, tolerability and neurobiological mechanisms. Early Interv Psychiatry. 2018 Oct; 12(5): 774-783. <https://doi.org/10.1111/eip.12544>*

7. Consumption Of Green Coffee And The Risk Of Chronic Diseases

Green coffee contains macro nutrients such as carbohydrates, protein, fat, as well as minor components such as **caffeine, trigonelin and chlorogenic acid**. Phenolics, chlorogenic acids and brown pigments are sources of natural antioxidants. High polyphenolic materials found in green coffee and especially chlorogenic acid place an important role. Researcher found that antioxidant activity of chlorogenic acid present in green coffee are effective in reducing body mass, blood glucose, lipid levels, blood pressure and prevention from cardiovascular diseases.

Source: *Sanlıer N, Lokman Hekim University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara, Turkey. Consumption of green coffee and the risk of chronic diseases. Journal Critical Review in Food Science and Nutrition, Volume 59, 2019- Issue 16, Pages 2573-2585. <https://doi.org/10.1080/10408398.2018.1461061>*

8. Chemical Profile, Total Phenolic Content, DPPH Free Radical Scavenging And α -Glucosidase Inhibitory Activities Of Cosmos Caudatus Kunth Leaves

Researchers in Malaysia have shown that the plant **Cosmos caudatus Kunth** contains chemicals that can lower blood glucose levels. The plant leaf is rich in chemicals known as flavonoid glycosides, which can reduce blood glucose levels by inhibiting **alpha-glucosidase**, an intestinal enzyme involved in glucose uptake in the gut.

Source: *Khazirah Shaari, Laboratory of Natural Products, Institute of Bioscience, Universiti Putra Malaysia (UPM), Serdang, Selangor, Malaysia. Chemical profile, total phenolic content, dpph free radical scavenging and α -glucosidase inhibitory activities of cosmos caudatus kunth leaves. Pertanika J. Trop. Agric. Sci. 41 (3): 1367 - 1381(2018). [http://www.pertanika.upm.edu.my/Pertanika%20PAPERS/JTAS%20Vol.%2041%20\(3\)%20Aug.%202018/32%20JTAS%201327-2018.pdf](http://www.pertanika.upm.edu.my/Pertanika%20PAPERS/JTAS%20Vol.%2041%20(3)%20Aug.%202018/32%20JTAS%201327-2018.pdf)*

9. Portfolio Dietary Pattern And Cardiovascular Disease: A Systematic Review And Meta-Analysis Of Controlled Trials

Researcher found that eating a diet which includes peanuts, chickpeas, apples and a little amount of plant sterols will reduces cholesterol level and improve blood pressure.

Study shows that diet with beneficial effect includes 42 grams of nuts (tree nuts or peanuts), 50 grams of plant protein from soy products or dietary pulses (beans, peas, chickpeas, or lentils), 20 grams of viscous soluble fiber from oats, barley, psyllium, eggplant, okra, apples, oranges, or berries and two grams of plant sterols from supplements or plant-sterol enriched products per day.

Source: *John L. Sievenpiper, Toronto 3D Knowledge Synthesis and Clinical Trials Unit, Clinical Nutrition and Risk Factor Modification Centre, St. Michael's Hospital; Department of Nutritional Sciences, Faculty of Medicine, University of Toronto; Li Ka Shing Knowledge Institute, St. Michael's Hospital, and Division of Endocrinology and Metabolism, St. Michael's Hospital, Toronto, Canada. Portfolio dietary pattern and cardiovascular disease: a systematic review and meta-analysis of controlled trials. Progress In Cardiovascular diseases, Volume 61, Issue 1, May-June 2018, Pages 43-53. <https://doi.org/10.1016/j.pcad.2018.05.004>*

10. Effectiveness Of Plant-Based Diets In Promoting Well-Being In The Management Of Type 2 Diabetes: A Systematic Review

Researchers found that plant-based diets are beneficial in improving glycemic control, cholesterol and lead to weight loss in people with Type 2 diabetes.

Study shows that plant-based diets benefit both glycemic control and cardiovascular health because they are low in saturated fat, rich in phytochemicals, high in fiber and often rich in low-glycemic fruits and vegetables.

Source: Source: Anastasios Toumpanakis, School of Health Sciences, University of London, London, UK. Effectiveness of plant-based diets in promoting well-being in the management of type 2 diabetes: a systematic review. BMJ Open Diabetes Research and Care 2018; 6:e000534. <http://dx.doi.org/10.1136/bmjdr-2018-000534>

11. Dietary Intake Of Whole Strawberry Inhibited Colonic Inflammation In Dextran-Sulfate-Sodium-Treated Mice Via Restoring Immune Homeostasis And Alleviating Gut Microbiota Dysbiosis

New study shows that eating less than a cup of strawberries per day improve the symptoms of inflammatory bowel disease. Researcher found that in mice who ate strawberries the levels of harmful gut bacteria were reduced including **Akkermansia and Dorea**, and levels of healthy flora, such as **Lactobacillus** and **Bifidobacterium** were increased.

Source: Hang Xiao, Department of Food Science, University of Massachusetts, Amherst, Massachusetts, United States. Dietary intake of whole strawberry inhibited colonic inflammation in dextran-sulfate-sodium-treated mice via restoring immune homeostasis and alleviating gut microbiota dysbiosis. J. Agric. Food Chem. 2019, 67, 33, 9168-9177. <https://pubs.acs.org/doi/abs/10.1021/acs.jafc.8b05581>

12. Antiproliferative Activity Of Ontario Grown Onions Against Colorectal Adenocarcinoma Cells

Researchers found that red onions have the strongest cancer fighting power as they contain one of the highest concentrations of **quercetin**, a type of flavonoid. The Guelph study revealed that the red onion not only has high levels of quercetin, but also high amounts of anthocyanin, which enriches the scavenging properties of quercetin molecules.

Source: Suresh Neethirajan, BioNano Laboratory, School of Engineering, University of Guelph, Guelph, Ontario, Canada. Antiproliferative activity of ontario grown onions against colorectal adenocarcinoma cells. Food Research International, Volume 96, June 2017, Pages 12-18. <https://doi.org/10.1016/j.foodres.2017.03.017>

13. Adjunctive Nutrients In First-Episode Psychosis: A Systematic Review Of Efficacy, Tolerability And Neurobiological Mechanisms

Researchers found that certain nutrient supplements, used alongside standard treatment, may improve mental health in young people with psychosis more than standard treatment alone.

Study shows that **Taurine** (an amino acid) per day reduced psychotic symptoms; antioxidant supplements such as **n-acetylcysteine and vitamin C** are effective for patients with high levels of oxidative stress and omega-3 supplements improved brain health in young people with psychosis.

Source: Joseph Firth, NICM Health Research Institute, School of Science and Health, University of Western Sydney, Sydney, New South Wales, Australia and Division of Psychology and Mental Health, University of Manchester, Manchester, UK. Adjunctive nutrients in first episode psychosis: a systematic review of efficacy, tolerability and neurobiological mechanisms. Early Interv Psychiatry. 2018 Oct; 12(5): 774-783. <https://doi.org/10.1111/eip.12544>

14. Influence Of Mangos On Vascular Function And Platelet Reactivity In Postmenopausal Women

Researcher found that two cups of mangos a day had beneficial effects on systolic blood pressure among healthy postmenopausal women. Study shows that the bioactive compounds i.e. polyphenols such as **mangiferin, quercetin, gallotannins, and gallic acid** are responsible for the favorable response.

Source: Xiang Li, Department Of Nutrition, University Of California, Davis. Influence of mangos on vascular function and platelet reactivity in postmenopausal women. Submitted to the National Mango Board Final report January 30, 2018 Collaborators. <https://pdfs.semanticscholar.org/c78d/cffa64df008a7ab666121004df83ff425c74.pdf>

15. The Impact Of Dietary Fiber On Gut Microbiota In Host Health And Disease

Scientists found that fiber intake will affect weight, as well as blood sugar, insulin sensitivity and bowel health because fiber promote gut health by being consumed as fuel by 'good' bacteria during digestion. Researcher found that low-fiber diets led to weight gain, high blood sugar, and insulin resistance in mice.

Source: Fredrik Bäckhed, Department of Molecular and Clinical Medicine/Wallenberg Laboratory, Institute of Medicine, University of Gothenburg and Sahlgrenska University Hospital, Gothenburg, Sweden. The impact of dietary fiber on gut microbiota in host health and disease. Cell Host and Microbe, Volume 23, Issue 6, 13 June 2018, Pages 705-715. <https://doi.org/10.1016/j.chom.2018.05.012>

16. Diets Rich In Whole Grains Increase Betainized Compounds Associated With Glucose Metabolism

Researchers found that a high intake of whole grains increased the levels of **betaine** compounds in the body which was associated with improved glucose metabolism.

Source: Dr. Kati Hanhineva, University Of Eastern Finland. Diets rich in whole grains increase betainized compounds associated with glucose metabolism. The American Journal of Clinical Nutrition, Volume 108, Issue 5, November 2018, Pages 971-979. <https://doi.org/10.1093/ajcn/nqy169>

17. Epigenetic Modulation Of Inflammation And Synaptic Plasticity Promotes Resilience Against Stress In Mice

Researcher found that the therapeutic properties of a polyphenol compounds i.e. **dihydrocaffeic acid (DHCA)** and **malvidin-3'-O-glucoside (Mal-gluc)** derived from grapes are effective in the treatment of depression and anxiety.

Source: Giulio M. Pasinetti, Department of Neurology, Icahn School of Medicine at Mount Sinai and Geriatric Research, Education and Clinical Center, James J. Peters Veterans Affairs Medical Center, Bronx, NY, USA. Epigenetic modulation of inflammation and synaptic plasticity promotes resilience against stress in mice. Nat Commun 9, 477 (2018). <https://doi.org/10.1038/s41467-017-02794-5>

18. Short-Chain Fatty Acids: Microbial Metabolites That Alleviate Stress-Induced Brain-Gut Axis Alterations

Eating high fiber foods reduces stress levels in the body and prevents food and bacteria leaking from the gut into the blood. The link between the bacteria in the bodies and behavior particularly anxiety and stress is a growing area of scientific research. Researchers found that over a long period of time, low levels of Short-Chain Fatty Acids (SCFAS) cause the gut to become less effective and 'leaky'.

Source: Professor John Cryan, Department of Anatomy and Neuroscience, University College Cork, Cork. 18. Short-chain fatty acids: microbial metabolites that alleviate stress-induced brain-gut axis alterations. The Journal Of Physiology, 15 October 2018 issue. <https://doi.org/10.1113/JP276431>

19. Gut Bacteria Selectively Promoted By Dietary Fibers Alleviate Type 2 Diabetes

Eating more of dietary fibres that promote a type of gut bacteria may help in the fight against Type 2 diabetes. Research findings showed that a diversified high fibre diet can promote 15 strains of gut bacteria that produce short-chain fatty acids (SCFAs), which provide energy to gut cells, reduce inflammation and help regulate hunger.

Source: Liping Zhao, State Key Laboratory of Microbial Metabolism and Ministry of Education Key Laboratory of Systems Biomedicine, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University, Shanghai, China and Department of Biochemistry and Microbiology and New Jersey Institute for Food, Nutrition, and Health, School of Environmental and Biological Sciences, Rutgers University, NJ, USA. 19. Gut bacteria selectively promoted by dietary fibres alleviate type 2 diabetes. Science 09 Mar 2018:Vol. 359, Issue 6380, pp. 1151-1156. DOI: 10.1126/science.aao5774 and <https://science.sciencemag.org/content/359/6380/1151>

20. Phytoecdysteroid-Enriched Quinoa Seed Leachate Enhances Healthspan And Mitochondrial Metabolism In Caenorhabditis Elegans

Researchers found that metabolic genes present in a nematode worm are similar to mammals and humans.

Study shows that administering the quinoa leachate to the nematode worms brings improvement in the lifespan, locomotor performance, and mitochondrial bioenergetics and reductions in the presence of advanced glycation end products, reactive oxygen species, and body fat.

Source: Rong Di, Department of Plant Biology and Pathology, Rutgers University, New Brunswick, NJ, USA. Phytoecdysteroid-enriched quinoa seed leachate enhances healthspan and mitochondrial metabolism in caenorhabditis elegans. Journal of functional Foods, ISSN: 1756-4646, October 2017, Vol: 37, Page: 1-7. <https://doi.org/10.1016/j.jff.2017.07.016> and <https://www.sciencedirect.com/science/article/abs/pii/S1756464617304048#!>

21. Acceptability Of Peanut Skins As A Natural Antioxidant In Flavored Coated Peanuts

Studies show that peanuts skin is rich in phenolic compounds which have health promoting property and therefore serves as a functional food ingredient.

Source: Lisa L. Dean, USDA, Agricultural Research Service, Market Quality and Handling Research Unit, N.C., U.S.A. Acceptability of peanut skins as a natural antioxidant in flavored coated peanuts. J Food Sci. 2018 Oct; 83 (10):2571-2577. DOI:10.1111/1750-3841.14323. <https://doi.org/10.1111/1750-3841.14323>

22. Clinical Evidence On Dietary Supplementation With Chia Seed (Salvia Hispanica L.): A Systematic Review And Meta-Analysis

A systematic review of PubMed and Embase databases found that high-quality evidence regarding the health benefits of chia seed, a popular dietary supplement, is lacking. Future trials with improved methodological quality, well-described clinical events, and validated surrogate markers as outcomes are needed to support the potential health benefits of chia seed consumption.

Source: Nathorn Chaiyakunapruk, School of Pharmacy, Monash University Malaysia, Selangor, Malaysia. Clinical evidence on dietary supplementation with chia seed (salvia hispanica l.): a systematic review and meta-analysis. Nutrition Reviews, Volume 76, Issue 4, April 2018, Pages 219-242, <https://doi.org/10.1093/nutrit/nux071>

23. Memory And Brain Amyloid And Tau Effects Of A Bioavailable Form Of Curcumin In Non-Demented Adults: A Double-Blind, Placebo-Controlled 18-Month Trial

Studies show that eating turmeric daily will boost memory and uplift mood. Researchers found that the chemical compound named curcumin present in turmeric has anti-inflammatory and antioxidant properties which will reduce the prevalence of Alzheimer's disease.

Source: Gary Small, Department of Psychiatry and Biobehavioral Sciences, Semel Institute for Neuroscience and Human Behavior, UCLA Longevity Center, Department of Molecular and Medical Pharmacology, and Center for Human Nutrition, David Geffen School of Medicine at the University of California, Los Angeles, Los Angeles, CA, US. Memory and brain amyloid and tau effects of a bioavailable form of curcumin in non-demented adults: a double-blind, placebo-controlled 18-month trial. The American Journal of Geriatric Psychiatry, Volume 26, Issue 3, March 2018, Pages 266-277. <https://doi.org/10.1016/j.jagp.2017.10.010>

24. Using A Functional Carrot Powder Ingredient To Produce Sausages With High Levels Of Nutraceuticals

Study shows that carrot powder is effective ingredient in sausage formulation to increase the nutraceutical content without affecting its shelf life.

Source: Alvarado-Ramírez M, Tecnológico de Monterrey, Escuela de Ingeniería y Ciencias, Ave. Eugenio Garza Sada 2501, Monterrey, NL, México. Using A Functional Carrot Powder Ingredient To Produce Sausages With High Levels Of Nutraceuticals. J Food Sci. 2018 Sep; 83(9):2351-2361. <https://doi.org/10.1111/1750-3841.14319>

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