

Functional Foods and Nutraceuticals: Previous, Recent and Future Perspectives



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Indonesian Society of Functional Foods and Nutraceutical (P3FNI)



FGDBSN –AFFI 2018



What's wrong
with the
conventional
foods?



Nutritious and delicious

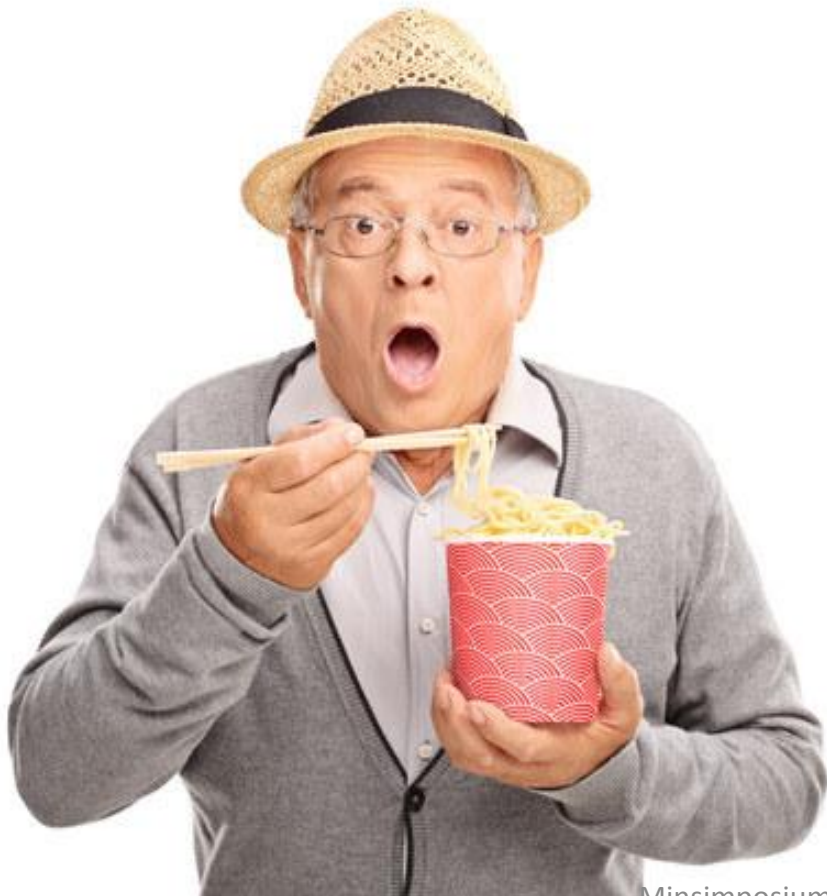
The life-style of modern society has changed..



Requiring different types of foods to support society's health

Something more than just nutritious and delicious

Nutrient intake should be modified due to changes of way of life..



**Faced on
diseases also
requiring
outstanding
physiological
active
compounds
intake.**

Functional food



The European Commission's Concerted Action on Functional Food Science in Europe (FuFoSE), coordinated by International Life Science Institute (ILSI) Europe defined functional food as follows:



Functional Food logo in Japan, called as FOSHU

“a food product can only be considered functional if together with the basic nutritional impact it has **beneficial effects on one or more functions of the human organism** thus either **improving the general and physical conditions** or/and **decreasing the risk of the evolution of diseases**. The amount of intake and form of the functional food should be as it is normally expected for dietary purposes. Therefore, it could not be in the form of pill or capsule just as **normal food form**” (Diplock *et al.*, 1999).

Healthy or Fit?

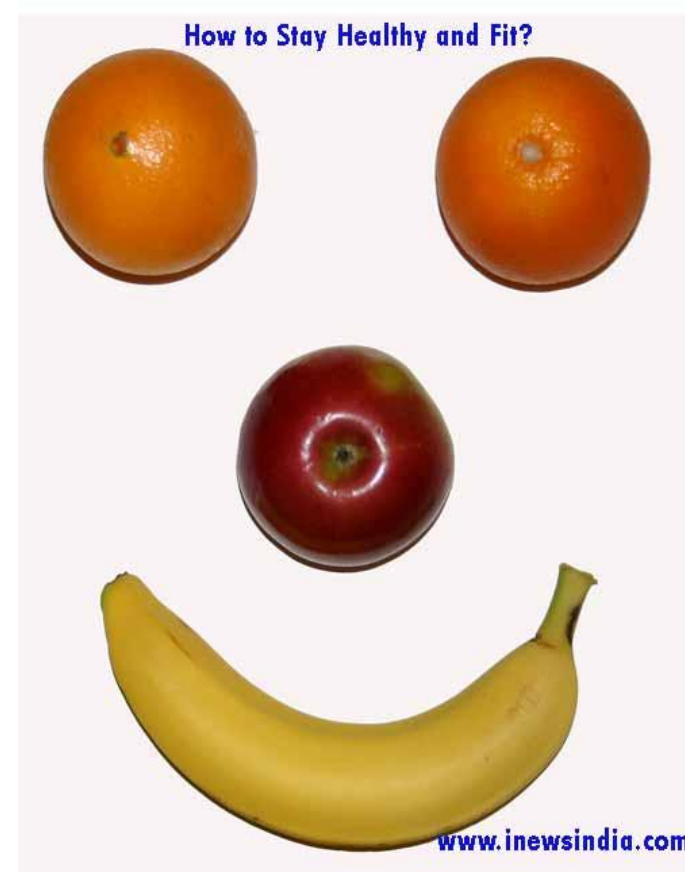


Maintain-
ing:

Not only physically but
mentally

Not only body but also mind

Not only physiologically but
also psychologically



Functional foods



Prominent types of functional foods Siro' *et al.* (2008)

Type of functional food	Definition
Fortified product	A food fortified with additional nutrients
Enriched products	A food with added new nutrients or components not normally found in a particular food
Altered products	A food from which a deleterious component has been removed, reduced or replaced with another substance with beneficial effects
Enhanced commodities	A food in which one of the components has been naturally enhanced through special growing conditions, new feed composition, genetic manipulation, or otherwise

Yoghurt

with added active nutrient
to reduce the risk of osteoporosis



Ice-cream

with added active nutrient
to reduce stress



Minsimposium nFGD P3FNI Yogyakarta 170119

Soup

with added active nutrient
to reduce the risk of heart diseases



Consumers tend to prefer functional food concepts that primarily communicate **disease-related health benefits in carriers with a healthy image or health positioning history.**

Kleef *et al.* (2015)

Diversity in Indonesian Diets

Various in ethnic groups, Indonesia is rich in culinary cultures

Indonesia has 17,504 islands, 1,128 ethnic groups, 3,025 animal species, and 47,000 plant species

Traditional “Roots”



JAMU



**Traditional Chinese
Medicine**



Ayurveda



Jamu

Indonesian Jamu



Javanese herbal medicines

JAMU



is a unique system of traditional herbal medicine that can be taken fresh every day for both disease prevention and treatment of health problems

has been practiced for many centuries in Indonesian community to maintain healthiness & to treat diseases



Jamu culture is most prevalent in Java prevailing in Javanese royal courts of Yogyakarta and Surakarta

- Originated in Medang Mataram Kingdom era, some 1300 years ago-----Liyangan archaeological site on the slope of Mount Sundoro, Central Java.
- The reliefs on Borobudur depicts the image of people ground something with stone mortar and pestle, drink seller, physician and masseuse treating their clients.

The famed beauty of *putri kraton* (princess and palace ladies) are owed to *jamu* and *lulur* (traditional lotion) ----- the ancient books on herbal medicine prescribes to royalties is kept in royal library.

PT. Mustika Ratu and PT. Martina Bertho founded by women from Central Java with important links to the Javanese palace .Traditional Javanese knowledge of healthcare, medicinal plants and the art of making *Jamu* transmitted exclusively within the *Kraton* and the royal family.

The Roles of *Jamu*

• Healing

- Uric acid
- Diabetic
- Sore-throat
- Cough
- Rheumatic
- Kidney stone
- Malaria
- Jaundice
- Diarrhea
- Etc.

• Health Maintenance and Beauty Care

- *Galian singset* (body-shape)
- Anti-inflammation
- Anti-oxidant
- Skin radiance
- Anti-insomnia
- Deodorant
- Appetite control
- Tonic
- Increase sexual quality
- Menstruation pain relief
- Detoxification
- etc.



Jamu-type Functional Drinks

Traditionally divided as :

Bitter Type

contains ingredients with peculiar property, such as *pegal linu* (stiffness-relief) and *galian singset* (body shape-purpose)

Sweet Type

tend to be used as “threat-drink” in order to mask the bitter after taste, i.e. *beras kencur* and *kunyit /kunir asam*





Jamu seller in Yogyakarta c.a.1910

Jamu Update



Scientific Approaches

JAMU & KESEHATAN

EDISI II



Prof dr Tjandra Yoga Aditama
Sp P(K), MARS, DTM&H, DTCE

2015



Review

Jamu: Indonesian traditional herbal medicine towards rational phytopharmacological use



Elfahmi^a, Herman J. Woerdenbag^b, Oliver Kayser^{c,*}

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ABSTRACT

Jamu is the Indonesian traditional herbal medicine that has been practised for many centuries in the Indonesian community to maintain good health and to treat diseases. Although modern (conventional) medicine is becoming increasingly important in Indonesia, jamu is still very popular in rural as well as in urban areas. Based on its traditional use jamu is being developed into a rational form of therapy, by herbal practitioners and in the form of phytopharmaceuticals. Jamu has acquired a potential benefit, both economically and clinically. We surveyed the most frequently used plants in jamu that have also been investigated



Available online at www.sciencedirect.com

ScienceDirect

Procedia Chemistry 14 (2015) 216 – 224

Procedia
Chemistry

2nd Humboldt Kolleg in conjunction with International Conference on Natural Sciences, HK-ICONS 2014

Flower Bracts of Temulawak (*Curcuma xanthorrhiza*) for Skin Care: Anti-Acne and Whitening Agents

Imanida Batubara^{a,b,*}, Iren Julita^a, Latifah K Darusman^{a,b}, Ali Mahmoud Muddathir^c, Tohru Mitsunaga^d

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Jurnal Jamu Indonesia

<http://jamu.journal.ipb.ac.id/index.php/jamu/>



<http://biofarmaka.ipb.ac.id/>



Also available :

Traditional Jamu Herbal Tour | Yogyakarta
Unique Tour Experience

30th Workshop, Tokyo, December 1st, 2018



12 SMP IAI
by the Association of
Indonesian Scientists
ON 06/08/18

IST4 THE 4TH INTERNATIONAL SYMPOSIUM ON TEMULAWAK AND POTENTIAL PLANTS FOR JAMU

28 August 2018 | IPB International Convention Center | Bogor, Indonesia

"from Temulawak and Potential Plants for Jamu to their Modern Drugs and Cosmetics Advancements"

CALL FOR PAPERS

Topics Coverage

- Biodiversity, conservation, breeding, and cultivation
- Biotechnology aspect
- Chemistry and Biology aspect
- Recent advance of pharmaceutical aspect
- Modern drug and cosmetic development
- Policy, social, and economic aspect
- Miscellaneous topics

Symposium Venue



IPB International Convention Center
Botani Square, Bogor, Indonesia

Speakers



Karyata Sopian
Coordinating Ministry for
Human Development and
Cultural Affairs
Indonesia



Prof. Sunjaya Prasana
(Univ. of Sejak Mera,
IDN)



Prof. Tehru Sidiyasa
(UM University, JPN)



Prof. Dr. Taya Ruziyati
(Universiti Putra
Malaysia, MY)



Dr. Ali Mahmut Ali
Mustafa (Univ. of
Kaduna, SDN)



Dr. Wahid Darin
Sulaiman (PT Baha,
IDN)



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University, TH)



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Category**	Early Bird s. 6 July 2018	Regular > 6 July 2018
International Participant		
Presenter or Non-Presenter	65 USD	100 USD
Local Participant		
Student	650K IDR	850K IDR
Non-Student	750K IDR	850K IDR
Presenter (including Student & Non-Student)	850K IDR	1200K IDR

**Registration fee does not include article processing charge for publication in the Journal

Abstract Submission

<http://bit.ly/ist4submission>

Important Dates

- Early Bird Registration: 5 July 2018
- Abstract Submission Deadline: 5 July 2018
- Abstract Acceptance Notification: 30 July 2018
- Full-Paper Submission Deadline: 5 August 2018

Selected papers will be published in:

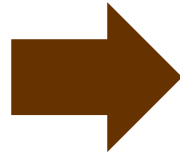
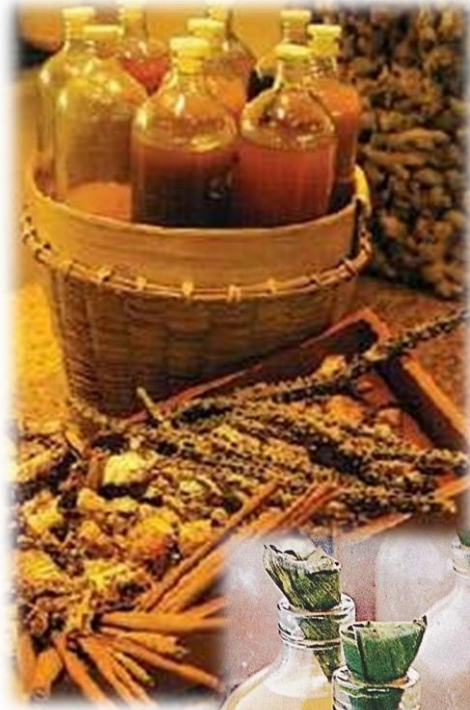


For more information, please visit <http://bit.ly/ist42018>
 Secretariat:
<http://bit.ly/ist42018> | ist4@ipb.ac.id | Dina, WA Only +62 812-1031-8643

30th Workshop, Tokyo, December 1st, 2018



Transformation of Appearances



Jamu GOES to Hotels



Freshly preparing service

Jamu GOES TO AIRPORT LOUNGE ALSO TO MEETINGS



“Cheering”
(geonbe)
with jamu





“Jamu” National Day Declaration

May, 2008

Available Functional Ingredients



- Vitamin
- Mineral
- Alcoholic sugar
- Polyunsaturated fatty acid
- Bioactive peptide and protein
- Amino acids
- Phytosterols and Phytostanol
- Polyphenol (Tea)
- Dietary fibers
- Prebiotic
- Probiotic
- Colin, lecithin and Inositol
- *Karnitin* and *Skualen*
- Isoflavon
- Other functional ingredients



Consumers Demands for Their Diets



What kind of functional foods in the for front trends?

Nutritious

Healthy

Weight loss

Convenience

Tasty



Prebiotik



Cocoa power



Minyak Goreng Generasi Baru

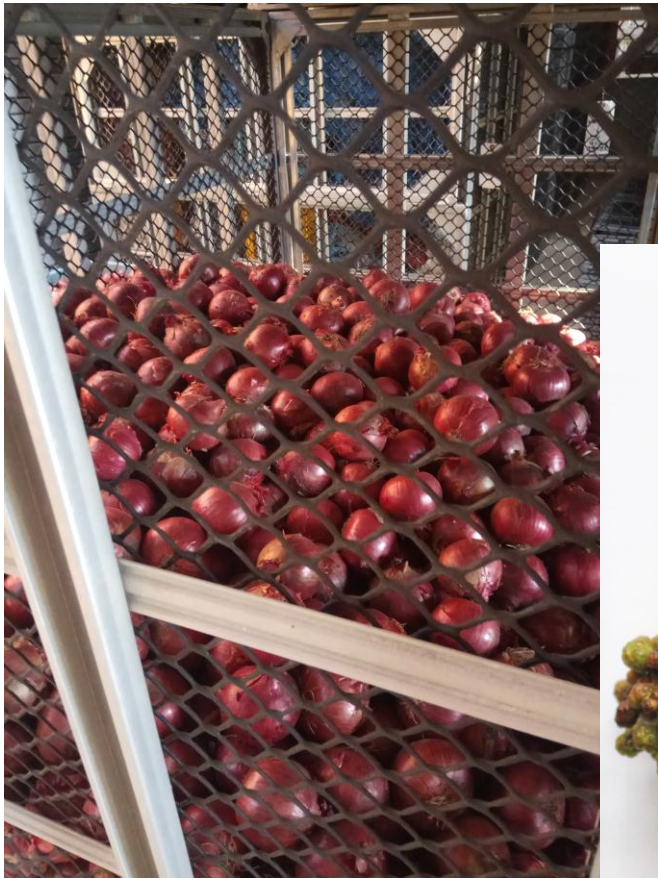


Produk Baru

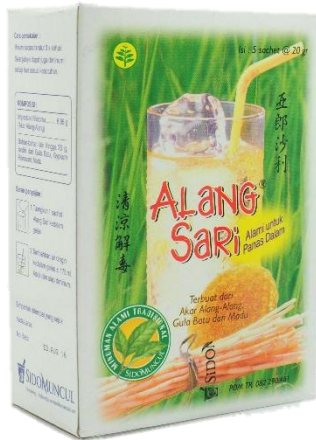








Trend of Herbal Drinks



Functional food (FS) is very attractive because..



Foods

FS

Medicine



More expensive

The economical strategic might invite disputes particularly for regulation



Regulation becomes complicated. **Functional food claims is a dynamic and complex area of regulatory law**

Indonesia along with Japan have known for having clear regulation on functional foods. However, **now is not anymore.**

Many of countries jurisdictions implemented regulations to govern the approval of function foods as well as grant health claims. --- 3 decades –many countries introduced new health claims on foods based on clinical research on bioactives ingredients. Regulatory authorities have established new venues – authorizing functional claims

Global functional foods regulation update

Canada: 2012--Natural Health Products Regulation vs functional foods

USA: USFDA Modernization Act, health claims may be authorized by letter of enforcement discretion.

EU: 2007 introduced on nutrition and health claims on foods –now more than 200 claims authorized by EFSA.

Australia & New Zealand : ANZFS published revised code standards 1.2.7- the standard describes risk reduction claims, contribution to health and nutrient function claim can be used on foods in January 2016

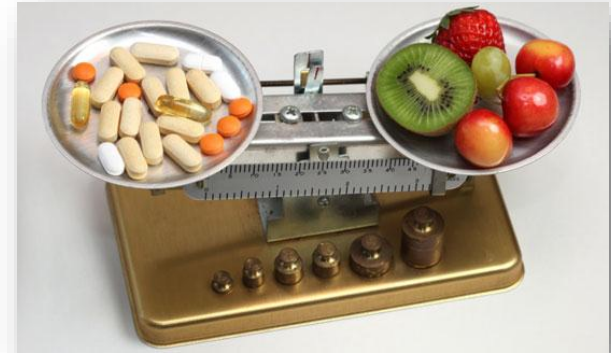


Recommendation?



Functional Foods

- $\geq 80\%$ food ingredients
- $\leq 20\%$ bioactives compounds



Drugs

- $\leq 20\%$ food ingredients
- and $\geq 80\%$ bioactives compounds



Recent researches



Blueberries: improve learning and motor skills



Apples: power food from mind, body, and emotions



Almonds: increase blood flow to the brain



Cabbage: high intake of cruciferous may lower risk of brain, lung, & prostate cancer



Ginger: anti-inflammatory, protect from brain diseases



Pine nut: helps to stimulus brain activity



Lettuce: helps increase blood flow to the brain & cleans blood plaque



Walnuts: high in omega 3

Memory improvements—vitality of body and mind

Recent Researches

Dominant research area

Antioxidants

DM

Body weight



Recent Researches



Ayurveda/
TIM
(Traditional
Indian
Medicine)

TCM
(Traditional
Chinese
Medicine)



Jamu from
Indonesia?

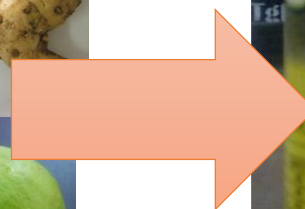
Improvements—vitality of body and mind

Example: Java tea-based functional drink



Idea: Indonesian jamu with standardization health function and convenient flavor.

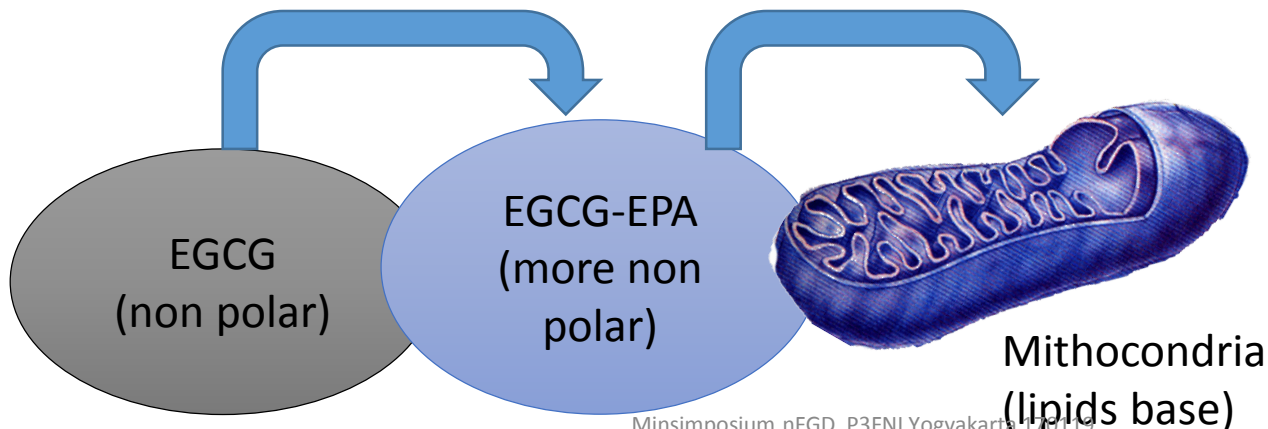
Has been patented and commercialization





Novel phytosterol with esterification

- A compound like EGCG will have efficiency if it reaches inside the mitochondria
- Compound polarity should be considered



Minsimposium nFGD P3FNI Yogyakarta 17/11/19

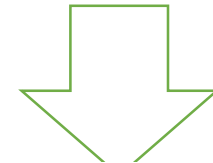


Recent Researches



Multi targets

- There are ingredients synergistically reduce blood glucose
- Single target measurements might miss target
- What we ingest may not be the ones with efficacy



Flaxseed Lignans: Source, Biosynthesis, Metabolism, Antioxidant Activity, Bio-Active Components, and Health Benefits

Alhassane Touré and Xu Xueming

Including flaxseed, pumpkin seed, sesame called secoisolariciresinol diglucoside lignans, enterodiol, and enterolactone, daily hormone-sensitive ones such as -donating antioxidant activity as well as beneficial to human health. The extraction action, identification, and detection components found in plant foods, such as flaxseed are also briefly discussed.

COMPREHENSIVE
REVIEWS

Research Article

Functional food source[†]

001 Full publication history

[/w/save citation](#)

[Citation tools](#)

Contribution No 2092.



Drug Discovery Today

Volume 12, Issues 1–2, January 2007, Pages 34–42



Review

Gene to Screen

Multi-target therapeutics: when the whole is greater than the sum of the parts

Grant R. Zimmermann¹, Joseph Lehár^{1,2}, Curtis T. Keith¹

Minsimposium nFGD P3FNI Yogyakarta 170119

Nanotechnology



**International Conference on
Nanomaterials and Nanotechnology**
A global platform for smart nanotechnology

01 – 03 March, 2017, Allahabad, India
www.vbripress.com/icnano

Step towards  Organized and sponsored by

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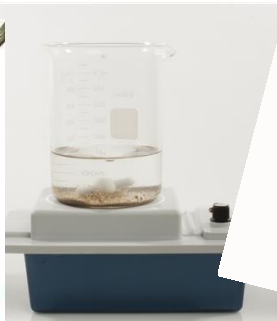
 VBRI Press
Committed to Excellence

Abstract submission deadline: 30 October, 2016

Nanoencapsulation process to stabilize carotenoid pigment in red fruit oil (*Pandanus conoideus* Lamk).
(Ferdiansyah, Wijaya CH, Limnatara L 2015) Nano-halal



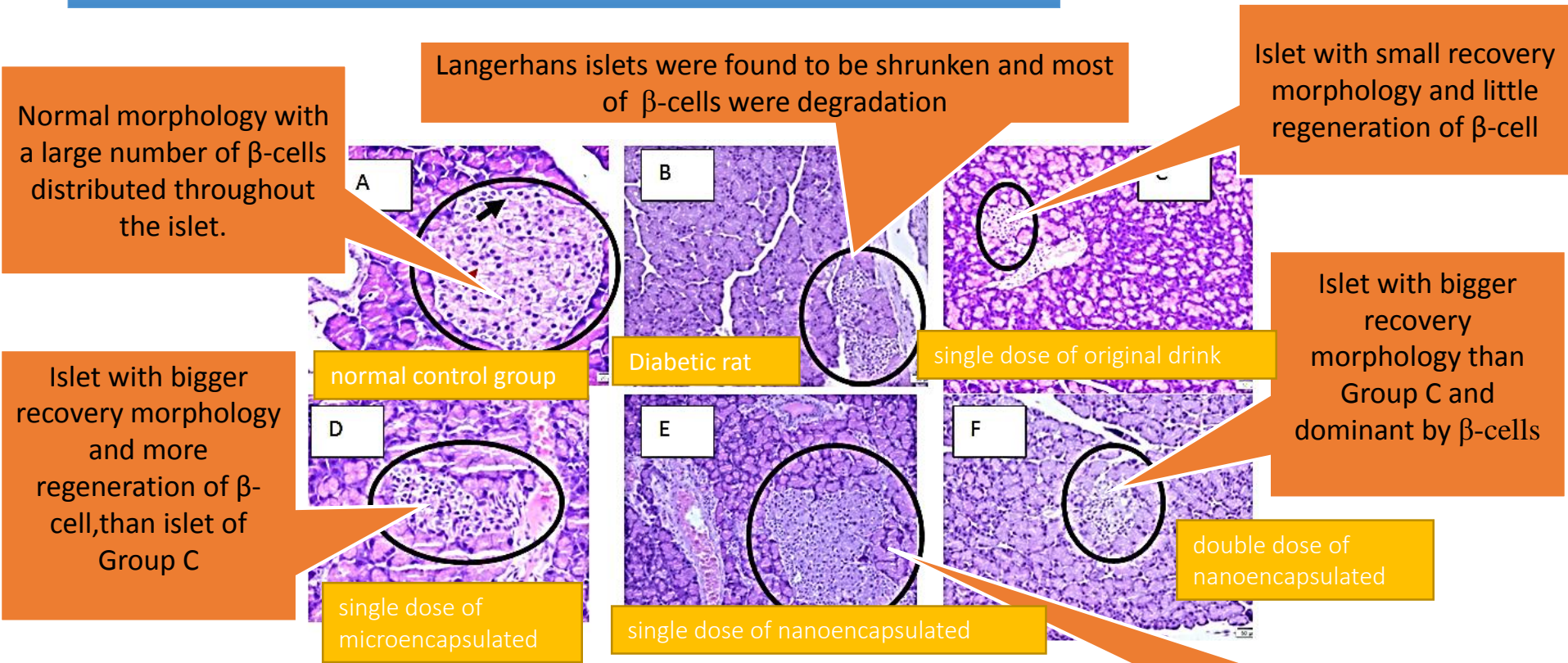
chitosan





Antihyperglycemic activity of Java-tea functional drinks in *Sprague Dawley* rats

Hematoxylin eosyn staining (Pancreas tissue)



Normal morphology with a large number of β -cells distributed throughout the islet.

Langerhans islets were found to be shrunken and most of β -cells were degradation

Islet with small recovery morphology and little regeneration of β -cell

Islet with bigger recovery morphology and more regeneration of β -cell, than islet of Group C

Islet with bigger recovery morphology than Group C and dominant by β -cells

normal control group

Diabetic rat

single dose of original drink

single dose of microencapsulated

single dose of nanoencapsulated

double dose of nanoencapsulated

Islets with the biggest recovered morphology and most of β -cells regeneration

Smaller particle size increases contact surface of Java Tea nanoencapsule beverage that improves the cell repairing.

Metabolomic, Nutrigenomics-non targeted attracted more attention



Food Research International

Volume 54, Issue 1, November 2013, Pages 1152–1161



Review

Metabolomics as a tool for the study of fermented and functional foods

Fernanda Mozzi^a, Maria Eu^b
[Show more](#)



Current Opinion in Biotechnology

Volume 13, Issue 5, 1 October 2002, Pages 517–521



Review



Phytochemistry

Volume 62, Issue 6, March 2003, Pages 817–836

Plant Metabolomics



Metabolomics in the nutrition and health field

Review

Plant metabolomics: large-scale phytochemistry in the functional genomics era

Lloyd W Sumner^a, Pedro Mendes^b, Richard A Dixon^a

[Show more](#)

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Cosmoceuticals, Nutricosmetics



Tropical pterostilbene prevents UV-B-mediated skin damage

- Dellinger *et al.* (University of California, USA)

Polyphenol-enriched ingredients for skin resilience

- Lila MA & Esposito D (North Carolina State University, USA)

Anti-aging mechanisms of equol that decrease oxidative stress and increase cellular longevity of human skin

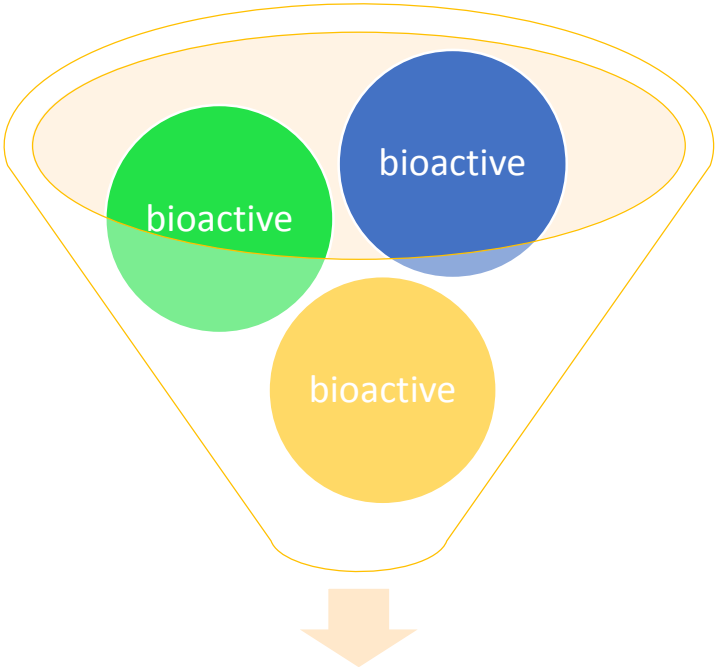
- Lephart ED (Brigham Young University, USA)

Scavenger receptor B1 as a target of environmental stressors affects cutaneous structure

- Muresan XM (University of Ferrara, Italy)



Recent research



Functional foods:
cocktails and soups of bioactives.



Flavour should be there!

Psychology and Emotional Correlation with Flavor Attribute



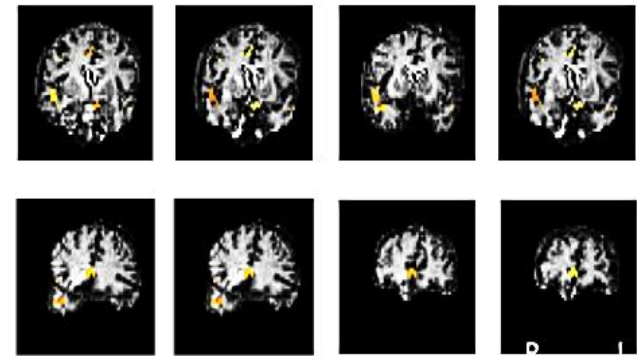
Strong influence of flavor to memory and emotion

Correlation of psychology and flavor for food development (Koster and Mojet 2015)

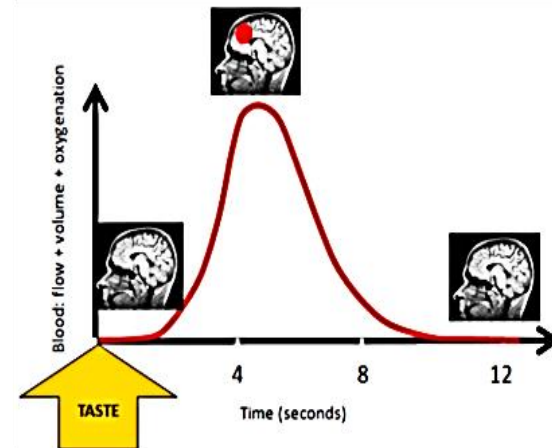
What's Next in Future Trends



functional Magnetic Resonance Imaging (f-MRI)



Cortical areas activated by glucose taste ($p = 0.005$).



Help to understand how cognitive influence the brain in flavor interpretation from food and for knowing how to control food appetite and obesity (Grabenhorst *et al.* 2008).

Development and usage of flavor



FLAVOR ENHANCER
for enhancing food
intake elders
(Mathey *et al.* 2001;
Pouyet *et al.*)

Challenge ?!



**Healthy and happy
elders generation**

Flavor for Foods Metabolism
Flavor for Body Weight Control

The market's driven factors



Growing R & D and technological innovations

Increasing demand for convenience foods

Nutrition and taste convergence

Growing end user application

(Markets and Markets, January 2016)

Food and beverage manufacturers continue to capitalize on the functional ingredients trend and product positioning based on science-based health benefits to context of their overall health approach

Asia-Pacifics—Emerging Nations



- Due to:
- Rich in material resource— extraction and production
 - Rich in man power
 - Urbanization – developing country life style

(Markets and Markets , January 2016)

Functional foods development

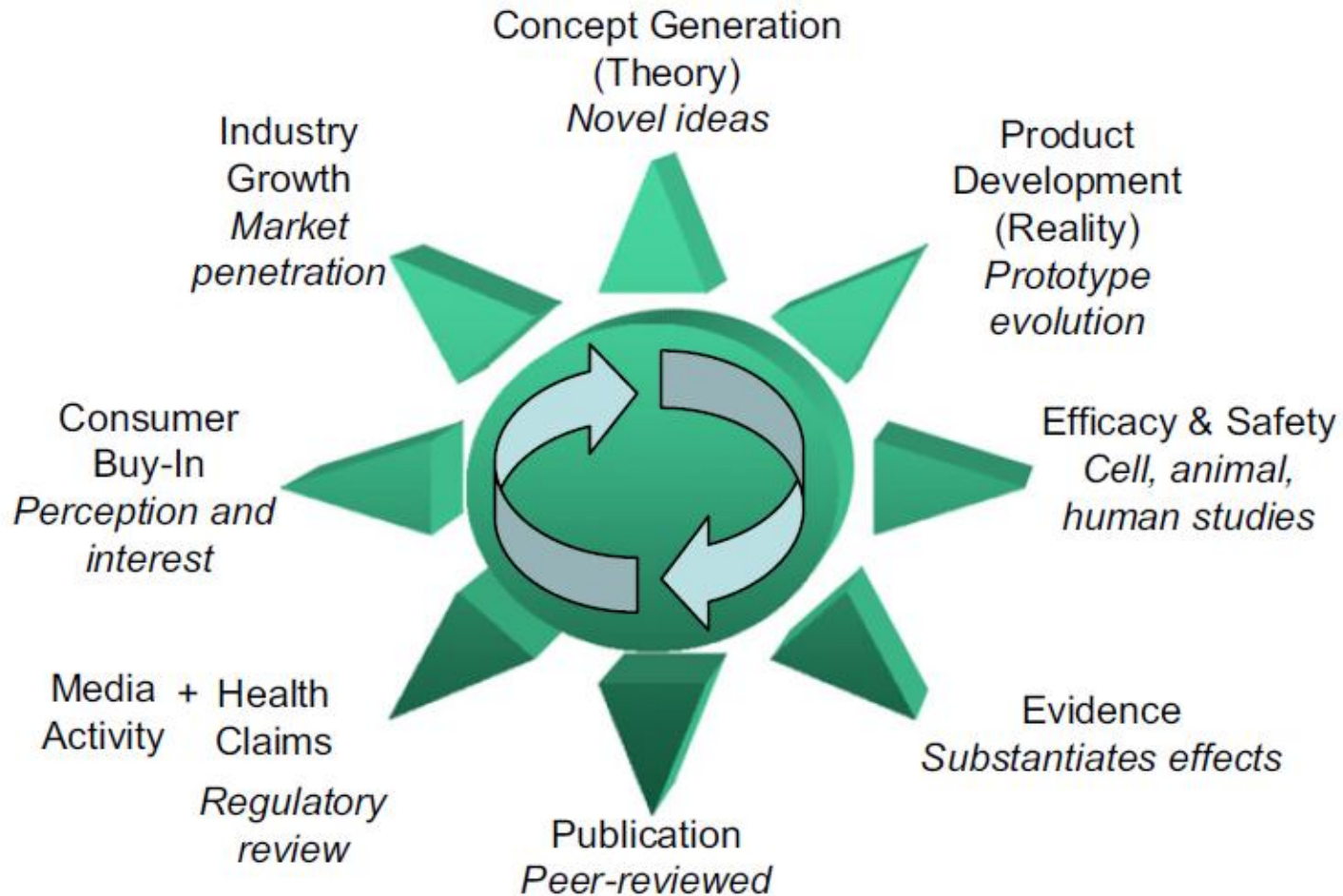


Fig. 1. Functional foods and health promotion: cycle of success.

(Jones et al 2007)

Wrapping up



- Modern life-style requires foods with more functionality
- Foods with bioactive compounds are known as functional foods
- Functional foods has strategic position in maintaining not only human healthiness but human fitness (body and mind)
- Economical merits of functional foods and strong consumer demands create a touch challenging in regulation-side
- Functional foods which are convenience, tasty, healthy, nutritious and manage body weight are driven big market recently
- Food and beverage manufacturers continue to capitalize on the functional ingredients trend and product positioning based on science-based health benefits to context of their overall health approach
- Researches on functional foods shifted from bioactive compounds efficacy to more food aspects
- Indonesia has powerful position to create a lot of invention in functional foods

P3FNI

PERHIMPUNAN PENGGIAT PANGAN FUNGSIONAL DAN NUTRASETIKAL INDONESIA

From Indonesia for Health



TUJUAN

Umum

Memfasilitasi penggiat pangan fungsional dan nutrasetikal agar berkarya secara terpadu dan memberi solusi atas permasalahan pangan dan kesehatan dalam rangka menuju kesejahteraan manusia

Khusus

1. Mengorganisasi kegiatan terkait pangan fungsional dan nutrasetikal secara terpadu dan terprogram agar mencapai manfaat yang terbaik bagi kesejahteraan masyarakat
2. Menjembatani kemajuan pangan fungsional dan nutrasetikal antar negara di percaturan internasional untuk menghadapi persamaan sekaligus saling memperkaya keunggulan khas dari negara anggota

KELEMBAGAAN



ISFFN
(Indonesian Society
for Functional Food
and Nutraceutical)



terlibat dalam

Manfaat untuk
anggota :

- ✓ Memberikan kontribusi ilmu pengetahuan dan teknologi serta mengikuti pemutakhiran pangan fungsional dan nutrasetikal
- ✓ Bersosialisasi dan berkesempatan dalam pertemuan ilmiah bersama penggiat pangan fungsional dan nutrasetikal dari berbagai negara

TIM FORMATUR P3FNI

(PERHIMPUNAN PENGGIAT PANGAN
FUNGSIONAL DAN NUTRASETIKAL
INDONESIA)



Prof. Dr. C. Hanny Wijaya
(Ketua)



Prof. Dr. Eni Harmayani
(Wakil Ketua)



Dr. Ardiansyah
(Sekretaris)



Dr. Indah Epriliati
(Bendahara)

ICoFF / ISNFF



The 7th International Conference on Food Factors (ICoFF2019)
The 12th International Conference and Exhibition on Nutraceuticals and Functional Foods (ISNFF2019)

Theme Food Factor Science from Molecular to Human Studies

Presidents ICoFF2019 President **Hitoshi Ashida** (Kobe University) ISNFF2019 Local Conference President **Kenji Sato** (Kyoto University)

Period December 1 (Sun) – 5 (Thu), 2019

Web <http://icoff2019.umin.jp/>

ICPH



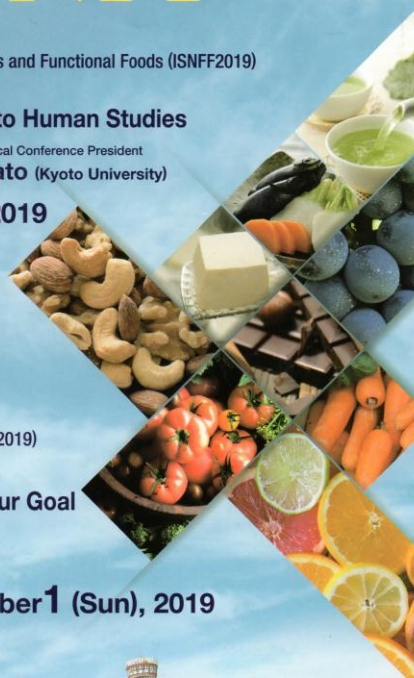
The 9th International Conference on Polyphenols and Health (ICPH2019)

Theme Basic and Human Studies to Reach Our Goal

Presidents **Hitoshi Ashida** (Kobe University)
Kayoko Shimoi (University of Shizuoka)

Period November 28 (Thu) – December 1 (Sun), 2019

Web <http://icph2019.umin.jp/>



FOOD FACTOR WEEK IN KOBE

Venue Kobe Convention Center, Kobe, Japan

Important Dates

Early-bird registration deadline: August 1, 2019

Abstract submission deadline: June 30, 2019

Secretariat Information

ICoFF2019 / ISNFF2019 / ICPH2019 Registration Secretariat

c/o JTB Communication Design Inc., Meeting & Convention Business Unit
11F Bldg. 7F-2-1-25, Kunitaromachi, Chuo-ku, Osaka 541-0056, Japan

Next ISNFF Conference

Take home messages



Foods might contribute to your health if...

- Reduce stressful activities
- Move your body, increase physical activities
- Calm your mind
- Diverse your nutrients intake, enjoy your foods
- Customize your diet – adjust with your body condition—genetically diverse
- Be happy with abundant of love



We Can
...Smile

ACKNOWLEDGEMENTS TO ALL HEARTY CONTRIBUTION FOR THE SUCCESSFUL SEMINAR

“Health Ingredients and Functional Foods for Better Quality of Life”

JiExpo, Jakarta - Indonesia, 6-7 April 2016



Indonesian Society for Functional Foods and Nutraceuticals (ISFFN)



Thank You



Any question?



We are
the Happy Team