The International Society for Nutraceuticals and Functional Foods

ISNFF Newsletter **Volume 12, Issue 1**
July 2019

CONTENT

MESSAGE FROM THE ISNFF

The International Society for Nutraceuticals and Functional Foods (ISNFF) has made remarkable contribution in research and development of functional foods, nutraceuticals, dietary supplements, and natural health products. Our activities have given great benefit to foster strong, wide, and international communication among professionals in academia, industry, governments, and other organizations, and among inventors, investors, and other interested parties. One of the most important tools for the provision of the communication is the Annual Conference and Exhibition. Our success has been due to the support received from presenters who have provided state-of-the-art contributions in the field as well as sponsors and exhibitors and enthusiastic presence of attendees. Industry relevant R & D work and establishing true pre-clinical and clinical support for the ideas put forth is still needed to establish strong relationship between what is found in the laboratory to reach production and supported by *in vivo* health promotion and disease risk reduction studies.

The newly-designed ISNFF website <www.isnff.org> contains easily accessible information for retrieving archives from the main activities in the past 12 years. Please take advantage by visiting our website. We will be most appreciative to receive your constructive input to enhance our activities. Please also note that the new journal of the ISNFF, Journal of Food Bioactives is easily accessible through our website and contributions to the journal may be made directly through its dedicated website <isnff-jfb.com>. All manuscripts received in 2019 and 2020 will receive a waiver of applicable fees, if qualified.

Meanwhile, the 2019 Annual Conference and Exhibition of the ISNFF will be held in Kobe, Japan, December 1 to 5. The conference will be co-organized with International Conference on Food Factors (ICoFF) as ICoFF2019/ISNFF2019. On behalf of ISNFF, we greatly appreciate the contributions of our sponsors, exhibitors, and participants in this exciting joint meeting. ICoFF is one of the best known international conferences on food factors and their health benefits. We look forward to hearing your latest findings and developments, to meet old friends and to make new ones in the meeting. Please also note that applications for the ISNFF Merit Award, Fellow Award, and Fereidoon Shahidi Fellowship should be sent directly to the ISNFF office <isnffsecretary@gmail.com> and to the attention of Professor Chi-Tang Ho <ho@aesop.rutgers.edu>.

Kobe is a food paradise; it offers delicious Western-style as well as Japanese foods. When you visit a restaurant in Kobe serving its namesake beef, it is easy to see just why this is like no other. Kobe beef comes from the Tajima-gyu breed of cattle found in Japan's Hyogo Prefecture, where the animals must be born, raised and slaughtered to earn the 'Kobe beef' title. Kobe is also famous for Sake. Many areas in Japan produce sake, but the west of Kobe is perhaps the most famous and well-established one nationwide. Sake production here dates back nearly seven centuries. High quality of Sake in Kobe area is dependent on the local rice, water and surrounding air. We look forward to welcoming you to the ICoFF2019/ISNFF2019 in Kobe.

Dr. Fereidoon Shahidi (Principal Founder and Executive Board Member of ISNFF)
Dr. Kazuo Miyashita (Chair of ISNFF)

SCIENTIFIC REVIEW ARTICLES

Highly pigmented root vegetables for enhanced human health

Rong Tsao
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Root vegetables such as carrots and potatoes are a major staple food in the world after wheat and rice. Highly pigmented root vegetables (HPRV), particularly the purple or black varieties rich in anthocyanins have been found to possess higher antioxidant and anti-inflammatory effects, thus potentially contribute more significantly to human health than their non-coloured counterparts [**1-3**]. Although the total anthocyanin contents of HPRV are lower than small berries, they may have greater health implications considering that they are 1) produced in bulk and widely consumed; 2) much less expensive; 3) available year round and much less perishable [**1**]. Anthocyanins are the main pigments of the HPRV and other vegetables such as purple tomatoes [**1,4**]. Different from the berry fruits, HPRV contain highly complex feruloyl- or coumaroylglycosides of anthocyanidins [**3,5,6**]. Anthocyanins of purple potatoes helped improve glucose tolerance in mice, while those of purple carrots reduced blood pressure [**2**]. Anthocyanins of potato inhibited a-glucosidase activity, and reduced glycaemic index in humans, possibly by modulating metabolic syndrome pathologies in adipose and liver tissues [**7,8**]. Anthocyanins engage in chemoprotective functions by attenuating inflammation and regulating cellular signalling transductions, making them effective immune modulatory agents against a variety of inflammatory diseases [**9,10**]. However, like polyphenols in general, only a small portion of anthocyanins are absorbed *in vivo* to exert these health benefits. The majority are carried through the human digestive tract and metabolized by the gut microbiota. The non-absorbed anthocyanins and their gut microbial metabolites may be directly involved in regulating local and/or systemic immune responses and improve gut health. However, the bioaccessibility, bioavailability and the potential benefits of HPRV-derived anthocyanins in gut health and their effect on microbiome are not well studied [**4,11**], and very scant information is available. Recently, anthocyanins of HPRV were found to be absorbed by an active transport mechanism involving glucose transporter proteins SGLT1 andGLUT2, and the absorbed low concentrations showed strong anti-inflammatory effects [**5**]. Further, dietary anthocyanins of purple potato reduced body weight and improved blood glucose and lipid profiles, and improved gut health in a high-fat-diet-LPS mouse model [**12**]. Current evidence suggests that anthocyanins are key to the health promoting effects of HPRV, especially in inflammation and gut health.

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Cytochrome P450 metabolites of linoleic acid as endogenous regulators of colon tumorigenesis

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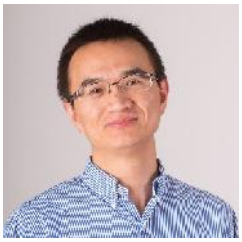

The consumption of linoleic acid (18:2ω-6), which is abundant in vegetable oil products (such as corn, soybean, and canola oils, as well as fried food, salad dressing, and mayonnaise), is very high in the United States: the average intake of linoleic acid is as high as ~12-17 grams/person/day in United States [**1**]. The potential issue with excess intake of linoleic acid is exacerbated because consumption of linoleic acid-rich vegetable oil has increased ~130% in the US between 1909 to 1999 [1], and could be even more prevalent in the future as dietary recommendation continues to encourage greater consumption of linoleic acid-rich vegetable oil products [**2**]. The impact of high dietary intake of linoleic acid on human health is an intensively debated topic [**1,3**]. Notably, animal experiments showed that linoleic acid increased azoxymethane (AOM)-induced colon tumorigenesis, suggesting its potential adverse effect on colon cancer [**4-7**]. However, the impact of linoleic acid on colon cancer in humans is inconclusive, making it difficult to make dietary recommendations or guidelines for the optimal intake of linoleic acid [**3**]. A better understanding of the molecular mechanisms of linoleic acid on colon tumorigenesis could help to clarify its health effect, and facilitate development of mechanism-based strategies for preventing colon cancer.

Our recent research showed that: (1) the concentrations of epoxyoctadecenoic acids (EpOMEs), which are metabolites of linoleic acid produced by cytochrome P450 (CYP) monooxygenases, are increased in the plasma and colon of AOM/dextran sodium sulphate (DSS)-induced colon cancer mice; (2) treatment with EpOMEs increases cytokine production and JNK phosphorylation in macrophage cells and colon cancer cells; (3) treatment with EpOME exacerbates AOM/DSS-induced colon tumorigenesis in mice; (4) the enzymes that produce EpOMEs, CYP monooxygenases, are overexpressed in colon tumour tissues *in vivo* and colon cancer cells *in vitro*; and (5) pharmacological inhibition or genetic ablation of CYP monooxygenases suppresses AOM/DSS-induced colon tumorigenesis *in vivo* [**8**]. Together, these results support that the previously unappreciated CYP/EpOME pathway could play a critical role in the carcinogenesis of colon cancer, and could mediate the colon cancer-enhancing effects of dietary linoleic acid.

Based on our findings, overconsumption of linoleic acid could increase tissue concentrations of EpOMEs, which have potent effects to exaggerate inflammation and colon tumorigenesis, and therefore result in enhanced colonic inflammation and colon cancer. In addition, the polymorphisms in the genes encoding CYP monoxygenases, as well as its down-stream fatty acid-metabolizing enzyme, soluble epoxide hydrolase (sEH), could affect the metabolism of linoleic acid to generate EpOMEs [**9-15**], which could in part explain the inconsistent results from human studies. In support of our idea, Taha et al. recently showed that with increasing levels of linoleic acid in the diet, the circulating concentrations of EpOMEs were significantly elevated in rats: after a 15-week treatment with diet containing 0.4%, 5.2%, and 10% energy linoleic acid, the plasma concentrations of EpOMEs in the treated rats were ~27.9, 175.4, and 346.3 pmol/ml,

respectively [**16**]. In contrast, the plasma concentrations of other fatty acid metabolites, such as linoleic acid-derived 9-hydroxyoctadecadienoic acid (9-HODE) and 13-hydroxyoctadecadienoic acid (13-HODE), were not significantly changed [**16**]. These results support a critical role of EpOMEs in mediating the biological actions of dietary linoleic acid. A better understanding of the biological actions of EpOMEs could establish a new mechanistic linkage between excess linoleic acid intake and increased risks of colon cancer. The obtained results will provide the fundamental knowledge that is required to clarify the health impact of linoleic acid, and broadly enhance our understanding of how diet-gene interactions affect human health.

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Development of Java tea-based functional beverage with antihyperglycemic capacity

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Diabetes is a non-communicable disease, indicated by the elevation of blood glucose, which can lead to complications of all organs. It is a global health burden that caused 1.5 million deaths in 2012 **[1]**, which motivates many scientists to develop new approaches for prevention and treatment of diabetes. Several herb and spices which are traditionally known to suppress blood glucose level has been compiled. Java tea (*Orthosiphon aristatus* BI. Miq) which is known in Indonesia as "*kumis kucing*", is one a potential herb for diabetes due to its widely used and its high content of antioxidant **[2]**. Inspired by "*jamu*" or Indonesian traditional medicinal drink **[3]**, a Java tea-based functional beverage was formulated with other herbal plants including ginger, turmeric, *Citrus hystrix*, *Citrus aurantifolia*, and sappan woods extract **[4]**. While these herbs and spices were individually found to have antihyperglycemic activity **[5-9]**, the mixture of these herbal plants enhances antioxidant activity **[10]** and is able to increase the absorption of glucose in mice diaphragmatic cell *ex vivo* **[11]**. Furthermore, the antihyperglycemic bioactivity of Java tea-based functional drink was investigated *in vivo* on streptozotocin induced diabetic mice. The drink suppressed blood glucose and inhibited the damage of pancreatic beta cells **[12]**. HPLC analysis of the drink characterized bioactive compounds such as sinensetin, 6-gingerol, 8-gingerol, 10-gingerol, 6-shogaol, curcumin, desmethoxycurcumin, brazilin, hesperidin and naringin **[12]**. However, the availability and shelf life of each ingredient became an obstacle to industrially scale up its production. Utilization of extracts from *simplisia* (dried medicinal plant ingredients) managed to overcome these problems while maintaining its palatability, antioxidant activity, and antihyperglycemic activity **[13]**. An optimized formula showed antioxidant and antihyperglycemic activities of 335.69 ppm AEAC (Ascorbic Acid Equivalent Antioxidant Capacity) and 31.98% respectively **[13]**. Recently this type of ready to drink (RTD) product has obtained a national legal license for its commercialisation (BPOM 0592/Reg/2019). Further studied showed that nanoencapsulation managed to increase the bioavailability of Java tea-based functional beverage, better than RTD and microencapsulated forms. Nanoencapsulated drink lowered the blood glucose level (7.98%) and had better capability to protect the viability of Langerhans (49.09%) and β-cell (32.50%) **[14]**. The antihyperglycemic mechanism of the beverage was through reduction of MDA (malondialdehyde) formation was demonstrated by *in vitro* and *in vivo* assays **[15]**. Degradation of antioxidant activity and color during storage lead to reformulation using Red Fruit (*Pandanus conoideus* Lam) oil emulsion which managed to increase the antioxidant activity without any significant difference in overall sensory acceptance **[16]**. Nanoencapsulated Red Fruit oil was more soluble in the beverage system, therefore, could improve the Java tea-based functional beverage having increased carotenoid stability **[17,18]**. In summary, nanoencapsulated Java tea-based functional beverage which has been enriched by red fruit oil is a promising functional food to reduce the risk of diabetes through reduction of oxidative stress.

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ISNFF CONFERENCE WEBSITE

http://icoff2019.umin.jp/index.html

WELCOME TO ICoFF2019/ISNFF2019

We are delighted to invite you to the 7th International Conference on Food Factors (ICoFF2019) and the 12th International Conference and Exhibition on Nutraceuticals and Functional Foods (ISNFF2019).

With the mission of promoting research into all aspects of basic and applied Food and Nutritional Science, ICoFF held its first conference in 1995 and has continued to hold every four years. ICoFF is one of the largest international conferences for researchers, scientists, professors and students in the field of food factors and their health-promoting effects. ISNFF, founded in 2007, has been focusing on the research and development on materials that can be used as functional foods.

For ICoFF2019/ISNFF2019, we have adopted the theme, “Food Factor Science from Molecular to Human Studies”. The conferences will offer opportunities to exchange scientific ideas and create networks between people from academia, industry and regulatory authorities, as well as between young and established scientists and professionals.

The organizing committee, mainly comprising members of the Japanese Society for Food Factors (JSoFF), is putting its utmost efforts into preparing for the conferences, which will be held at the Kobe Convention Center and the nearby Kobe Portopia Hotel on Port Island, Kobe. Other academic societies such as Japanese Society of Polyphenols, the International Union of Food Science and Technology (IUFoST) Japan, and Japanese Society of Catechinology and sponsor companies will agree to cooperate on ICoFF2019/ISNFF2019.

We welcome your participation in ICoFF2019/ISNFF2019 and very much look forward to welcoming all of you to our wonderful city.

Hitoshi Ashida
President
ICoFF2019

Kenji Sato
Local ISNFF2019 Conference President

Important Dates
Registration/abstract submission opens: Mar. 1, 2019 (JST, UTC+9)
Early-bird registration deadline: Aug. 1, 2019 (JST, UTC+9)
Abstract submission deadline: Jun. 30, 2019 (JST, UTC+9)
Regular registration deadline: Oct. 31, 2019 (JST, UTC+9)

KEYNOTE SPEAKERS AT ICoFF2019/ISNFF2019

Anticarcinogenic and chemopreventive substances in food
Young-Joon Surh
Director & Professor; Tumor Microenvironment Global Core Research Center; College of Pharmacy, Seoul National University; Korea

Precision of cancer prevention by phyochemicals
Zigang Dong
The Hormel Institute; The University of Minnesota; USA

The novel physiology of bile acids and food functions
Ryuichiro Sato
Professor; Department of Applied Biological Chemistry; The University of Tokyo; Japan

Actual contribution of plant food bioactives in promoting health effects of plant foods – why looking at inter-individual variability?
Christine Morand
National Institute for Agricultural Research (INRA), France; Department of Human Nutrition – University of Clermont-Auvergne; France

Dietary polyphenols for cardiovascular health
Kevin D Croft
PhD, University of Western Australia, 1978; Fellow of the Royal Society of Chemistry; Australia

Phenolipids in food: bioactivities and health effects
Fereidoon Shahidi
Memorial University of Newfoundland; Canada

Development and Application of Novel Biomarkers for Human Studies of Functional Food Factors
Toshihiko Osawa
Research Professor; Department of Health and Nutrition; Faculty of Psycological & Physical Science
Aichi Gakuin University; Japan

Carotenoid application as functional food ingredients: Present and future
Kazuo Miyashita
Faculty of Fisheries Sciences; Hokkaido University; Japan

Linking Chemical Measurements with Sensorial Correlates to Understand Consumer Liking and Product Quality
Alyson E. Mitchell
University of California Davis; USA

Helicobacter pylori infection and food bioactives
Chin-Kun Wang
Chung Shan Medical University; Taiwan

Impact of low-grade chronic inflammation toward to metabolic disorders and microbiota
Yoshinori Mine
Professor, Department of Food Science, University of Guelph, Guelph, Ontario, Canada; Canada

Title TBD
Hisanori Kato
Graduate School of Agricultural and Life Sciences; Japan

Flavonoids and inflammation: local and systemic effects
Cesar G. Fraga
University of Buenos Aires; Argentina

A Novel System Processing Mitochondrial-leaked Electrons is a Target of Functional Food
Pingfan Rao
ZZJGS University Joint Center for Food and Nutrition Research; China

Research and development of functional foods in Japan - History and perspectives -
Makoto Shimizu
Professor Emeritus, The University of Tokyo; Guest Professor, Tokyo University of Agriculture; Japan

UPCOMING NUTRACEUTICALS AND FUNCTIONAL FOODS EVENTS

July 2019

12-19, American Society of Pharmacognosy; Madison, WI

August 2019

4-7, 13th Asian Congress of Nutrition; Bali, Indonesia

25-29, American Chemical Society Fall 2019 Meeting; San Diego, CA

October 2019

15-18, 13th European Nutrition Congress; Dublin, Ireland

20-23; Bioactive Lipids in Cancer, Inflammation and Related Diseases; St.Petersburg, FL

23-24, ICBFH 2019: International Conference on Bioactive Foods and Health; London, UK

November 2019

28 - Dec 1, International Conference on Polyphenols and Health; Kobe, Japan

December 2019

1-5, ICoFF2019/ISNFF2019 Annual Conference & Exhibition; Kobe, Japan

8-10, IHHF 2019 Innovative Horticulture for Healthy Food Conference; UWA and Pullman Bunker Bay Resort, Australia

May 2020

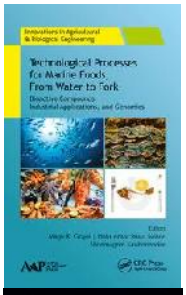
18-19, NUTS 2020; Reus, Spain

30-Jun 2, ASN Nutrition 2020; Seattle, WA

July 2020

12-15, IFT Annual Meeting; Chicago, IL

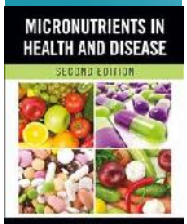
NEW TITLES



Technological Processes for Marine Foods, From Water to Fork: Bioactive Compounds, Industrial Applications, and Genomics

Megh R. Goyal, Hafiz Ansar Rasul Suleria, Shanmugam Kirubanandan (Editors)

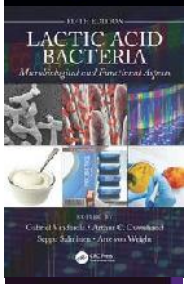
June 2019, CRC Press



Micronutrients in Health and Disease, Second Edition

Kedar N. Prasad (Editor)

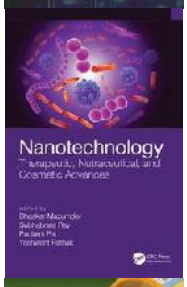
April 2019, CRC Press



Lactic Acid Bacteria: Microbiological and Functional Aspects (5th Edition)

Gabriel Vinderola, Arthur Ouwehand, Seppo Salminen, Atte von Wright (Editors)

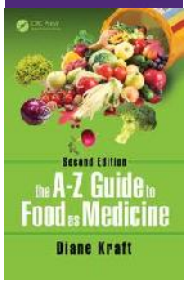
April 2019, CRC Press



Nanotechnology: Therapeutic, Nutraceutical, and Cosmetic Advances

Bhaskar Mazumder, Subhabrata Ray, Paulami Pal, Yashwant Pathak (Editors)

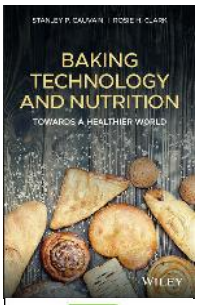
March 2019, CRC Press



The A-Z Guide to Food as Medicine, Second Edition

Diane Kraft (Editor)

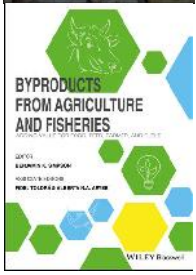
January 2019, CRC Press



Baking Technology and Nutrition: Towards a Healthier World

Stanley P. Cauvain, Rosie H. Clark (Editors)

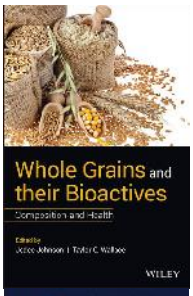
October 2019, Wiley



Byproducts from Agriculture and Fisheries: Adding Value for Food, Feed, Pharma and Fuels

Benjamin K. Simpson (Editor), Alberta N. Aryee (Associate Editor), Fidel Toldrá (Editors)

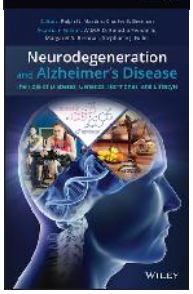
September 2019, Wiley



Whole Grains and their Bioactives: Composition and Health

Jodee Johnson (Editor), Taylor C. Wallace (Editors)

March 2019, Wiley

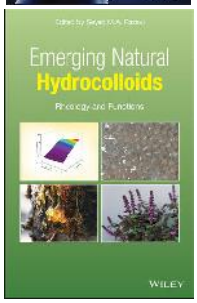


Neurodegeneration and Alzheimer's Disease: The Role of Diabetes, Genetics, Hormones, and Lifestyle

Ralph N. Martins, Charles S. Brennan (Editors)

Binosha Fernando, Margaret A. Brennan, Stephanie J. Fuller (Associate Editors)

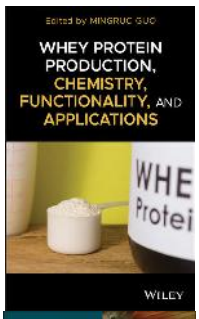
May 2019, Wiley



Emerging Natural Hydrocolloids: Rheology and Functions

Seyed M.A. Razavi (Editor)

February 2019, Wiley



Whey Protein Production, Chemistry, Functionality, and Applications

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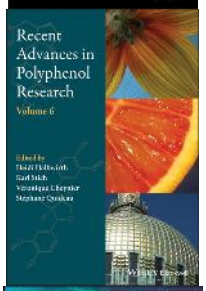
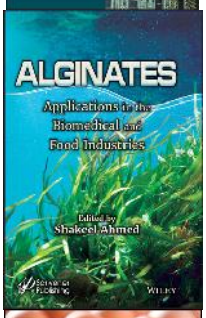
January 2019, Wiley



Recent Advances in Polyphenol Research, Volume 6

Heidi Halbwirth, Karl Stich, Véronique Cheynier, Stéphane Quideau (Editors)

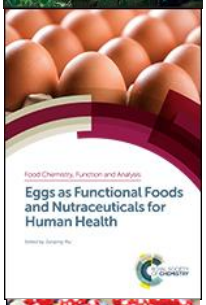
January 2019, Wiley-Blackwell



Alginates: Applications in the Biomedical and Food Industries

Shakeel Ahmed (Editor)

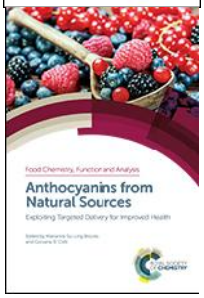
February 2019, Wiley



Eggs as Functional Foods and Nutraceuticals for Human Health

Jianping Wu (Editor)

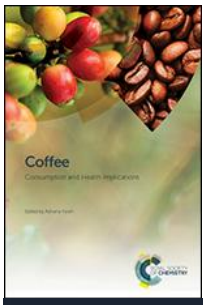
May 2019, RSC



Anthocyanins from Natural Sources: Exploiting Targeted Delivery for Improved Health

Marianne Su-Ling Brooks, Giovana B Celli (Editors)

February 2019, RSC



Coffee: Consumption and Health Implications

Adriana Farah (Editor)

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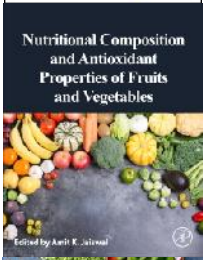
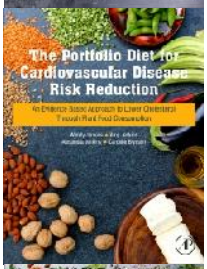


Nutritional Composition and Antioxidant Properties of Fruits and Vegetables

Amit Jaiswal (Editor)

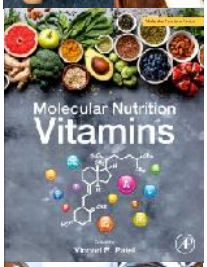
December 2019, Academic Press



The Portfolio Diet for Cardiovascular Disease Risk Reduction

Wendy Jenkins, Amy Jenkins, Alexandra Jenkins, Caroline Brydson (Authors)

September 2019, Academic Press



Molecular Nutrition

Vinood Patel (Editor)

September 2019, Academic Press

Nutraceuticals and Natural Product Pharmaceuticals

Charis Galanakis

August 2019, Academic Press

ISNFF JOURNALS

Journal of Food Bioactives (JFB)

The JFB, a dedicated publication of ISNFF, was launched in 2018 and completed a successful first year with many reviews and original manuscripts. Please note that papers presented during ISNFF Conferences and Exhibition may be submitted for publication consideration to the Journal of Food Bioactives (isnff-jfb.com). To review the published manuscripts please refer to the journal web-site. The first volume of the 2019 was recently published. We have also moved to Scholar One Software which is more familiar to the authors.

Web-site: http://www.isnff-jfb.com/index.php/JFB

Calculated Impact Factor (2018): 1.30

Journal of Functional Foods (JFF)

The very first issue of the JFF, as the first publication with Elsevier, was released in October 2008 (dated January 2009). .This journal, the Official Scientific Journal of ISNFF< was founded by Professor Fereidoon Shahidi who also served as the principal Founding Member of ISNFF.

Web-site:
https://www.journals.elsevier.com/journal-of-functional-foods

Impact Factor (2018): 3.197

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