



ISNFF 2017

The 10th International Conference and Exhibition on Nutraceuticals & Functional Foods

Platform for Foods, Nutrition and Medical Science

October 22 - 25, 2017 / GSCO, Gunsan, Jeonbuk, Korea


Abstract Book

Organized by



International Society for Nutraceuticals and Functional Foods (ISNFF)

Co-Organized by

 **KFIPF** Korea Food Industry Promotion Forum (KFIPF)



Korea National Food Cluster (FOODPOLIS)



Microbial Institute for Fermentation Industry (MIFI)



Rural Development Administration (RDA)



Korean Society of Food Science and Technology (KoSFoST)



Jeonbuk Institute for Food-Bioindustry (JIF)



Clinical Trial Center for Functional Foods (CTCF2) of Chonbuk National University Hospital



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We are proud that the conference is being held in a beautiful city with a rich history and cultural sites and the chance for food sampling and sightseeing. Please use the advantage of visiting important historical and cultural attractions in your spare time during the evenings that are free. On behalf of ISNFF, we wish you a very enjoyable and productive meeting.

Dr. Faridoun SHAHIDI (President, Founder and Executive Committee Member)

Dr. Cesarillo ALASALAB (ISNFF Secretary)



Welcome Messages

Message from the Organizers

The International Society for Nutraceuticals and Functional Foods (ISNFF) is pleased to have its 10th annual conference and exhibition in Jeonbuk (Gunsan), Korea.

The ISNFF was established in 2008 as a not-for-profit society in response to widespread recognition of the role on natural health products, including functional foods, nutraceuticals as well as dietary supplements for health promotion and disease risk reduction. Over the past decade, the ISNFF has managed to bridge the existing gap among scientific community, health care professionals, industry and investors, as well as the public and consumers through its conferences, short courses, seminars, newsletters, and other publications. The previous conferences of ISNFF (Taichung-Taiwan, San Francisco-USA, Bali-Indonesia, Sapporo-Japan, Kona/Hawaii-USA, Taipei-Taiwan, Istanbul-Turkey, Wuxi-China, and Orlando, USA) attracted some 310-800 participants from around the globe. Meanwhile, the Journal of Functional Foods served as a means to disseminate relevant information to the interested parties. We are proud that with intensive efforts of ISNFF and with the dedication of its founding editor, associate editors, editorial board members, contributors and reviewers it has now reached a state of maturity. ISNFF will also be providing complementary publication means to expand its horizon with new initiatives that will be announced during the conference. Moreover, the Society organizes short courses/seminars in hot topic areas as pre-conference activities or jointly with other organizations such as Institute of Food Technologists (IFT), American Chemical Society's (ACS) special meetings, European Union Framework Programmes, and International Union of Food Science and Technology (IUFoST). The ISNFF publishes several newsletters each year for communicating the latest information in the field to its members and the general public as well as those interested in the latest developments in this ever-growing area.

The 2017 conference includes participation of delegates from nearly 33 countries with over 846 oral and poster presentations (211 orals and 635 posters). The presentations are from world renowned experts in the field, bringing to the audience state of the art information and the latest developments in the field. Our Korean Co-Organizers have provided an amazing scientific program along with technical and cultural tours for you. For the first time, there are several dedicated sessions for industry as well as young scientists and graduate students presentation competitions. The exhibition at ISNFF complements its scientific meeting programs with products, services, and publications in the field of functional foods, nutraceuticals, and natural health products. We expect that you actively participate at the conference and its different events and to meet old friends and make new ones.

We are proud that the conference is being held in Jeonbuk (Gunsan) in the vicinity of the historical and cultural sites and the centre for food science and development activities in Korea. Please also take advantage of visiting important historical and cultural attractions in any spare time you may find in the evenings that are free. On behalf of ISNFF, we wish you a very productive and enjoyable meeting.

Dr. Fereidoon SHAHIDI (Principle Founder and Executive Committee Member of ISNFF) 

Dr. Cesarettin ALASALVAR (ISNFF Chair) 

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Pre/Probiotics 2

Room D

October 23 (Mon), 2017 || 16:00~17:40

Sponsored by **JiR** 전라북도생물산업진흥원
Jeonbuk Institute for Food-Bioindustry

Chair : Mary Ann Lila (North Carolina State University, USA)

- 072.** | Prebiotic and Immunoprotective Effects of Dietary Berries
16:00~16:20 | Mary Ann Lila (North Carolina State University, USA)
Invited
- 073.** | Properties of Kimchi Prepared with *Lactobacillus sakei* HY-11
16:20~16:40 | Suk-Heung Oh^{1*}, Seung-Gyu Lee¹, Tae-Ha Kim¹, Mi-Sun Jung¹, Su-Min Lim¹, Su-Gon Kim¹,
Invited | and Jung-Gun Hur² (¹Department of Food & Biotechnology, Woosuk University, Republic of Korea, ²Champyungan Co-op. Republic of Korea)
- 074.** | Dietary Fiber and Prebiotic Potential of Bamboo Shoot from *Tabah* Bamboo (*Gigantochloa Nigrociliata* Buse-Kurz)
16:40~17:00 | Nyoman Semadi Antara, Ida Bagus Wayan Gunam, Dylla Hanggaeni, Ketut Agus Ary Subakti, and dan Putu Agus Nadiarta (Laboratory of Bioindustry and Environment, Department of Agroindustrial Technology, Faculty of Agricultural Technology, Udayana University, Indonesia)
- 075.** | Characterization of Glucomannan-Chitosan Hydrogel for Probiotic Cell Encapsulation
17:00~17:20 | Eni Harmayani¹, Veriani Aprilia^{1,2}, Agnes Murdijati¹, and Pudji Hastuti¹ (¹Department of Food Science, Faculty of Agricultural Technology, Universitas Gadjah Mada, Indonesia, ²Department of Nutrition Science, Faculty of Health Sciences, Alma Ata University, Indonesia)
- 076.** | Probiotic in Promoting Brain Health
17:20~17:40 | Min-Tze Liong (School of Industrial Technology, Universiti Sains Malaysia (USM), Malaysia)
Invited

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Prebiotic and Immunoprotective Effects of Dietary Berries

Mary Ann Lila

North Carolina State University, USA

Edible berries, both wild-crafted and commercially-produced, provide recognized nutritional benefits, and serve as concentrated resources for health-protective, extra-nutritional phytoactive compounds which, due to their broad anti-inflammatory bioactivities, provide protection against the onset of a range of chronic human disease conditions. While the parent compounds (those in the berryfruit) have only limited bioavailability, recent evidence suggests that gut-mediated biotransformation of berry polyphenols is critical to reabsorption and delivery of the bioactive metabolites into circulation. Further, these post-digestion metabolites from berries are capable of modulating both pathogenic and beneficial commensal bacteria in the gut microbiome, thereby attenuating inflammatory processes in the gastrointestinal tract and influencing satiety and immune responses of the human host. In vivo appetite-suppressing mechanisms of water extracts of blueberry (resulting in 5-9% decrease in body weight gain in rats gavaged with 1 ml kg⁻¹ d⁻¹ blueberry extract) were determined to be unrelated to antioxidant capacity of the berries, and gavage for 6 d at 4 ml kg⁻¹ d⁻¹ significantly increased populations of commensal lactobacilli and bifidobacteria. In a human clinical intervention with trained athletes, serum biosignatures of metabolites characteristic of gut bacterial catabolism of berries were significantly elevated after a 14-17 d intervention, with a sharp increase in biosignature levels commensurate with exercise. Further, the serum biosignatures of gut-derived berry metabolites inhibited viral replication and depressed viral virulence during prolonged, intensive exercise, and during the post-exercise recovery phase. Our *in vitro*, *ex vivo* and clinical evidence all combine to suggest that anti-inflammatory, satiety-inducing and immune system protective benefits of berry consumption are coupled to their prebiotic activities.

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Dietary Fiber and Prebiotic Potential of Bamboo Shoot from *Tabah* Bamboo (*Gigantochloa nigrociliata* Buse-Kurz)

Nyoman Semadi Antara, Ida Bagus Wayan Gunam,
Dylla Hanggaeni, Ketut Agus Ary Subakti,
and dan Putu Agus Nadiarta

Laboratory of Bioindustry and Environment, Department of
Agroindustrial Technology, Faculty of Agricultural Technology,
Udayana University, Indonesia

Tabah bamboo (*Gigantochloa nigrociliata* BUSE-KURZ) that is one of the local varieties of bamboo produces shoot juvenile which commonly consumed as a source of nutrition. The study was conducted to determine the properties of *tabah* bamboo shoots as a functional food. Two main functional properties of the shoot that determined in this research were as a source of dietary fiber and as a prebiotic. Three parts of the bamboo shoot, namely tip, middle, and bottom part were evaluated their dietary fiber property. The shoots were determined their content of dietary fiber enzymatically, simple sugar and oligosaccharide using HPLC. Total dietary fiber content was significantly different among parts of the shoot. The tip and middle part contained higher dietary fiber than a bottom part. The shoots contained low amount of simple sugar glucose, fructose, and galactose, but higher amount of oligosaccharide raffinose. Carbohydrate content supported the prebiotic property of bamboo shoot. By *in vitro* test, the bamboo shoot powder could stimulate the growth of lactic acid bacteria (LAB) and produce short chain fatty acids (SCFA) by *Lb. casei* subsp. *rhamnosus* and fecal bacteria.

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Properties of Kimchi Prepared with *Lactobacillus sakei* HY-11

Suk-Heung Oh^{1*}, Seung-Gyu Lee¹, Tae-Ha Kim¹, Mi-Sun Jung¹,
Su-Min Lim¹, Su-Gon Kim¹, and Jung-Gun Hur²

¹Department of Food & Biotechnology, Woosuk University, Republic of Korea, ²Champyungan Co-op. Republic of Korea

We prepared Kimchi with or without *Lactobacillus sakei* HY-11 and investigated changes in the properties including γ -aminobutyric acid (GABA) content during fermentation. After preparing Kimchi, we stored it at 10 °C in a refrigerator for 17 days. The pH of samples sharply decreased during the 6 days and then slowly decreased. Acidity of samples increased during the 17 days. The number of lactobacilli was the highest on the 6th and 9th day of fermentation. The GABA content of the samples was the highest in the sample with 1% *Lactobacillus sakei* HY-11 on the 6th day. These results suggest that relatively enhanced levels of GABA in Kimchi samples can be produced by adding the *Lactobacillus sakei* HY-11, which may have beneficial health effects. This work (Grants No. C0442012) was supported by Business for Cooperative R&D between Industry, Academy, and Research Institute funded Korea Small and Medium Business Administration in 2017.

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Characterization of Glucomannan-Chitosan Hydrogel for Probiotic Cell Encapsulation

Eni Harmayani¹, Veriani Aprilia^{1,2}, Agnes Murdijati¹,
and Pudji Hastuti¹

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Universitas Gadjah Mada, Indonesia, ²Department of Nutrition
Science, Faculty of Health Sciences, Alma Ata University, Indonesia

The survival of probiotic cells during process, storage, and consumption is important for the industry. Technology of encapsulation the cells is needed for the protection. Hydrogel generated from the interaction of negatively carboxymethyl porang glucomannan and positively chitosan may be developed for cell encapsulation. This study aimed to evaluate the effect of concentration glucomannan on the encapsulation efficiency and properties of hydrogel. Hydrogel was prepared by extruding 0.5% (w/v) chitosan in 1% acetic acid to different concentration of carboxymethyl glucomannan (0.3; 0.5; 0.7; 0.9%). Encapsulation efficiency was determined by using *Lactobacillus acidophilus* FNCC 0051 as core model. Properties of hydrogel such as particle size, polydispersity index, zeta potential, FTIR (Fourier transform infra red) spectra, and swelling ratio were measured. The result of study showed that the use of 0.5% glucomannan yielded the highest encapsulation efficiency (65.83%). Particle size of hydrogels increased from 1.12 μ m to 2.14 μ m as the concentration increased, while polydispersity indexes were not significantly different in all concentration, that was about 0.43-0.56. Zeta potential of hydrogel became more electropositive in decreasing of concentration. The FTIR spectra confirmed that different concentration of glucomannan influenced the interaction in hydrogel. All hydrogel were sensitive to pH and salt environment based on swelling ratio data.