

PROGRAM BOOK

"Innovation of Food in the New Normal Era" | 2021



The aim of this conference is to provide forum for researcher and industries to disseminate their latest research innovation in food technology, health, and food security, create opportunities for researcher to discuss health and food security problems around the world as well as the strategy to manage such problems and also strengthen the collaboration between universities and industries by designing an event for researcher and industries to gather and discuss opportunities for collaborations.

The participants including invited speakers are coming from different countries such as United Kingdom, Japan, Thailand, Taiwan, Philippines, China, India, Bangladesh and Indonesia. There are total of 116 papers presented in both oral presentation (99 paper) and poster presentation (17 paper). The reviewed papers will be published in the Food Research and International Journal of Food, Nutrition and Public Health and also E3S Proceedings indexed by SCOPUS.

We would like to express our sincere gratitude to all of the invited speakers: Prof. Dr. Ir. Purwiyatno Haryadi, Prof. Emiko Yanase, Dr. Warapa Mahakarnchanakul, Prof. Wang Chin Kun, Margaretha Indah Epriliati, S.TP., M.Si., PhD, and Dr Ihab Tewfik. And also the invited speakers: Prof. Umi Purwandari, Prof. Budi Widianarko, Bertrand Muhoza, Ph.D., Dr. Francisco B. Elegado, Prof. Made Astawan, and Satoru Fukiya, Ph.D.

We would like to express our gratitude to The Indonesian Association of Food Technology (PATPI) Surabaya and Indonesian Society for Lactic Acid Bacteria and Gut Microbiota (ISLAB-GM) and for the assistance in preparation for this conference. We would also like to thank our sponsors that made this event possible. Last but not least, I would like to thank all members of organizing committee for their full supports and commitments in preparing this conference. I wish that all of us will have a fruitful discussion and a pleasant virtual meeting. Thank you.

Warm regards

Dr. Anita Maya Sutedja, S.TP, M.Si., Ph.D.
Organizing committee IFC 2021



International Food Conference 2021

Innovation of Food in the New Normal Era

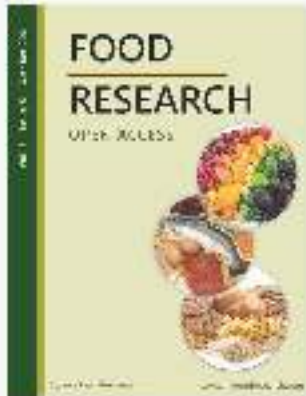
Surabaya, East Java, Indonesia
November 3rd, 2021

Organized By :



Faculty of Agricultural Technology
Widya Mandala Surabaya Catholic University

In collaboration with :



Food Research Journal



International Journal of Food, Nutrition and Public Health



E3S Web of Conferences



Indonesian Society for Lactic Acid Bacteria and Gut Microbiota (ISLAB-GM)



Center for Food and Nutrition Studies Gadjah Mada University (CFNS)



Pusat Unggulan Ipteks Perguruan Tinggi (PUI-PT)



World Association for Sustainable Development (WASD)



International Forum for Public Health (IFPH)



Indonesian Society for Functional Food and Nutraceutical (ISFFN/P3FNI)



Indonesian Food & Beverage Association (IFBA/GAPMMI)



Indonesian Association of Food Technologist (IAFT/PATPI)

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Cokelat nDalem



Mazaraat Artisan Cheese



Giles Brooker Group



- Rice symbolizes one of the staple foods
- The sun symbolizes a bright future. Through this event, it is hoped that there will be innovations that can give hope to overcome food problems
- Fish symbolize food sources; there are plants and animals. The fish also means abundant life
- The test tube represents science
- The house is a symbol of the current condition where many activities are carried out at home, but this does not cause us to stop innovating to produce something better

Overall meaning

Scientific innovation can play a role in managing various food sources, both vegetable and animal commodities, with the hope of providing goodness and prosperity

The Speech of Rector on The International Food Conference 2021

Our Distinguished Guests, Ladies and Gentlemen,

1

Greetings from Widya Mandala Surabaya Catholic University (WMSCU)! On behalf of the University, I herewith would like to warmly welcome all of you, the participants of the International Food Conference 2021.

First of all, I would like to invite all of you to express our sincerest gratitude to our Lord, the Almighty God, for His grace and blessings in our lives that allow us to join this conference in a good health condition although in the midst of Covid-19 pandemic.

This international event is held every five years by the Faculty of Agricultural Technology WMSCU, and the theme of this year is, "Innovation of Food in the New Normal Area". This prestigious and very important conference will provide a number of very prominent and experts in the field of food innovation (science and technology), either from Indonesia or overseas, as keynote and invited speakers, in addition to many paper contributors either via oral or poster presentations. Thus, on this very good opportunity, I would like to express my sincerest gratitude and highest appreciation to all speakers and paper contributors in this conference, for their willingness and time to share their knowledge, skills, expertise, and research findings with other conference participants and community at large. This international event is also intended to strengthen the partnership between higher education institutions and other organizations as their stakeholders, including domestic and international business and government sectors, especially those who are interested and involved in the field of food science and technology.

I hope this international conference will eyewitness and strengthen the University's vision, mission, virtues, and positioning statement as 'a life-improving university' through a high quality academic forum, a long tradition of a well-established university, in order to respond the current and future problems and challenges occurring in Indonesia and elsewhere. Therefore, I would like to thank the Dean, all faculty, staff, and students of the Faculty of Agricultural Technology WMSCU, especially the Steering and Organizing Committees for the theme selection and their great and hard effort, to make this international conference a successful one resulting in a meaningful impact on the global society. Undoubtedly, food as one of the human basic needs is a major, very important, and very critical element in human lives to be seriously studied and reviewed, to ensure the fulfillment of global human's welfare as stated in the Millenium Development Goals.

May this international academic forum increase our awareness, care, commitment, enthusiasm, leading to the significant contribution of academia and higher learning institutes to respond all related issues in the community we serve, through a mutual and sustainable partnership among all involved parties.

Surabaya, November 3rd, 2021

Rector



Drs. Kuncoro Foe, G.Dip.Sc., Ph.D., Apt.
NIK. 241.90.0176

PREFACE

Dean of Faculty of Agricultural Technology Widya Mandala Surabaya Catholic University

3

On behalf of the Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University, it is my great pleasure to welcome you to the International Food Conference 2021. The International Food Conference (IFC) is a conference held once every five years since 2011. The IFC 2021 is organized by Department of Food Technology, Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University in collaboration with Indonesian Society for Lactic Acid Bacteria-Gut Microbiota (ISLAB-GM), Pusat Unggulan Inovasi Perguruan Tinggi (PUI-PT) Gadjah Mada University, Center for Food and Nutrition Studies (CFNS)-Probiotic Gadjah Mada University, Perhimpunan Penggiat Pangan Fungsional dan Nutrasetikal Indonesia/Indonesian Society for Functional Food and Nutraceutical (P3FNI/ISFFN), Indonesian Food and Beverages Association, World Association for Sustainability Development (WASD), International Forum for Public Health (IFPH), the Indonesian Association of Food Technologists (IAFT) Surabaya. Due to COVID 19 pandemic, this year IFC is held as virtual conference. The theme 'Innovation of Food in the New Normal Era' addresses the challenging issues of the role of food as one essential contributors in the new normal era.

I would like to thank all honorable speakers: Professor Purwiyatno Hariyadi, Professor Emiko Yanase, Professor Warrapa, Professor Wang Chin Kun, Indah Epriliati, PhD, Dr. Ihab Tewfik, Professor Umi Purwandari, Professor Made Astawan, Professor Budi Widianarko, Dr. Fransisco Elegado, Bertrand Muhoza, PhD, Dr. Satoru Fukiya, moderator Professor Teli Estiasih and Dr. Ardiansyah Michwan and all presenters for your willingness to share your expertise, idea and research today at the IFC 2021. I hope that we will have fruitful discussions today at the IFC 2021.

Furthermore, I would like to thank all collaborators, sponsors, steering committee, organizing committee and all those who directly and indirectly contribute to the organization of IFC 2021. I would also like to apologize for any inconvenience that you might experience during preconference and conference. I hope this conference is useful to all of us to contribute our role in the food sector during this new normal era.

Surabaya, November 3rd, 2021

Dr. Ignatius Srinta
Dean of Faculty of Agricultural Technology
Widya Mandala Surabaya Catholic University

PREFACE

Chairman Indonesian Food & Beverage Industry Association (IFBA)

"Innovation of Food in the New Normal Era" The role of food as an essential contributor to the combat against COVID 19

4

Let us express our gratitude that we can still meet, even though online at the 2021 INTERNATIONAL FOOD CONFERENCE (IFC) event is organized by the Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University, Indonesia. The Covid-19 pandemic has caused us to adapt to online meetings, and this is one of the innovations in communication and discussion. Interestingly, in this new way we can even meet with colleagues around the world in a short time.

Although growth is lower than normal conditions, the Indonesian Food Industry continues to grow positively amid the Covid-19 pandemic. In 2020 the Indonesian Food industry grew by 1.58% and in the first semester of 2021 it grew by 2.95% (YoY). Along with this growth, the contribution of the food industry to the GDP of the non-oil and gas industry also continued to increase, in 2017 the contribution was 34.30% and increased to 38.42% in Q2-2021. This shows that the food industry contributes to the economy and plays an important role in food availability, thereby strengthening food and nutrition security. Availability of food and nutrition is very important during this pandemic Indonesia plans to increase GDP per capita to approximately USD 23 thousand when Indonesia is 100 years old in 2045 (Golden Indonesia), where the current GDP per capita (2020) is USD 3,912. With the increase in GDP, it is estimated that people's purchasing power will increase, and the need for processed food products will be more varied, added value, more qualified, nutritious and functional at the same time. This is a golden opportunity and prospect for the food industry in meeting food needs in Indonesia.

This potential was also responded positively by investors, especially foreign investors, so that investment growth in the food industry sector was also quite good. In 2020, investment in the food industry increased, mainly supported by Foreign Direct Investment which grew by 25.41%, although it was not followed by Domestic Direct Investment, which contracted by 23.77%. Until semester 1-2021, FDI also grew even larger, namely 87.14%, and the contraction of DDI growth narrowed to 18.72%. Totally optimistic that investment in the food industry will continue to increase.

All of these improvements are in order to meet the demand for better quality, nutritious and functional food products. Especially during the COVID-19 pandemic, the need for nutritious food is increasing along with changes in people's consumption patterns which prioritize nutritious food to increase the body's immunity to fight disease (covid-19).

Several surveys show that during a pandemic, consumers pay more attention to food safety and a more nutritious diet. This trend is positive, as it increasingly encourages producers to pay more attention to it to meet consumer demand. Considering these conditions, the role of food products is increasingly important in maintaining food and nutrition security. This role must be supported by innovation in producing more affordable, value-added, quality, nutritious and even more functional food products.

Innovation in all aspects, including finding alternative raw materials and ingredients that are cheaper and of higher quality; innovation in production processes (technological engineering) that are more efficient and green technology; innovation in food packaging; even innovations in logistics and marketing. Especially during this pandemic, new breakthroughs in logistics and marketing that are more efficient are needed amid restrictions on community activities. One of them is the growing development of e-commerce and digital platforms

Innovation is defined as the integration between invention and commercialization. So far, many inventions have been produced by researchers and academics, but have not succeeded in becoming commercial products. So, for the success of innovation, collaboration of stakeholders is needed. Quadruple helix collaboration needs to be continuously encouraged, namely between Business – Academics – Government – Community so that existing inventions can be commercialized into product innovations that are very much needed by consumers.

We believe, if collaboration can occur and is based on a "business approach", then innovation will result in a sustainable business. And make the contribution of processed food products even greater in food security and nutrition.

Congratulations to the Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University, Indonesia for holding the 2021 INTERNATIONAL FOOD CONFERENCE (IFC). Hopefully this event will be useful for the development of food science and technology and contribute to the growth of the food industry. And more inventions can become innovations in this event. Success for all participant
Thanks for the collaboration. Stay safe and healthy for all.

Ir. Adhi S. Lukman

Chairman Indonesian Food & Beverage Industry Association (IFBA)

November 1st, 2021

PREFACE

Chairperson International Food Conference 2021

Honorable guests, ladies and gentlemen

6

Welcome to the INTERNATIONAL FOOD CONFERENCE 2021, virtual, at Widya Mandala Surabaya Catholic University, Surabaya, Indonesia. We are delighted to have you here to meet and to share our knowledge, research, and discuss latest trend in the area of food science and technology. This year is the third edition of the conference after successful first edition in 2011 and second edition in 2016.

As we already aware that the field of Food Technology is growing rapidly and its development is making a great impact on the health and wellbeing of the society. Therefore, food technology has become one of the most important contributors in human life.

The theme "Innovation of food in the new normal era" was chosen as the main theme of this activity. It is hoped that the results of research and development in the field of food technology will support efforts to achieve food security and public health, especially in this new normal era. We are currently still in the COVID-19 pandemic; and food is always be a basic need. So, it is always need an innovation and hard effort to meet the healthy food needs of the whole world. And hopes that it can be fulfilled through the use of food commodity in each area by development of processing, fermentation, and use of local source for functional food to improve the health and probiotic microbial to improve the gut health, with regard to food safety issues. That is why we have six main issues in this conference: Food Availability; Food Process and Product Development; Fermented Food; Functional Food; Food Safety; and Probiotic and Gut Health. How innovation must be carried out to produce products that can be enjoyed by all groups including the poor must be able to access them. On the other hand, the food produced must be able to respond to modern challenges as healthy food and not a trigger for various diseases. Food technology innovation allows the production of various food products that provide health benefits; besides that, it will expand the opportunities for opening up businesses in the food sector.

The aim of this conference is to provide forum for researcher and industries to disseminate their latest research innovation in food technology, health, and food security, create opportunities for researcher to discuss health and food security problems around the world as well as the strategy to manage such problems and also strengthen the collaboration between universities and industries by designing an event for researcher and industries to gather and discuss opportunities for collaborations.

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Warm regards

Dr. Anita Maya Sutedja, S.TP, M.Si., Ph.D.
Chair person of IFC 2021 Organizing Committee

SCHEDULE

| Jakarta Time (GMT+7) | Activities | |
|-------------------------|--|---|
| 07.00 – 08.00 | Registration and Zoom meeting opened | |
| 08.00 – 08.30 | OPENING CEREMONY | |
| | <p>National Anthem <i>Indonesia Raya</i> International Food Conference 2021 Chairperson report: Dr. Anita Maya Sutedja, S.TP, M.Si., Ph.D. Head of Indonesian Food and Beverage Association speech: Ir. Adhi S. Lukman Rector of WMSCU speech: Drs. Kuncoro Foe, G.Dip.Sc., Ph.D, Apt.</p> | |
| 08.30 – 10.08 | PLENARY SESSION - I | |
| | <p>1) Prof. Purwiyatno Haryadi [IPB University- Indonesia and Vice Chairperson pada Codex Alimentarius Commission (CAC)] "Food Technology Innovation and Regulation: Challenges for Future Food Security"</p> <p>2) Prof. Emiko Yanase [Faculty of Applied Biological Science, Gifu University, Japan] "A Study on the Color Deepening in Red Rice"</p> <p>3) Prof. Warapa Mahakarnchanakul [Department Food Science & Technology, Faculty of Agro-Industry, Kasetsart University Thailand] "Interaction Between Mycotoxigenic Fungi and Indigenous Mycobiota on the Co-occurrence of Mycotoxins in Food Crops"</p> | <p>Moderator : Prof. Dr. Teti Estiasih, STP., MP. [Brawijaya University and Indonesian Association of Food Technologist, Malang]</p> |
| 10.08 – 10.50 | Pannel Discussion and Documentation | |
| 10.50 – 12.10 | PARALEL SESSION - I | |
| | ROOM FA | <p>FOOD AVAILABILITY</p> <p>Invited Speaker: Prof. Umi Purwandari [Trunojoyo University, Madura and Indonesian Association of Food Technologist, Surabaya] "Food Availability During Pandemic: Impact on Children Nutritional Status and Role of Underutilised Local Food"</p> |
| | | <p>Moderator : Mardon Elian, S.TP., M.Sc., M.Ed.</p> |

| Jakarta Time (GMT+7) | Activities | | |
|---------------------------------|-------------------|--|---|
| 10.50 – 12.10 | ROOM FS | <p><u>FOOD SAFETY</u></p> <p>Invited Speaker: Prof. Budi Widianarko [Soegijapranata University, Semarang] “The Current Status of Microplastics in Freshwater Fish”</p> | <p><u>Moderator :</u> Ch. Yayuk Trisnawati, S.TP., MP.</p> |
| | ROOM FP | <p><u>FOOD PROCESS AND PRODUCT DEVELOPMENT</u></p> <p>Invited Speaker: Bertrand Muhoza, Ph.D. [College of Food Science, Northeast Agricultural University, Harbin - China] “Salt Reduction in Food”</p> | <p><u>Moderator :</u> Dr.rer.nat Ignasius Radix A. P. J., S.TP., MP.</p> |
| | ROOM FF | <p><u>FERMENTED FOOD</u></p> <p>Invited Speaker: Dr. Francisco B. Elegado [University of the Philippines Los Baños] “Harnessing the Benefits of Philippine Traditional Fermented Foods ”</p> | <p><u>Moderator :</u> Virly, S.TP., M.S.</p> |
| | ROOM FC | <p><u>FUNCTIONAL FOOD</u></p> <p>Invited Speaker: Prof. Made Astawan [ISFFN and IPB University] “The Development of Tempe as a Functional Food for the Future”</p> | <p><u>Moderator :</u> Netty Kusumawati, S.TP., M.Si.</p> |
| | ROOM PG | <p><u>PROBIOTIC AND GUT HEALTH</u></p> <p>Invited Speaker 1 Satoru Fukiya, Ph.D. [Laboratory of Microbial Physiology, Graduate School of Agriculture, Hokkaido University - Japan] “Interactions between the gut microbiota members for production of deoxycholic acid in the intestine”</p> | <p><u>Moderator :</u> Prof. Dr. Ir. Endang Sutriswati R., MS.</p> |

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| | | <p>Invited Speaker 2</p> <p>Dr. Rina Agustina, M.Sc., Ph.D. [Department of Nutrition, Human Nutrition Research Center (HNRC) & Indonesian Medical Education and Research Institute (IMERI) Faculty of Medicine, Universitas Indonesia]</p> <p>"Dietary Modulation of Probiotics to Intestinal Infection and Inflammation"</p> | |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 14.45 | PARALEL SESSION - II | | |
| 14.45 – 16.26 | PLENARY SESSION - II | | |
| | <p>1) Prof. Chin-Kun Wang [Chung Shan Medical University, Taiwan] "Dietary intake and inflammation"</p> <p>2) Margaretha Indah Epriliati, S.TP., M.Si., Ph.D [Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University, Indonesia] "Innovation of Foods in the New Normal Era Required Genome Based Food Science and Technology Revolutionary for Healthy Life"</p> <p>3) Dr Ihab Tewfik [University of Westminster, United Kingdom] "Medical Therapeutic Food [MTF]: Tailored Food Recipes (TFRs) for a Double Win [Health and Sustainability]"</p> | <p>Moderator : Dr. Ardiansyah [Indonesian Society for Functional Food and Nutraceutical (ISFFN) and Universitas Bakrie]</p> | |
| 16.26-16.56 | Panel Discussion | | |
| 16.56 – 17.10 | Best Poster & Oral Presentation Announcement | | |
| 17.10 – 17.30 | CLOSING CEREMONY | | |

Parallel Session

| Topic | FOOD AVAILABILITY | | |
|---------------|---|--|--|
| ROOM | Zoom Breakout FA-1 Moderator : Prof Umi Purwandari | | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FA-1-1 | Retnaningsih, C., Retnawati, B.B., Ruenda, O. | "Implementation of Distribution Permits in the Development of Processed Seafood Products in Semarang City" |

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| | FA-1-2 | Yumas, M., Ristanti, E.Y., Loppies, J.E., Khaerunnisa, Ramlah, S., Rosniati, Alfrida | "Characterization of Toothpaste Made With Non-fermented Cocoa Powder (<i>Theobroma cacao L</i>) Againsts Bacteria <i>Streptococcus Mutans</i> " |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FA-1-3 | Zahroh, N.L., Mojiono, Faridz, R., Purwandari, U. | "Incorporation of coconut dregs flour into gluten-free purple sweet potato crackers: a study on texture and color profile" |
| | FA-1-4 | Suparthana, I.P., Astuti, P.W.I., Putra, N.K. | "Enhancement of Local Agricultural Product <i>Xanthosoma sagittifolium</i> as the Food Ingredient and Industrial Raw Material" |
| | FA-1-5 | Tungary, E. | "People's Consciousness In Mental And Physical Health And Product Availability In Food Nutrition And Consumption In Urban Life During This New Normal Era: A Systematic Review" |
| | FA-1-6 | Canti, M., Kurniady, F., Hutagalung, R.A., Prasetya, W. | "Nutritional, physical, and sensory properties of fish crackers produced from the head of catfish (<i>Clarias gariepinus</i>)" |
| 13.57 – 14.45 | FA-1-7 | Rahmadanih, Salman, D., Mahyuddin, Saadah, Viantika, N.M. | "The Role of Online Transportation in Helping Households to Access Food during The COVID-19 Pandemic in Makassar City" |
| | FA-1-8 | Tarigan, N. | "Formulation of Tinuktuk Recipes (Traditional Ingredients of The Batak Simalungun Ethnic) and Potential as Functional Food" |
| | FA-1-9 | Surahman, D.N., Ekafitri, R., Rahman, T., Cahyadi, W., Setyadi, D.A., Hendarwin, M.A., Ashri, I., Yusuf, A., Cahya, E.W.A. | "Organoleptic Characteristics of Banana Flakes Based on Maturity Level of Ambon Banana (<i>Musa paradisiaca</i>)" |

| Topic | FOOD AVAILABILITY | | |
|----------------------|---|-------------------------------|--|
| ROOM | Zoom Breakout FA-2 Moderator: Mardon Elian, S.TP., M.Sc., M.Ed. | | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FA-2-1 | Soedarini, B., Meilana | "Physicochemical and Sensory Properties of Reformulated Bakery Products Affected by Fat Mimetic" |

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|----------------------|--------------------|--|---|
| | FA-2-2 | Gabutin, D.R. , Duenas, R. | "Filipino Native Citrus Fruit Extract on Baked Breads: A Qualitative Observation" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FA-2-3 | Andriani, C. , Ananingsih, V.K., Puspita, H.C. | "The Physicochemical and Organoleptic Properties of Jelly Candy with the Addition of Green Grass Jelly Extracts" |
| | FA-2-4 | Johan, Y. , Wang, R.C., Nugrahedi, P.Y. | "Effect of Rice Bran and Soymilk Spent on The Dough Rheological Properties and Quality of Bread" |
| | FA-2-5 | Horisah, K. , Purwandari, U., Burhan | "The Effect of Crude Jellyfish Cryoprotectant on The Quality and Storage Stability of Frozen Tortilla Bread Made from Local Corn of Madura" |
| | FA-2-6 | Ananingsih, V.K. , Soedarini, B., Wibowo, A.A. | "Optimization of Formulation Ingredients for Crystallization of Nutmeg Seed Oleoresin" |
| 13.57 – 14.45 | FA-2-7 | Illaningtyas, F. , Laily, N. | "The Differences in the Result of Examination of Adolescent Haemoglobin Levels using Digital and Sodium Lauryl Sulphate Methods" |
| | FA-2-8 | Herlina, V.T. , Lioe, H.N., Kusumaningrum, H.D., Adawiyah, D.R. | "The Variability of Tauco Products in Indonesia Based on Chemical Characteristics" |

| Topic | FOOD SAFETY | | |
|----------------------|---|--|---|
| ROOM | Zoom Breakout FS Moderator: Prof. Budi Widianarko | | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FS-1-1 | Yanti, R. , Wulandari P., Pranoto P., Cahyanto, M.N. | "Antifungal Activity of Bay Leaf (<i>Syzygium polyanthum</i>) Essential Oil Against The Mycotoxin Producers (<i>Aspergillus</i>)" |
| | FS-1-2 | Rachmawati, N. , Triwibowo, R. | "Histamine Fish Poisoning (HFP) in Indonesia: Current Status and Challenges" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FS-1-3 | Suismono, Djali, M. , Setiasih, I.S., Munarso, S.J., Darniadi, S. | "Changes of Physical and Chemical Properties of Rice (<i>cv. Mentikwangi</i>) as Affected by Storage Conditions" |

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| | FS-1-4 | Soedarini, B. , Nugraha, D., Harumi, M. | "Chemical Sanitizers and Their Application in Seafood and Bakery Industries: a Review" |
| | FS-1-5 | Meiliana , Harumi, M., Soedarini, B. | "Study of Pectin Capability to Adsorb Cd(II) in Aqueous Solution and its Selectivity with Zn Mineral" |
| | FS-1-6 | Sumardi , Ananingsih, V.K., Aptasista, A.A. | "The Addition of Basil (<i>Ocimum basilicum</i> L.) Leaves and Chitosan to Prolong the Shelf Life of Consumers Accepted Wet Noodles" |
| 13.57 – 14.45 | FS-1-7 | Hantoro, I. , Harumi, M., Soedarini, B., Widianarko, B. | "Microplastics Detection in Refill Drinking Water in Bendan Area, Semarang" |
| | FS-1-8 | Hamad, A. , Djalil, A.D., Fadlilah, I.N., Mentari, M., Hartanti, D. | "Galangal and ginger essential oils exerted microbial growth inhibitory activity and preservation potential on tofu" |

| Topic | FOOD PROCESS AND PRODUCT DEVELOPMENT | | |
|---------------|--|---|---|
| ROOM | Zoom Breakout FP-1 Moderator: Dr.rer.nat Ig. Radix A. P. J., S.T.P., MP. & Florence Naomi, S.T.P. | | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FP-1-1 | Iwansyah, A.C. , Fauzi, H., Hariadi, H., Cahyadi, W. | " Optimization Of Moringa (<i>Moringa oleifera</i> L.) Effervescent Tablet Formulation With Acid-Base Combination Using D-Optimal Mixture Design " |
| | FP-1-2 | Wiguna, B. , Laily, N., Sukarti, I., Muhammaludin, Eko, W. | "Differences in Characteristics of Three Variants of Rice Flakes Products (Instant Baby Porridge: Rice Flake Beef, Chicken, and Fish) Result of Laboratory Scale Development" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FP-1-3 | Jati, I.R.A.P. , Natasha, L., Nugraha, D.T., Virly, Setijawaty, E. | "Synergistic Effect of Kappa-carrageenan and Konjac Flour in Enhancing Physicochemical and Organoleptic Properties of Wheat-based Edible Straw" |

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|---------------|--------|--|--|
| | FP-1-4 | Kahfi, J., Laily, N., Pangestu, A., Muhammaludin, Rachman, D. | "Quality of Purula (Rice Seasoning from Hydrolysed Soybean and Seaweed) during Pilot Plant Scale Development using Drum Drying Process" |
| | FP-1-5 | Natasha, M. | "The Characteristics of Gelatin from Bones of Local Chicken (<i>Gallus gallus domesticus</i>), Broiler Chicken (<i>Gallus domesticus</i>) and Duck (<i>Anas platyrynchos</i>)" |
| | FP-1-6 | Retnaningsih, C., Pratiwi, A.R., Meiliana, Wijaya, J., Hendryanti, D.N. | "Characteristic of Winged Bean Seed (<i>Psophocarpus tetragonolobus</i> (L.) DC.) and Soybean (<i>Glycine max</i>) as Composite Tofu" |
| 13.57 – 14.45 | FP-1-7 | Srianta, I., Soejanta, B.R., Natanael, J., Ristiarini, S., Nugerahani, I., Tewfik, I. | "Effect of <i>Monascus</i> Fermented Durian Seed Concentration on Physicochemical and Organoleptic Properties of Meat Analog Sweet Potato Flour-Gluten Based" |
| | FP-1-8 | Cecilia, D., Widyaningrum, D., Pamungkaningtyas, F.H. | "Effect of Xanthan Gum Addition on the Physical Stability and Sensory Acceptability of Tea and Cocoa Concentrate" |

| Topic | FOOD PROCESS AND PRODUCT DEVELOPMENT | | |
|---------------|---|---|--|
| ROOM | Zoom Breakout FP-2 Moderator: Angeline Christina, S.T.P. | | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FP-2-1 | Pamungkaningtyas, F.H., Harris, G.T.A., Michelle, N.Y.V., Amrinola, W. | "Development of Ready-to-Drink Chocolate Beverage Made of West Sumatra Cacao Nibs Extract Using Kano Model" |
| | FP-2-2 | Prayudani, A.P.G., Winarsih, W., Subarna, Syamsir, E., Astawan, M. | "Application of Ultrasound in Germinated Soybean Tempe Protein Concentrate Production with Various Types of Solvents" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FP-2-3 | Harlen, W.C., Ristiarini, S. | "Effect of Using Different Clarifying Agents And Temperature to Physicochemical and Sensory Properties of Sweet Sorghum Syrup Extract" |

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|---------------|--------|--|--|
| | FP-2-4 | Yulianto, W.A. , Tistianingrum, N.W., Swasono, F.D.H. | "The Effect of Soaking Temperature and Cinnamon Extract Concentration on the Quality of Parboiled Rice" |
| | FP-2-5 | Witoyo, J.E. , Ni'maturohmah, E., Argo, B.D., Yuwono, S.S., Widjanarko, S.B. | "Proximate, Amino Acid Composition, Mineral Content, and Microstructural Profiles of Porang (<i>Amorphophallus muelleri</i> Blume) Flour" |
| | FP-2-6 | Lindayani , Wiredjo, F.Y., Hartajanie, L. | "Review: Wine Pairing of Spicy Coconut Beef and Betutu Chicken" |
| 13.57 – 14.45 | FP-2-7 | Ratnaningsih, N. , Handayani, T.H.W., Handayani, S., Devi, M.K., Sugati, D. | "Effect of Addition of Texturizer on The Proximate Content and Texture Properties of Geblek, a Cassava Starch-Based Traditional Food from Indonesia" |
| | FP-2-8 | Saputri, A. , Aminy, N., Rahmadi, I., Nasution, S., Mareta, D.T., Permana, L., Nurdin, S.U. | "Comparison of Proximate Analysis Value of Fresh Fruits and Vacuum-Fried Fruits Chips" |

| Topic | | FOOD PROCESS AND PRODUCT DEVELOPMENT | |
|---------------|-------------|--|---|
| ROOM | | Zoom Breakout FP-3 Moderator: Andreas Alvin, S.T.P. & Oki Krisbiyanto, S.TP., M.Sc. | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FP-3-1 | Ulfa, G.M. , Fibrianto, K., Putri, W.D.R., Widjanarko, S.B. | "Optimization of temperature and reaction time on ultrasound-modified sweet potato starch" |
| | FP-3-2 | Luthfiyanti, R. , Hidayat, D.D., Rahman, T., Iwansyah, A.C., A'yun, K.Q., Achyadi, N.S., Ardiansyah, R.C.E., Rahman, N. | "The Effect of Autoclave-Cooling Cycle Modified Flour on Psychochemical Properties of Purple Sweet Potato Brownies" |
| 12.10 – 13.00 | | Lunch Break | |
| 13.00 – 13.57 | FP-3-3 | Prihantari, A.F. , Fauza, G., Ariviani, S., Muhammad, D.R.A. | "Sensory evaluation and characterization of spice-milk chocolate using Rate-All That-Apply (RATA) Method" |
| | FP-3-4 | Muktiningrum, T.A. , Fauza, G., Ariviani, S., Muhammad, D.R.A., Affandi, D.R. | "Sensory profile analysis of ready to drink chocolate using quantitative descriptive analysis (QDA) method" |

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| | FP-3-5 | Chrisnanda, R. , Fauza, G., Praseptiangga, D., Muhammad, D.R.A. | "Sensory profile analysis of ready to drink chocolate using Rate All That Apply (RATA) method based on customer perception" |
| | FP-3-6 | Nugrahedi, P.Y. , Damara, A.L., Paramita, C.S., Meiliana | "Effect of Production Methods on The Properties of Clear Beverages of Red Guava and Pineapple" |
| 13.57 – 14.45 | FP-3-7 | Chowhan, S. , Islam, M., Hoque, M.I., Nahar, K., Ali, M.K.J., Husain, M.M., Rahman, M.M., Rana, M.S., Islam, M.A., Islam, S. | "Assessing the performance of pulse and oil seed based four crops cropping pattern" |
| | FP-3-8 | Sevi, T. , Jati, I.R.A.P., Tristanto, N.A., Ristiarini, S. | "Consumer Perceptions of Edible Packaging Made of Gelatin as Chili Powder Packaging" |

| Topic | | FERMENTED FOOD | |
|---------------|--------|---|--|
| ROOM | | Zoom Breakout FF-1 Moderator: Virly, S.TP., MS. | |
| Time | Code | Author | Title |
| 11.38 – 12.10 | FF-1-1 | Yarlina, V.P. , Nabilah, F., Djali, M., Andoyo, R., Andoyo, R., Lani, M.N. | "Identification and Characterization Molds in Ragi Tempeh "Raprima" LIPI Indonesia and Over-fermented Tempeh Koro Pedang Beans" |
| | FF-1-2 | Agustina, W. , Kandowangko, D.N., Cahyadi, W., Iwansyah, A.C., Desnilasari, D., Ardiansyah, R.C.E | "The Addition of Palm Sugar Levels and Fermentation Time Affect the Characteristics of Kombucha Moringa" |
| 12.10 – 13.00 | | Lunch Break | |
| 13.00 – 13.57 | FF-1-3 | Srianta, I. , Iswanto, N., Poernomo, L.N., Nugerahani, I., Kuswardani, I., Ristiarini, S., Tewfik, I. | "The Effect of Different Concentrations of Banana Ambon Puree on the Physicochemical, Microbiological, and Organoleptic Properties of Rice Bran Yogurt" |
| | FF-1-4 | Nugerahani, I. , Cahyadi, F.I., Hartono, P.C., Kuswardani, I., Ristiarini, S., Srianta, I., Tewfik, I. | "The Effect of Cavendish Banana (<i>Musa acuminata</i>) Puree Concentration to the Microbiological, Physicochemical, and Sensory Properties of Rice Bran Yogurt" |
| | FF-1-5 | Kuswardani, I. , Yuwono, F., Dharmawan, N.E., Nugerahani, I., Srianta, I., Tewfik, I. | "The Effect of Difference Strawberry (<i>Fragaria x ananassa</i>) Puree Concentration on Microbiological, Physicochemical, and Organoleptic |

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|---------------|--------|---|---|
| | | | Properties of Monascus Fermented Durian Seeds Yogurt" |
| | FF-1-6 | Ahmad, L., Pranoto, Y., Setyabudi, F.S., Marseno, D.W. | "Amylose Content And Physical Changes In Waxy Corn Starch Modified By Spontaneous Fermentation" |
| 13.57 – 14.45 | FF-1-7 | Devanthi, P.V.P., Wardhana, Y.R., Pratiwi, G., Surjawan, I. | "Amylase, Protease, and Lipase-Producing Microbes of Local Origin as Potential Starter Cultures for Low-Salt Moromi Fermentation" |
| | FF-1-8 | Wahyuni, I., Subagio, A., Nurhayati | "Potency of Tapai Yeast as Probiotic for Human Gut Health" |

| Topic | FERMENTED FOOD | | |
|---------------|---|--|--|
| ROOM | Zoom Breakout FF-2 Moderator: Natasya Hermawan, S.T.P. | | |
| Time | Code | Author | Title |
| 11.30 – 12.10 | FF-2-1 | Okfrianti, Y., Herison, C., Fahrurrozi, Budiyo | "Ethnic Food Fermentation From Bengkulu as a Source of Lactic Acid Bacteria" |
| | FF-2-2 | Yuliana, N., Sumardi, Wirawati, C.U., Indrawan, I. | "The Characteristics of Cream Cheese Made from Lampung Farmer's Milk as Impact of Stabilizer Application on Different Curd Recovery" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FF-2-3 | Hartajanie, L. | "Physicochemical and Sensory Characteristics of Star Fruit Wine Aged with Spices" |
| | FF-2-4 | Avirasdya, R.A., Nursiwi, A., Sari, A.M., Zaman, M.Z., Sanjaya, A.P. | "Kinetics Study of Bacterial Cellulose Production by <i>Acetobacter xylinum</i> FNCC 0001 with Variation of Carbon Sources" |
| | FF-2-5 | Zamzami, F.Y., Subagio, A., Nurhayati | "Indigenous Microbe from Gatotan, Indonesian Fermented Cassava, for Developing Starter of Probiotic-Kefir Product" |
| 13.57 – 14.45 | FF-2-6 | Pramanda, I.T., Saputro, M.N.B., Naidu, N.C., Devanthi, P.V.P. | "Starter Cultures Inoculation Procedure Changes Microbial Community Structure during Low-Salt Moromi Fermentation" |
| | FF-2-7 | Hermita, R., Surono, I.S., Wasposito, P., Wardana, A.A., Lo, D. | "A Study of Factors Affecting Mother's Purchase Intention for Probiotics in Jabodetabek Area" |

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| | FF-2-8 | Nugerahani, I., Alvin, A., Ristiarini, S., Kuswardani, I., Srianata, I., Tewfik, I. | "Effect of Molasses Concentration on the Pigment Production of <i>Monascus purpureus</i> M9 of <i>Monascus</i> Fermented Durian Seed" |
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| Topic | | FUNCTIONAL FOOD | |
|---------------|--------|---|---|
| ROOM | | Zoom Breakout FC-1 Moderator: Prof Made Astawan & Netty Kusumawati, S.TP., M.Si. | |
| Time | Code | Author | Title |
| 11.30 – 12.10 | FC-1-1 | Wresdiyati, T., Papilaya, M.C., Laila, S.R., Sadiah, S., Astawan, M. | "Cholesterol Synthesis Inhibition of <i>Cajanus cajan</i> Leaves and <i>Zingiber officinale</i> Extracts Through HMG-CoA Reductase Inhibitory Activity " |
| | FC-1-2 | Singgih, M., Kurniati, N.F., Permana, B., Yuliana, A., Amelia, D.R. | "In silico Anti-Cholesterol of Monacolin from <i>Monascus sp</i> on HMG-CoA Protein Receptor" |
| 12.10 – 13.00 | | Lunch Break | |
| 13.00 – 13.57 | FC-1-3 | Wahjuningsih, S.B., Azkia, M.N. | "Hypocholesterolemic Effects of Noodles Prepared from Sago, Sorghum and Mung Bean Flours in Hyperglycemic Rats" |
| | FC-1-4 | Agustinah, W.A., Putritama, K.A. | "Dynamic Changes of Total Phenolic Content, Antioxidant Activity, and Gamma-Amino Butyric Acid (GABA) Content of Germinated, Fermented, and Cooked Red Rice" |
| | FC-1-5 | Bait, Y., Marseno, D.W., Santoso, U., Marsono, Y. | "Effect of Cherry (<i>Muntingia calabura</i>) leaves extract on The Starch Digestibility, Estimated Glycemic Index (EGI) and Resistant Starch Content of Functional Rice" |
| 13.57 – 14.45 | FC-1-6 | Marsono, Y., Putri, R.G., Gunawan, H., Indrawanto, R. | "Red Kidney Bean (<i>Phaseolus vulgaris</i> L.) Instant Porridge: Effect of Isomalto-Oligosaccharides and Fibercreme as Sucrose Replacement on Lipid Profile Improvement in Hypercholesterol-Induced Rats" |
| | FC-1-7 | Mar'atusholihah, N.D., Nurani, A., Almira, R., Anggriani, R. | "White bread formulation with the addition of Okra (<i>Abelmoschus esculentus</i> (L) Moench) fruit mucilage as an alternative food for diabetics" |

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| | FC-1-8 | Astawan, M., Cahyani A.P., Wresdiyati, T. | "Antioxidant Activity and Isoflavone Content of Indonesian Overripe Tempe" |
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| Topic | | FUNCTIONAL FOOD | |
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| ROOM | Zoom Breakout FC-2 Moderator: Florence Naomi, S.T.P.& Prof Emiko Yanase | | |
| Time | Code | Author | Title |
| 11.30 – 12.10 | FC-2-1 | Fadila, A.N., Widyaningrum, D. | "Chemical Properties and Sensory Acceptance of Cookies Containing Chlorella" |
| | FC-2-2 | Abdurrasyid, Z., Astawan, M., Lioe, H.N., Wresdiyati, T. | "Evaluation of Hypoglycaemic Potency in Tempe with Soybean Germination Process and Extended Fermentation Time" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FC-2-3 | Priatni, S., Kosasih, W., Rosmalina, T., Tanuwidjaja, S., Mulyaningsih, N. | "Preparation and Characterization of Omega-3 Concentrate from Lemuru Fish (<i>Sardinella Longiceps</i>) Oil" |
| | FC-2-4 | Wariyah, C., Riyanto, Slamet, A. | "The Antioxidant Activity Of Aloe Vera (Aloe vera var. Chinensis) Powder With Maltodextrin And Gum Arabic As Fillers" |
| | FC-2-5 | Yoshari, R.M., Astawan, M., Prangdimurti, E., Wresdiyati, T. | "The Production Process of Tempe Protein Isolate from Germinated Soybeans and Its Potential as an Antidiabetic" |
| 13.57 – 14.45 | FC-2-6 | Saputri, D.S., Chien, W.J., Lin, H. Y., Yanti, S., Agrawal, D.C. | "Flavonoid and Main Aroma-active Compounds Identification of Taiwan <i>Citrus depressa</i> Hayata Peels" |
| | FC-2-7 | Lembong, E., Djali, M., Utama, G.L. | "Antioxidant Properties and Microbiology of Cocoa (<i>Theobroma cacao</i> L.) Beans as Functional Food" |

| Topic | | FUNCTIONAL FOOD | |
|---------------|---|---|---|
| ROOM | Zoom Breakout FC-3 Moderator: Syeda Fahria Hoque Mimmi & Mitha Ayu Pratama Handoyo, S.TP., M.Sc. | | |
| Time | Code | Author | Title |
| 11.30 – 12.10 | FC-3-1 | Gokulanathan, A., Kumar, A.A. | "Cytotoxic and antioxidant activities of <i>Phyllanthus emblica</i> (L) and <i>Phyllanthus acidus</i> (L) extract mixture as a new food dietary supplement" |
| | FC-3-2 | Muhammad, D.R.A., Praseptiangga, D., Sanjaya, A.P., Fauza, G. | "An updated review on the development of functional cocoa drinks" |
| 12.10 – 13.00 | Lunch Break | | |
| 13.00 – 13.57 | FC-3-3 | Muhammad, D.R.A., Zulfa, F., Purnomo, D., Widiatmoko, C., Fibri, D.L.N. | "Antioxidant activities and physical properties of chocolate enriched with plant-based functional ingredients" |
| | FC-3-4 | Mimmi, S.F.H. | "Prospects of Lactoferrin as Potential Natural Antibiotic" |
| | FC-3-5 | Kartikasari, L.R., Hertanto, B.S., Nuhriawangsa, A.M.P. | "Omega-3 Profiles and Chemical Substances of Chicken Meat Fed Diets Containing Purslane Meal (<i>Portulaca oleraceae</i>) Rich in Omega-3 Fats" |
| 13.57 – 14.45 | FC-3-6 | Lalong, P.R.F., Zubaidah, E., Martati, E. | "In Vivo Evaluation of Faloak (<i>Sterculia quadrifida</i> R.Br) Stem Bark Kombucha as Hyperglycemia and Therapeutic Agent" |
| | FC-3-7 | Rachmawati, N.A., Astawan, M., Wresdiyati, T., Yoshari, R.M. | "Effect of Tempe Protein Isolate from Germinated and Non-germinated Soybean on Oxidative Stress in Diabetes Rats" |

| Topic | | PROBIOTIC AND GUT HEALTH | |
|---------------|---|---|---|
| ROOM | Zoom Breakout PG Moderator: Moderator: Prof Endang Sutriswati R. | | |
| Time | Code | Author | Title |
| 13.00 – 13.57 | PG-1-1 | Sujaya, I.N., Nociantri, K.A., Fatmawati, N.N.D., Ramona, Y., Suwardana, G.N.R., Kastawa, N.W.E.P.G., Putra, I G.P.B.A. | "Effect of Fermented Tamarillo (<i>Solanum betaceum</i> Cav.)-Juice Containing Weissella confusa F213 on Gut Microbiota of Healthy Human Subjects" |
| | PG-1-2 | Fatmawati, N.N.D., Sujaya, I.N., Suwardana, G.N.R., Nociantri, K.A., Mariadi, I.K., Sriwidyani, N.P., Winaya, I.B.O. | "Safety evaluation of Weissella confusa F213 and <i>Lactobacillus rhamnosus</i> " |

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| | | | FBB81, the promising probiotics candidates" |
| | PG-1-3 | Pato, U. | "Probiotic and Gut Health" |
| | PG-1-4 | Wijaya, A. | "Probiotic Bacteria and Their Impact on Human Health" |
| 13.57 – 14.45 | PG-1-5 | Rahayu, E.S., Gatya, M. , Yoga, W.K., Komalasari, H., Tode, Y., Mariyatun, M., Yuda, W., Manurung, N.E.P., Hasan, P.N., Suharman, Pamungkaningtyas, F.H., Nurfiana, D.A., and Utami, T. | "The Effect of Consumption Probiotic Chocolate Containing <i>Lactobacillus plantarum</i> Dad-13 on Gut" |
| | PG-1-6 | Utami, T. | Probiotics And Intestinal Health |
| | PG-1-7 | Mariadi, I.K. , Nesa, N.N.M., Fatmawati, N.N.D., Sujaya, I.N. | <i>Lactobacillus rhamnosus</i> SKG34 as a Potential Probiotic with Anti-inflammatory Properties for Colitis |

Plenary Session

Curriculum Vitae Keynote Speaker 1

Purwiyatno Hariyadi



Place/Date of Birth : Pati, Indonesia, March 9th 1962

Present Position : Professor, Department of Food Science and Technology, Faculty of Agricultural Engineering & Technology, IPB University, Bogor, Indonesia.

Senior Scientist, Southeast Asian Food & Agricultural Science & Technology (SEAFAST) center, IPB University, Bogor, Indonesia

Vice Chairperson, Codex Alimentarius Commission

Education

| Education Level | University | Country | Field of Study | Graduated |
|-----------------|---------------------------------|-----------|-----------------------------------|-----------|
| Bachelor | Bogor Agricultural University | Indonesia | Food Science and Engineering | 1984 |
| Master | University of Wisconsin-Madison | USA | Food Science | 1990 |
| Doctoral | University of Wisconsin-Madison | USA | Food Science/Chemical Engineering | 1995 |

Working Experience

1. Vice Chairperson, Codex Alimentarius Commission (CAC), a joint intergovernmental body of the Food and Agriculture Organization (FAO) and World Health Organization (WHO) of the United Nations. 2017 – now
2. Director, Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University (Bogor Agricultural University), Bogor. (www.seafast.ipb.ac.id), 2005-2015

3. Head of Department, Department of Food Science and Technology, IPB University (Bogor Agricultural University), Bogor, 2000-2004
4. Vice Dean for Student Affairs, Faculty of Agricultural Technology, IPB University (Bogor Agricultural University), Bogor. 1995-2000

Research (Last Five Years)

1. Modification & processing of lipids:
 - Synthesis of structured lipids (from palm oil, coconut oil, fish oil).
 - Study on red fruit oil
2. Food Processing (especially on thermal processing)

Publications (Last Five Years)

Hasrul Abdi Hasibuan, H.A., Sitanggang, A.B., Andarwulan, N. and **Hariyadi, P.** 2021. Solvent fractionation of hard palm stearin to increase the concentration of tripalmitoylglycerol and dipalmitoyl-stearoyl-glycerol as substrates for synthesis of human milk fat substitute, *International Journal of Food Science and Technology* 2021. 56: 4549–4558.

Hasrul Abdi Hasibuan, H.A., Sitanggang, A.B., Andarwulan, N. and **Hariyadi, P.** 2021. Enzymatic Synthesis of Human Milk Fat Substitute – A Review on Technological Approaches, *Food Technology and Biotechnology* 59(4).

Hariyadi, P. 2021. Post-COVID-19 Transformation Towards Sustainable Healthy Diet, FFTC's 50th Anniversary and Symposium - Making Agri-Food Systems Sustainable. Taipei, Taiwan: FFTC, 167p. First edition: October, 2021 (ISBN 978-986-99366-5-1).

Hariyadi, P. 2021. Tantangan dan Kebutuhan Regulasi untuk Meningkatkan Daya Saing Produk Pangan Indonesia dalam Perdagangan Global. Wirakaratkusumah, M.A. Et al. Komitmen dan Inovasi Membangun Pangan dan Gizi Bangsa secara Berkelanjutan. Akademi dalam Bidang Ilmu Pangan dan Gizi Komisi Ilmu Rekayasa Akademi Ilmu Pengetahuan Indonesia (AIPG – KIR – API).

Hariyadi, P. 2021. Understanding the Codex Standard to Ensure Safety and Quality of Palm Oil. *International Journal of Oil Palm*. Volume 4, Number 1, 2021, Page 1-7.

Z.L. Sarungallo, **Purwiyatno Hariyadi**, Nuri Andarwulan, and Eko Hari Purnomo. 2020. Effect of heat treatment prior to extraction on the yield and quality of red fruit (*Pandanus conoideus*) oil, *Food Research* 4 (3): 659-665.

Erka Fitria, Nur Wulandari, **Purwiyatno Hariyadi**, Hendra Wijaya. 2020. Identifikasi dan fraksinas Karotenoid pada Minyak Buah Merah (*Pandanus conoideus*), *Warta Industri Hasil Pertanian*. 37(1):7.

Qabul Dinanta Utama, Azis Boing Sitanggang, Dede Robiatul Adawijah, **Purwiyatno Hariyadi**. 2020. Lipase-Catalyzed Synthesis of Medium-Long-Medium-Type of Structured Lipids from Refined Bleached Deodorized Olein. *Applied Food Biotechnology*. 7(2): 85-94.

Didik J. Pursito, Eko H. Purnomo, Dedi Fardiaz, and **Purwiyatno Hariyadi**. 2020. Optimizing Steam Consumption of Mushroom Canning Process by Selecting Higher Temperatures and Shorter Time of Retorting, *International Journal of Food Science*. 2020: 1-8.

Satiti Kawuri Putri, **Purwiyatno Hariyadi**, Mursalin, Nuri Andarwulan. 2020. Pemurnian Produk Mono-Diasilgliserol (MDAG) Hasil Gliserolisis Kimia dengan Metoda Demulsifikasi Krim, *Jurnal Agritech*. 40(1):39.

Siti Nurhasanah, S. Joni Munarso, Nur Wulandari, **Purwiyatno Hariyadi**. 2020. Physical Characteristics of Structured Lipid Synthesized by Lipase-Catalyzed Interesterification of Coconut and Palm Oils, *Pertanika Journal of Science and Technology*. 28 (1): 19-31.

Azis Boing Sitanggang, Dase Hunaeifi, Dede R Adawiyah, Eko H Purnomo, Elvira Syamsir, Feri Kusnandar, Nur Wulandari, **Purwiyatno Hariyadi**. 2019. *Landasan Teknik Pangan*. IPB Press.

Purwiyatno Hariyadi. 2019. *Masa Simpan dan Batas Kedaluwarsa Produk Pangan: Pendugaan, Pengelolaan, dan Penandaannya*. PT Gramedia.

Nur Fitriana Dewi, Eko Hari Purnomo, **Purwiyatno Hariyadi**. 2019. Effect of Waiting Time and Process Temperature on the Quality of Commercially Sterile Flavored Liquid Milk, *Jurnal Mutu Pangan*. 6(1): 17-23.

Qabul Dinanta Utama, Azis Boing Sitanggang, Dede Robiatul Adawijah, **Purwiyatno Hariyadi**. 2019. Lipase Catalyzed Interesterification for the Synthesis of Medium-Long-Medium (MLM)-Type of structured Lipids – A review, *Food Technology and Biotechnology*. 57(3): 305-318.

Tjahja Muhandri, Subarna, Afifah Zahra Agista, **Purwiyatno Hariyadi**, Aminullah. 2019. Optimization of Drying Process of Corn Noodles using Fluidized Bed Dryer, *Scientific Study and Research: Chemistry and Chemical Engineering, Biotchnology, Food Industry*. 20(1): 0430052.

Dede R Adawijah, Leonardus Raditya Prabowo, **Purwiyatno Hariyadi**. 2019. Peningkatan Skala Produksi Mikroenkapsulat Minyak Sawit Merah dengan Pengering Semprot, *Jurnal Mutu Pangan*. 6(1).

Siti Nurhasanah, Nur Wulandari, S Joni Munarso, **Purwiyatno Hariyadi**. 2019. Production of Structured Lipids Rich in Triacylglycerols Containing Medium-Chain Fatty Acids and Unsaturated Fatty Acids at the Sn-2 Position through Enzymatic Interesterification, *International Journal on Advanced Science, Engineering and Information Technology*. 9 (5):1624-1630.

Purwiyatno Hariyadi. 2018. *Teknologi Proses Termal untuk Industri Pangan*. PT Media Pangan Indonesia.

Drajat Martianto, Nuri Andarwulan, Donald Slahaan, Desty Gitaprawatiwi, Ria Noviar Triana, **Purwiyatno Hariyadi**. 2018. Critical Chemical Quality Assessment for the Oxidative Stability of Bulk Palm Oil in Indonesia, *International Journal of Palm Oil*.1(3): 129-136.

Khusnayaini, A. A., **Hariyadi, P.** and Syamsir, E. 2018. Kinetic changes of antioxidant capacity and physical quality of tempe during heating, *International Food Research Journal*. 25(3): 1166-1173.

Purwiyatno Hariyadi. 2017. *Desain Saniter untuk Industri Pangan*. PT Media Pangan Indonesia.

Marpaung, A.A. Andarwulan, N., **Hariyadi, P.**, and Faridah, D.N. 2017. The colour degradation of anthocyanin-rich extract from butterfly pea (*Clitoria ternatea* L.) petal in various solvents at pH, *Natural Product Research*. March 2017.

Mursalin, M., **Hariyadi, P.**, Purnomo, E.H., Andarwulan, N. and Fardiaz, D. 2016. Crystallization kinetics of coconut oil based on Avrami model, *International Food Research Journal*. 23(4): 1355-1360.

Ayu, D.F., Andarwulan, N., **Hariyadi, P.**, Purnomo, E.H. 2016. Effect of tocopherols, tocotrienols, β -carotene, and chlorophyll on the photo-oxidative stability of red palm oil, Food science and Biotechnology 25(2):401-407.

Awards and Honors

| No | Awards and Honors | Given by | Level | Years |
|----|---|--|-----------------|-----------------------------|
| 1 | Fellow of International Academy of Food Science & Technology (IAFoST) | IAFoST | International | 2016 |
| 2 | Website Winner (phariyadi.staff.ipb.ac.id) | IPB | Local | 2016 |
| 3 | Tribute to Innovators & Authors 2015 (Publication Field) | IPB | IPB | 2015 |
| 4. | Tribute to Innovators & Authors 2015 (Inovation Field) | IPB | IPB | 2015 |
| 5. | Certified Food Scientist (CFS) | The International Food Science Certification Commission | International | 2015 (Re-certified 2020) |
| 6. | The ILSI Southeast Asian Region Recognition Award | ILSI (International Life Science Institute) | South East Asia | 2014 |
| 7 | Indonesian President's Certificate of Honor. Satyalancana Karya Satya 20 Years. | President of the Republic of Indonesia | National | 2012 |
| 8 | Akademi Ilmu Pengetahuan Indonesia (API) | Indonesia Government | National | 2012 |
| 9 | 101 Inovasi Paling Prospektif, dengan judul Proses Sintesis Mono- dan Di-asilgliserol (MDAG) dari RBDPO dengan Cara Gliserolisis Kimia (Pembuatan Emulsifier) | Business Inovation Center (BIC)- Ministry of Research and Technology Republic of Indonesia | National | 2009 |

FOOD TECHNOLOGY INNOVATION AND REGULATION: CHALLENGES FOR FUTURE FOOD SECURITY

Purwiyatno Hariyadi

Professor at the Department of Food Science & Technology, Faculty of Agricultural Engineering and Technology, IPB University

Senior Scientist at Southeast Asian Food and Agricultural Science & Technology (SEAFAST) Center, IPB University

Abstract

The UN report, entitled *The State of Food Security and Nutrition in the World 2021*, highlights the major challenges of food security, particularly in achieving the Sustainable Development Goals (SDGs) target of Zero Hunger by 2030. The report also shows that between 720 and 811 million people worldwide face hunger in 2020, which is an increase of around 161 million over 2019. Coupled with other factors, such as lower availability (and quality) of arable land; limited water supply, competition for biomass for renewable energy, the uncertain impact of climate change, and unsustainable lifestyles, efforts to achieve the SDGs target goals are even more challenging. To address these challenges, innovation in food science and technology is needed, to be able to produce more, safer, and more nutritious food, in a more efficient manner, and with minimal impact on the environment. Innovation, the process of transformation from invention to product that is successful and accepted in the market, is not only influenced by aspects of science and technology, but also by various aspects such as marketing, organization, partnership, and regulation. For this reason, it is necessary to build a good innovation ecosystem, including the regulatory system, so that it can facilitate innovation to overcome the challenges mentioned above. Regulatory systems need to be designed, not only to protect human health and the environment, but also to promote innovation for a better future food security.

Keywords: Food Security, Regulation, Innovation, COVID-19, and SDGs

Curriculum Vitae Keynote Speaker 2

Emiko Yanase



Place/Date of Birth : Japan, March 7th, 1974

Present Position : Professor in Faculty of Applied Biological

Education

| Education Level | University | Country | Field of Study | Graduated |
|-----------------|-----------------|---------|----------------|-----------|
| Master | Gifu University | Japan | Agriculture | 1998 |
| Doctoral | Gifu University | Japan | | 2005 |

Working Experience

1. Assistant professor at Gifu University From 1999 to 2011
2. Associate professor at Gifu University From 2011 to 2021
3. Professor at Gifu University From 2021 to present
4. Outside director of Nagara Science Co., Ltd. From 2002 to 2011
5. Post-doc at Columbia University, USA From 2006 to 2007

Research (last five years)

1. Studies of plant polyphenols (catechin, isoflavone, anthocyanin and procyanidin)
2. Chemical change of them in the food processing.

Publication (last five years)

- Ochiai, Y., Hirose, S., **Yanase, E.** 2021. Understanding the Regioselectivity in the Oxidative Condensation of Catechins Using Pyrogallol-type Model Compounds, *J. Org. Chem.* 85(19): 12359-12366.
- Sheng, X., Nagaoka, S., Hashimoto, M., Amiya, Y., Beppu, M., Tsukamoto, K., **Yanase, E.**, Tanaka, M., Matsui, T. 2020. Identification of peptides in blood following oral administration of β -conglycinin to Wistar rats, *Food Chem.* 241: 128197.
- Sutedja, A. M., **Yanase, E.**, Batubara, I., Fardiaz, D., Lioe, H. N. 2020. Antidiabetic components from the hexane extract of red kidney beans (*Phaseolus vulgaris L.*): isolation and structure determination, *Biosci. Biotech. Biochem.* 84(3), pp. 598-605.
- Hirose, S., Kamatari, Y.O., **Yanase, E.** 2020. Mechanism of oolongtheanin formation via three intermediates, *Tetrahedron Lett.*, 61:151601.
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- Hibi, Y., **Yanase, E.** 2019. Oxidation of Procyanidins with Various Degrees of Condensation: Influence on the Color-Deepening Phenomenon, *J. Agric. Food Chem.*, 67(17): 4940-4946.
- Sakakibara, T., Sawada, Y., Wang, J., Nagaoka, S., **Yanase, E.** 2019. Molecular Mechanism by Which Tea Catechins Decrease the Micellar Solubility of Cholesterol, *J. Agric. Food Chem.* 67(25): 7128-7135.
- Hayashi, S., Nakano, K., **Yanase, E.** 2018. Investigation of color-deepening phenomenon in catechin-(4-8)-dimer as a proanthocyanidin model and structural determination of its derivatives by oxidation, *Food Chem.* 239: 1126-1133.
- Kawakami, W., Oshima, A., **Yanase, E.** 2018. Structural characterization of proanthocyanidins from adzuki seed coat, *Food Chem.* 239: 1110-1116.
- Satake, R., **Yanase, E.** 2018. Mechanistic studies of hydrogen-peroxide-mediated anthocyanin Oxidation, *Tetrahedron.* 74: 6187-6191.

Awards and Honors

1. JSBBA Award for Women Scientists, 2021

A STUDY ON THE COLOR DEEPENING IN RED RICE

Emiko Yanase

*Laboratory of Bio-organic Chemistry, Faculty of Applied Biological Sciences,
Gifu University, 1-1 Yanagido, Gifu 501-1193, Japan*

Corresponding author: e-yanase@gifu-u.ac.jp

Abstract

Red rice is commonly known as ancient rice, that containing red pigment in hull and/or bran layer. The main pigments are proanthocyanidin. Proanthocyanidin are one of the polyphenols found in a variety of plants and have the various bioactivities such as antioxidation and anticancer activity. Red rice is caused the color deepening phenomenon during the storage period after crops. It is unlikely that any new pigment is produced by the red rice during the storage period, and it is postulated that the color deepening phenomenon is a result of changes occurring in preexisting chemical species. We presumed that this phenomenon is related to the oxidation of the procyanidins in the red rice, and oxidation reaction were performed to catechin dimer and trimer as a model compound. As a result, several novel oxidized products with spiro-type skeletons that contain new internal bonds were isolated. We believe that the internal bonding system formed in procyanidin is one of factors that causes color deepening. The term "oxidation" is often used to describe the degradation of food quality. The oxidation products clarified in this study may be valuable to serve as the basis for evaluating the freshness of red rice as well as various plants containing procyanidins.

Keywords: Color deepening, Oxidation, Polyphenol, Procyanidin

Curriculum Vitae Keynote Speaker 3

Warapa Mahakarnchanakul



Place/Date of Birth : Chiangmai Thailand, 1962

Present Position : Assistant professor

Education

| Education Level | University | Country | Field of Study | Graduated |
|-----------------|-----------------------|----------|-----------------|-----------|
| Bachelor | Kasetsart University | Thailand | General Science | 1984 |
| Master | Kasetsart University | Thailand | Food Science | 1988 |
| Doctoral | University of Georgia | USA | Food Science | 1998 |

Working Experience

1. Director of Kasetsart University Research and Development Institute (present 2021)
2. Assistant to the President for Research (2008 – 2018)
3. Teaching about Microbiology of Food Products, Principles of Food Microbiology, Food Plant Sanitation, Hazard Analysis & Critical Control Points, Hygienic Problems of Foods, Advanced Food Science, Advanced Food Microbiology, Fishery Products Technology, Fruit & Vegetable Technology, Research technique, Seminar, Special Problems and Thesis

Research of interest: Food safety system management; Inactivation of foodborne pathogen by chemical and innovative technology; Fungal and mycotoxins assessment in food and feed

Research (Last five years)

1. 2021-2024 Capacity Building and Development of Advance Study Research System to Achieve the Competitiveness in Food and Agriculture Advanced Food Science (Ministry of Higher Education Science Research and Innovation, MHESI)
2. 2021 Development of Laboratory Safety Management to Support the Food and Agriculture Standards (Funded by MHESI)
3. 2020-2021 Efficacy of Surfactant on Vegetable Cleaning Products and Risk Assessment (Funded by Agricultural Research Development Agency)
4. 2019-2020 The Central Thailand Food Valley Development (Funded by Agricultural Research Development Agency)
5. 2018 Assessment of Mycotoxins in Staple Thai Food: Glutinous Rice Grain and Dried chilli (Funded by Kasetsart University Research Development Institute)
6. 2018 Assessment of Mycotoxins and Mycobiota in Thai Glutinous Paddy and Grain (Funded by Kasetsart University Research Development Institute)
7. 2018 Assessment of Ochratoxin and Mycobiota in Dried Chili (Funded by Kasetsart University Research Development Institute)
8. 2017 Assessment of Ochratoxin and Aflatoxins in Popular Thai Spices (Funded by National Food Institute)

Publication (Last five years)

Atchara S., W. **Mahakarnchanakul**, R. Rittiron, T. Sajjaanantakul and T. Thongket. 2021. "Detection of Profenofos in Chinese Kale, Cabbage and Chili Spur Pepper by Fourier Transform Near-Infrared and Fourier Transform Mid-Infrared Spectroscopy Techniques", ACS Omega.

Chuaysrinule C., W. **Mahakarnchanakul**, T. Maneeboon. 2020. Comparative study on the effect of temperature and water activity on *Aspergillus flavus* and *Aspergillus carbonarius* isolates growth and mycotoxin production on a chili powder medium, *Cogent Food & Agriculture*. 6 (1) (2020) 1782097-1-13

Chuaysrinule C., T. Maneeboon, C. Roopkham, W. **Mahakarnchanakul**. 2020. Occurrence of aflatoxin- and ochratoxin A-producing *Aspergillus* species in Thai dried chilli. *Journal of Agriculture and Food Research* 2 (-) (2020) 100054-1-8

Tantasuttikul, A, W. **Mahakarnchanakul**. 2019. Growth parameters and sanitizer resistance of *Raoultella ornithinolytica* and *Raoultella terrigena* isolated from seafood processing plant. *Cogent Food & Agriculture*. 5 (1).

Frisvad, J.C., Hubka, V., Ezekiel, C.N., Hong, S.-B., Novakava, A., Chen, A.J., Arzanlou, M., Larsen, T.O., Sklenar, F., W. **Mahakarnchanakul**, Samson, R.A., Houbraken, J. 2019. Taxonomy of *Aspergillus* section Flavi and their production of aflatoxins, ochratoxins and other mycotoxins. *Studies in Mycology* 93 (-) (2019) 1-63

Wache Y., Do TL., Do TBH., Do TY., Haure M., Ho PH., Anal AK., Le VVM., Li WJ., Licandro H., Lorn D., Ly-Chatain MH., Ly S., **Warapa Mahakarnchanakul**, Mai DV., Mith H., Nguyen DH., Nguyen TKC., Nguyen TMT., Nguyen TTT., Nguyen TVA., Pham HV., Pham TA., Phan TT., Tan R., Tien TN., Tran T., Try S., Phi QT., Valentin D., Vo-Van QB., Vongkamjan K., Vu DC., Vu NT., Son CK. 2018. Prospects for Food Fermentation in South-East Asia, Topics From the

Tropical Fermentation and Biotechnology Network at the End of the AsiFood Erasmus plus Project. *Frontiers in Microbiology*. 9 (-) (2018)

Klintham, P, S. Tongchitpakdee, W Chinsirikul, W. **Mahakarnchanakul**. 2018. Two-step washing with commercial vegetable washing solutions, and electrolyzed oxidizing microbubbles water to decontaminate sweet basil and Thai mint: A case study. *Food Control* 94: 324-330.

Phaephiphat, A, W. **Mahakarnchanakul**. 2018. Surface decontamination of Salmonella Typhimurium and Escherichia coli on sweet basil by ozone microbubbles, *Cogent Food & Agriculture*. 4 (1).

Manurakchinakorn, S., Chamnan, U., W. **Mahakarnchanakul**. 2018. Quality of minimally processed mangosteen stored under different modified atmospheres, *Acta Horticulturae*. 1194: 505-512

Klintham P., S. Tongchitpakdee, W. Chinsirikul, W. **Mahakarnchanakul**. 2017 Combination of microbubbles with oxidizing sanitizers to eliminate Escherichia coli and Salmonella Typhimurium on Thai leafy vegetables, *Food Control* 77: 260-269

Tassanaudom U., Toorisut Y., Kooranee Tuitemwong, Jittaprasartsin C., Wangroongsarb P., W. **Mahakarnchanakul**. 2017. Prevalence of toxigenic Clostridium perfringens strains isolated from dried spur pepper in Thailand, *International Food Research Journal*. 24 (3): 955-962.

Phatsaman J., Hongprayoon R., **Mahakarnchanakul W.** 2017. Construction and Characterization of single chain variable fragment-alkaline phosphatase for rapid detection of aflatoxin B1 in an ELISA-based assay, *Journal of the International Society for Southeast Asian Agricultural Sciences*. 23 (1): 79-89.

Awards and Honors

Her research team with Immuno-affinity column specific for aflatoxin detection had awarded for the excellence innovation prize from the NCST (2012) and bronze prize from Taiwan Innovation and Invention Exhibition (2014).

INTERACTION BETWEEN MYCOTOXIGENIC FUNGI AND INDIGENOUS MYCOBIOTA ON THE CO-OCCURRENCE OF MYCOTOXINS IN FOOD CROPS

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¹*Department of Food Science and Technology, Faculty of Agro-industry, Kasetsart University, Bangkok, 10900 Thailand*

²*Mycotoxin Laboratory, Scientific Equipment and Research Division, KURDI, Kasetsart University, Bangkok, 10900 Thailand*

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Abstract

Mycotoxins are toxic secondary metabolites produced by certain fungal species, such as *Aspergillus*, *Fusarium*, and *Penicillium*. Mycotoxins are major food contaminants affecting global food safety and cause economic losses due to their significant toxic effect on both animals and humans. Recent data from the mycotoxin survey in many crops intended used for food and feed productions indicated that the worldwide prevalence of mycotoxins is up to 60-80% and more than 40% of the analyzed samples contained two or more mycotoxins. Various abiotic stresses and competition with other resident organisms are reported among the factors influencing mycotoxin production. The interaction of mycotoxigenic fungi and indigenous mycobiota has an important role in the mycotoxin contamination in food crops. Since crops can be contaminated with mixed fungal species in the field, during post-harvest, storage, and processing, thus it is necessary to conduct the environmental conditions with a mixed culture of mycotoxigenic species. Mycotoxin production can be inhibited by the presence of non-mycotoxigenic fungi, especially non-aflatoxigenic *A. flavus*. In our laboratory, we observed the interaction between mixed mycotoxigenic fungal species such as *A. flavus*, *A. carbonarius* and *A. alliaceus*. Mycotoxin production by each fungus can inhibit or stimulate depending on the fungal strain, population density, and environmental factors. In addition, the change of environmental conditions, in particular temperature and water activity, can alter the competitiveness of some mycotoxigenic fungi resulting in the co-contamination of mycotoxins in food crops.

Keywords: Mycotoxins, biotic factor, fungal competition, mycobiota, food safety

Curriculum Vitae Keynote Speaker 4

Chin-Kun Wang



Place/Date of Birth : Taiwan, 4th February 1966

Present Position : Distinguished Professor

Education

| Education Level | University | Country |
|-----------------|----------------------------|---------|
| Master | National Taiwan University | Taiwan |
| Doctoral | National Taiwan University | Taiwan |

Working Experience

1. Council member of International Academy of Food Science and Technology
2. Former President of International Society for Nutraceuticals and Functional Foods (ISNFF)
3. Fellows of International Academy of Food Science & Technology; ISNFF
4. Honorary president of Nutrition Society of Taiwan
5. Chair, Global Incident Alert Network, Global Harmonization Initiative
6. Dean of Chung Shan Medical University
7. Vice President of Chung Shan Medical University
8. President of Chung Shan Medical University

Research (last five years)

Digestive health
Clinical trial for traditional herbs and nutraceuticals and functional foods
Human metabolism and disorders
Neurodegeneration disease intervention
Anti-virus study

Publication (last five years)

Hui-Fang Chiu, Tung-Yi Lin, You-Cheng Shen, Kamesh Venkatakrisshnan, **Chin-Kun Wang**. 2016. Improvement of green tea polyphenol with milk on skin with respect to antioxidation in healthy adults: A double-blind placebo-controlled randomized crossover clinical trial, *Food & Function*. 7: 893-901.

Yat-Yin Law, Hui-Fang Chiu, Hui-Hsin Lee, You-Cheng Shen, Kamesh Venkatakrisshnan, **Chin-Kun Wang**. 2016. Consumption of onion juice modulates oxidative stress and attenuates the risk of bone disorders in middle-aged and post-menopausal healthy subjects, *Food & Function*. 7: 902-912.

Hui-Fang Chiu, You-Cheng Shen, Ting-Yun Huang, Kamesh Venkatakrisshnan, **Chin-Kun Wang**. 2016. Cardioprotective efficacy of red wine extract of onion in healthy hypercholesterolemic subjects, *Phytotherapy Research*. 30: 380-385.

Mei-Ling Peng, Hui-Fang Chiu, Hsuan Chou, Hui-Ju Liao, Shyan-Tarng Chen, Yue-Ching Wong, You-Cheng Shen, Kamesh Venkatakrisshnan, **Chin-Kun Wang**. 2016. Influence/impact of lutein complex (marigold flower and wolfberry) on visual function with early age-related macular degeneration subjects: A randomized clinical trial, *Journal of Functional Foods*. 24: 122-130.

Hui-Fang Chiu, Yin-Hua Wu, You-Cheng Shen, Shing-Jung Wang, Kamesh Venkatakrisshnan and **Chin-Kun Wang**. 2016. Antioxidant and physiological effects of Si-Wu-Tang on skin and liver: a randomized, double-blind, placebo-controlled clinical trial, *Chinese Medicine*. 11(1): 30-40.

Hi-Huang Chang, Hui-Fang Chiu, Yi-Chun Han, I-Hsien Chen, You-Cheng Shen, Kamesh Venkatakrisshnan, **Chin-Kun Wang**. 2016. Photoprotective effects of cranberry juice and its various fractions against blue light-induced impairment in human retinal pigment epithelial cells, *Pharmaceutical Biology*. 55(1): 571-580.

Chin-Kun Wang. 2016. Passion fruit juice, Chapter 37 in *Handbook of functional beverages and human health*. Ed. By Fereidoon Shahidi and Cesarettin Alasalvar, CRC Press, New York, USA. 455-462.

Sheng-Fu Liu, Yin-Ruei Wang, You-Cheng Shen, Chien-Li, Chen, Chine-Ning Huang, Tzu-Ming Pan, **Chin-Kun Wang**. 2017. A randomized, double-blind clinical study to determine the effect of AnKascIn 568 plus on blood lipid regulation, *Journal of Food and Drug Analysis*. 25(1): 1-8.

Yin-Ruei Wang, Sheng-Fu Liu, You-Cheng Shen, Chien-Li, Chen, Chine-Ning Huang, Tzu-Ming Pan, **Chin-Kun Wang**. 2017. A randomized, double-blind clinical study to determine the effect of ANKASCIN 568 plus on blood glucose regulation, *Journal of Food and Drug Analysis*. 25(2): 409-416.

Hui-Fang Chiu, Bo-Kai Chen, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrisshnan, Oksana Golovinskaia, **Chin-Kun Wang**. 2017. Hypocholesterolemic efficacy of Royal Jelly in healthy mild hypercholesterolemic adults, *Pharmaceutical Biology*. 55(1): 497-502.

Hui-Fang Chiu, Yun-Chien Huang, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Oksana Golovinskaia, Kamesh Venkatakrisshnan, **Chin-Kun Wang**. 2017. Regulatory/modulatory

effect of prune essence concentrate on intestinal function and blood lipids, *Pharmaceutical Biology*. 55(1): 974-979.

Hui-Fang Chiu, Hui-Yu Fu, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, Oksana Golovinskaia, **Chin-Kun Wang**. 2017. Triterpenoids and polysaccharide peptides-enriched *Ganoderma lucidum*: a randomized, double-blind placebo-controlled crossover study of its antioxidation and hepatoprotective efficacy in healthy volunteers, *Pharmaceutical Biology*. 55(1): 1041-1046.

Hui-Fang Chiu, Shin-Ru Huang, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, **Chin-Kun Wang**. 2017. Antimutagenicity, antibacteria, and water holding capacity of chitosan from *Luffa aegyptiaca* Mill and *Cucumis sativus* L. *Journal of Food Biochemistry*. 41(3): e12362 (DOI 10.1111/jfbc.12362)

Hui-Fang Chiu, Chang-Shyue Yang, Hsien-I Chi, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, **Chin-Kun Wang**. 2017. Cyclooxygenase-2 expression in oral precancerous and cancerous conditions and its inhibition by caffeic acid phenyl ester-enriched propolis in human oral epidermal carcinoma KB cells, *Archives of Biological Sciences*. 69(1): 83-91.

Hui-Fang Chiu, Yen-Jung Chen, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, **Chin-Kun Wang**. 2017. Regulatory efficacy of fermented plant extract on the intestinal microflora and lipid profile in mildly hypercholesterolemic individuals, *Journal of Food and Drug Analysis*. 25(4): 819-27.

Chi-Hua Yen, Hui-Fang Chiu, Chuihua Wu, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, **Chin-Kun Wang**. 2017. Beneficial efficacy of various propolis extracts and their digestive products by in vitro simulated gastrointestinal digestion, *LWT-Food Science and Technology*. 84: 281-289.

Hui-Fang Chiu, Jin-Yi Liao, Yan-Ying Lu, Yi-Chun Han, You-cheng Shen, Kamesh Venkatakrishnan, Oksana Golovinskaia, **Chin-Kun Wang**. 2017. Anti-proliferative, anti-inflammatory and pro-apoptotic effects of *Dunaliella salina* on human KB oral carcinoma cells, *Journal of Food Biochemistry*. 41(3): e12349 (DOI: 10.1111/jfbc.12349).

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Tsong-Ming Lu, Hui-Fang Chiu, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, Oksana Golovinskaia, **Chin-Kun Wang**. 2018. Efficacy of fermented goat milk on blood pressure in prehypertensive adults: A randomized, placebo-controlled, clinical trial, *Journal of Food Biochemistry*. 42 (2): E12474. Early view (DOI: 10.1111/jfbc.12474)

Hui-Fang Chiu, Su-Chun Hsiao, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, **Chin-Kun Wang**. 2018. Efficacy of protein rich pearl powder on antioxidant status in a randomized placebo-controlled trial, *Journal of Food and Drug Analysis*. 26(1): 309-317.

Min-Chi Lu, Hui-Fang Chiu, Chih-Ping Lin, You-Cheng Shen, Kamesh Venkatakrishnan, **Chin-Kun Wang**. 2018. Anti-*Helicobacter pylori* effect of various extracts of *ixeris chinensis* on inflammatory markers in human gastric epithelial AGS cells, *Journal of Herbal Medicine*. 11: 60-70.

Chi-Hua Yen, Hui-Fang Chiu, Su-Yu Huang, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrishnan, and **Chin-Kun Wang**. 2018. Beneficial effect of Burdock complex

on asymptomatic *Helicobacter pylori* infected subjects: A randomized, double-blind placebo-controlled clinical trial" *Helicobacter*. doi: 10.1111/hel.12469.

Kamesh Venkatakrisnan, Hui-Fang Chiu, Ju-Chun Cheng, Ya-Hui Chang, Yan-Ying Lu, Yi-Chun Han, You-Cheng Shen, Kun-Shun Tsai, and **Chin-Kun Wang**. 2018. Comparative studies on the hypolipidemic, antioxidant and hepatoprotective activities of catechins enriched Green and Oolong tea in a double-blind clinical trial, *Food and Function*. 9(2): 1205-1213.

Hui-Fang Chiu, You-Cheng Shen, Kamesh Venkatakrisnan and **Chin-Kun Wang**. 2018. Popular functional foods and nutraceuticals with lipid lowering activity and in relation to cardiovascular disease, dyslipidemia, and related complications: an overview, *Journal of Food bioactives*. 2: 16-27.

Anat Elmann, **Chin-Kun Wang**, David Vauzour. 2018. Polyphenols targeting brain cells longevity, brain's redox status, and neurodegenerative diseases. *Oxidative Medicine and Cellular Longevity*. <https://doi.org/10.1155/2018/7402795>

Hui-Fang Chiu, You-Cheng Shen, Kamesh Venkatakrisnan, **Chin-Kun Wang**. 2019. Food for Eye Health: Carotenoids and Omega-3 Fatty Acids In: Melton, L., Shahidi, F., Varelis, P. (Eds.), *Encyclopedia of Food Chemistry*, vol. 3, pp. 313–322. Elsevier.

Kamesh Venkatakrisnan and **Chin-Kun Wang*** 2019. Role of various Functional foods in endurance sports- Book chapter in *Extreme and Rare Sports: Performance Demands, Drivers, Functional Foods and Nutrition*, CRC Press, Taylor & Francis group, NM (Elsevier- in press).

Miao-Yu Liao, You-Cheng Shen, Hui-Fang Chiu, Siew-Moi Ten, Yan-Ying Lu, Yi-Chun Han, Kamesh Venkatakrisnan, Shun-Fa Yang, **Chin-Kun Wang**. 2019. Down-regulation of partial substitution for staple food by oat noodles on blood lipid levels: A randomized, double-blind, clinical trial, *Journal of food and drug analysis*. 27(1):93-100.

Kamesh Venkatakrisnan, Hui-Fang Chiu, **Chin-Kun Wang**. 2019. Popular functional foods and herbs for the management of type-2-diabetes mellitus: A comprehensive review with special reference to clinical trials and its proposed mechanism, *Journal of Functional Foods*. 57:425-38.

Kamesh Venkatakrisnan, Hui-Fang Chiu, **Chin-Kun Wang**. 2019. An extensive review on popular functional foods and nutraceuticals against obesity and its related complications with a special focus on randomized clinical trials, *Food & Function*. 10 (5): 2313-2329.

Hui-Fang Chiu, Shine-Ling Huang, You-Cheng Shen, Yi-Chun Han, Kamesh Venkatakrisnan and **Chin-Kun Wang**. 2019. Inhibitory Effect of Grape Seed Polyphenol Extract and Vitamin C on Melanogenesis in Cultured B16-F1 Melanoma Cells, *International Journal of Pharmacology*. 15 (5): 533-541.

Tsong-Ming Lu, Hui-Fang Chiu, Yi-Mei Chen, You-Cheng Shen, Yi-Chun Han, Kamesh Venkatakrisnan and **Chin-Kun Wang**. 2019. Efficacy of balanced nutrition meal replacement diet with altered macromolecule composition along with a caloric restriction on body weight control, *Food & Function*. 10: 3581-3588.

Hui-Fang Chiu, Hung-Ming Wang, Youcheng Shen, Kamesh Venkatadrishnan and **Chin-Kun Wang**. 2019. Anti-inflammatory properties of fermented pine (*Pinus morrissonicola* Hay.) needle

on lipopolysaccharide-induced inflammation in RQW264.7 macrophage cells, *J. Food Biochem.* 43(11):e12994. doi: 10.1111/jfbc.12994.

Hui-Fang Chiu, You-Cheng Shen, Kamesh Venkatakrishnan and **Chin-Kun Wang**. 2019. Food for Eye Health: Carotenoids and Omega-3 Fatty Acids In: Melton, L., Shahidi, F., Varelis, P. (Eds.), *Encyclopedia of Food Chemistry*, vol. 3, pp. 313–322. Elsevier. (Chapter in a book)

Yi-Chun Han, Ju-Yu Wu & **Chin-Kun Wang**. 2019. Modulatory effects of miracle fruit ethanolic extracts on glucose uptake through the insulin signaling pathway in C2C12 mouse myotubes cells, *Food Science & Nutrition*, 7(3), 1035-1042.

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Oksana Golovinskaia, **Chin-Kun Wang**. 2021. Review of Functional and Pharmacological Activities of Berries, *Molecules*. 26(13), 3904 <https://doi.org/10.3390/molecules26133904>

Sheng-Chang Lin, Hsien-Chun Tseng, Hui-Fang Chiu, Shuru Zhuang, Ming-Yi Fan, Hsin-Yi Lu, Yi-Chun Han, You-Cheng Shen, Kamesh Venkatakrisnan and **Chin-Kun Wang**. 2021. Role of Ready to Drink Nutritional Formula (Protison Enriched with ω -3 FA and BCAA) Supplemented by Nasogastric Tube Feeding in Various Cancer Patients: A Clinical Trial, *International Journal of Pharmacology* (DOI: 10.3923/ijp.2021.113.121)

Sheng-Chang Lin, Hui-Fang Chiu, Yun-Chen Hsieh, Kamesh Venkatakrisnan, Oksana Golovinskaia and **Chin-Kun Wang**. 2021 Enhanced bioavailability of EGCG after esterification and complexation with fish oil (DHA/EPA), *International Journal of Pharmacology* (in print).

Awards and Honors

2018 Excellent Academy Award of Nutrition Society of Taiwan

2018 Excellent Academy Award of Health Food Society of Taiwan

2018 Fellow, International Society for Nutraceuticals and Functional Foods

2016 Fellow, International Academy of Food Science and Technology

2012~21 Who's who in the world
2012~21 Who's who in Asia
2011~21 Cambridge certificate for outstanding medical achievement
2009~21 Who's Who in Healthcare and Medicine
2009~2017 Who's Who in the world
2009 Merit Award, International Society for Nutraceuticals and Functional Foods
2009 Outstanding alumnus of National Taiwan University
2009 Excellent Academy Award of Taiwan Association for Food Science and Technology
2003 National Award of Biotechnology and Medicine
2003 Excellent professor award, Chung Shan Medical University
2000 Research award of National Science Council, Taiwan
2000 Excellent student guide award, Chung Shan Medical University
1998 Research award of National Science Council, Taiwan
1997 Research award of National Science Council, Taiwan
1996 Research award of National Science Council, Taiwan
1996 Excellent professor award, Chung Shan Medical University
1994 Research award of National Science Council, Taiwan

DIETARY INTAKE AND INFLAMMATION

Chin-Kun Wang

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Abstract

Inflammation is very critical for many diseases. Natural food resources and dietary intake can greatly improve the inflammation and terminate the advanced disease development. Phytochemicals from daily vegetables, fruits and foods are found to suppress the inflammation by specific pathway. Propolis is obtained from bees' nest and contains thousands of phytochemicals. Propolis extracts were used to evaluate the bioactivities by using cell model, animal model and human clinical trial and confirm its real application. Results clearly show that, propolis extracts greatly inhibit the inflammation through NFκ-B in cell and animal models. Intervention in oral submucous fibrosis, leukoplakia and oral carcinoma patients strongly showed propolis extract improve the inflammation, syndrome and reduce tumor size. Caffeic acid phenethyl ester (CAPE) was the major contributor for antiinflammation. CAPE dose-dependently inhibited IFN-γ-induced Try701 and Ser 727 phosphorylation in STAT1. It was also observed that CAPE inhibited promoter activity of IP-10 gene and the secretion of IP-10 protein. CAPE has very poor bioavailability and stability, its modified similar compound K36 were also found positive effect on neurodegeneration.

Keywords: Propolis, NFκ-B, CAPE, STAT1, K36

Curriculum Vitae Keynote Speaker 5

Indah Epriliati



Place/Date of Birth : Blitar, Indonesia, April 13th 1970

Present Position : Head of Research Laboratory, Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University

Education

| Education Level | University | Country | Field of Study | Graduated |
|-----------------|-------------------------------------|-----------|---|-----------|
| Bachelor | Gadjah Mada University (GMU) | Indonesia | Agricultural Product Processing | 1984 |
| Master | Bogor Agricultural University (BAU) | Indonesia | Food Science/Engineering | 1988 |
| Doctoral | The University of Queensland | Australia | Food Technology and Sciences/Food Science | 1998 |

Working Experience

lecturer at the Faculty of Agricultural Technology, Widya Mandala Surabaya Catholic University, since 1995

Research Experience (Last Five Years)

| Year | Research topics/titles | Position in Team | Research funding |
|------|---|------------------------|--|
| 2019 | Sintesa Biodiesel dari kemiri sunan dengan nano katalis biosilika sekam padi menggunakan microwave reactor sebagai bahan alternatif terbarukan | Principal investigator | 157.605 million rupiahs Ministry of Research, Technology, and Higher Education (MoRTHE) |
| | The development of indigenous commodities of Indonesia using nanotechnology for red fruit functional food stability | Collaborator Member | 199 million rupiahs Ministry of Research, Technology, and Higher Education (MoRTHE) |
| | Scaling up of functional food ingredient to a pilot plan scale with a model of production house based on ' <i>health oriented processing</i> ' | Principal investigator | 167.5 million rupiahs Ministry of Research, Technology, and Higher Education (MoRTHE) |
| | The development of organic fertilizer 'ribon atom 1' for food plants through production technology improvement | Principal investigator | 350 milion rupiahs MoRTHE |
| | Optimizing Health Ingredient Stability and Efficacy of Local and Underutilized Commodities in Indonesia: Velvet Bean Tempe Nutriomic/Metabolomic For Economic Growth. | Principal investigator | 81 million rupiahs Ministry of Research, Technology, and Higher Education (MoRTHE) |
| | Konstruksi sosial masyarakat desa hutan menjadi pelaku agroindustri pangan berbasis labu kuning dalam pengentasan kemiskinan dan kemandirian pangan wilayah pedesaan | Member | 90 million rupiahs Ministry of Research, Technology, and Higher Education (MoRTHE) |
| 2018 | Scaling up of functional food ingredient to a pilot plan scale with a model of production house based on ' <i>health oriented processing</i> ' | Principal investigator | 140 million rupiahs Ministry of Research, Technology, and Higher Education (MoRTHE) |
| | The development of organic fertilizer 'ribon atom 1' for food plants through characterization of nutritional, self-life, and its derivative products | Principal investigator | 500 million rupiahs MoRTHE |

Publication (Last Five Years)

Zita Letviany Sarungallo, Budi Santoso, Mathelda K. Roreng, Ester Papuani Yantewo, **Indah Epriliati**. 2021. Karakteristik Fisiko-kimia, Organoleptik, dan Kandungan Gizi Mayones Minyak Buah Merah (*Pandanus conoideus*), *AgriTECH*, **in press**

H. Hindarso, **I. Epriliati**, D. Hoerudin, S. Yuliani. 2021. Synthesis and Characterization of Biosilica from Rice Husks as a Catalyst for the Production of Biodiesel, *Fine Chemical Engineering*. 2 (2): 38-43.

Epriliati, I., Kuswardani, I., Armunanto, B. 2020. Pengembangan Industri Pupuk BAOC Ribon Atom I melalui Penyempurnaan TTG Teknologi Produksi, *Jurnal Teknologi, Industri, dan Rekayasa(JTIR)*.1(1): 1-8.

Epriliati, I. 2020. Minimum water consumption method screening of velvet bean (*Mucuna sp.*) processing to produce functional food ingredients, *Journal of Functional Food and Nutraceutical*. 2(1): 1 – 28.

Haryono, E. Siswati, **I. Epriliati**, M. Muchid, I. P. P. Salmon. 2020. Supply Chain Management Model at Pumpkin Production Center in East Java, *Buletin Penelitian Sosial Ekonomi Pertanian Fakultas Pertanian Universitas Haluoleo*. 2020:22(2):58-65.

Haryono, Endang Siswati, **Indah Epriliati**, Indra P P Salmon. 2020. Commercialize the Cultivation of Yellow Pumpkin Plants, *Review of European Studies*. 12(1): 66 – 74.

Balogun, O.I., **Epriliati, I.**, Otunola, E.T., Agboola, H.A. 2017. *Rhizopus oryzae* FNCC 6010, *Rhizopus oligosporus* FNCC 6011, and their hybrid lowered antioxidant capacity in velvet beans compared to germination, *Internat. Food Res. Journal*. 24(4): 3363-3376.

INNOVATION OF FOODS IN THE NEW NORMAL ERA REQUIRED GENOME BASED FOOD SCIENCE AND TECHNOLOGY REVOLUTIONARY FOR HEALTHY LIFE

Indah Epriliati, Ph.D

*Department of Food Technology, Faculty of Agricultural Technology, Widya Mandala Surabaya
Catholic University, Indonesia*

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Abstract

The so-called New Normal Era is the world after SARS-CoV-2 attacked human initially in December 2019 -official consensus in the world-. Then the world has been paralyzed since 2020 and it is predicted losses reaching \$22 trillion in 2025. What will it be? How will foods contribute human being to staying healthy? What are lessons learnt from the pandemic for the young to face such diseases cycle in the future? What food innovations will be required in the future? Meanwhile, the viral mutations generated multi facet symptoms of Covid-19 and transmission speeded it up in the population. Furthermore, pathogenesis of the virus involves epigenetic mechanisms which are well-established i.e. DNA methylation and histone modifications to switching -on or -off the gene expression of diseases or being accessed by the viral infection. We are in the genome sci-tech levels. Based on the mutation rates it is noteworthy that the core solution is the capacity of human resources mastering the key science to cope various situations in the globe, with different strengths and weaknesses. To be fruitful, innovations of food products necessarily support health system. First, food teaching and curricula require a revolutionary balance between health and food leisure experiences implementing nutriomics, nutrigenomics, nutrigenetics. Second, pitching uncommon society eating practices as surveillance using data risk analysis of hazards including potential compounds activators/inhibitors of epigenetic machinery. The last is a living style that preserves the earth capacity to supporting human life. Overall, it is a sustainable food system and health might useful in the future: 1) organic food to train immune system; 2) functional food development for family strengths; 3) nutraceutical resources for health practitioners to recommend healthy diets for patients; and 4) only developing safe and environmentally friendly food technologies and industries.

Keywords: genome based food sci-tech, teaching and curricula revolutionary; epigenetics, nutriomics, nutrigenetics/nutrigenomics, sustainable food system

Curriculum Vitae Keynote Speaker 6

Dr Ihab Tewfik



Present Position : Senior Lecturer in Global Nutrition
Division of Food, Nutrition and Public Health
University of Westminster.
Scientific Assessor - UK National Commission
for UNESCO: Newton Prize [since 2019-
present]

Education

Ihab Tewfik graduated from University of Alexandria and completed his Master of Public Health [MPH] and Doctorate of Public Health [DrPH], Nutrition Department, University of Alexandria. He also holds PhD from London South Bank University. He is a registered Public Health Nutritionist and Fellow of the Royal Society of Public Health, UK.

Teaching and Professional Experience

| | |
|---------------|---|
| 1992-1999 | Assistant Lecturer, Nutrition Dep. Institute of Public Health, Alexandria University |
| 1999-2008 | Lecturer, Nutrition Dep. Institute of Public Health, Alexandria University |
| 2008-2010 | Associate Professor, Nutrition Dep. Institute of Public Health, Alexandria University |
| 1999-2001 | Post-Doc. University of Westminster |
| 2002- Present | Senior Lecturer, University of Westminster [UoW] |

| | |
|-----------|--|
| 2007-2008 | Programme Leader MSc Public Health, Nutrition & Physical Activity, UoW |
| 2009-2010 | Programme Leader MSc Public Health, Nutrition & Physical Activity, Uo |

Working Experience

1. Fellow of the Royal Society of Public Health (FRSPH) since 2005.
2. Registered Nutritionist (Public Health) at the Association for Nutrition -UK (RNutrPH) since 2001 [Registration number 952].
3. Fellow of the Higher Education Academy (RPHEA) since 2002.
4. Editor-in-Chief for the International Journal of Food, Nutrition and Public Health (IJFNPH) – WASD Publisher, UK.

Research Experience (Last Five Years)

1. **52,000** (GBP) FSA-Grant (1999-2002): To refine, validate and carry out interlaboratory trials using a new Direct Solvent Extraction (DSE) method for the analysis of cyclobutanones in a range of lipid-containing irradiated foods.
2. **62,000** (GBP) FSA-Grant (2001-2003): Feasibility study to assess development of methodology for the analysis of ammonium phosphatide (E442) in cocoa and Chocolate.
3. **20,000** (GBP) Grant from National Cancer Research Institute – UK (2006-2008): Biomarkers for predicting breast radiotherapy induced side-effect.
4. **1,520** (GBP) Grant from The Wellcome Trust (July-August 2011) 'Evaluating the effectiveness of moderate vs. vigorous physical activity levels on physiological and biochemical indices among healthy individuals: A pilot intervention'.
5. **25,000** (GBP) Grant from The Emirates Foundation Funds (2010-2012) Childhood Obesity Prevention in Emirates (COPE): A Pilot school-based Intervention study.
6. **60,630** (GBP) Grant from Social Science Research Unit of the UK Food Standards Agency 'To conduct a study to identify proposals for alternative controls to E.coli 0157 amongst small food businesses' (FS615017) (2014 – 2015).
7. **20,000** (GBP) Ministry of Health, UAE. Vitamin D status and determinants of deficiency among pregnant women- United Arab Emirates (2014-2015).
8. **42,000** (GBP) Attitudinal Determinants of diet and lifestyle in women. <http://www.womenattitude.org/the-attitude-study-team/>
9. **20,000** Global Challenges Research Fund (GCRF), Promoting Physical Activity to reduce the risk of CVD in Egypt.
10. **9,000** Global Challenges Research Fund (GCRF), Ascertaining the efficacy of an indigenous tailored nutrition intervention to improve health outcomes of children aged 6-23 months in Wolisso, Ethiopia.

Publication (Last Five Years)

Bener, A., Kamal, A., **Tewfik, I.** & Sabuncuoglu, O. (2006). Prevalence of dieting, overweight, body image satisfaction and associated psychological problems in adolescent boys. *Nutrition & Food Science* 36 (5), 295 – 304.

Bener, A. and **Tewfik, I.** (2006). Prevalence of overweight, obesity, and associated psychological problems in Qatari's female population. *The International Association for the Study of Obesity. Obesity reviews*; 7(2), 139–145.

Bener, A., Al-Mahdi, H. S., Ali, A.I., Al-Nufal, M., Vachhani, P.J. and **Tewfik, I.** (2011). Obesity and low vision as a result of excessive internet use, and television viewing. *International Journal of Food Sciences and Nutrition*, 62(1): 60-2.

Bener A., Al-Mahdi H.S., Al-Nufal M., Ali A. I., Vachhani P. J., **Tewfik, I.** (2012) Association between Childhood Computer Use and Risk of Obesity and Low Vision. *Public Health Frontier*, 1 (2); 1-7.

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Brock C, Whitehouse J, **Tewfik I**, Towell T. (2014) American skullcap (*Scutellaria lateriflora*): a randomised, double-blind placebo-controlled crossover study of its effects on mood in healthy volunteers. *Phytotherapy Res.* 28 (5): 692-698.

Amlogu A.M., **Tewfik S.**, Wambebe C. Godden K. and **Tewfik I.** (2014) Tailored Functional Recipe (TFR) approach to delay the progression of HIV to AIDS among People Living with HIV (PLWH) in Abuja, Nigeria. *Pharmacology & Pharmacy*, 5, 926-936.

Meguid, N.A., Anwar, M., Zaki, S.T., Kandeel, W., Ahmed, N. H. and **Tewfik, I.** (2015) Dietary Patterns of Children with Autism Spectrum Disorder: A Study Based in Egypt. *Open Access Macedonian Journal of Medical Sciences*, 3(2):262-267).

Amlogu A.M., **Tewfik S.**, Wambebe C. and **Tewfik I.** (2016) A comparative study: long- and short-term effect of a nutrition sensitive approach to delay the progression of HIV to AIDS among people living with HIV (PLWH) in Nigeria. *Functional Foods in Health and Disease*; 6(2):79-90.

Kapoor, N., Naufahu, J., **Tewfik, S.**, Bhatnagar, S., Garg, R. and **Tewfik, I.**(2016) A Prospective Randomized Controlled Trial to Study the Impact of a Nutrition-Sensitive Intervention on Adult Women With Cancer Cachexia Undergoing Palliative Care in India. *Integrative Cancer Therapies*. April-June: 1–11, DOI: 10.1177/1534735416651968.

Hussein I, Taha Z, **Tewfik I**, Badawi S, Siddieg H, Adegboye AR, McGrady K. (2016) Risk factors for maternal vitamin D deficiency within the United Arab Emirates. *J Preg Child Health* 2016; 3:5. 1000276.

Ali HI, Platat C, El Mesmoudi N, El Sadig M, **Tewfik I** (2018) Evaluation of a photographic food atlas as a tool for quantifying food portion size in the United Arab Emirates. PLoS ONE 13(4): e0196389. <https://doi.org/10.1371/journal.pone.0196389>.

Al- Joufi F., El- Bana M A., **Tewfik I.** and Anwar M. (2018). Efficacy of co-supplementation therapy with vitamins B9, B12, and D on endothelial dysfunction in streptozotocin-induced diabetic rats. Asian Journal of Pharmaceutical and Clinical Research 11(9):407-410.

Bener A., Al-Hamaq A. O.A.A., Öztürk M. and **Tewfik I.** (2019) Vitamin D and elevated serum uric acid as novel predictors and prognostic markers for type 2 diabetes mellitus. Journal of Pharmacy and Bioallied Sciences {DOI: 10.4103/jpbs.JPBS_240_18}.

Lawal I., **Tewfik I.** and Amlogu A. (2019) Evaluation of health-related quality of life HIV/AIDS patients on highly active antiretroviral therapy in State House Medical Centre Abuja, Nigeria. Journal of Infectious Disease and Immunology.1 (9) 1-14.

Tewfik, I., Amlogu A.M., Tewfik S. and Wambebe C. (2019) Supplementation of Optimum Nutrient-Dense Formula to Modulate HIV Infection in Resource Limited Settings. American Journal of Biomedical Science & Research 5(1) 6-78.

Shrestha S. C., Ghebremeskel K., White K., Minelli C., **Tewfik I.**, Thapa P. and Tewfik S. (2021) Formulation and Characterization of Phytostanol Ester Solid Lipid Nanoparticles for the Management of Hypercholesterolemia: An ex-vivo study". International Journal of Nanomedicine 2021:16 1977–1992 [<https://doi.org/10.2147/IJN.S276301>]

Moonisah Usman, Maria Woloshynowych, Jessica Carrilho Britto, Ivona Bilkevic, Bethany Glassar, Simon Chapman, Martha Ford-Adams, Ashish Desai, Murray Bain, **Ihab Tewfik**, and Emanuela Volpi (2021). Obesity, oxidative DNA damage and vitamin D as predictors of genomic instability in children and adolescents. Int J Obes 45, 2095–2107.

Medical Therapeutic Food [MTF]: The Tailored Food Recipes (TFRs) for a Double Win [Health and Sustainability]

Ihab Tewfik

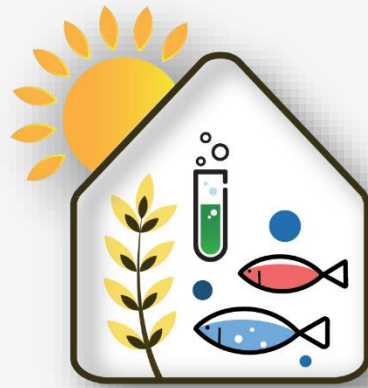
*University of Westminster; 115, New Cavendish Street, London W1W 6UW
United Kingdom*

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Abstract

One billion people struggle with chronic hunger each year, this figure has significantly increased under the current pandemic. People who are hungry are less productive, and more susceptible to chronic diseases. Henceforward, the combined impact of medical therapeutic food (MTF) with global food security has shown to play sensible role in enhancing SDGs, maintaining universal economy, and addressing profile of chronic illnesses. In such context, the pivotal role of food science has heightened the knowledge surround the intrinsic role that MTF plays in reinforcing health of vulnerable individuals. This has subsequently led to an increase in applications of various MTF interventions as mean to modulate chronic NCDs and improve quality of life of the neediest populations. The cornerstone MTF strategy is to develop tailored food recipes (TFRs) that are not limited to elimination of hunger or disease prevention but improving bioavailability of nutrients and sustaining health promotion. With three varieties of optimised TFR meals (iAtta, S-Cool and Amtewa), our research team has significantly improved the quality of life in advanced cancer patients receiving comprehensive palliative care in India, enhanced the schools nutrition programme in Ghana, and delayed the progression of HIV to AIDS of people living with HIV in Nigeria. These TFR meals have transformed MTF protocols by employing indigenous nutrient-dense food ingredients that are locally produced thus considered sustainable, viable alternative to attend food insecurity and balance nutritional status of consumers. The novelty of the TFR concept lies in linking metabolic disease pathways with nutritional requirements of target population and their specific dietary preferences to sustain long-term optimum health outcome.

Keywords: Tailored Functional Recipes; Global Health; Chronic Disease; Cancer cachexia, Schoolchildren Growth and Development



Parallel Session

Food Availability (FA)

Curriculum Vitae Invited Speaker

Umi Purwandari



Place/Date of Birth : Kebumen, August 1964
Present Position : Lecturer at Study Program of Agroindustrial Technology,
University of Trunojoyo Madura

Education

- **Undergraduate degree;** Faculty of Agriculture Technology, Gadjah Mada University, Indonesia
- **Master degree;** Department of Applied Biology and Biotechnology, Faculty of Biotechnology and Health Sciences, Royal Melbourne Institute of Technology University, Melbourne, Australia
- **Doctoral degree:** Department of Biotechnology and Health Sciences, Faculty of Science, Victoria University, Melbourne, Australia

Working Experience

- 1988-2002 : Lecturer at Bangkalan University, Madura
- 2002- present : Lecturer at University of Trunojoyo University

Publications (last five years)

Umi Purwandari, M. Agri Bimantara, Darimiyya Hidayati. 2017. Functional properties of gluten-free gathotan noodle: lipid profile and satiety power. *International Food Research Journal*. 24(2):672-678.

Umi Purwandari. 2018. Metabolites of *Botryodiploda theobromae* for therapeutic agent and food industry. *International Food Research Journal*. 25(3):884-889

Ensiklopedia Pengolahan Pangan Indonesia 1 (kontributor), 2017

Ensiklopedia Pengolahan Pangan Indonesia 2 (kontributor), 2018

Mikrobiologi Industri (kontributor, editor). 2018

Umi Purwandari, U. Farida, V.P.P Dianing, L.Y. Sari, A.G. Kurniawati, A. Warnianti, Elys Fauziyah. 2018. Texture, sensory, antioxidant, and blood glucose profile of gluten-free taro

and banana noodles using gathotan flour as texturing agent, *International Food Research Journal*. 25(6): 2459-2466.

Umi Purwandari, Zeilina R. Pangestika, Rakhmawati, M. Fuad Fauzul Muktamar. 2019. Physical, chemical, and microbial changes during fermentation of bungkil: a traditional snack originated from banyumas, Central Java. Proceeding 2nd SIS Seafast International Seminar. Azis B. Sitanggang, Lilis Nuraida (Editors.), Bogor, Indonesia. 4-5 September 2019.

Perspektif Global Ilmu dan Teknologi Pangan. (Kontributor)

Junaidi, **Umi Purwandari**, Raden Faridz, 2021. Formulasi Crackers Fungsional Dari Komposit Tepung Jagung Dan Daun Tujuh Bilah (*Pereskia scharosa* G.). Prosiding. Seminar Nasional Teknologi Dan Industri Pangan Unisri "Peran Pangan Fungsional Berbahan Baku Lokal Di Era Pandemi Covid-19". Irvia Resti Puyanda, Vivi Nuraeni, Onne Akbar Nur Ihsan (Editor), Solo, Indonesia. 12 Juni 2021.

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Food Availability During Pandemic: Impact on Children Nutritional Status and Role of underutilized Local Food

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Abstract

Food availability during the Covid-19 pandemic positively correlates to household income. Reduced in buying power due to unemployment led to insufficient quality food intake, further worsened the health quality of vulnerable groups where 14% of them were children. In Indonesia, wasted, micronutrient deficiency, obesity, and stunting in children existed before the pandemic, with two million malnutrition cases, and seven millions stunting cases in children under five years old. The number was predicted to increase to 15%, if not handled properly. Disruption of health services further increased their vulnerability to health problems. Several coping strategies became commonly applied during the pandemic, including increasing consumption of functional foods, herbs, high-protein foods, utilization of local foods, and growing own food in underutilized spaces including rooftops. Special attention was given to underutilized but nutritious and functional local foods, to give more opportunity for low income groups to acquire sufficient food for improving their health status. A number of local low-cost food source abundant in Madura were identified as potentially preventive towards nutritional problem in children, including sea cucumber, moringa, vegetable hummingbird, java plum, ancovies, palmyra, annual seablite, wild passionfruit, wild tomatillo, Indian jujube, various roots and tubers, bay fruit, cowpea, jack bean, and various sea mollusca. Their role in preventing malnutrition was discussed, while possible new products suitable and appealing for children were also described.

Keywords: pandemic, children, nutrition, local foods, underutilized

Implementation of Distribution Permits in the Development of Processed Seafood Products in Semarang City

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Abstract

The development of food products to meet safety and quality standards for consumers needs to be carried out for food micro, small and medium enterprises (MSMEs) and is one of the requirements for obtaining distribution permits. Food distribution permit is a permit granted to food circulating in Indonesia and must be owned by business actors. This study was identified the process of developing food products from planning to improve product quality to the stage of implementing a distribution permit for food products. Data was collected through literature study, interviews, and direct observation in the field. Interviews and field observations were conducted on 25 MSME actors who processed seafood in Semarang City. The results of the analysis were obtained by comparing the data from observations and interviews and then deepened with a literature study. The results showed that as many as 12 MSMEs processed seafood products had developed and implemented marketing permits for the food products made. The implementation of distribution permits in food products was important because it could increase consumer confidence and provided peace for producers regarding the legality of marketed food products.

Keywords: Implementation, distribution permit, seafood product

Characterization of Toothpaste Made With Non-fermented Cocoa Powder (*Theobroma cacao L*) Againsts Bacteria *Streptococcus Mutans*

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Abstract

Cocoa beans contain phenolic compounds including catechin, epicatechin, anthocyanin, proanthocyanidin, phenolic acids, condensed tannins, alkaloids, teroid/terpenoids, flavonoids, and some minor components. The phenolic compounds have antibacterial and anti-inflammatory effects. This research was aimed to determine the physico-chemical properties and effects of toothpaste containing active components of non-fermented cocoa powder on the growth of *Streptococcus mutans* bacteria. This study used a completely randomized design by varying concentrations of non-fermented cocoa powder used as an active ingredient in toothpaste. Toothpaste was prepared with active ingredients of non-fermented cocoa powder with a concentration of 1.0; 2.5; 4, 0; 5.5% (w/w), and each treatment was repeated three times. The results indicated that the four concentrations of non-fermented cocoa powder contained in toothpaste showed an inhibitory effect against 20.936; and 21.039 mm respectively. The fourth toothpastes had a viscosity above 400 dps, pH value above 7, therefore met SNI 01-3524-1994 standard. The panelist scored this toothpaste with 3.

Keywords: non-fermented cocoa powder, antibacterial, active compound, *Streptococcus mutans*, toothpaste

Incorporation Of Coconut Dregs Flour Into Gluten-Free Purple Sweet Potato Crackers: A Study On Texture And Color Profile

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Abstract

The foremost challenge in the development of gluten-free crackers from Indonesian local tubers is its textural properties. In this work, we incorporated coconut dregs flour (CDF) into purple sweet potato (PSP) in crackers making, which aimed to improve their physical and sensory characteristics, since CDF is a texture modifier with high content of fiber (around 30%) and protein (around 17%). The crackers were prepared with three different levels of PSP:CDF (100:0, 85:15, 70:30, w/w) and margarine (15, 20, 25%). Parameters tested include hardness, fracturability, lightness (L), redness (a), yellowness (b) and water content. Statistical analysis showed that the addition of margarine, the proportion of purple sweet potato and coconut dregs flour and the interaction of the two factors had a significant effect ($p < 0.05$) on the hardness, fracturability, lightness, redness, and water content of crackers. The results exhibited that hardness and fracturability of the crackers increased as more DRF was added, while they declined as margarine concentration increased. Sample prepared with PSP:DRF of 70:30 and 15% margarine resulted in the highest hardness (75.689 gf) and fracturability (1109.874 gf). In terms of colour, the rising level of margarine and CDF increased brightness (L) and redness (a), but decreased yellowness (b). It can be concluded that crackers prepared by PSP:CDF (70:30) and 15% margarine was significantly superior in hardness, fracturability, color profile, and water content to the rest of combinations.

Keywords: Coconut Dregs Flour, Color, Crackers, Purple Sweet Potato, Texture

Enhancement of Local Agricultural Product *Xanthosoma sagittifolium* as the Food Ingredient and Industrial Raw Material

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Abstract

Food product diversification made based on local ingredients, especially tubers, has become an important program of the Indonesian government in support of food security. *Xanthosoma sagittifolium* is one of the tuber plants which is abundant especially in Bali and also in Indonesia. Utilization of this tuber is still hampered by the content of oxalate compound which causes an increased risk of kidney stones and lower mineral absorption in the body. This research aimed to overcome the lack of its potential as a comestible and industrial raw material. The guidelines for reducing oxalate content from *X. sagittifolium* were developed by utilizing salt (NaCl) solution (K : 0%, 5%, 10%, and 15%) with soaking time (W : 10, 20, and 30 minutes) and proceeded into flour. The effect of treatment to the parameters (water content, ash content, starch content, total oxalate compound, and the degree of white flour) was studied by using analysis of variance tool (ANOVA) and continued with Duncan Multiple Range Test (DMRT) for the data showing significant effect. We found that the lowest water content was showed by K3W1 with 3,293%; the lowest ash content was showed by K0W1 with 5,171%; K1W3 showed the highest starch content with 51,195%; K3W3 contained the lowest total oxalate compound with 394,3262 mg/100g, and for the best white flour degrees were showed by K3W3 with a value of 67.0783%. We concluded that treatment as simple as we showed, can be utilized to prepare *X. sagittifolium* as an alternative for comestible and industrial raw material.

Keywords: food ingredient, industrial raw material, oxalate, salt solution, soaking time

People's Consciousness In Mental And Physical Health And Product Availability In Food Nutrition And Consumption In Urban Life During This New Normal Era: A Systematic Review

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Abstract

COVID-19 pandemic changes our value in physical and mental health. To support that, people turned to fundamental things, such as food and diet. In urban areas, the food availability can be challenging in terms of its quality and quantity. Access to unhealthy food is easy while maintaining fresh food consumption is found to be challenging. Studies were retrieved through systematic literature review. This paper aims to evaluate the connection between people's consciousness in mental and physical health, product availability and food nutrition, as well as consumption in urban life during this new normal era. It was found that this pandemic has a different effect on the higher and lower-income people. Higher-income people had the tendency to worry less about food insecurity and worry more about physical and mental health during this era. Thus, they turned to the style of higher fruit and vegetable consumption. They also had lower meat and processed food consumption. Meanwhile, food insecurity affects mental health on people with lower income. They had the tendency to reduce fruit, vegetables, meat, and other fresh product consumption and consume more processed and unhealthy food.

Keywords: COVID-19, food availability, food consumption, lifestyle, urban

Nutritional, physical, and sensory properties of fish crackers produced from the head of catfish (*Clarias gariepinus*)

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Abstract

Catfish processing produces large quantities of by products such as fish heads and has not been utilized. The head of the catfish has high nutritional content so that it has the potential for the development of food products, such as crackers. This research aimed to produce crackers made from catfish heads and to evaluate the nutritional, physical, and sensory properties of the crackers produced. The stages of this research included the preparation of catfish head flour (CHF) and catfish head crackers (CHC). Formula of catfish head crackers with ratio of tapioca flour (TF): catfish head flour (CHF) as follows: CHC 0 (100: 0); CHC 1 (90:10); CHC 2 (80:20); CHC 3 (70:30); and CHC 4 (60:40). Furthermore, the crackers were analyzed for their nutritional, physical, and sensory properties. The results showed that CHF had high protein, calcium, and phosphorus contents, respectively, 30.89% db; 21.83% db; 10.26% db. The CHF essential amino acid profile was also high, such as leucine, lysine, threonine, valine, and phenylalanine. The CHC 3 had higher protein contents, calcium, phosphorus than controls ($p < 0.05$). The CHC 3 had good color and texture and could be preferred by panelists in all sensory attributes. Based on nutritional, physical, and sensory properties, CHC 3 was the best cracker treatment. This study indicated that catfish heads as food ingredients could produce nutritious and preferred crackers by panelists.

Keywords: By product, catfish head, fish crackers, nutritional, sensory properties

The Role Of Online Transportation In Helping Households To Access Food During The COVID-19 Pandemic In Makassar City

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Abstract

The COVID-19 pandemic has become a serious problem in the world in the last two years, including in Indonesia. This problem causes the government to treat the PSBB/Lockdown policy, where the policy can have an impact on the difficulty of certain people in accessing food. One technology that is expected to help people to access food is the presence of online transportation. This study aimed to analyze (1) the role of online transportation in helping households to access food and (2) the diversity of household food access during the COVID-19 pandemic in Makassar City. This research was designed using qualitative and quantitative approaches. Data collection was carried out using survey and in-depth interviews methods. Data were analyzed qualitatively and quantitatively descriptively. The results showed that online transportation had a less role in helping the households to access food during the COVID-19. Based on 200 respondents who were involved in the survey, there were only 27.50-41.00% who routinely used online transportation to access food during the COVID-19 pandemic. The dominant types of food accessed through online transportation are snacks food, side dishes, vegetables and staple food substitutes. The reason for most households to use online transportation services to access food during a pandemic is because it is more practical and they do not have to leave the house to shop for food. Meanwhile, other households which did not use online transportation were dominant due to the limitation of financial condition during the lockdown period.

Keywords: online transportation, food access, household, covid-19 pandemic

Formulation Of Tinuktuk Recipes (Traditional Ingredients Of The Batak Simalungun Ethnic) And Potential As Functional Food

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Abstract

The potential of traditional wealth is expressed by the ethnic diversity that exists in the territory of Indonesia. In North Sumatra, the Batak Simalungun ethnic group has a traditionally processed and concoction called *Tinuktuk*, especially given to postpartum women. *Tinuktuk* is made by mashing (tuktuk = mashed) herbs and spices as the ingredients. Herbs and spices have been used as medicine for long time because they contain thousands of beneficial phytochemicals and well-known specialty compounds, including alkaloids, polyphenols including flavonoids, and terpenoids. The purpose of this study was to explore the formulation of tinuktuk recipes in the Batak Simalungun community. The method of data collection was by means of interviews and participant observation. The total of six *Tinuktuk*'s makers were interviewed; the oldest was 75 years old and has been making *Tinuktuk* for 37 years. The formulation of the *Tinuktuk*'s recipe obtained differed from one *Tinuktuk* maker to another and the ingredients used were varied from 8 to 15 types. However, there were seven similar basic ingredients, namely red ginger, *kencur*, onion, garlic, black pepper, candlenut and salt. Other additional ingredients according to each *Tinuktuk*'s maker are turmeric, curcuma, *temu kunci*, *andaliman*, cloves, galangal, lemongrass, rice, pumpkin seeds, cucumber seeds, chives, *kincung* fruit, and several types of tamarind. Accordingly, maintaining the local wisdom of the Batak Simalungun culture can be done by standardizing *Tinuktuk* formulation through scientific studies, synergism of the best herbs and spices for health as functional food.

Keywords: tinuktuk, herbs, spices, batak simalungun

Organoleptic Characteristics Of Banana Flakes Based On Maturity Level Of Ambon Banana (*Musa Paradisiaca*)

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Abstract

Bananas are rich in minerals such as potassium, magnesium, iron, phosphorus, and calcium, contain vitamins A, B6 and C and contain serotonin which is active as a neurotransmitter for intelligence. Bananas can be processed into semi-finished products or finished products. One of the semi-finished products from bananas is Banana Flour. Banana flour is an alternative to banana preservation because bananas are perishable fruits. Banana flour can be made from unripe bananas and ripe bananas. The types of breakfast cereals that are most consumed or preferred by consumers are products in the form of breakfast drinks, extruded products and flakes. Flakes belong to the cereal milk food group. The purpose of this study was to determine the organoleptic characteristics of banana flakes made from banana flour with different ripeness levels of bananas. The research methodology included organoleptic test with the hedonic test method on a scale of 1-7, with a total of 30 panelists. The test parameters carried out include color, taste, aroma, hardness, crunchiness and overall acceptance. The results showed that the sample a1b3 (ripe banana flour, 25 minutes of roasting) was the most preferred by the panelists, with test values for color 5.40, taste 5.90, aroma, 5.63, hardness 5.50, crispness 5.67, overall admission of 6.07.

Keywords: banana flour, maturity level, banana flakes, organoleptic, hedonic test

Physicochemical and Sensory Properties of Reformulated Bakery Products Affected by Fat Mimetic

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Abstract

Obesity is a condition that can lead to more serious health problems, such as heart disease and strokes. The major reasons for obesity are increased calorie intake, nutritional diet composition and low level of physical activity. Therefore, fat reduction has become a trend in food products development, including bakery. Fat mimetic recently popular to be applied in fat reduction of bakery products. The focus of this article is on the characterization of the steamed brownies and sponge cake after reformulated using fat mimetic. There were five fat mimetics we exercised in this research: ripe and overripe banana puree, ripe and overripe papaya puree, also ripe pumpkin puree. Fifty percent and 75% of banana and papaya puree were applied as margarine replacer in the reformulation of the steamed brownies, while 60% of pumpkin puree was used in the reformulation of baked cake. Regardless of their ripeness levels, the increased proportion of banana puree or papaya puree resulted in the rise of the volume, but hardness levels of those steamed brownies. Further, the higher the proportion of fat mimetic, the higher water, ash, protein, and carbohydrate contents. Among the reformulated steamed brownies, fat mimetic of 50% ripe banana puree and 75% of overripe banana puree were preferred by the sensory test panelists. Interestingly, the proportion of 75% of ripe papaya puree acquired the best hedonic sensory score while 75% of overripe papaya puree was the most disliked one. In terms of fat mimetic of pumpkin puree, 60% of ripe pumpkin puree yield the optimum results based on its chemical and sensory characteristics.

Keywords: fat mimetic, reformulated bakery, banana puree, papaya puree, pumpkin puree

Filipino Native Citrus Fruit Extract on Baked Breads: A Qualitative Observation

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Abstract

The study was conducted to determine the effect of native citrus fruit extract on the growth of yeast and molds in bread. Native citrus fruits were extracted from calamansi (*Citrofortunella macrocarpa*), dayap (*Citrus aurantiifolia*), dalanghita (*Citrus reticulata*), pomelo (*Citrus maxima*), and Ponkan (*Citrus reticulata*) were applied in five (5) mixtures of bread separately and one (1) serves as the control. The native citrus fruit extract significantly affected the color, smell, taste, and texture of the bread. They serve as an inhibitor and it helps delay the growth of yeast and molds in the bread. It was observed to determine the most effective native citrus fruit extract and prolong the shelf life of bread.

Keywords: Native Citrus Fruit, Breads, Yeast, Molds

The Physicochemical And Organoleptic Properties Of Jelly Candy With The Addition Of Green Grass Jelly Extracts

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Abstract

Jelly candy is a soft candy made from juice and a gel-forming agent such as gelatin. Green grass jelly leaves contain hydrocolloid polysaccharide mainly low-methoxy pectin that plays an important role in gel formation. The pectin in green grass jelly leaves could work as an alternative substitution for gelatin in jelly candy. The objective of this study was to characterize the physical, chemical, and organoleptic properties of green grass jelly candy. In this research, jelly candy was formulated by the addition of green grass extract (20%, 30%, 40%) and gelatin (18%, 20%, 22%) and resulted in nine different formulas. The physical analysis was hardness, chewiness, adhesiveness, and color. The chemical analysis included water content, reducing sugars, water activity. The increasing proportion of gelatin and green grass jelly extract would increase the water content. However, the interaction between those ingredients was not significantly proven. The more gelatin and green grass jelly extract added increased the hardness and reduce the chewiness and adhesiveness level. The increasing proportion of gelatin and green grass jelly extract didn't significantly affect the product color. The more gelatin and green grass jelly extract added would increase the level of reducing sugars and water activity. The overall water content of green grass jelly candy had met the SNI standard with a moisture value <20%. The hedonic rating test showed that jelly candy with 30% green grass jelly extract and 22% gelatin was chosen. This showed that jelly candy from green grass jelly has potential to be developed.

Keywords: green grass jelly leaves, jelly candy, gelatin

Effect of Rice Bran and Soymilk Spent on The Dough Rheological Properties and Quality of Bread

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Abstract

The utilization of agricultural residues (ARs) has been involved in the bakery product, particularly due to the functional ingredients of AR, such as phytochemicals, fibers, or resistant starch. The concept of glycemic index (GI) is indicated to classify carbohydrate-based foods according to their postprandial glucose response. Long term consumption of food with high GI will lead to the risk of chronic disease. The purposes of this study are to investigate the effect of the substitution of AR on the physical properties of dough and physicochemical and sensory properties of breads. Two ARs, namely soymilk spent (SS) and rice bran (RB) were used as ingredients of dough and breads. Physicochemical properties of ARs, rheological properties of dough, and physicochemical and sensory properties of breads were analyzed in this study. The results observed that SS and RB contained high fiber ranging from 9.16 to 20.48% (d.b.). The stability and extensibility of rheological properties of dough decreased with the increases of the substitution of AR. The substitution of SS significantly decreased the volume and height of bread but increased hardness and chewiness. Furthermore, the substitution of AR significantly ($p < 0.05$) reduced the value of estimated glycemic index (eGI) from 94.6 to 62.9. Moreover, the breads containing 10%, 20% RB, and 10% SS were not different from the control according to the result of sensory evaluation, which can be used to improve the nutritional quality of bread and enhance the value added of AR in the development of healthy foods.

Keywords: Soymilk spent, Rice Bran, Rheology, Bread quality

The Effect of Crude Jellyfish Cryoprotectant on The Quality and Storage Stability of Frozen Tortilla Bread Made from Local Corn of Madura

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Abstract

To support food security, a frozen tortilla bread was prepared from local Madura corn with crude jellyfish gelatin as cryoprotectant. The purpose of this study was to determine the effect of jellyfish gelatin concentration on the quality of Madura corn frozen tortilla bread during storage at low temperature. This research was conducted using a completely randomized factorial design with two factors, namely jellyfish gelatin concentration (0, 5 and 10%) and storage time (0, 7, 14 and 21 days). The research parameters analyzed were color, hardness, elongation, tensile strength, staling rate, water content, water activity and hedonic sensory characteristics. Results showed that gelatin concentration increased hardness; preference toward taste and mouthfeel, and overall preference; reduced L value, elongation, tensile strength, water activity, and preference toward color. Meanwhile, storage time increased the L and a values, hardness, tensile strength, water content, water activity, and preference for taste; and decreased the value of b, elongation, preference toward color, texture and overall preference. These two factors did not affect staling rate and preference toward aroma. The interaction between the two factors showed a significant effect on hardness, elongation, and tensile strength. In conclusion, crude jellyfish gelatin can be used to maintain the physical, chemical, and sensory qualities of frozen tortilla bread made from local Madura corn during low temperature storage.

Keywords: Cryoprotectant, frozen, gelatin, jellyfish, Madura corn, tortilla

Optimization Of Formulation Ingredients For Crystallization Of Nutmeg Seed Oleoresin

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Abstract

Nutmeg (*Myristica fragrans* Houtt) is a native spice from Indonesia. It contains oleoresin which has a unique aroma. Extraction of oleoresin from nutmeg seed is carried out by ultrasound assisted extraction (UAE) method because it requires lower temperature and shorter operating time, thus making it suitable for extracting sensitive compounds. The shelf life of nutmeg seed's oleoresin can be extended by microencapsulation process. Microencapsulation of nutmeg seed's oleoresin can be conducted by crystallization method using sucrose as a coating material. This study was aimed to optimize the formulation ingredients for nutmeg seed's oleoresin crystallization. The factors used in this study were nutmeg seed's oleoresin contents (5, 10, and 15 g), sucrose contents (30, 35, and 40 g), and water contents (15, 20, and 25 g). The physicochemical characteristics measured were moisture content, water activity (a_w), color, total oil, surface oil, trapped oil, and antioxidant activity. Optimization of process conditions were analyzed by Response Surface Method (RSM) with the concept of Composite Central Design (CCD). The results showed that the mixing of nutmeg seed's oleoresin (13.266 g), sucrose (35,047 g), and water (20,019 g) produced the optimum antioxidant activity of microencapsulated oleoresin. The application of nutmeg seed's oleoresin (11,088 g), sucrose (36,381 g), and water (19,331 g) resulted in the optimum trapped oil percentage of microencapsulated oleoresin. Furthermore, the optimum lightness value of microencapsulated oleoresin was obtained by using the composition of oleoresin (15,789 g), sucrose (98,762 g), and water (80,069 g).

Keywords: crystallization, microencapsulation, nutmeg, oleoresin

The Differences In The Result Of Examination Of Adolescent Haemoglobin Levels Using Digital And Sodium Lauryl Sulphate Methods

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Abstract

The prevalence of anemia in Indonesian adolescent is still high, which is around 32%. This means that 3-4 out of 10 adolescents suffer from anemia. This will greatly affect the next cycle of adolescent health and productivity. Therefore, it is necessary to conduct a routine screening to determine the prevalence of anemia. Routine screening to identify the incidence of anemia can be done by examination of Haemoglobin (Hb). The study aimed to evaluate the difference between Hb examination using the Digital (Hb meter) and the Sodium Lauryl Sulphate (SLS) method. The research method used was descriptive comparative with adolescence respondents in Maros, South Sulawesi. The results showed there were 106 adolescents who were categorized as anemia after being examined using the digital method, while only 33 young women were found to suffer from anemia after being examined using the SLS method. There was a significant difference between the results of the Hb examination with the Digital method and the SLS method ($p = 0.000$)

Keywords: Anemia, Hb examination, adolescent, Digital method, SLS method

The Variability of Tauco Products in Indonesia Based on Chemical Characteristics

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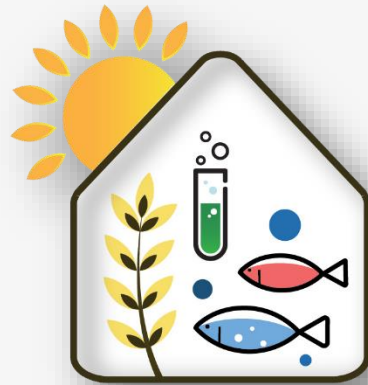
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Abstract

Tauco is an indigenous Indonesian fermented food made from soybeans through mould and brine fermentation. Tauco products from different producers in Indonesia might have different characteristics. This study was aimed to determine the variability of tauco products in Indonesia based on chemical characteristics (amino acid profiles). The samples used in this study were tauco products from 24 producers from seven provinces in Indonesia (West Java: Cianjur, Bogor; Central Java: Pekalongan, Tegal; Bangka; North Sumatra: Medan; West Sumatra: Padang; South Sumatra: Palembang; and West Kalimantan: Singkawang). Proximate composition, total acids, total sugars, and salt concentration were determined for each sample. Amino acid profiles were analyzed using an HPLC instrument. Tauco products had moisture content of 29.19-68.06% wb, ash content of 10.02-73.83% db, crude fat content of 0.92-23.38% db, crude protein content of 9.72-33.62% db, carbohydrates *by difference* of 7.95-68.27% db, total acids of 1.58-6.70% db, total sugars of 3.56 -45.54% db, and NaCl salt content of 7.13-68.44% db. A sample from Medan possessed the highest protein and salt contents. Clustering analysis showed that 24 tauco products were divided into four groups based on the chemical characteristics at 0.30 cophenetic distance and three groups based on the amino acid profile at 0.40 cophenetic distance. Clustering showed that tauco from the same area (different producers) did not always exhibit the same characteristics. The total of four samples from Tegal, Bogor, Singkawang and Palembang had relatively high concentrations of umami-flavoured amino acids (glutamic and aspartic acid) which were potentially to have more intense umami taste.

Keywords: Amino acid profile, chemical characteristics, clustering, fermented soybean, tauco



Parallel Session

Food Safety (FS)

Curriculum Vitae Invited Speaker

Budi Widianarko



Present Position :

- Executive Director of Sandjojo Foundation

Education

- **Undergraduate degree;** Faculty of Animal Science from Diponegoro University (1986)
- **Master degree;** Ecotoxicology from Vrije Universiteit Amsterdam (1991)
- **PhD degree:** Ecotoxicology from Vrije Universiteit Amsterdam (1997)

Working Experience

His teachings, research and community services are centered around Food Ecology and Safety. Since 1998, he has successfully promoted 10 PhDs in Food Science, Environmental Toxicology and Health Science - in affiliation with Indonesian and Dutch universities. Currently, he is supervising 5 PhD students. He is also serving in several boards and committees related to food, agriculture and ecology. In the field of higher education, he is a trustee of the United Board for Christian Higher Education in Asia (UBCHEA, based in New York and Hong Kong), and was the Rector SCU for two terms (2009-2017), and now he is Executive Director of Sandjojo Foundation.

The Addition Of Palm Sugar Levels And Fermentation Time Affect The Characteristics Of Kombucha Moringa

Budi Widianarko, Inneke Hantoro & Valentina Ni Gusti Ayu Putri Valencia

*Food Safety and Integrity Research Group, Faculty of Agricultural Technology,
Soegijapranata Catholic University, Semarang, INDONESIA*

Abstract

Jambeck et al. (2015) reported that Indonesia is the second largest contributor of mismanaged plastic waste – after China. This globally impactful publication has triggered awareness among the academic circles, civil society organizations and the government of Indonesia. One of the notable responses of the Indonesia government is the commitment to reduce plastic waste up to 70% in the year 2025. Our research group has been working on microplastics topics since five years ago, but mostly focusing on coastal seafood. In this presentation, the current status of research on microplastics in freshwater fish is described. This study is based on a systematic review on the most recent literature on the topic. The focus of this review is to provide comprehensive overview of microplastics contamination in freshwater fish around the world. Relevant literatures were collected from main portals of scientific articles and reports using appropriate keywords. Collected scientific articles and reports were the filtered and mapped to identify the achievements and gaps. Existing literatures cover information on the abundance, type of polymer, size, shape, and color; as well as detection methods such as microscopy, Raman spectroscopy, and Fourier Transform-Infra Red (FTIR) spectroscopy. Top three polymers contaminating freshwater fish are poly ethylene (PE), polystyrene (PS), and polypropylene (PP). The dominant forms of microplastics are fiber and fragments, mostly in white and transparent colors. Freshwater fish exposed to microplastics, especially the edible species, will ultimately pose health risk to human consumer. Two important gaps are identified in this study, i.e. (1). studies on impacts of microplastics on human health is still very limited, and accordingly (2). safe limits of microplastics in foodstuffs, including freshwater fish are virtually absent. These gaps offer a new niche in microplastics related food safety research.

Keywords: microplastics, freshwater fish, current status, gaps

Antifungal Activity Of Bay Leaf (*Syzygium polyanthum*) Essential Oil Against The Mycotoxin Producers (*Aspergillus*)

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Abstract

Essential oil of bay leaf was extracted by water-steam distillation. The components of the oil were analyzed using GC-MS. Antimicrobial activity was evaluated against *Aspergillus flavus*, *A. parasiticus*, and *A. tamarii*. Spores of the fungi were inoculated into potato dextrose agar, supplemented with the oil at different concentrations and incubated at 30°C for 7 days. Development of colonies was observed during the incubation. The main compound of the oil was decanal (34.13%), followed by cis-decenal (28.10%), octanal (24.90%), α -pinene (4.69%) and humulene oxide (1.28%) and other minor compounds. The oil indicated antifungal activity to all of *Aspergillus*. *A. candidus* was the most affected fungus. The oil at 0.2% inhibited 100% of growth of all *Aspergillus*.

Keywords: bay leaf, essential oil, antifungal, *Aspergillus*, mycotoxin.

Histamine Fish Poisoning (HFP) In Indonesia: Current Status And Challenges

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Abstract

Histamine fish poisoning (HFP) is one of many global food safety issues faced by both developed and developing countries, in which temperature abuse and mishandling during processing, storage, and distribution are identified as the main sources of histamine formation and accumulation in the products. In Indonesia, official reports on HFP are limited, however, mass media documents HFP cases and outbreaks which occurred each year, from to in different regions of Indonesia. The Scombroid fish, including Bullet and Frigate Tuna locally named as *Tongkol* (*Auxis rochei*, *A. thazard*), was reported as the main food vehicle causing the majority of HFP cases. The maximum allowable level of histamine for fresh and processed fish marketed in Indonesia was 100 mg/kg, except for fresh tuna for sashimi (50 mg/kg). The results from official control and monitoring programs by Indonesian's government, as well as published studies reported the presence of elevated levels of histamine in fish sold at domestic markets, hence implementing the cold-chain system during post-harvest stages was still a challenge. Evaluation of the current national requirement for histamine testing for fish products was also important to ensure product safety prior to consumption.

Keywords: *tongkol*; domestic market; national standard; temperature; fish products safety

Changes Of Physical And Chemical Properties Of Rice (Cv. Mentikwangi) As Affected By Storage Conditions

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Abstract

The quality of rice can be changed during storage caused by respiration and enzyme activity. The respiration process remains during storage, producing carbon dioxides, vapour, and heat. This study was aimed to examine the changes in physical and chemical properties of rice (cv. Mentikwangi) for six months of storage. Rice samples were packed using plastic polypropylene and stored at ambient temperatures of 27-30 °C and 54-62% humidity. Rice sampling was done four times, i.e., months 0, 2, 4, and 6. Observations were made on starch crystallinity, particle morphology, reduced sugars, amylose, glucose, and maltose. Based on the SEM image and XRD data, the result showed that the rice starch was less rigid and more amorphous after 4 month storages. In addition, eating quality data showed that the rice had high swelling and needed more water. Amilographic also performed that rice samples had getting harder. Sugar and amylose reduction levels increased by 1.84% and 2.5%, respectively. Unlike both, around 7.94% of starch was reduced. The α -amylase had broken the amylopectin chain according to the glucose content incline and worked naturally during the six-month storage period.

Keywords: rice, storage time, physical and chemical properties

Chemical Sanitizers And Their Application In Seafood And Bakery Industries: A Review

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Abstract

Sanitation in food industry aims to ensure the food safety of the final product. Sanitizers are chemicals with the ability to reduce the number of microorganisms present on the surface of equipment. There are many types of sanitizers available on the market, where each has a different level of effectiveness when it is applied in a particular food industry. The effectiveness of a sanitizer can be influenced by several factors, such as concentration, contact time, equipment materials, and typical microorganisms present in the food industry. Plate-shaped equipment is commonly used in the seafood and bakery industries, namely conveyor equipment, cutting boards, tables, and knives. Considering the materials and characteristics of the equipment, there are some challenges to choose the right sanitizer based on its effectiveness as well as safety aspects. The purpose of this study was to conduct a mapping of various kinds of sanitizers applied to plate-shaped equipment used in the seafood and bakery industries. There were at least 50 journal articles related to the topic used in this studies.

Keywords: sanitation, sanitizers, plate-shaped equipment, seafood, bakery.

Study Of Pectin Capability To Adsorb Cd(II) In Aqueous Solution And Its Selectivity With Zn Mineral

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Abstract

Seafood has been confirmed to contain several heavy metal ions. A polluted environment leads to food chain contamination that poses risks to human health. Pectin is a type of water-soluble fibers that can be found in many fruit and vegetables. As an eco-friendly adsorbent, pectin has been studied to effectively adsorb Cd(II) and other heavy metal ions. Although pectin has the potential to prevent heavy metal ions absorption, it might also interfere with the absorption of other minerals in the digestive process. This research aimed to analyze the ability of pectin to adsorb Cd(II) ions in multi metal solutions at stomach condition (pH 2) and small intestine condition (pH 6) with competition to another mineral (Zn) as an essential nutrient. About 0.2 grams of pectin was dispersed into multi metal solutions containing 32 ppm of Cd(II) and 1 ppm of Zn(II) at pH 2 and 6. The concentrations of metal ions were analyzed using Atomic Absorption Spectroscopy (AAS). The results proved that pectin could adsorb 0.32 ppm (29.03%) of Zn(II) and 13.8 ppm (38.87%) of Cd at pH 2. At pH 6, the adsorption of Cd(II) was lower compared to pH 2 (11.43 ppm or 34.73%), while the adsorption of Zn(II) was higher at about 0.49 ppm (44.34%). Pectin was also proven to be more selective to adsorb Zn(II) at pH 6. This analogue result was provided in the distribution coefficient (D), where an increase in pH enhanced pectin selectivity towards Zn(II). A very high performance of pectin selectivity toward Cd was at pH 2 with $\alpha_{Cd/Zn}$ of 1.55.

Keywords: heavy metal, mineral, pectin, adsorption

The Addition Of Basil (*Ocimum Basilicum L.*) Leaves And Chitosan To Prolong The Shelf Life Of Consumers Accepted Wet Noodles

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Abstract

Wet noodles contain 35% water, so the shelf life is only 12 hours. The use of artificial preservatives can extend up to 24 hours, but endanger the health of consumers. Chitosan can prevent the growth of bacteria and molds and the essential oils in basil leaves (*Ocimum basilicum L.*) can inhibit bacterial growth, so that it can be a natural preservative for wet noodles. This study aims to determine the treatment dose of chitosan and the extract of basil leaf (EBL) which produces wet noodles with physical and chemical characteristics close to control, and the longest shelf life. The study was conducted in three stages: first, determining the dose of chitosan and EBL treatment; second, physical and chemical measurements; and, thirdly, organoleptic determination of shelf life. The first phase of the study tested the combination of chitosan and EBL treatments, by 17 trained personnel who have been making wet noodles for more than 10 years. As a result, chitosan and EBL cannot be carried out together but must be separated. Based on the elasticity and color of the dough, a good concentration of chitosan is between 2,500 - 3,500 ppm, and the concentration of EBL is 15 - 35% (w/v). These results became the basis of the second phase of the study, with the basic dough (100 g wheat flour, 1 g salt, 0.6 g Na₂CO₃ and between 32-34 g water) as the control, basic dough +2,500 ppm, +3,000, +3,500 ppm chitosan, basic dough +15, +25 and +35% (w/v) EBL; 7 treatments in total. The physical condition and the appearance of the dough of these 7 treatments were evaluated by 33 trained panelists. Physical analysis were the color and texture of the noodle, while chemical analysis were pH, water content, and water activity (aw), run at the Food Chemistry Laboratory, Soegijapranata University. The results of one-way ANOVA and DMRT at p<5% showed that the noodles with physical and chemical properties closest to the control were those produced from 2,500 ppm chitosan and 15% EBL. These two results together with the control noodles were evaluated the shelf life organoleptically in the third stage of the study. The evaluation included the color and hardness at 0, 4, 8, 12, 16, 20, 24 and 28 hours after produced, by 72 panelists who consumed noodles at least once per week, and the results were the shelf life of the control noodle was 12-16 hours, and either the noodles treated with 2500 ppm chitosan nor 15% EBL were last up to 20 hours.

Keywords: wet noodles, chitosan, EBL, shelf life, physical and chemical properties, organoleptics

Microplastics Detection In Refill Drinking Water In Bendan Area, Semarang

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Abstract

Microplastic contamination in various food products, both fresh and processed, has raised food safety issues. Due to their ubiquitous nature, microplastics have become new contaminants that are difficult to avoid, and have contaminated various food products, including bottled drinking water. Previous studies have detected the presence of microplastics in bottled drinking water. In Indonesia, drinking water in refillable containers (gallons) is very commonly used for drinking water and cooking processes. Most of the refill drinking water is obtained from drinking water depots with various production processes and conditions. This research is focused on detecting microplastic contamination in refill drinking water produced by a number of depots around the Bendan area of Semarang. Samples of refill drinking water were taken from 5 refill depots in Bendan Village (Bendan Dhuwur and Bendan Ngisor), and sampling was carried out three times on different days. From each gallon, 2 litres of sample were taken and filtered with PTFE membrane (1 μm pore size) using a vacuum pump. Samples were observed under a microscope to determine the number, shape and size of microplastic particles. Identification of microplastics was carried out by micro-FTIR using mapping analysis. The results showed that the refill drinking water samples produced in the Bendan area were contaminated with microplastics. Various microplastics were found in the samples. Nylon, PVC, PE, PP, EVOH, and PET are some of the types of microplastics found in refill drinking water samples.

Keywords: microplastics, refill drinking water, Semarang

Galangal And Ginger Essential Oils Exerted Microbial Growth Inhibitory Activity And Preservation Potential On Tofu

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² *Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Muhammadiyah Purwokerto, Purwokerto, Indonesia*

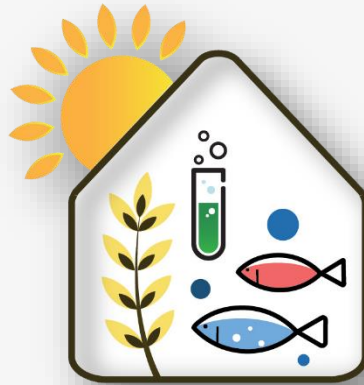
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Abstract

Galangal (*Alpinia galanga* (L.) Willd.) and ginger (*Zingiber officinale* Roscoe) of Zingiberaceae are commonly used as spices in Indonesian cuisine. Interestingly, the antimicrobial activity of both plants has been reported against a wide array of microorganisms, including food spoilage ones. This study aimed to evaluate the effects of essential oils of galangal and ginger on the microbial growth, physical characters, and preservation potential on tofu during 8-day storage at room temperature. The essential oils were prepared by steam-and-water distillation method and their chemical constituents were individually analyzed by Gas Chromatography-Mass Spectroscopy (GC-MS). The microbial growth on the tofu was evaluated by the optical density (OD)-based microbial enumeration method. The physical characteristics of tofu were observed by organoleptic test every other day. The preservation potentials were calculated based on the changes in tofu physical characters compared to the negative control. The main constituents of galangal essential oil were 1,8-cineole, β -farnesene, and α -pinene, while those of ginger were geranyl acetate, 1,8-cineole, and camphene. Galangal essential oil at a concentration of 1.25 mg/ml and higher significantly inhibited microbial growth, maintained the texture of tofu until day 8 and exerted preservation potential for 4 days. Albeit showed a similar preservation potential to galangal, ginger essential oil at a concentration of 6.26 mg/ml showed a weak microbial growth inhibitory activity and generated the unfavorable tofu texture at day 6. Our results suggested galangal essential oil is a suitable candidate to be developed into a natural food preservative.

Keywords: Galangal, ginger, essential oil, natural preservative, tofu



Parallel Session

Food Process And Product Development (FP)

Curriculum Vitae Invited Speaker Bertrand Muhoza



Date of Birth : September 6th 1979
Country of Origin : Rwanda
Nationality : Rwandanese

Education:

- **Doctor of Engineering** in Food Science and Engineering, Jiangnan University/ Wuxi City/Jiangsu Province/People's Republic of China (2016-2020).
- **Masters of Engineering** in Food Science and Technology, Jiangnan University/ Wuxi City/Jiangsu Province/People's Republic of China (2013-2016).
- **Bachelors of Science** in Food Science and Technology, Kigali Institute of Science, Technology and Management, Kigali City, Rwanda (2001-2005).

Working Experience:

I hold a Doctor of Engineering in Food Science and Engineering. My research focuses on the structural design particularly the utilization of protein and polysaccharide to encapsulate and deliver bioactive compounds, enhance the nutritional value, enhance the shelf life of food products, production functional foods and food diversification. I have an experience in writing research projects, also I have skills such as review and evaluation of project proposals submitted for grant competition. I am also an experienced Researcher with a demonstrated history of working in the food, beverages industry and Agricultural Research Institute. Skilled in Food processing (tea, wine, juice etc.), Quality Management, Control Theory, Green environmental for food industry, HACCP and GMP.

Publication (Last Five Years)

First author:

1. **Bertrand Muhoza**, Baokun Qi, Jean Damascene Harindintwali, Marwa Yagoub Farag Koko, Shuang Zhang & Yang Li. Combined plant protein modification and complex coacervation as a sustainable strategy to produce coacervates encapsulating bioactives. Food Hydrocolloids (2021)107239. Impact Factor 9.147

2. **Bertrand Muhoza**, Baokun Qi, Jean Damascene Harindintwali, Marwa Yagoub Farag Koko, Shuang Zhang & Yang Li. Encapsulation of cinnamaldehyde: an insight on delivery systems and food applications. *Critical Reviews in Food Science and Nutrition*. September (2021). Impact Factor 11.176
3. **Bertrand Muhoza**, Shuqin Xia*, Xuejiao Wang, Xiaoming Zhang, Yang Li & Shuang Zhang. Microencapsulation of essential oils by complex coacervation method: preparation, thermal stability, release properties and applications. *Critical Reviews in Food Science and Nutrition*. November (2020). Impact Factor: 11.176
4. **Bertrand Muhoza**, Shuqin Xia*, Xuejiao Wang, Xiaoming Zhang. The protection effect of trehalose on the multinuclear microcapsules based on gelatin and high methyl pectin coacervate during freeze-drying. *Food Hydrocolloids* 105 (2020) 105807. Impact Factor: 9.147.
5. **Bertrand Muhoza**, Shuqin Xia*, Xiaoming Zhang. Gelatin and high methyl pectin coacervates crosslinked with tannic acid: The characterization, rheological properties, and application for peppermint oil microencapsulation. *Food Hydrocolloids* 97 (2019) 105174. Impact Factor: 9.147.
6. **Bertrand Muhoza**, Shuqin Xia*, Jibao Cai, Xiaoming Zhang, Emmanuel Duhoranimana, Jiakun Su. Gelatin and pectin complex coacervates as carriers for cinnamaldehyde: Effect of pectin esterification degree on coacervate formation, and enhanced thermal stability. *Food Hydrocolloids* 87 (2019) 712-722. Impact Factor: 9.147.
7. **Bertrand Muhoza**, Yating Zhang, Shuqin Xia, Jibao Cai, Xiaoming Zhang, Jiakun Su. Improved stability and controlled release of lutein-loaded micelles based on glycosylated casein via Maillard reaction. *Journal of Functional Foods*. March 2018. (45) 1-9 Impact Factor: 4.451
8. **Bertrand Muhoza**, Shuqin Xia, Jibao Cai, Xiaoming Zhang, Jiakun Su, Li Li. Time effect on coenzyme Q 10 loading and stability of micelles based on glycosylated casein via Maillard reaction. November 2017. *Food Hydrocolloids* 72:271-280. Impact Factor: 9.147
9. **Bertrand Muhoza**, Eric Karangwa, Emmanuel Duhoranimana, Xiaoming Zhang, Shuqin Xia Influence of Pectin on the Stability of Whey Protein Isolate Stabilized Emulsion for Encapsulating Lutein. *Advance Journal of Food Science and Technology* 12(11): 617-626, 2016.

Co-Author:

1. Bingjie Liu, Lingfeng Lai, **Bertrand Muhoza**, Xia Shuqin. Complex coacervates based on gelatin and sodium carboxymethyl cellulose as carriers for cinnamaldehyde: Effect of gelatin Bloom values on coacervates formation and interfacial properties. October 2021. *Food Bioscience*. 101403. Impact Factor 4.24
2. Victor Christian Kaharso, **Bertrand Muhoza**, Xiangzhen Kong, Yufei Hua, Caimeng Zhang. Quality improvement of soymilk as influenced by anaerobic grinding method and calcium addition. August 2021. *Food Bioscience*. 101210. Impact Factor 4.24

3. Qian Liu, Heping Cui, **Bertrand Muhoza**, Khizar Hayat, Shahzad Hussain, Muhammad Usman Tahir, Xiaoming Zhang, Chi-Tang Ho. Whey protein isolate-dextran conjugates: Decisive role of glycation time dependent conjugation degree in size control and stability improvement of colloidal nanoparticles. August 2021. *LWT-Food Science and Technology*.148: 111766. Impact Factor 4.952
4. Qian Liu, Heping Cui, **Bertrand Muhoza**, Emmanuel Duhoranimana, Khizar Hayat, Xiaoming Zhang, Chi-Tang Ho. Mild Enzyme-Induced Gelation Method for Nanoparticle Stabilization: Effect of Transglutaminase and Laccase Cross-Linking. January 2021. *Journal of Agricultural and Food Chemistry*. 69: (4) 1348-1358. Impact Factor.5.279
5. Jean Damascene Harindintwali, Jianli Zhou, **Bertrand Muhoza**, Fang Wang, Anna Herzberger, Xiaobin Yu. Integrated eco-strategies towards sustainable carbon and nitrogen cycling in agriculture. September 2021. *Journal of Environmental Management*. 293: 112856. Impact Factor.6.789
6. Suping Ji, Chengsheng Jia, Dandan Cao, **Bertrand Muhoza**, Xiaoming Zhang. Formation, characterization and properties of resveratrol-dietary fiber composites: Release behavior, bioaccessibility and long-term storage stability. July 2020. *LWT-Food Science and Technology*.129: 109556. Impact Factor 4.952
7. Chengsheng Jia, Xue Xia, Huiqi Wang, **Muhoza Bertrand**, Gang Chen, Xiaoming Zhang. Preparation of phytosteryl ornithine ester hydrochloride and improvement of its bioaccessibility and cholesterol-reducing activity in vitro. *Food Chemistry*.331 (2020)127200.Impact Factor: 7.514.
8. Xingwei Wang, Xuejiao Wang, **Bertrand Muhoza**, Tingting Feng, Shuqin Xia, Xiaoming Zhang Microwave combined with conduction heating effects on the tenderness, water distribution, and microstructure of pork belly. *Innovative Food Science and Emerging Technologies* 62 (2020) 102344. Impact Factor: 5.916.
9. Qian Liu, Heping Cui, **Bertrand Muhoza**, Emmanuel Duhoranimana, Shuqin Xia, Khizar Hayat, Shahzad Hussain, Muhammad Usman Tahir, Xiaoming Zhang. Fabrication of low environment-sensitive nanoparticles for cinnamaldehyde encapsulation by heat-induced gelation method. *Food Hydrocolloids*.105 (2020) 105789. Impact Factor: 9.147.
10. Xuejiao Wang, **Bertrand Muhoza**, Xingwei Wang, Tingting Feng, Shuqin Xia, Xiaoming Zhang. Comparison between microwave and traditional water bath cooking on saltiness perception, water distribution and microstructure of grass carp meat. *Food Research International*.125 (2019)108521. Impact Factor: 6.475.
11. Xuejiao Wang, Li Liu, Shuqin Xia, **Bertrand Muhoza**, Jibao Cai, Xiaoming Zhang, Emmanuel Duhoranimana, Jiakun Su. Sodium carboxymethyl cellulose modulates the stability of cinnamaldehyde loaded liposomes at high ionic strength .*Food Hydrocolloids* 93:10-18. Impact Factor: 9.147.
12. Chengsheng Jia, Dandan Cao, Suping Ji, Xiaoming Zhang, **Bertrand Muhoza**. Tannic acid-assisted cross-linked nanoparticles as a delivery system of eugenol: The characterization, thermal degradation and antioxidant properties. *Food Hydrocolloids* 104 (2020) 105717. Impact Factor: 9.147.

13. Chengsheng Jia, Dandan Cao, Suping Ji, Weiting Lin, Xiaoming Zhang, **Bertrand Muhoza**. Whey protein isolate conjugated with Xylo-oligosaccharides via maillard reaction: Characterization, antioxidant capacity, and application for lycopene microencapsulation. *LWT - Food Science and Technology*. 2019. YFSTL 108837. Impact Factor 4.952

Projects (Last Five Years)

1. Utilization of plant proteins and polysaccharides capsules with Controlled Release Characteristics in various harsh environmental conditions, foods and biological systems. Period: 2020-2022
2. Modification of plant protein and potential application in food matrix (Extrusion of plant protein to production of meat analogues, cereals breakfast, snacks, pasta and baked products). Period: 2021-2022
3. Fabrication and stability mechanism of the delivery system for essential oil (Orange flavor, peppermint oil, cinnamaldehyde, eugenol) using complex coacervation based on gelatin and pectin. Period: 2017-2019
4. Fortification of food products: Case study Soy milk and soymilk products. Period: 2018-2020
5. Increasing the saltiness perception and enhancing the quality attributes of low salt foods. Period: 2017-2020.
6. Design and preparation of carotenoids delivery systems using milk proteins and anionic polysaccharides. Period: 2016-2017.

Awards and Honors

1. Second-grade President Scholarship academic year 2018-2019 for doctoral students School of International education /Jiangnan University/ Wuxi, People's Republic of China
2. First-grade President Scholarship academic year 2017-2018 for doctoral students School of International education/ Jiangnan University/ Wuxi, People's Republic of China
3. Second-grade President Scholarship academic year 2016-2017 for doctoral students School of International education /Jiangnan University/ Wuxi, People's Republic of China

Studies On Salt Reduction In Selected Food Products

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Abstract

Although sodium chloride is widely used in food processing as a preservative, flavor and texture enhancer, its high intake has been reported to cause cardiovascular disease, kidney disease and gastric cancer. The use of chloride salts and the reduction of sodium chloride content in food products have been proposed as common strategies to control high salt intake. However, sodium chloride reduction in food can lead to a significant loss of flavor and texture which can be quickly noticed by consumers. To mitigate these issues, various researchers are developing techniques to reduce sodium chloride without affecting the flavor, texture and taste. In the present contribution, oven-roasted peanuts, microwave and traditional bath cooked grass crab meat and surimi emulsified sausages were studied as models to reduce salt in food and good results were achieved. The approaches used in these studies are promising and open new perspectives in the future development of low sodium chloride food products.

Keywords: sodium chloride; salt reduction; food products; sensory properties

Optimization Of Moringa (*Moringa oleifera L.*) Effervescent Tablet Formulation With Acid-Base Combination Using D-Optimal Mixture Design

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Abstract

This study aimed to obtain the optimal formulation of moringa effervescent tablet using D-optimal mixture design. The research was conducted in two stages, namely preliminary and primary research. The preliminary research consisted of characterizing and determining solvent for moringa extraction with antioxidant properties evaluation. The primary research included optimizing moringa effervescent tablet formulation by using the Design Expert 11.0 D-optimal method program and characterizing the selected effervescent tablet. Physical properties and sensory characteristics of the effervescent tablet were evaluated. The results of the study showed that the optimal formulation yielded a moringa effervescent tablet with a dissolving time of 0.66 minutes, a hardness value of 4.69 kgf, and sensory characteristics (color attribute 4.58; taste attribute 3.40; aroma attribute 3.9) with the desirability value of 0.798. Based on this study, it can be concluded that the optimal formulation yielded moringa effervescent tablet that met the quality assigned by Indonesia national standard (SNI).

Keywords: moringa, effervescent tablet, D-optimal mixture design

Differences In Characteristics Of Three Variants Of Rice Flakes Products (Instant Baby Porridge: Rice Flake Beef, Chicken, And Fish) Result Of Laboratory Scale Development

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Abstract

Rice flakes are instant baby porridge that main components are made from rice, soybean hydrolysate, and animal protein sources (beef extract, chicken extract, and fish extract). It contains low molecular weight (<20 kDa) biopeptide from soybean that can enhance mineral absorption and is fortified with vitamins and minerals to prevent stunting. Currently, three variants of rice flake products have been developed, namely rice flake beef, chicken, and fish. This research aimed to compare the differences of characteristics between three variants of rice flake products. Parameters compared include moisture content, ash content, fat, protein, crude fiber, carbohydrates, calories, iron, zinc, and folic acid. The method used in the analysis of moisture content, ash content, fat, protein, and crude fiber is SNI 2891-1992. Parameters of iron and zinc using the method of SNI 19-2896-1998. The folic acid parameters used the LCMSMS method. The results of this study indicated that there are several characteristic differences in all parameters, including the protein content of rice flake beef is 17.74%, rice flake chicken is 18.00%, and rice flake fish is 18.23%. The calorie value of rice flake beef was 419.99 Kcal/100g, rice flake chicken 421.61 Kcal/100g, and rice flake fish 416.58 Kcal/100g. Several parameters such as calories, fat, and fiber are in accordance with the Regulation of the Minister of Health No. 51 of 2016.

Keywords: rice flakes, soybean hydrolysate, characteristics, beef extract, chicken extract, fish extract

Synergistic Effect Of Kappa-Carrageenan And Konjac Flour In Enhancing Physicochemical And Organoleptic Properties Of Wheat-Based Edible Straw

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Abstract

The food and beverage sector is one of the contributors to plastic pollution from the use of disposable tableware. The development of edible straws is an affordable solution to reduce the use of plastic tableware as well as a promising innovation to promote an eco-friendly lifestyle. This study was aimed at producing wheat-based edible straw made by combining high-protein wheat flour with kappa-carrageenan, konjac flour, salt and water. All ingredients were introduced to mixing, kneading, resting, dough rolling, dough flattening, molding, and baking. The effect of six different proportions of kappa-carrageenan and konjac flour (100:0, 80:20, 60:40, 40:60, 20:80, 0:100) on the physicochemical and organoleptic properties of wheat-based edible straw was evaluated. The water content of edible straws from all treatments ranged from 7.07-8.12%. Among the six treatments, the maximum synergy of kappa-carrageenan and konjac flour in producing high gel strength and desired edible straw characteristics was obtained from the proportion of 60:40 with the produced edible straw possessed the lowest water activity (A_w), % water absorption at tested temperatures (0-5, 25-30, and 65-70° C), turbidity, and fracturability. The results of the organoleptic evaluation showed that the panelists slightly liked and could accept the aroma and color of wheat-based edible straw made with the proportion of kappa-carrageenan and konjac flour 60:40.

Keywords: edible straw, wheat flour, kappa-carrageenan, konjac flour

Quality Of Purula (Rice Seasoning From Hydrolysed Soybean And Seaweed) During Pilot Plant Scale Development Using Drum Drying Process

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Abstract

Purula is a new rice seasoning product made from hydrolysed soybean and seaweed. It contains low molecular weight (<20 kDa) biopeptide from soybean that can enhance iron absorption and is fortified with vitamins and minerals to prevent anemia. This paper aimed to monitor the quality of Purula and its main ingredient during the pilot plant scale process. Two main ingredients of Purula were hydrolysed soybean flour and seaweed slurry. Steam explosion and enzymatic hydrolysis treatment was applied to the soybean, followed by drum drying to make hydrolysed soybean flour. Brown and green algae were processed and blended to make seaweed slurry. The hydrolysed soybean flour and seaweed slurry were blended with flour mix to make Purula dough, and drum dried to make flakes. The flakes were finally mixed with vitamins and minerals to produce Purula. Proximate, microbiological, and heavy chemical analysis were conducted on hydrolysed soybean flour and seaweed slurry. Viscosity analysis was conducted on Purula dough prior to drum drying. Moisture content and thickness analysis were conducted on the flakes. Proximate, protein electrophoresis, microbiological, and heavy chemical analysis were also conducted on Purula. The result shows that the viscosity of Purula dough is $1876,33 \pm 799,03$ mPas. The moisture content and thickness of the flakes are $4,377 \pm 1,477\%$ and $0,575 \pm 0,099$ mm. Microbiological and chemical quality of hydrolysed soybean flour, seaweed slurry, and Purula conform with the food safety requirement. Purula also contains low molecular weight protein (<20 kDa). This study concluded that Purula is able to be properly produced on pilot plant scale.

Keywords: Purula, soybean hydrolysed flour, seaweed slurry, pilot plant scale, drum drying

The Characteristics Of Gelatin From Bones Of Local Chicken (*Gallus Gallus Domesticus*), Broiler Chicken (*Gallus domesticus*) And Duck (*Anas Plathytynchos*)

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Abstract

Gelatin is a protein derivative that can be extracted from bone. Poultry bones are by-products of public consumption and have not been optimally utilized. One of the alternatives is to utilize poultry bones for the manufacture of gelatin. The purpose of this study was to determine the characteristics of gelatin from bones of local chicken, broiler chicken, and duck. The experimental design used was a completely randomized design with two factors. The first factor was the types of bones (local chicken, broiler chicken, and duck). The second factor was the hydrolysis temperatures (55°C, 65°C, and 75°C). The data were analyzed using ANOVA with a 95% confidence interval. Results with significant differences were proceeded to Duncan test (DMRT). The optimum treatment for producing gelatin was obtained from broiler chicken bones hydrolyzed at 75°C with the yield 11.02%, moisture 8.18%, ash 0.83%, protein 67.48%, gel strength 252.07 g bloom, viscosity 5.95 cP, fat 6.45%, gel point 17.3°C, melting point 60.35°C. The organoleptic evaluation showed that the scent, color, and texture of the produced gelatin were with the scores of 4.16, 4.76, and 3.48, respectively. Fourier transform infrared (FTIR) spectra of gelatin extracted from broiler chicken with the hydrolysis conducted at 75°C showed the presence of band corresponding to O-H, N-H, CH₂, C=C, C=O, C-N, C-H alkane and aromatic ring, C-O carboxylate acid.

Keywords: poultry bone, gelatin, local chicken, broiler chicken, duck

Characteristic Of Winged Bean Seed (*Psophocarpus Tetragonolobus* (L.) Dc.) and Soybean (*Glycine Max*) as Composite Tofu

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Abstract

Winged bean (Indonesian name: koro kecipir) is a type of legumes that has a relatively similar protein content to soybean and have a great potential to substitute tofu. The purposes of this research were to determine the optimal amount of winged beans in producing composite tofu using commercial acetic acid and calcium chloride as a coagulant and to evaluate the quality of the composite tofu based on its physicochemical and sensory characteristics. In making the composite tofu, the research used six different winged beans formulations which started from 0%, 10%, 20%, 30%, 40%, to 50%. The results of the sensory evaluation showed formulation with 0%, 10 % and 20 % of winged beans were the most preferred and accepted by panelists. Physical tests (color, cohesiveness, and yield) and chemical tests (protein, potassium, and cyanide acid) were conducted for the three formulations. The results of color, cohesiveness, and calcium content tests showed that there were no significant difference between the three formulations. The calcium contents in the three formulations were ranged from 236.61 to 285.59 mg/100g, while the protein contents were ranged from 13.54 to 15.31%. The cyanide acid contents in the composite tofu were ranged from 0.68 to 0.86 ppm and not exceeding the safe limit of food, thus making the tofu safe to consume.

Keywords: Composite tofu, soybean, winged bean

Effect Of Monascus Fermented Durian Seed Concentration On Physicochemical And Organoleptic Properties Of Meat Analog Sweet Potato Flour-Gluten Based

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Abstract

Meat analog (MA) is a versatile food product that has a texture, color, and flavor that resembles beef but is made from vegetable ingredients. MA can be prepared by combining the flour of sweet potato with gluten. To enhance MA's color, some coloring agents are recommended such as Monascus Fermented Durian Seed (MFDS) which is not only a color, but it acquires some bioactive properties (anti-hypercholesterolemia and antioxidant). The purpose of this study was to evaluate the effect of MFDS on the physicochemical and organoleptic properties of meat analog consisted of sweet potato flour and gluten. The research design employed a Randomized Complete Block Design (RCBD) with one factor, namely the concentration of MFDS which consist of five levels; 0%, 0.2%, 0.4%, 0.6%, and 0.8% with five times repeated. Findings revealed that MFDS had a significant effect on color objectively and organoleptic (color preference, taste, texture), but hadn't any significant effect on moisture content and texture (hardness, cohesiveness, springiness). The higher the concentration of MFDS, the higher redness, color preference, and texture preference of meat analog. Based on performed organoleptic tests, the best treatment was the addition of 0.6% MFDS which produced meat analog with moisture content 48.01%; lightness 54.4; redness 7.4; yellowness 13.9; chroma 15.3; °hue 63.4; hardness 1992.688g; cohesiveness 0.696; springiness 0.941; and water activity (aw) 0.946. MFDS was a potential color enhancer that improved the physicochemical and organoleptic properties of meat analog.

Keywords: monascus fermented durian seed, meat analog, sweet potato flour, gluten, food processing

Effect Of Xanthan Gum Addition On The Physical Stability And Sensory Acceptability Of Tea And Cocoa Concentrate

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Abstract

Xanthan gum is a hydrocolloid that is commonly used as a suspension stabilizer in beverage products. This study was aimed to determine the effect of the addition of hydrocolloid on the physical stability and sensory acceptability of tea and cocoa concentrate. The physical stability was determined by sedimentation index, viscosity, total dissolved solids, and re-dispersibility. Hedonic tests were conducted to determine the level of acceptance of the product after the addition of hydrocolloids. The data obtained were statistically analyzed in IBM SPSS Statistics 25. The addition of 0,05% (w/v) xanthan gum to the concentrates improves the stability of concentrate suspension with a sedimentation index of 0.00 ± 0.00 after 24 and 48 hours of storage at 8°C. The addition of a higher concentration of xanthan gum increased the total dissolved solids and viscosity. Besides, the addition of 0,05% (w/v) xanthan gum showed a notable redispersion of concentrate in milk compared to control. The addition of xanthan gum significantly improved sensory in the flavor, texture, and aftertaste aspects of concentrates. Based on the results obtained, the addition of xanthan gum with a concentration of 0.05% (w/v) in tea and cocoa concentrate improved physical stability and sensory acceptability.

Keywords: hydrocolloid, xanthan gum, physical stability, concentrate, tea, cocoa

Development Of Ready-To-Drink Chocolate Beverage Made Of West Sumatra Cacao Nibs Extract Using Kano Model

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Abstract

Ready-to-drink (RTD) beverage has gained increasing attention for its practical use. Unfortunately, the use of Indonesia cacao derivatives, particularly those originated from West Sumatra, for the development of RTD chocolate has not been studied. In this study, market research was performed by employing the Kano model to investigate consumers' needs and expectations on an RTD chocolate beverage. The result showed that among the twelve attributes investigated, sedimentation was categorized as a reverse attribute indicating that the presence of cocoa sediment could cause dissatisfaction to the consumer or the absence of it could cause satisfaction. To avoid sedimentation, liquid extract from cacao nibs was used in the development of RTD chocolate beverages instead of dissolving and dispersing cocoa powder. Further investigation on the effect of the extraction method on the sedimentation and sensory attributes was carried out. Extraction of 10-30 mesh-sized West Sumatra cacao nibs using hot water at 95°C for 10 minutes resulted in a significant decrease of sediment compared to the extract that was prepared from cocoa powder. Improvement of West Sumatra cacao nib extraction method was needed to enhance the sensory of RTD chocolate beverage.

Keywords: ready to drink, chocolate beverage, Kano model, West Sumatra cacao, cacao nib extraction

Application Of Ultrasound In Germinated Soybean Tempe Protein Concentrate Production With Various Types Of Solvents

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Abstract

Tempe is a traditional Indonesian fermented food which has high protein content. It contains highly bioactive compounds, such as peptides and isoflavones which can contribute to immune health. Therefore, tempe has potential to be processed into raw materials for food and supplement products, such as protein concentrate. In this study, tempe was made from germinated and non-germinated soybeans. The protein concentrate production process was carried out by removing fat in tempe flour by conventional and ultrasonicated-assisted extraction methods using two types of solvents: ethanol and hexane. Tempe flour was made from drying and milling of fresh tempe, then continued with 60 mesh-sieving. The purpose of this study was to compare the physicochemical characteristics of the protein concentrates produced to obtain the optimum treatment in producing tempe protein concentrate with highest protein content. The results showed that ultrasonicated-assisted extraction significantly improved the extraction process and fat extraction using hexane resulting in protein concentrate which conformed to standard of minimum protein content for protein concentrate. Germinated soybean tempe protein concentrate extracted using hexane was the best protein concentrate, which had the highest protein content (72.8%), brightness value (L^*) 84.3, whiteness index 81.3, bulk density 0.5 g/mL, and repose angle 29.4°. Germinated process in soybean affected the protein content of the concentrate due to the degradation of other components into energy which was required for new protein synthesis.

Keywords: Germination, protein concentrate, soybean, tempe, ultrasound

Effect of Using Different Clarifying Agents And Temperature to Physicochemical and Sensory Properties of Sweet Sorghum Syrup Extract

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Abstract

This research aimed to study the sorghum syrup extraction process by using clarifying agents: $\text{Ca}(\text{OH})_2$, bentonite, and activated carbon, followed by heating process at 70°C or 80°C. Sorghum stalks were milled to produce sorghum juice then clarified and heated up to make sweet sorghum syrup. The clarification process was done to reduce particles in sorghum juice before the heating process. In this work, the psycho-chemical and sensory properties of sorghum syrup as a result of clarifying and heating process were analyzed. A randomized block design was used as the experimental design. The parameters were pH, color, turbidity, reducing sugar content, flavor and aroma. After the clarification process, the total soluble solids of the sorghum syrup reached 68.78-76.78 °Brix. Adding $\text{Ca}(\text{OH})_2$ and heating at 80°C resulted in sorghum syrup with higher pH and lower turbidity if compared to that heated in 70°C. The combination of $\text{Ca}(\text{OH})_2$ and 2.5% activated carbon heated at 80°C resulted in low pH but the highest reducing sugar if compared to all of the experimental groups. The combination of $\text{Ca}(\text{OH})_2$ and 3% or 5% bentonite in the clarification process resulted in turbidity and pH that were not significantly different from the clarification using $\text{Ca}(\text{OH})_2$ only but resulted in a brighter color, while the 3% bentonite heated at 70°C was the brightest of them all. The evaluation revealed that the combination of $\text{Ca}(\text{OH})_2$ and 5% bentonite generated the sweetest flavor, caramel aroma, and preferred psycho-chemical properties showed at pH (5.28), turbidity (35.56 NTU), and reducing sugar (57.52%).

Keywords: Sweet sorghum stalk juice, Sorghum syrup, Clarification, Extraction

The Effect Of Soaking Temperature And Cinnamon Extract Concentration On The Quality Of Parboiled Rice

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Abstract

The availability of parboiled rice which has a low glycemic index and a taste that is acceptable to diabetics, most of whom are deficient in Cr and Mg, needs serious attention. The temperature of the soaking of paddy in a solution of chromium and magnesium, as well as cinnamon extract affects the hydration of the paddy, the adsorption of chromium and magnesium, and the taste of parboiled rice. The purpose of this study was to produce parboiled rice which is favoured by panellists, has a low glycemic index (GI) and has a high content of resistant starch (RS), Cr and Mg. This research was carried out using a completely randomized design with two treatment factors, namely the paddy soaking temperatures (60, 65 and 70°C) and the soaking concentrations of cinnamon extract (0, 5, 10 and 15%). The paddy was soaked for 2.5 h, boiled at a temperature of 100°C for 20 min, cooled at a temperature of 0°C for 12 h, dried at 50°C and underwent the process of hulling. The results showed that the paddy soaking temperature and the soaking concentrations of cinnamon extract influenced the levels of RS, fortificants, GI and the panellists' preference level of the parboiled rice produced. The preferred rice was produced with a soaking temperature of 65°C and cinnamon extract of 10%. As the rice had a GI of 30.62, RS of 13.82%, Cr of 46 µg/kg and Mg of 381 mg/kg, it is suitable for diabetics.

Keywords: cinnamon, fortification, glycemic index, parboiled rice, resistant starch

Proximate, Amino Acid Composition, Mineral Content, And Microstructural Profiles Of Porang (*Amorphophallus muelleri blume*) Flour

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Abstract

This study compared the proximate, amino acid composition, mineral content, and microstructural profiles of porang (*Amorphophallus muelleri* Blume) flour, both CPF (crude porang flour) and OPF-MM (optimum Porang flour- micro-mill milled). The result showed that the protein and the moisture contents of CPF were significantly higher, while the carbohydrate was significantly lower than OPF-MM. The fat content and ash content of both samples were similar. The primary amino acids in CPF and OPF-MM were L-glutamic acid, L-aspartic acid, L-Arginine, L-Leucine, and L-Phenylalanine. In 18 types of amino acids, the OPF-MM had a significantly lower concentration than CPF. The mineral of K, Ca, P, S, and Fe was found in CPF and OPF-MM by XRF (X-Ray Fluorescence) analysis. Quantitative mineral analysis by Atomic Absorbance Spectrophotometry (AAS) showed the CPF was a higher concentration of Ca, Na, Fe, and Mg and a lower of K than OPF-MM. The SEM-EDX showed that the main component of porang flour, both of CPF and OPF-MM, was C and O. The surface of the CPF was coarse and rough compared to the OPF-MM based SEM observation.

Keywords: comparison, porang flour, profile, microstructural, mineral analysis

Review: Wine Pairing Of Spicy Coconut Beef And Betutu Chicken

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Abstract

Wine is a drink that is generally paired with western food. It is known that the main ingredients of western food are red and white meat. So that wine has the potential to be paired with Indonesian food because Indonesian food contains red and white meat. Indonesian food that goes international is Spicy coconut beef while Betutu chicken is a popular food originating from the island of Bali. Spicy coconut beef made from red meat (beef), is commonly available in all Padang restaurants. While Betutu chicken is a food made from white meat. The two Indonesian dishes (Spicy coconut beef and Betutu chicken) are the topic of a review to be paired with red wine and white wine. The aim of wine pairing with Indonesian food is to determine the suitability of wine and the sensory attributes of Indonesian food with wine components. The review method is carried out based on the collection and screening of literature, analysis and tabulation of data. Based on the results of the review, it can be seen that red meat is appropriate to be paired with red wine, because meat has a protein that can be bound by tannin compounds from wine. The sensory attribute produced between red wine and red meat is to balance the sour taste of the wine and the stronger flavor. Meanwhile, white meat and spicy foods are appropriate to be paired with white wine. The sensory attributes produced between white wine and white meat are increasing the sweetness of the wine, the acidity of the wine gives a refreshing sensation in the mouth and the spice flavor increases. The conclusion from the review is that the wine pairing of Spicy coconut beef is appropriate for red wine, while Betutu chicken is appropriate for white wine.

Keywords: wine pairing; spicy coconut beef; betutu chicken; red wine; white wine

Effect Of Addition Of Texturizer On The Proximate Content And Texture Properties Of Geblek, A Cassava Starch-Based Traditional Food From Indonesia

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Abstract

Geblek is a traditional food from Kulonprogo, Yogyakarta that is made from cassava starch with characteristics including white color, shaped like number eight, savory, and chewy. Chewy texture of geblek becomes tough if it is stored at room temperature, which can decrease quality and consumer preference of geblek. The objective of this research was to evaluate the proximate and texture properties of geblek with the addition of food additives such as guar gum, xanthan gum, carrageenan, alginate, and dry grated coconut for increasing the quality and preference of geblek. Raw and fried geblek were analyzed by proximate and texture properties using Texture Analyzer (TA1, Lloyd Instruments). Research results showed that frying can increase lipid content of geblek. Addition of dry grated coconut to the geblek dough caused the highest increase in fat content, while alginate and xanthan gum had the lowest fat content. Hardness of fried geblek was from 16.67 N (control) to 30.34 N (carrageenan) after frying then increased 68.52 N (alginate) to 218.06 N (carrageenan) after storing for 24 hours. Chewiness of the geblek with the addition of dry grated coconut was similar with control. Storage of fried geblek at room temperature for 24 hours increased the hardness, gumminess, springiness, chewiness, crispiness, and crunchiness, but decreased the cohesiveness and resilience. The best texture of fried geblek after 24 hours was found in geblek with the addition of alginate.

Keywords: geblek, traditional food, cassava starch, hydrocolloid, texture properties

Comparison Of Proximate Analysis Value Of Fresh Fruits And Vacuum-Fried Fruits Chips

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Abstract

Indigenous fruit, such as banana, jackfruit, and pineapple, has desirable sensory characteristics, but this fresh fruit has a short shelf life. Processing of fresh fruit into fruit chips using vacuum frying is one solution to extend its shelf life together with preserving the quality and nutrition content. The purpose of this study was to evaluate the proximate composition value of fresh fruit and fruit chips. The research method used was proximate analysis that included water, carbohydrate, lipid, crude protein, crude fiber, and ash contents. The results showed that there was a significant difference in the proximate analysis results between fresh fruit and vacuum-fried fruit chips. The water content of fresh fruit was higher than the vacuum-fried fruit chips. The lipid, crude protein, and ash contents of vacuum-fried fruit chips were higher than the fresh fruit. The crude fiber of vacuum-fried pineapple chips was higher than fresh pineapple. However, the crude fiber of fresh jackfruit and banana was higher than the vacuum-fried fruit chips.

Keywords: Banana, Jackfruit, Pineapple, Proximate Composition, Vacuum-Fried Fruit Chips

Optimization Of Temperature And Reaction Time On Ultrasound-Modified Sweet Potato Starch

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Abstract

Native starch has limitations when used directly, such as low solubility, hydration, stability, and high retrograde rates. Ultrasound as a novel physical technique can overcome these limitations. The optimization of temperature and reaction time on ultrasound sweet potato starch was investigated using the response surface method with a central composite design. The results showed that using 59.58°C for 8.01 mins gave the best products on ultrasound-modified starch. The micrograph of modified starch showed a rougher surface and pores than native starch. These could increase starch hydration and the functional properties of starch. Ultrasound starch is suggested to be used as an absorbent for oil and other bioactive compounds to increase its stability.

Keywords: Modification, Optimization, Starch, Sweet Potato, Ultrasound

The Effect Of Autoclave-Cooling Cycle Modified Flour On Psychochemical Properties Of Purple Sweet Potato Brownies

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Abstract

This study was conducted to determine the effect of modified flour types and concentrations resulting from the Autoclaving-Cooling Cycle process (ACC) on purple sweet potato brownies. This research consisted of two stages; the initial step was preparation and analysis of raw materials, and the second stage was a study of the effect of modification types and starch concentrations on purple sweet potato brownies. Results of the variance analysis found that modified flour was not affected by the kind and concentrations; otherwise, the flavor, taste, and starch levels had a significant impact on the color, overall moisture content, hardness, adhesiveness, and cohesiveness of purple sweet potato brownies. The scoring method was used to determine the best sample formula. Results of the study which was based on organoleptic, chemical, and physical responses, found that purple sweet potato with the addition of modified sweet potato flour with a concentration of 6% was the best sample formula. The best formula of the sample had a moisture content of 16.21%, ash content of 1.28%, protein content of 3.53%, a fat content of 29.42%, carbohydrate content of 49.56%, and dietary fiber of 9.06%.

Keywords: autoclaving-cooling cycle, brownies, dietary fiber, purple sweet potato

Sensory Evaluation And Characterization Of Spice-Milk Chocolate Using Rate-All That-Apply (RATA) Method

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Abstract

This research was aimed at evaluating and characterizing the sensory profile of a spice-milk chocolate bar. The Rate-All-That-Apply (RATA) method was applied to characterize the products. In RATA, the customers performed as the panelists to evaluate the products. These customers were categorized based on their ages. Further, the PCA, spider web and preference map diagram were applied to analyze the data. There were eight products being compared in this study, two of them (sample A and E) were the developed products while the six others (B, C, D, F, G and H) were the commercial products that have been established in the market. The customer panelists evaluated the samples based on appearance, aroma, taste, flavor and texture. Overall, the results showed that the samples had different characteristics. The preference map presented that samples C, D, G and H became the potential competitors for the developed products since they possessed similar liking scores.

Keywords: spice-milk chocolate, sensory profile, RATA, PCA, spider web, preference map

Sensory Profile Analysis Of Ready To Drink Chocolate Using Quantitative Descriptive Analysis (QDA) Method

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Abstract

This study aimed to analyze the sensory profile of a low-fat ready to drink (RTD) chocolate. The low fat RTD chocolate was being developed in the laboratory of food science and technology department at Universitas Sebelas Maret. The QDA method was applied to characterize the sensory profile of the developed product (called sample D) and four commercial products (sample A, B, C, and E). The total of 14 panelists were trained to evaluate those samples based on appearance, odor, flavor, basic taste and texture. Further, ANOVA was utilized to differentiate the samples, while PCA and Spider web were applied to describe the sensory profile of the samples. Based on the panelists evaluation, 15 sensory profiles were identified in the samples, namely, three appearance attributes (undissolved particles, white-cream layer, color), four odor attributes (milky, cocoa, vanilla, malt), three flavor attributes (milky, cocoa, malt), two basic taste attributes (sweet, bitter), and three texture attributes (creamy, sandiness, thickness). The results of PCA and Spider web showed that the sensory characteristics of sample D was quite similar to sample A, while sample C was relatively similar to sample E, and sample B had different characteristics from others. Since the low-fat RTD had the closest characteristics to sample A, it might become the most potential competitor. Hence, the product improvement direction in the next phase may need to consider the sensory attribute of sample A.

Keywords: ready to drink chocolate, QDA, sensory profile, trained panelist, PCA, spider web

Sensory Profile Analysis Of Ready To Drink Chocolate Using Rate All That Apply (RATA) Method Based On Customer Perception

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Abstract

This research aimed at evaluating and characterizing the sensory profile of the low-fat ready to drink (RTD) chocolate. The majority of the researches used trained panelists to evaluate the sensory profile of a food product and utilized conventional approaches e.g., quantitative descriptive analysis as well as spectrum diagram analysis. However, those methods have shortcomings, such as time consuming and high costs. In addition, customers' perception is a crucial factor to be considered in developing a product that can compete in the market. Hence, in this study, the direction of product development was driven by customers' perception on the product. Customers were asked to evaluate the characteristics of the developed product. Rate All That Apply method were used to analyze the sensory profile of the product. In addition, the hedonic test was utilized to examine the customers' preferences on the developed product (sample B) and its competitors (commercial product in the market –sample A, C, D and E). Fifteen sensory attributes were identified and the obtained data were evaluated using statistical tools, such as PCA, spider web, and preference map. The results from PCA and spider web showed that the sample B had similar sensory characteristics to sample E. Sample C were quite similar to sample D, but both samples were different from sample A. The hedonic test showed that customers preferred sample E. It can be inferred that sample E would be sample B's benchmark. Hence, the product development direction should consider the sensory profile of product E.

Keywords: ready to drink chocolate, RATA, sensory profile, PCA, spider web, preference map

Effect Of Production Methods On The Properties Of Clear Beverages Of Red Guava And Pineapple

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Abstract

Fruit beverages that have a clear appearance and free of visible large particles provide an alternative for consumers who search for health promoting drinks. However, production method (particularly the extraction) employed to obtain this clear beverage with an adequate bioactive content may affect to the quality of the product. A simple direct steam extraction-distillation apparatus is constructed and tested to produce it in comparison with other methods. This study was aimed to investigate the effect of the several production methods on the yield, turbidity, vitamin C, and antioxidant activity of clear beverage made from red guava and pineapple. The four methods, namely maceration for 24 hours at room temperature, boiling at 70 °C for 15 min, vacuum heating at 50 °C for 15 min, and direct steam extraction-distillation for 1 h were applied on the dried fruit powder. Distilled water was incorporated as the solvent at a ratio to powder 25:1. The product properties were measured, i.e., yield, turbidity, ascorbic acid, and antioxidant activity. Result showed that different production methods led to significantly different levels of all properties measured, ranging from 25.87 to 88.8 %, 9.11 – 220.85 NTU, from not-detected to 30.75 mg/100mL, and 0.31 – 28.35 %, for the yield, turbidity, ascorbic acid, and antioxidant activity, respectively. However, the product of direct steam extraction-distillation had the lowest yield, ascorbic acid, and antioxidant activity; nevertheless, the clearest product.

Keywords: Clear fruit beverage, turbidity, vitamin C, antioxidant

Assessing The Performance Of Pulse And Oil Seed Based Four Crops Cropping Pattern

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Abstract

Crop production is becoming commercialized now a days. To gain adequate profit; it's imperative to choose the best suitable cropping pattern (CP) with short duration, high yielding and more market price based crops that fits in time (season) and space (field). Considering the above objective, evaluation of a four crops based cropping pattern were undertaken to unveil the economic return and yield. The experimentation were set following RCBD with three dispersed locations at Santhia upazila of Pabna district, Bangladesh during July 2020. Three CPs i.e. CP₁ = Transplanted *Aman* rice (cv. Binadhan-7)—Mustard (cv. Binasarisha-9)— Mungbean (cv. Binamoog-8) — Transplanted *Aus* rice (cv. Binadhan-19); CP₂ = T. *Aman* (cv. Binadhan-17)—Lentil (cv. Binamasur-8)—Stem amaranth— Sesame (cv. Binatil-2); CP₃ (Control) = T. *Aman* (cv. *Shorna*) – Wheat (cv. BARI Gom 33) – Jute (cv. JRO 524) were used as treatments. Observations divulged that, highest REY (23.68 t/ha), gross margin (729150 Tk/ha) and BCR (2.10) was obtained from CP₂. Whereas, the lowest REY (15.13 t/ha), gross margin (515900 Tk/ha) and moderate BCR value (1.79) was attained with CP₁. CP₃ had the minimum BCR (1.61) but judicious level of gross margin (697200 Tk/ha). Finally, it was concluded that, four crops based pattern is no doubt more improved and profitable than three crops pattern in terms of economic outcome. But, cultivation of four crops in a yearly cropping cycle is quite tough due to time management; contrary, prevailing weather situation, soil moisture status, fertility is of prime concern. For establishing four crops pattern practice; farmers' have to be totally mechanized to acquire the optimum economic benefit.

Keywords: four crops pattern, pulse and oil crops, Pabna, BCR, REY.

Consumer Perceptions Of Edible Packaging Made Of Gelatin As Chili Powder Packaging

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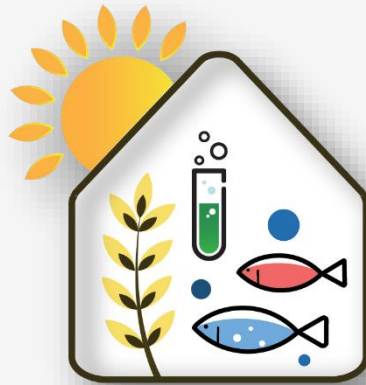
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Abstract

Nowadays, edible packaging is a trending product and started to be massively produced. Edible packaging production influences new perceptions about packaging. Perception is an act of processing experience to conclude several things from certain point of view. There has not been much research on panelists' perceptions of edible films, so it is necessary to determine their acceptance of edible films. Chili powder packaging is one of the edible packaging applications in the food industry. Edible packaging application to replace chili powder plastic packaging can reduce plastic consumption, increase feasibility, and maintain chili powder quality. However, the utilization of certain materials can also affect the perception of edible packaging, such as gelatin. Halal legality of gelatin is usually questionable and involves consumers' acceptance. Negative perception about gelatin-based edible packaging will inhibit edible film's production and development. Therefore, this research aimed to analyze consumers' perception of edible packaging made of gelatin as chili powder packaging. This research was conducted using survey method that utilized a questionnaire from Google Forms with 215 respondents and organoleptic tests that utilized preference test with 101 randomly selected non-professional panelists. Based on the observation, most respondents reflected positive knowledge and perception about edible packaging made of gelatin as chili powder packaging. The percentages of panelist acceptance towards the products' color, viscosity, aroma, and taste were 87, 77, 72, and 69%, respectively.

Keywords: perception, edible packaging, preference, survey, gelatin



Parallel Session

Fermented Food (FF)

Curriculum Vitae Invited Speaker

Francisco B. Elegado



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Present Position : Research Professor

Education

- Doctor of Agriculture in Food Science, Kyushu University
- Master of Science (M. Sc.) Agricultural Engineering major in Bioprocessing
- Bachelor of Science (B. Sc.) Sugar Technology

Working Experience

- **Jan. 2014 – present** : Research Professor, National Institute of Molecular Biology and Biotechnology University of the Philippines Los Baños.
- **July 2005 - Dec. 2013** : Research Associate Professor, National Institute of Molecular Biology and Biotechnology University of the Philippines Los Baños.
- **Nov. 1996 - June 2005** : Research Assistant Professor, National Institute of Molecular Biology and Biotechnology University of the Philippines Los Baños.
- **July 1988 – Oct. 1996** : University Researcher, National Institute of Molecular Biology and Biotechnology University of the Philippines Los Baños.
- **March 1987 – June 1989** : Research Associate, National Institute of Molecular Biology and Biotechnology University of the Philippines Los Baños.
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Research (last five years)

1. Enhancement, field validation and market readiness of DNA-based nanobiosensor for the detection of *E. coli*, *E. coli* O157:H7 and *Salmonella enterica* in food, feed, and farm produce (Feb. 2018-Oct. 2020, funded by DOST)
2. Utilization of cassava (*Manihot Esculenta* Crantz) in sourdough fermentation by linamarase-producing lactic acid bacteria and yeast from existing collection of cultures (Jan 2018- April 2021, funded by DA)
3. Development of microbial and process technologies for ethanol production from various local feedstocks (Jan 2016-present, BIOTECH Core Fund)
4. Optimization of pediocin production from *Pediococcus acidilactici* (BIOTECH Core Fund)

Publication (Last Five Years)

1. Peralta, J.G.B., **F.B. Elegado**, J.F. Simbahan, I.G. Pajares and E.I. Dizon. 2021. Microbial and metabolite profiles of spontaneous and adjunct-inoculated cacao (*Theobroma cacao* L.) fermentation. *Food Research*.5(2): 331-339.
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Awards and Honors :

- U.P. Scientist II (2016-2018, 2019-2021); U.P. Scientist I (2013-2015)
- 2019 Univ. Philippines Los Baños (UPLB) Outstanding Researcher Award in the Natural Sciences Discipline (Senior Faculty Category).
- Invention Disclosure Awards. A) Development of DNA-based Nano-biosensors for Food and Environmental Applications.; B) Composition and Method of Production of Guava-based Probiotic Drink. Philippine Genome Philippine Genome Center, Univ. Philippines (U.P.). December 12, 2018.
- 2018 UPLB Alumni Association, Inc. 100th Loyalty Day College Distinguished Alumni Award. College of Engineering and Agro-Industrial Technology
- Philippine Society for Microbiology (PSM) Outstanding Microbiologist (2016)
- U.P. Research, Extension and Professional Staff Association Outstanding Researcher (2007)
- Creative Research Award, Dept. of Science and Technology (DOST), 2007
- National Academy of Science and Technology (NAST) Most Outstanding Publications (2007, 2011)
- Dept. of Agriculture, Bureau of Agricultural Res.(DA-BAR) Award for Outstanding Publication (2003)
- Gold Awardee. 2019, AFMA R&D Paper Award. 31st DA-BAR National Research Symposium
- 2019 Best Poster Award (Biotechnology). 6th Annual Scientific Conference and 10th General Assembly Meeting. UP REPSS.
- Best Poster Paper. 2019 International Nanotech Conference.

- Best Poster Paper and Flash Talk. GARD Innovation Forum: Bridging Technologies and Market. Category 3 - Prevention of Future Pandemics; Food Safety and Security. June 25-26, 2021 (virtual)
- DA-BAR Outstanding Research (2004); PSM Best Poster Papers (1989, 2010, 2014)
- NAST Best Poster Papers (2012, 2019)
- Philippine Association for the Advancement of Science Best Poster Papers (2011, 2013)
- National Research Council of the Philippines Best Poster Paper (2014)
- U.P. President's Award for Academic Distinction (2004, 2005, 2007, 2008, 2009, 2010, 2012, 2013)

Harnessing the Benefits of Philippine Traditional Fermented Foods

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Abstract

Like Indonesia, the Philippines is an archipelagic country, consisting of more than 7,000 islands, hence is rich in biodiversity and a variety of culture and foods, brought about by a rich history of immigration and occupation. Just like other countries in the Asian region, the Philippines boasts of a plethora of traditional fermented foods (TFF) that are less known than their commercialized counterparts. These Philippine TFF are generally consumed as condiments and flavorings for dishes. However, with modernization and the advent of Western influenced fast foods, the consumption of TFF is waning and should be further promoted. Studies on the isolation and characterization of beneficial microorganisms and their formulation as adjuncts or supplements to fermented food products that are attractive to consumers should be continued. Health-related research are much needed nowadays to contribute to worldwide efforts in harnessing the benefits of these good microorganism from traditional fermented foods.

Keywords: Philippine traditional fermented foods, beneficial microorganisms

Identification And Characterization Molds In Ragi Tempeh "Raprima" Lipi Indonesia And Over-Fermented Tempeh Koro Pedang Beans

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Abstract

Tempeh Molds is a seed used to make tempeh a starter mixed with legumes as a substrate. Generally, tempeh molds were *Rhizopus* sp, but it is not specific to a particular genus. This study aimed to identify and characterize the molds contained in the tempeh "Raprima" LIPI Indonesia and over-fermented (60 hours) tempeh koro pedang. The method used in this research was identification with media-specific molds tempeh i.e., Yeast Mold Agar (YMA) and Malt Extract Agar (MEA), and analyzed by most chamber and microscopic, as well as characterization by biochemical analysis with API-test and molecular with ITS sequencing by PCR Product. The results showed that "RAPRIMA" tempeh yeast had total molds of 4.94 log cfu/ml on YMA media, and 4.85 log cfu/ml on MEA media, while over-fermented tempeh had total molds of 4.84 log cfu/ml on YMA media and 4.60 log cfu/ml on YMA media. The characteristics of molds were black, white, and oval mycelia. Based on the API-test analysis, it was identified that the tempeh yeast "RAPRIMA" and over-fermented tempeh was *Rhizomucor*, based on ITS sequencing by PCR products, was *Rhizopus microsporus*.

Keywords: Ragi Tempeh "RAPRIMA", over-fermented tempeh, identification, *Rhizopus* sp

The Addition Of Palm Sugar Levels And Fermentation Time Affect The Characteristics Of Kombucha Moringa

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Abstract

Moringa leaves contain minerals and active compounds that can act as natural antioxidants. To get the benefits of moringa leaves it is processed into kombucha which can be drunk as a functional drink. This study was aimed to determine effects of adding palm sugar and fermentation time on the characteristics of kombucha moringa. Factorial randomized block design was used as experimental design, with 2 factor, namely, ratio of sucrose and palm sugar ($a_1=1:3$, $a_2=1:1$, and $a_3=3:1$); and fermentation time ($b_1=6$ day, $b_2=9$ day, and $b_3=12$ day), 3 repetitions. Physicochemical, antioxidant activity, sensory characteristics, and antimicrobial activity were analyzed. The results showed that the addition of palm sugar levels and fermentation time of kombucha moringa affected on physicochemical, antioxidant activity and sensory characteristics ($p < 0.05$). The ratio of sucrose to palm sugar was 3:1 with a fermentation time of 6 days had the best treatment, which contained total acid titration 0.35%, pH 3.75, cellulose thickness 0.43 cm, cellulose weight 16.23 grams, antioxidant activity (IC_{50}) 418 $\mu\text{g/mL}$, vitamin C 75.94 $\mu\text{g/mL}$, and the diameter of the zone of inhibition at *S.aureus* 9.6 mm and *E. coli* 7.3 mm. it was concluded that by utilizing the properties of moringa leaves and palm sugar made kombucha moringa as an alternative to functional drinks.

Keywords: fermentation, kombucha, moringa, Moringa oleifera, palm sugar

The Effect of Different Concentrations of Banana Ambon Puree on the Physicochemical, Microbiological, and Organoleptic Properties of Rice Bran Yogurt

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Abstract

The addition of ambon banana puree [ABP] has the potential to improve the functional and organoleptic properties of rice bran yogurt. Hence, the purpose of this study was to determine the effect of different concentrations of ABP on physicochemical, microbiological, and organoleptic properties of rice bran yogurt. The latter was prepared with UHT (Ultra High Temperature) milk, 1% rice bran, sugar, skim milk, starter, and ABP at concentrations of 0%, 5%, 10%, 15%, 20%, and 25% (w/v) and repeated 4 (four) times. Different concentrations of ABP had significant effect ($P < 0.05$) on syneresis day 7, pH value, total LAB of yogurt rice bran, and organoleptic of mouthfeel and appearance. Results showed that different ABP concentrations had no significant effect ($P > 0.05$) on syneresis day 0, total lactic acid of rice bran yogurt, and organoleptic property of taste. Based on these findings, rice bran yogurt with different concentrations of ABP had syneresis on day 0 was 0.089-0.500%, syneresis day 7 was 0.130-0.522 %, pH 4.349-4.593, and total lactic acid 0.9733%-1.0513%. Furthermore, organoleptic testings presenting the appearance preferences ranged from 2.15 to 6.07 (dislike-like), taste 4.10-4.78 (neutral-like), and mouthfeel 3.65- 5.53 (neutral-like). The result of total LAB was 8.7335-9.1543 log cfu/g. ABP had a favorable effect on the physicochemical, microbiological, and organoleptic properties of rice bran yogurt.

Keywords: yogurt, rice bran, banana ambon

The Effect Of Cavendish Banana (*Musa acuminata*) Puree Concentration To The Microbiological, Physicochemical, And Sensory Properties Of Rice Bran Yogurt

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Abstract

Cavendish banana [CB] is a widely known fruit for its high saccharide content and many volatile aroma compounds [esters and alcohols]. Integrating CB to rice bran yogurt [RBY] is expected to enhance the sensory properties, however, its contents of starch, simple sugars and organic acids may affect LAB's growth, which impacts the physicochemical and sensory properties of RBY. The aim of this study was to ascertain the microbiological, physicochemical and sensory properties of RBY integrated with CB puree at various concentrations. The research design used was randomized block design (RBD) with single factor, namely the concentration of CB puree which consisted of 6 (six) treatment levels; 0%, 5%, 10%, 15%, 20%, and 25% (w/v) with 4 (four) repetitions. Results showed that the integration of CB puree has significantly affected the total LAB ($P < 0.05$), pH and sensory preferences of RBY (appearance and mouthfeel), however, it has no significant effect on the titratable acidity (as %lactic acid) ($P > 0.05$), syneresis and taste preferences of RBY. The total LAB of RBY integrated with various CB puree concentrations ranged from 8.8989 to 9.2461 log CFU/g with pH 4.298-4.605 and titratable acidity (as %lactic acid) 0.9418-1.0263%. Syneresis varied between 0.821-1.528% (day 0) and 0.584-1.154% (day 7). Increment levels of integration of CB puree reduced the appearance and mouthfeel preferences, while taste preferences tended to increase up to 15% level of integration. CB puree exerted a praising effect on the microbiological, physicochemical and sensory properties of RBY.

Keywords: yogurt, rice bran, Cavendish banana puree.

The Effect of Difference Strawberry (*Fragaria x ananassa*) Puree Concentration on Microbiological, Physicochemical, and Organoleptic Properties of *Monascus* Fermented Durian Seeds Yogurt

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Abstract

Today more than ever, leading a healthy lifestyle by consuming fermented products, is the trend that is quite popular among healthconscious individuals. *Monascus* Fermented Durian Seed (MFDS) is a fermented product from durian seed using *Monascus purpureus* culture. MFDS has specific bioactive properties: an excellent source of antioxidants, anti-diabetes, and anti-Hypercholesterolemia. However, MFDS extract in yogurt showed some limitations [reduction of color and taste preference], hence innovative food technology methods that focused to enhance key organoleptic characteristics of a new yogurt product that combines MFDS in presence of strawberry puree at 5%, 10%, 15%, and 20% (w/v) of the total mixture. The purpose of this study was to determine the effect of serial concentrations of strawberry puree on microbiology, physicochemical, and organoleptic properties of MFDS yogurt products. The results showed that all concentrations of strawberry puree affected favourably the microbial, physicochemical, and sensory properties of the new yogurt product. The addition of strawberry purees caused an increase in the acidity of yogurt with pH value (4.287 - 4.475) and titratable acidity (0.74% - 1.17%). The color parameters such as lightness and yellowness also decreased, however, the values of redness, chroma, and hue have increased. The shelf-life experiment [maximum of 7 days] of the yogurt product revealed a maximum syneresis of 22.52%. Based on the sensory evaluation preferences, the new yogurt product with 10% strawberry puree was the best, with a preferred value of the color at 5.6 (rather like), the flavor at 5.8 (rather like), and mouthfeel (rather like).

Keywords: Yogurt, *Monascus* Fermented Durian Seed, *Monascus* Fermented Durian Seed extract, Strawberry Puree

Amylose Content and Physical Changes In Waxy Corn Starch Modified By Spontaneous Fermentation

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Abstract

The aim of this study was to determine the changes in the ratio of amylose and amylopectin and the physical properties of spontaneously fermented waxy corn starch granules. The results showed that the amylose content of waxy corn starch that was fermented spontaneously from 9 to 15 days experienced a significant change from that of native starch, which was around $\pm 86 - 117\%$. The hydrolysis process was caused by lactic acid bacteria with the highest activity showed at 15th day of fermentation. Changes in starch composition also affected the swelling power, solubility, water absorption, and gelatinization profile of waxy corn starch. Starch that was fermented for 15 days had the highest amylose percentage (24.92%) and the lowest swelling value compared to native starch. The percent solubility of fermented starch increased up to 65.56% with increasing the amount of amylose and on the 15th day of fermentation. Water absorption increased until the 6th day of fermentation and then decreased due to an increase in the amount of amylose. The gelatinization of native and fermented modified starch were of the same profiles.

Keywords: starch, amylose, fermentation, waxy corn, gelatinization

Amylase, Protease, and Lipase-Producing Microbes of Local Origin as Potential Starter Cultures for Low-Salt Moromi Fermentation

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Abstract

Soy sauce is made by fermenting soybean and wheat in two steps called *koji* (solid-state) and *moromi* (brine) fermentation. The latter uses a high amount of salt (NaCl 18-22%), which may contribute to excessive sodium intake. Reducing salt in moromi could negatively affect halophilic microbes' activity, central to the fermentation process. Starter culture utilization has been increasingly adopted to control the fermentation process better and bring about desirable changes. This study aims to isolate potential starter cultures for low-salt soy sauce fermentation from Indonesian traditionally fermented *koji* and *moromi*. Total mesophilic aerobic bacteria (TMAB), lactic acid bacteria (LAB), and fungi (yeast and mold) were isolated using nutrient agar (NA), de Man, Rogosa, and Sharpe (MRS) agar, and potato dextrose agar (PDA), respectively, supplemented with chloramphenicol or cycloheximide. Isolates showing enzymatic activities (protease, amylase, and lipase) at 5% and 20% NaCl were subjected to growth profile characterization in tryptic soy broth (TSB) varying in salt concentrations (0%, 5%, and 20%) and pH (4.0, 5.0, and 6.0). A total of 47 bacterial and 39 fungal isolates were obtained, with 14 bacterial and 12 fungal isolates showing enzymatic activities at 5% and 20% NaCl. DNA sequencing confirmed that most selected bacterial isolates belonged to *Bacillus subtilis* species, while the majority of selected fungal isolates belonged to *Aspergillus* genus (*Aspergillus oryzae* and *Aspergillus tamarisii*). Most *Bacillus* isolates demonstrated rapid growth in 5% NaCl and pH 5.0. This study suggested that *Bacillus* could be a promising starter culture candidate for fermenting low-salt soy sauce.

Keywords: *Bacillus*, *Aspergillus*, *koji*, *moromi*, low-salt soy sauce

Potency of Tapai Yeast as Probiotic for Human Gut Health

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Abstract

Most marketed probiotic supplements use bacterial strains, i.e *Lactobacilli* and *Bifidobacteria*. Another probiotic was recently developed from yeast. *Saccharomyces boulardii* is a probiotic yeast used in many countries as both preventive and therapeutic agents for diarrhea and other GI disorders caused by the administration of antimicrobial agents. This research was performed by isolating yeasts in tapai, an Indonesian fermented food from steamed cassava. Four types of tapai were collected from Jember and Bondowoso Regency, East Java, Indonesia. Screening process of yeast was based on their survival in artificial gastric acid at pH 2.0. These yeast strains were cultured in MEA and identified based on their phenotype and genotype characteristics. Molecular profiling using PCR-fingerprinting technique as well as identification of homology sequence by comparing to the GenBank database using BLASTN and the phylogenetic tree construction were also conducted. There were two yeasts that could survive in artificial gastric acid at pH 2.0 i.e SUL and SM isolate. The SUL colony was isolated from Sumber Madu brand tapai with morphological characteristics, i.e wrinkled colonies, containing pseudo mycelium, white colonies' surface, and round cell. Meanwhile, the SM colony was isolated from Sari Madu brand tapai with morphological characteristics, i.e thin and wide colonies, absence of pseudo mycelium, white turbid colonies' surface, and oval cell. The SUL isolate survived more (82%) than SM isolate (79%) at pH 2.0 of artificial gastric acid. Genotypic identification revealed SUL isolate as *Kodamaea ohmeri* and SM isolate as *Pichia kudriavzevii*.

Keywords: cassava, fermented food, probiotic, tapai, yeast

Ethnic Food Fermentation From Bengkulu as a Source of Lactic Acid Bacteria

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Abstract

In order to avoid extinction, local strains of lactic acid bacteria must be studied. The purpose of this study was to find Lactic Acid Bacteria (LAB) strains in fermented Betung bamboo shoots (*Dendrocalamus asper* Schult) and Yellow bamboo shoots (*Bambusa vulgaris* Schrad). This fermented foodstuff was only found in Bengkulu province because of the ethnic diet of the rejang tribe which was made by combining bamboo shoots with river fish and allowing it to stand for a few days until a distinct aroma emerges. The LAB identification was begun with homogenizing 10 g of the samples, which then get serially diluted with 1 percent sterile NaCl and spreaded on MRSA media. The isolates were identified molecularly using 16S rRNA gene amplification, which included the procedures of isolating genomic DNA, amplification using DNA, sequencing, and nucleotide sequence analysis on GenBank. *Lactobacillus plantarum* strain B1 and *Lactobacillus plantarum* strain B2 were identified on fermented Betung bamboo shoots, while *Lactobacillus plantarum* S1 and *Lactobacillus fermentum* S2 on Yellow Bamboo shoots. *Lactobacillus plantarum* and *fermentum* isolated from fermented bamboo shoots were gram positive bacteria and a group of lactic acid bacteria.

Keywords: Lactic Acid Bacteria, Bamboo shoot, Ethnic Food Fermentation, PCR, 16S rRNA

The Characteristics Of Cream Cheese Made From Lampung Farmer's Milk As Impact Of Stabilizer Application On Different Curd Recovery

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Abstract

The objective of the study was to evaluate the cream cheese characteristics made from Lampung farmer's milk improved by the combination of 2% xanthan gum and 1% gelatin as stabilizers. The cream cheese samples were prepared by three treatments namely (T1) stabilizer application on curd without whey separation, (T2) no stabilizer application on curd with whey separation, and (T3) stabilizer application on curd with whey separation. All experiments were repeated three times. Results demonstrated that the addition of stabilizer (xanthan gum and gelatin) with or without whey separation had a better impact on the proportional protein, fat, yield, as well as texture and spreadability. In addition, stabilizer addition had no adverse effect on the color, taste, and aroma of all cheese cream. Nevertheless, cream cheese without whey separation had higher moisture content than those with whey separation even though with stabilizer added. Therefore, it was possible to explore cream cheese made from Lampung farmers' milk with the addition of stabilizer and whey separation application.

Keywords: cheese cream, xanthan gum, gelatin, Lampung farmer's milk

Physicochemical And Sensory Characteristics Of Star Fruit Wine Aged With Spices

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Abstract

Starfruit is one of the tropical fruits that can be processed into fermented beverages (fruit wine). Young fruit wine has an unbalance in taste and aroma as well as cloudy color that quickly disappears, which are less desired in wine products. The aim of this study was to prove that aging can improve the sensory characteristics of star fruit wine. In this study, star fruit wine was ripened for two and four weeks with two doses of spices (cinnamon, cloves, and ginger). After aging, the physicochemical characteristics were measured for its turbidity, sugar content (obrix), pH, alcohol (ethanol and methanol), antioxidant activity, and tannin content. Microbiological testing included TPC and gram staining. Sensory analyses were carried out on 23 untrained panelists with the parameters of color, taste, aroma, and aftertaste. The results showed that: (1) two weeks aging with 0.1% cinnamon was the best formulation of sweet star fruit herbal wine - cinnamon; (2) two weeks aging with 0.15% cloves was the best formulation of sweet star fruit herbal wine – cloves; (3) four weeks aging with 0.3% ginger was the best formulation of sweet star fruit herbal wine – ginger. Accordingly, aging with the addition of spices could improve the characteristics of fruit wine.

Keywords: start fruit, wine, spices, aging

Kinetics Study Of Bacterial Cellulose Production By *Acetobacter Xylinum* Fnc 0001 With Variation Of Carbon Sources

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Abstract

Glucose and fructose (2.0% (w/v)) were used as the carbon sources and peptone was used as nitrogen source (1.5% (w/v)) in order to determine the kinetics study and yield of bacterial cellulose production. Coconut water was prepared as the fermentation medium. Data of the fermentation rate was observed at 19 points of certain time during 7 days of fermentation process. The number of cell biomass was calculated using cell dried weight method, total plate count method and optical density method which was observed at 660 nm. The remaining media substrate was analyzed using the DNS method, while the BC yield was determined by the gravimetric method. The results showed that the best values of μ , Td, Rx, Rs, Rp, Yp/s, Yp/x were achieved by fructose, while the best Yx/s value was achieved by glucose. The corresponding values were 0,1141/h, 6,0737 h, 0,1141 g/L/h, 0,0635 g/L/h, 0,3015 g/L/h, 0,317 g/g, 0,5927 g/g and 0,0983 g/g respectively. The highest BC yield at the end of fermentation process was achieved by glucose carbon at 5.83 g/L, followed by fructose at 4.91 g/L.

Keywords: *Acetobacter xylinum* FNCC 0001, bacterial cellulose, fermentation kinetics, fructose, glucose

Indigenous Microbe From Gatotan, Indonesian Fermented Cassava, For Developing Starter Of Probiotic-Kefir Product

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Abstract

Kefir is a diversification product of milk using starter that contains lactic acid bacteria (LAB) and yeast. This product is claimed as one of probiotic products. Some studies reported that probiotics isolated from indigenous food are more adaptive to microflora's ethnoecology, especially for human gut health. Indonesia has many fermented indigenous foods. *Gatotan* is known as Indonesian fermented food from cassava. Mold roles during solid fermentation, while lactic acid bacteria role during submerged fermentation of *gatot* production. This research was aimed to isolate and identify LAB and yeast from *gatot* production as probiotic candidates to apply on Kefir production. *Gatotan* was produced from cassava var. yellow (Malang 4) and cassava var. white (Malang 2). The microbe isolation from *gatotan* was conducted on submerged fermentation of *gatotan* after 5 days fermentation. The slurry was dissolved in pH 2.0 of artificial gastric acid to get the probiotic candidates, then was grown in MRSA medium for LAB and MEA medium for yeast. The phenotype and genotype characteristics of growing isolates were identified. There were two isolates i.e one LAB isolate from cassava var. white and one yeast isolate from cassava var. yellow. The LAB had a milk-white colony, rod-shaped, gram-positive bacteria, and negative catalase. The yeast had characteristics as a white-colony, ellipse-shaped, and pseudohyphae cell shape. Based on genotypic identification, the LAB isolate was known as *Lactobacillus brevis*, while the yeast was known as *Pichia kudriavzevii*. Further research can be carried out to apply the isolate as a co-culture starter to produce kefir probiotics.

Keywords: cassava, co-culture starter, *gatot*, lactic acid bacteria, probiotic

Starter Cultures Inoculation Procedure Changes Microbial Community Structure During Low-Salt Moromi Fermentation

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Abstract

Soy sauce is a liquid condiment made of soybeans and wheat fermented in a brine solution (18%-22 NaCl) called *moromi* fermentation. Such a high salt concentration may contribute to excessive sodium intake associated with many health problems. However, reducing salt content in *moromi* could alter the dynamics of the microbial community of *moromi*, resulting in undesirable changes in the aroma profile. The feasibility of performing low-salt *moromi* fermentation by introducing starter cultures, such as *Tetragenococcus* and *Zygosaccharomyces* species, into *moromi* has been reported. However, the impacts of their inoculation on the microbial population changes during fermentation remains unknown. This study investigated the effect of *Tetragenococcus* sp and *Zygosaccharomyces rouxii* inoculation procedure (ratio, concentration, and inoculation time) on bacterial and fungal population changes during low-salt (6% NaCl) *moromi* fermentation. Total bacterial and fungal cell counts were obtained by culture on tryptic soy agar (TSA) and potato dextrose agar (PDA), respectively. Adding *Z. rouxii* twice the amount of *Tetragenococcus* caused the bacterial population to increase sharply by 3.29 log CFU/mL during the first 8 days of fermentation. Meanwhile, a maximum of 3.70 log CFU/mL increase in yeast counts occurred when *Tetragenococcus* was added twice the amount of *Z. rouxii*. Inoculating both cultures simultaneously could maximize yeast population to 7.50 log CFU/mL; however, it suppressed bacterial growth. Simultaneous inoculation could promote bacteria-yeast synergistic growth when 5% inoculum with an equal ratio was used. This study could help soy sauce researchers and manufacturers determine appropriate inoculation procedures to control fermentation better.

Keywords: *Tetragenococcus halophilus*, *Zygosaccharomyces rouxii*, *moromi* fermentation, low-salt soy sauce

A Study Of Factors Affecting Mother's Purchase Intention For Probiotics In Jabodetabek Area

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Abstract

This study was aimed to identified the understanding and experience of mothers in Jabodetabek area about probiotics to identify factors that may affect mother's perception and their purchase intention on probiotics. The variables were analyzed including understanding of probiotics, experience in buying probiotics, perception about probiotics, and probiotics' purchase intention. A survey on 214 participants was used to investigate the influence of these variables on probiotics' purchase intention and regression analysis was carried out. The results indicated that understanding of probiotics and experience in buying probiotics influenced their perception about probiotics. Moreover, the perception about probiotic had effect to probiotics' purchase intention. Interestingly, respondents who domicile in Jakarta had significantly higher purchase intention of probiotics.

Keywords: probiotics, purchase intention, mothers, perception

Effect Of Molasses Concentration On The Pigment Production Of *Monascus Purpureus* M9 Of *Monascus* Fermented Durian Seed

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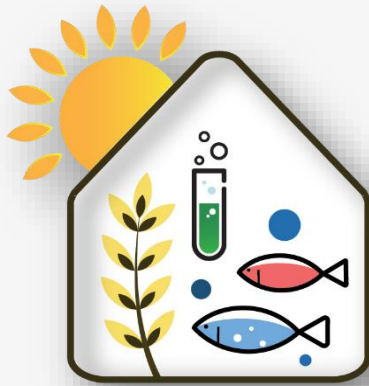
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Abstract

Intensive scientific efforts have been made to cultivate *Monascus purpureus* on durian seed media to produce *Monascus* Fermented Durian Seed (MFDS). The reutilization of durian seed has been documented as potential food processing industrial waste. Although MFDS has pigment characteristics that resemble those of rice Angkak, however the pigment production of MFDS needs to be amplified. This can be achieved by adding a carbon source in the form of a simple saccharide found in molasses. The purpose of this study was to determine the effect of molasses concentration on the production of *M.purpureus* M9 pigment in MFDS. The research design used was a randomized block design with one factor, namely the concentration of molasses (M) with six treatment levels, M0 = 0%; M1 = 2%; M2 = 4%; M3 = 6%; M4 = 8% and M5 = 10% with four repetitions. Findings showed that the concentration of molasses had a significant effect on the color of MFDS powder, water-soluble pigment level, 99.9% ethanol-soluble pigment level, and the pigment profile for both solvents. The best treatment based on pigment content was the M4 treatment with an 'L value' of 43.83, a* value of 14.92, b* value of 7.08, C value of 16.54, °H value of 24.45, and aquadest soluble pigment content of 16.86AU/g (yellow); 9.23AU/g (orange); and 8.19AU/g (red) and ethanol soluble pigment content of 9.8AU/g (yellow); 2.5AU/g (orange); and 3.0 AU/g (red). Molasses saccharide is able to enhance pigment production of *Monascus purpureus* M9 of MFDS.

Keywords: *Monascus* Fermented Durian Seed, Molasses, Color, Pigment Profile



Parallel Session

Functional Food (FC)

Curriculum Vitae Invited Speaker

Prof. Made Astawan, Ph.D.



Place/Date of Birth : Singaraja, February 2nd 1962

Present Position

- Head of the Division of Food Biochemistry, Department of Food Science and Technology, IPB University

Education

- Ph.D. in Food Chemistry and Nutrition, Tokyo University of Agriculture, Japan, 1995
- MS in Food Science, IPB University, 1990
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Working Experience

- Lecturer and researcher at IPB University

Research (last five years) :

| No | Period | Research Title |
|----|-----------|---|
| 1 | 2015-2017 | Application of Germinated Soybean Tempe Flour as Hypotensive, Hypocholesterolemic, and Hypoglycemic Functional Foods |
| 2 | 2016-2017 | Application of Tempe Flour from Local Soybeans as a Prevention of Osteoporosis and Premature Aging |
| 3 | 2018-2020 | Techniques for Making Tempe Protein Isolates, Analysis of Physicochemical Properties, and Its Applications as Functional Foods to Prevent Diabetes Mellitus |
| 4 | 2018-2020 | Equivalence Evaluation of Local Soybeans and Imported Transgenic and Non-transgenic Soybeans, and the Impact of Their Consumption through Subchronic Tests on Experimental Rats |
| 5 | 2018 | Metabolomic Technology as an Integrated Strategy in Characterization of Active Components of Natural Ingredients to Increase Added Value of Tropical Bioproducts |
| 6 | 2019 | Utilization of Fresh and Overripe Tempe as Hypoglycemic Functional Food |

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| 7 | 2019 | Introduction to the Use of Dehulled Soybeans in Making Tempe and Its Application to Improvement of the Hematological and Biochemical Profiles of Serum Patients with Diabetes Mellitus |
| 8 | 2019-2021 | Potential of Tempe as a Hypoglycemic Functional Food: Effect of Germination of Soybeans and Differences in Fermentation Time |
| 9 | 2021 | Improvement of Tempe Protein Isolate Manufacturing Technology to Increase Protein Content and Functional Properties |
| 10 | 2021-2022 | Techniques for Producing Tempe Protein Concentrate and Its Application as Beverage Powder |

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Awards and Honors :

1. Most Productive Author of Popular Books on Nutrition and Food (2013)
2. Anugerah Prakarsa Jawa Barat: Establishment of an Indonesian Tempe House in Bogor as a Pilot Center for National Hygienic Tempe Production (2014)
3. Ristek Dikti-Kalbe Award related to Tempe Research as a Prevention of Diabetes Mellitus (2018)

The Development of Tempe as a Functional Food for the Future

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Abstract

The Covid-19 pandemic demonstrates that local traditional foods rich in nutrients and bioactive compounds strengthen resilience against disease and improves immune systems. The current population of Indonesia is 272 million people, of which 56.01% is concentrated on the island of Java. The average contribution of protein consumption is 67% plant-based and 33% animal-based. One of the plant-based foods with the most potential to be developed as a functional food is tempe, a traditional food native to Javanese culture since the 16th century. Lately, tempe has been consumed throughout Indonesia and 27 other countries worldwide. The fermentation process by *Rhizopus* spp. and other microbes have contributed significantly to improving taste, the bioavailability of nutrients, and bioactive compounds in tempe. The minimum protein content requirement of tempe is 15%. The quality of tempe protein is equivalent to animal protein. Apart from being a source of protein, tempe is also rich in B vitamins (especially B12), minerals (calcium, phosphorus, iron), and bioactive compounds (dietary fiber, peptides, isoflavones, saponins, SOD, polyamines, and 3-hydroxyanthranilic acid). The bioactive compounds in tempe are indispensable for human health, namely in their function as agents of hypocholesterolemic, hypotensive, hypoglycemic, insulinotropic, antiatherogenic, antioxidant, anticarcinogenic, anti-inflammatory, antimicrobial, antidiarrhea, preventing osteoporosis, preventing disorders of the digestive tract, and regulate fat metabolism. Processing technologies of tempe need to be improved, adapted, and developed to establish their safety and to scale up for large-scale commercial production, while respecting the traditional, ethical, cultural, and religious aspects involved.

Keywords: bioactive compounds; functional food; plant-based protein; tempe

Cholesterol Synthesis Inhibition Of *Cajanus Cajan* Leaves And *Zingiber Officinale* Extracts Through Hmg-Coa Reductase Inhibitory Activity

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Abstract

One indicator of an antihypercholesterolemic candidates is that they have an inhibitory activity on 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase enzyme, subsequently the cholesterol synthesis will be inhibited. This study was aimed to analyze the HMG-CoA reductase inhibitory activities of *Cajanus cajan* leaf, *Zingiber officinale* var Amarum, and *Zingiber officinale* var Rubrum. *C. cajan* leaf, and two types of *Z. officinale* were extracted using maceration method with three types of solvents that are water, 70% ethanol and 96% ethanol. All of nine types resulted extracts then were analyzed the bioactive compounds, and tested for the HMG-CoA reductase inhibitory activity using HMG-CoA reductase analysis kit (BioVision's K588-100). It was carried out *in vitro* using a colorimetric microplate reader with a wavelength of 340 nm at 37°C. The results showed the extracts contain flavonoid, tannin, saponin and steroid. The nine extracts showed inhibitory activities on HMG-CoA reductase enzyme. There were three extracts showed highest inhibitory activity; 70% ethanolic *Z. officinale* var Amarum extract (by 47.87%), aqueous *Z. officinale* var Rubrum extract (by 40.62%) and 70% ethanolic *C. cajan* leaf extract (by 39.38%). These results indicated that the three extracts had medium inhibitory level of HMG-CoA reductase. The study suggested that the three types of extracts could be used as an antihypercholesterolemic candidates for further study in order to produce such antihypercholesterolemic functional food.

Keywords: *Cajanus cajan*, cholesterol, flavonoid, HMG-CoA reductase, *Zingiber officinale*

In Silico Anti-Cholesterol Of Monacolin From *Monascus Sp* On HMG-CoA Protein Receptor

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Abstract

The fungus *Monascus sp* has traditionally been used in fermenting brown rice (angkak) which is useful as a food coloring, food preservative and medicine. Currently, Angkak rice has become a well-known dietary supplement because of the many bioactive compounds it contains such as monacolin. The purpose of this study was to determine the activity of monacolin compounds as anti-cholesterol, as well as predict the toxicity of compounds through in silico studies. The test compound consisted of 14 monacolin compounds. The protein HMG CoA (3-hydroxy-3-methylglutaryl coenzyme A) reductase was used as an anticholesterol receptor. AutoDock software was used to analyze the receptor structural complex with the test compound. Toxicity prediction was performed using ADMET predictor software and pkCSM. Toxicity prediction and docking results showed that monacolin L the best anti-cholesterol activity against HMG CoA reductase. Molecular dynamic simulation study used MOE 2010 software. The simulation resulted data in the form of conformational energy values (kcal/mol), hydrogen bonds, and amino acid similarity which indicated the stability of the interaction of the ligands of monacolin compounds with amino acids at the receptor. The molecular dynamic results showed that monacolin L was stable because it had a low conformational energy value of -10.22 kcal/mol and there were two amino acids that form hydrogen bonds with the active site of the receptor, namely Arg A:568 and His A:752, and had 5 acid residues. the same amino acid as the result of docking.

Keywords: in silico, monakolin, *Monascus sp*, molecular dynamic, anticholesterol.

Hypocholesterolemic Effects Of Noodles Prepared From Sago, Sorghum And Mung Bean Flours In Hyperglycemic Rats

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Abstract

Nowadays food development is not only for fulfilling nutritional needs, but food can also have functional properties that are beneficial to health. Indonesia has the potential of abundant natural resources, optimizing the potential of local food ingredients needs to be continuously developed. This study aimed to determine the potential of noodles based on local food ingredients to be developed as functional food. The ingredients used to produce the noodles include sago, sorghum and mung beans flour with various formulas, namely F1 (sago 50%: sorghum 20%: mung bean 30%), F2 (sago 20%: sorghum 50%: mung bean 30%) and F3 (sago 10%: sorghum 60%: mung bean 30%). The functional properties of noodles were observed through blood serum cholesterol profile and SCFA (Short Chain Fatty Acid) levels in caecum. The in vivo studies used 5 groups of Sprague Dawley rats, namely healthy rats, hyperglycemic rats, hyperglycemic rats with F1 diet, hyperglycemic rats with F2 diet, and hyperglycemic with F3 diet. The results showed that the F1-F3 diet could improve blood cholesterol profile by decreasing total cholesterol 16.90-33.69%, triglycerides 30.41-35.64%, LDL 37.52-46.48% and increasing HDL 103.92-127.47%. Caecum samples in rats with F1-F3 diet contained acetic acid 5.35-9.28 mMol, propionic acid 3.56-6.39 mMol and butyric acid 1.97-4.05 mMol. This can conclude that noodles based on sago, sorghum and mung bean flour (F1-F3) can improve blood cholesterol profile and increase the SCFA levels of hyperglycemic rats caecum.

Keywords: Hypocholesterolemic, sago, sorghum, mung bean, noodles

Dynamic Changes of Total Phenolic Content, Antioxidant Activity, and Gamma-Amino Butyric Acid (GABA) Content of Germinated, Fermented, and Cooked Red Rice

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Abstract

Red rice had more bioactive compounds and harder texture than white rice. Germination and fermentation had been reported to improve the texture and GABA content of rice. Cooking involved heating process which could damage some bioactive compounds in plant products. The objective of this study was to investigate the changes of total phenolic content, antioxidant activity, and GABA content of red rice which was subjected to germination, fermentation, and cooking processes. The local red rice cultivar (Cempo) was soaked for 16 h and germinated for 24 h in the dark. The germinated red rice was pasteurized, cold-shocked, then fermented using *Lactobacillus acidophilus* ATCC 4356 (10^6 CFU/mL) for 24 and 48 h at 37 °C, rinsed, and cooked. The cooked rice was dried and pulverized. The total phenolics content, radical scavenging (antioxidant) activity, and GABA content were measured using spectrophotometric methods. Germination was shown to decrease the total phenolics content and the antioxidant activity and increase the GABA content of the red rice. Cooking process increased the total phenolics content and antioxidant activity only in the germinated sample. GABA content in the germinated sample was not changed by the high temperature treatment in the cooking process. Fermentation decreased all three parameters in all samples, except in the germinated red rice sample which remained relatively constant. In conclusion, germination and cooking process were beneficial to maintain the antioxidant activity and increase the GABA content of red rice, while fermentation was only beneficial to maintain the GABA content of germinated red rice.

Keywords: DPPH, flour, *Lactobacillus acidophilus*, *Oryza sativa*, spectrophotometric

Effect Of Cherry (*Muntingia calabura*) Leaves Extract On The Starch Digestibility, Estimated Glycemic Index (Egi) And Resistant Starch Content Of Functional Rice

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Abstract

The purpose of this study was to investigate the effect of cherry (*Muntingia calabura*) leaves extract on the starch digestibility, estimated glycemic index (EGI), and resistant starch (RS) content of functional rice. Functional rice was made from rice flour added with different concentrations of cherry leaves extract, namely 0% (FR0), 5% (FR5), 10% (FR10), 15% (FR15) and 20% (FR20), using extrusion technology (a twin-screw extruder). The result showed that the addition of cherry leaves extract significantly reduced starch digestibility and EGI, and increased RS content of functional rice. Among the concentrations of extract, the lowest starch digestibility (79.58%) and EGI (46.37) were found in functional rice added with 20% cherry leaves extract. On the other hand, functional rice with 20% cherry leaves extract also had the highest RS content (5.95%) compared to other concentrations. Thus, there could be a potential health associated with incorporation of phenolic-rich cherry leaves extract into food to slow starch digestion, EGI and increase RS content.

Keywords: Cherry leaves extract, Estimated Glycemic index, resistant starch, starch digestibility

Red Kidney Bean (*Phaseolus vulgaris L.*) Instant Porridge: Effect Of Isomalto-Oligosaccharides And Fibercreme As Sucrose Replacement On Lipid Profile Improvement In Hypercholesterol-Induced Rats

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Abstract

The aim of the present study was to evaluate the effect of consuming pregelatinized kidney bean porridge with the variation of sweeteners, including sucrose (BKM S), isomalto-oligosaccharides (BKM IMO) and Fibercreme (BKM FC) in hypercholesterolemia rats on the lipid profile, bile acid binding capacity, digesta cholesterol excretion and digesta characters including weight, water content and pH. The results showed that BKM IMO and BKM FC diets improved lipid profile of rats by reducing total cholesterol, LDL cholesterol and triglycerides, and increasing HDL cholesterol. In addition, both diets increased cholesterol excretion. *In vitro* measurement of bile acid binding capacity showed that BKM IMO and BKM FC had a higher binding capacity than BKM S. It can be argued that increasing of cholesterol excretion and bile acids binding capacity of these diets were responsible for the improving of the lipid profile. BKM IMO and BKM FC had a higher digesta weight and water content but lower pH. In conclusion, the substitution of sucrose as sweetener with isomalto-oligosaccharides and Fibercreme in the formulation of pregelatinized kidney bean porridge could improve the beneficial health effect of the kidney bean porridge.

Keywords: Fibercreme, isomalto-oligosaccharides (IMO), hypercholesterolemia, bile acid, lipid profile

White Bread Formulation With The Addition Of Okra (*Abelmoschus esculentus* (L) Moench) Fruit Mucilage As An Alternative Food For Diabetics

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Abstract

White bread as a staple food source in Indonesia tends to be avoided by diabetics because its glycemic index (IG) which is relatively high, more than 70, so it needs to be formulated with okra fruit mucilage which has antidiabetic activity. This study was aimed to determine the effect of adding okra fruit mucilage (30, 60, 90mL) to the white bread against blood glucose reduction after 2 hours of consumption. This research used laboratory experimental methods with pre posttest design with control group. Each group consisted of 5 mice (2 control groups and 4 treatment groups) so total mice used were 30 mice. In addition, antioxidant activity and fiber content were also conducted. Data analysis was carried out in a qualitative descriptive. Results of this study showed that the white bread of F2 formula (60mL addition of okra fruit mucilage) had the highest fiber content of 4.27% and was able to reduce blood glucose with the highest percentage reduction of 55.37% after 2 hours of consumption of the white bread. White bread with the addition of okra fruit mucilage had the potential to serve as a functional source of fiber and had antidiabetic activity.

Keywords: Diabetes Mellitus, Dietary Fiber, Okra Fruit Mucilage, White Bread Formula

Antioxidant Activity and Isoflavone Content of Indonesian Overripe Tempe

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Abstract

This study aimed to measure and compare the changes in the nutritional and isoflavone content and antioxidant activity of tempe flour as a result of soybean germination and fermentation time treatments. The soybeans were germinated for 24 hours, and then processed into fresh tempe and overripe tempe with a fermentation time of 2 and 7 days, respectively, at room temperature (28-30°C). The fresh tempe and overripe tempe were dried using a cabinet dryer at a temperature of 60°C for 8 hours, then ground and sifted to produce flour. The nutritional contents were determined through proximate analysis, antioxidant activity was measured using the DPPH method, and isoflavone was measured using an HPLC instrument. The soybean germination process and tempe fermentation time length were shown to have no effect on the nutritional contents but had a significant effect on the change in isoflavone content and IC₅₀ value. The highest daidzein and genistein isoflavone content was found in overripe tempe flour made from germinated soybeans (GS), at 343 and 701 µg/g, respectively. However, the highest antioxidant activity with an IC₅₀ of 1375 ppm was found in overripe tempe flour made from non-germinated soybeans (NGS).

Keywords: Antioxidant activity, germination, isoflavone, overripe tempe

Chemical Properties And Sensory Acceptance Of Cookies Containing *Chlorella*

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Abstract

Chlorella is a unicellular alga that contains high nutritional and bioactive compounds, especially protein and carotenoids. Therefore, it is potency as the ingredient for functional food. This study was aimed to develop a cookie product with the addition of *Chlorella*. Besides, we also investigated the effect of *Chlorella* addition at the various concentration on cookies on the chemical properties and consumer acceptance. Analysis of chemical properties included proximate and total carotenoid content. A 9-point hedonic test determined consumer acceptance. The results were statistically analyzed by one-way analysis of variance (ANOVA). The results showed that the addition of *Chlorella* significantly increased the protein content but decreased the carbohydrate content (by difference). The addition of *Chlorella* also significantly increased the total carotenoid content. The highest carotenoid was reached by cookies containing 3% *Chlorella* with the content of $51.97 \pm 0.49 \mu\text{g/g}$. The Cookies containing a 1% concentration of *Chlorella* had the highest overall acceptance (7.19 "Like moderately"), which were influenced by the acceptance of aroma, taste, and after taste.

Keywords: *Chlorella*, Cookies, sensory acceptance, carotenoid

Evaluation Of Hypoglycaemic Potency In Tempe With Soybean Germination Process And Extended Fermentation Time

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Abstract

As a comorbid, diabetes mellitus or hyperglycaemia exacerbates the severity of coronavirus disease 2019 (covid-19). One of the potential hypoglycaemic food from Indonesia is tempe. It contains components that inhibit the α -glucosidase enzyme in the intestine and improve the pancreas function through insulintropic amino acids and antioxidants. The use of germinated soybean and the extended fermentation time are potential methods to increase hypoglycaemic activity. This study was aimed to evaluate the potential hypoglycaemic activity of tempe because the use of germinated soybeans as raw material and the extended fermentation time (observation on 48, 72, and 96 hours). The observations included insulintropic free amino acids, protein solubility, peptides profile, antioxidants capacity, isoflavones, total phenolic compounds, and the α -glucosidase inhibitor activity. During the extended fermentation time from 48 hours to 96 hours, the germinated soy tempe had the highest insulintropic free amino acids level, while non-germinated soy tempe had the highest antioxidant components (isoflavones, total phenolic compounds, and antioxidants capacity). However, the activity of α -glucosidase inhibitor due to treatments was decreased. It was suspected that this was related to the decrease of the 11.40 kDa peptide, which was dominant in this study. To sum up, tempe fermented up to 96 hours had more hypoglycaemic potential than tempe fermented in 48 hours by increasing the components that improve pancreas functions. Non-germinated soy tempe with 48 hours fermentation had the highest hypoglycaemic activity.

Keywords: Diabetes mellitus, over-fermented, insulintropic free amino acids, peptides, antioxidant

Preparation and Characterization Of Omega-3 Concentrate From Lemuru Fish (*Sardinella longiceps*) Oil

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Abstract

Lemuru fish (*Sardinella longiceps*) oil as a by-product contains long-chain omega-3 polyunsaturated fatty acids (PUFA) that are essential for preventing several diseases. For daily intake, saturated fatty acids should be removed from fish oil to obtain the PUFA concentrates. Various methods have been attempted in producing omega-3 concentrates. This study aimed to produce the omega-3 concentrate from lemuru fish oil using the urea complexation method and to characterize the omega-3 product. Lemuru fish oil was saponified and purified to produce fatty acids and urea was added to the fatty acids to obtain crystal complexes. In this study, crystallization was carried out at -20°C for 24 h with fish oil-urea ratios of 1:0.625, 1:1.25, and 1:2.5. The results showed that the highest content of omega-3 (ALA, DHA, EPA) was generated from the ratio of fish oil-urea of 1:0.625. Based on the spectrum FTIR analysis, omega-3 concentrate contained specific spectrums indicated by HC=CH *trans*, -C=O (ester), and -C-O (acid) groups. UV-Vis spectra analysis showed that the light exposure affected the stability of omega-3 concentrate, as was evident by the hypsochromic shift in the resulting spectrum.

Keywords: lemuru, omega-3, urea, crystallization

The Antioxidant Activity Of Aloe Vera (*Aloe vera* var. *Chinensis*) Powder With Maltodextrin And Gum Arabic As Fillers

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Abstract

Aloe vera gel has antioxidant properties due to its flavonoid content. However, consuming fresh aloe vera gel is impractical. Previous research has processed aloe vera into powder with maltodextrin or gum arabic as fillers and dried using spray dryer. However, this method exhibited a low efficiency. The purpose of this study was to produce aloe vera powder with high antioxidant activity using fillers and dried using an oven at 50°C. This research was conducted with a completely randomized design with two factors, which are types of fillers (maltodextrin and gum arabic) and concentrations of fillers (0, 5, and 10%). The analysis of aloe vera gel and its powder included moisture content, total phenol, flavonoid, and antioxidant activity based on the ability to scavenge DPPH (1,1-Diphenyl-2-picrylhydrazil) radicals. The results showed that the fillers gave a significant effect on the antioxidant activity. An increase in fillers' concentration lowered the antioxidant activity, while the use of 5% (w/v) gum arabic or maltodextrin resulted in a higher antioxidant activity with Radical Scavenging Activity (RSA) of $16.24 \pm 1.33\%$ (db) and $16.06 \pm 0.99\%$ (db), respectively. However, the antioxidant activity was lower than aloe vera gel (RSA $87.12 \pm 1.29\%$ db) due to a decrease in the total phenol from 470 g GAE eq./g dry matter (aloe vera gel) to 10.36-15.30 g GAE/g dry matter (powder), and flavonoids from 17.44 g quercetin eq./g dry matter (aloe vera gel) to 0.19-0.23 g quercetin eq./g dry matter (powder). The IC_{50} value of powder with maltodextrin or gum arabic was about 0.2 g/ml.

Keywords: Antioxidant, flavonoid, antioxidant activity, filler

The Production Process Of Tempe Protein Isolate From Germinated Soybeans And Its Potential As An Antidiabetic

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Abstract

Government regulations that advise people to stay at home during the Covid-19 pandemic have limited physical activity which has the potential to be a risk factor for type 2 diabetes mellitus (DM) in the community. Recently, foodstuffs such as soy-based products can be used as therapy for the prevention and treatment of DM. Tempe is a traditional Indonesian food made from fermented soybeans. Currently, tempe is the most widely-sourced vegetable protein consumed in Indonesia. One of the tempe derivative products that has a good prospect to be developed as a functional food component is protein isolate. In this study, three types of protein isolates were used, namely tempe protein isolate from germinated soybeans (GTPI), tempe protein isolate from non-germinated soybeans (NGTPI), and commercial soybean protein isolate (CSPI) as a control. The aims of this study were (1) to analyze the effect of the soybean germination process on the extraction pH and precipitation pH (pI) of protein in the manufacture of tempe protein isolate (TPI), (2) to evaluate the potential of TPI as an antidiabetic by measuring aglycone isoflavone level, amino acid composition, and *in vivo* hypoglycemic assays. The results showed that the manufacture of GTPI requires a higher extraction pH (11.6-12.6) and a lower pI (3.6-4.2) than the manufacture of NGTPI. *In vivo* tests showed that GTPI has a better hypoglycemic ability than NGTPI and CSPI. This is supported by the higher content of arginine, daidzein, genistein, and isoflavone aglycones in GTPI compared to NGTPI and CSPI.

Keywords: tempe protein isolate; germinated soybeans; hypoglycemic ; isoflavones

Flavonoid And Main Aroma-Active Compounds Identification Of Taiwan Citrus Depressa Hayata Peels

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Abstract

Citrus peels are a known source of flavonoids and pleasant aroma compounds. Flavonoid compounds in peels of Taiwanese citrus called shiikuwasha (*Citrus depressa Hayata*) were extracted using microwave-assisted extraction (MAE) and ultrasonic-assisted extraction (UAE). Different solvents like distilled water, 50 % aqueous ethanol, and methanol were used. The qualitative analysis was carried out by observing UV/Vis and FTIR-ATR spectra, and then quantitatively by High Performance Liquid Chromatography – Diode Array Detector (HPLC-DAD). The composition of volatile aroma components was analyzed using GC-HS-SPME (Gas Chromatography, Headspace Solid Phase Microextraction). UV/Vis analysis showed highest intensity at samples that were treated by MAE in 50 % aqueous ethanol. HPLC DAD quantitatively confirmed UV results by showing that MAE with ethanol showed higher amounts of quercetin, myricetin, rutin, and kaempferol (670, 0.364, 8282.5, 7307.5 $\mu\text{g/g}$), compared to UAE (336.17, 0.204, 5000.6, 4469.15 $\mu\text{g/g}$, respectively). FTIR-ATR (Fourier-Transform Infrared Spectroscopy - Attenuated total reflectance) showed typical vibrations at phenolic compounds fingerprint area. Unlike quercetin as flavonoid standard, shiikuwasha peels extract showed peak at polymethoxyflavones (PMF) area (2829 – 2835 cm^{-1}). Fresh and dried unripe peels mostly contained limonene (53.01 – 54.79 %), γ -terpinene (27.67 – 29.4 %), pinene, myricene and cymene (1.6 – 3.2 %) as aroma-active compounds.

Keywords: flavonoid, aroma-active, shiikuwasha, microwave, ultrasonic

Antioxidant Properties And Microbiology Of Cocoa (*Theobroma cacao* L.) Beans As Functional Food

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Abstract

The processing of cocoa can affect the quality of the antioxidants contained in cocoa beans, for example, the fermentation and drying process can reduce the phenolic content and antioxidant activity of cocoa pods. This is unfortunate considering that antioxidants have an important role in the body. Therefore, analysis is needed to test the antioxidant activity of fresh cocoa beans (without post-harvest processes such as drying and fermentation) and the antioxidant activity of dried cocoa beans (with sun drying). The purpose of this study was to compare the antioxidant and microbiology properties of the cocoa beans. The research method used was an experimental method using t-test with two treatments (fresh and dried cocoa beans) and repeated for three times. The results showed the antioxidant activity of fresh cocoa beans was greater than the antioxidant activity of dried cocoa beans, which was 45.18 and 50.80 ppm, respectively, but there was no difference between them. Dried cocoa beans had a higher total phenolic content than fresh cacao beans, which was 5.18% and 2.84%, respectively, and there was a difference between them. Total Lactic Acid Bacteria and Total Acetic Acid Bacteria found in fresh wet cocoa beans without fermentation was 0 CFU/g and for samples of dried cocoa beans without fermentation was $<25 \times 10^4$ CFU/g.

Keywords: Fresh Cocoa Beans, Dried Cocoa Beans, Antioxidant, Polyphenol

Cytotoxic and antioxidant activities of *Phyllanthus emblica* (L) and *Phyllanthus acidus* (L) extract mixture as a new food dietary supplement

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Abstract

Phyllanthus acidus (L.) (Otaheite gooseberry or Malay gooseberry) and *Phyllanthus emblica* L. (amla Or goose berry) (Phyllanthaceae) are economically important fruits in Asian countries for their unique taste and health benefits. Both have history in ancient medicines like Ayurveda and siddha with numerous medicinal properties, which are also utilised as a dietary supplement in Asian and Western countries. The study examined the chemistry and antioxidant capabilities of freshly synthesised extracts from *P.acidus* and *P.emblica*. Both fruits were being used for many remedies and this study showed the combined study of the extracts effects. The raw fruits of *Phyllanthus acidus* and *Phyllanthus emblica* were procured and washed with distilled water continuously to remove foreign particles. The fruits were boiled separately under steam for 2.5 hours. Fruit seeds were removed after cooling and crushed. The crushed fruits were taken and extracted with purified water 1:5 (Fruit:Water). Both extracts were mixed together in the ratio of 2:2:5. This combined extract concentrated 450-550 mm/Hg at 70°C and this extract was used for the experiments. *In vitro* antioxidant activity by 1,1-diphenyl-2-picrylhydrazyl (DPPH) 1120 mg /g (AAE), ABTS was 800 mg/g (AAE). Total phenolic content was ranged from 110.35 to 140.87 mg gallic acid equivalents (GAE)/g and the flavonoid content was varied from 52.12 to 61.00 mg quercetin equivalents (QE)/g, ascorbic acid was 71 mg/g. In addition, cytotoxicity assay was also performed on cancer cells. Overall, this new extract combination had the best antioxidant and cytotoxicity performance and could be utilised as a new additional diet.

Keywords: *Phyllanthus* extract, food supplement, antioxidant.

An updated review on the development of functional cocoa drinks

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Abstract

The demand on functional foods has significantly increased in the last decades. Cocoa (*Theobroma cacao L.*) is a candidate of functional food due to its phenolic content and potential antioxidant activity. A series of studies, moreover, showed that cocoa has an anti-insomnia, anti-obesity, anti-inflammatory, anti-hyperlipidaemia and anti-hypertriglyceridemia activity. It also has a potency to improve immune system functionality, lipid metabolism and brain function as well as to reduce cardiovascular disease risk and platelet aggregation risk. Beverage is an appropriate product to deliver the beneficial effect of cocoa bioactive compounds. This literature study, therefore, investigate the development of functional cocoa drinks. This includes the incorporation of herbs and spices, as well as the improvement of the stability of cocoa ready-to-drink products. This study provides a direction to the future research dealing with the cocoa drink.

Keywords: cocoa, functional, drink, health benefit

Antioxidant activities and physical properties of chocolate enriched with plant-based functional ingredients

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Abstract

The improvement of health-promoting properties of chocolate is a current trend in the food industry. Plant-based food, such as mung bean, fenugreek seed, and moringa leaf, are well-acknowledged to have functional properties which are beneficial for health. Nevertheless, incorporating these materials into chocolate may affect the characteristics of chocolate. This research, therefore, was aimed to study the effect of powdered mung bean, fenugreek seed, and moringa leaf addition on the antioxidant activity and physical properties of chocolate. The materials were added in a range of 5-15%. Antioxidant properties, including total phenols, total flavonoids, and DPPH-radical scavenging activity as well as colour and texture were thoroughly analyzed. The results showed that the addition of mung bean, fenugreek seed, and moringa leaf significantly improve the antioxidant activity of chocolates. The addition of the above-mentioned materials also had a significant impact on the physical properties of the products. However, the effect was a type of the additional ingredient dependent indicating the importance of ingredient selection in the making of functional chocolate.

Keywords: chocolate, antioxidant, functional, ingredients

Prospects of Lactoferrin as Potential Natural Antibiotic

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Abstract

Lactoferrin's iron-binding capacity makes it undoubtedly advantageous to immune system modulation and different bacterial strains. For the current study, 4 of raw and 17 of commercially available milk samples were collected from different farms and super shops in Bangladesh. The presence of lactoferrin was confirmed using SDS-PAGE gel electrophoresis. Lactoferrin from Goat milk and Milk Vita commercial milk was recovered from SDS-PAGE gel and purified using a dialysis method. Concentration of purified protein was determined by NanoDrop technology. Then the purified lactoferrin was tested for its antimicrobial activity against 18 bacterial strains. Interestingly, *Vibrio cholera*, *Bacillus cereus*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Enterococcus faecalis* and *Streptococcus pneumoniae* significantly displayed sensitivity against lactoferrin extracted from aforementioned milk samples. This study suggests that lactoferrin has the potential to be used as an alternative of antibiotics for many diseases and also can be used to reduce microbial deterioration in the food industry.

Keywords: Lactoferrin, NanoDrop technology, Bacterial strains, SDS-PAGE gel-electrophoresis, Dialysis.

Omega-3 Profiles and Chemical Substances of Chicken Meat Fed Diets Containing Purslane Meal (*Portulaca oleraceae*) Rich in Omega-3 Fats

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Abstract

This study aimed to analyze the effect of the purslane meal addition into a basal diet on the quality and omega-3 (n-3) fatty acids of broiler meat. A total of 150 broilers were assigned randomly to five treatments with six replications. Each replication consisted of five broilers. The treatments were a basal diet supplemented with purslane meal at levels of 0% (T0), 1,5% (T1), 3% (T2), 4,5% (T3), and 6% (T4). Water and diets were provided ad libitum. Meat samples were taken on day 42 for quality and omega-3 fatty acid analysis. The data collected were analysed by the analysis of variance and the analysis was continued with the Tukey test if there was any effect of the diets. The results of this study showed that the addition of purslane meal to the basal diets did not affect ($P>0,05$) the protein and moisture content of the meat but significantly decreased ($P<0.05$) the fat content. Increasing the levels of dietary purslane meal rich in ALA (n-3 PUFA) increased the ALA, DHA, total n-3 PUFA, total n-6 PUFA and total PUFA ($P<0.05$) in the broiler meat. The DHA level of meat produced from broiler fed with 6% purslane meal increased doubled compared to those fed control diet. Importantly, diets enriched with ALA did not change the saturated fatty acids. In conclusion, broiler chicken meat fed ALA enriched diets up to a level of 6% produced meat higher in n-3 fatty acids without negatively affecting the chemical composition of the meat.

Keywords: Broiler, diets, purslane meal, meat chemical quality, n-3 fatty acids

In Vivo Evaluation of Faloak (*Sterculia quadrifida* R.Br) Stem Bark Kombucha as Hyperglycemia and Therapeutic Agent

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Abstract

This study aims to investigate the potential differences in the anti-hyperglycemia and antioxidant effects of fermented faloak (*Sterculia quadrifida* R.Br) stem bark (FSB) kombucha and FSB brew (without fermentation) in alloxan-induced diabetic rats. Black tea (BT) kombucha was used as a kombucha control. FSB kombucha, BT kombucha, and FSB brew were administered orally at a dose of 5 mL/Kg bw/day into the alloxan-induced diabetic rats for 28 days. Fasting blood glucose (FBG), body weight, superoxide dismutase activity, malondialdehyde levels, and pancreatic histopathology of the rats were analyzed. The results of this study showed that FSB kombucha, BT kombucha, and FSB brew were able to effectively reduce FBG, increase superoxide dismutase (SOD) activity, reduce malondialdehyde (MDA) levels, improve lipid profile, and repair pancreatic β -cells in the islets of Langerhans. The administration of FSB kombucha significantly ($P < 0.05$) showed a more optimal potency than the unfermented FSB brew, while the ability was comparable to that of BT kombucha. Thus, faloak (*Sterculia quadrifida* R.Br) stem bark can be used as an alternative substrate other than black tea in the making of kombucha.

Keywords: *Sterculia quadrifida* R.Br, stem bark, kombucha, hyperglycemia, dyslipidemia

Effect of Tempe Protein Isolate from Germinated and Non-germinated Soybean on Oxidative Stress in Diabetes Rats

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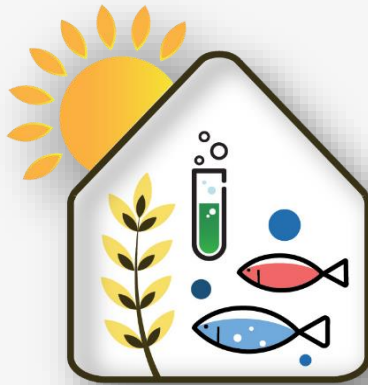
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Abstract

People with diabetes mellitus (DM) appear to be more susceptible to the COVID-19 virus. Evidence suggests that infection with COVID-19 virus leads to increase reactive oxygen species (ROS) production. This is coupled with hyperglycemia conditions which also produce excess ROS. Those can lead to oxidative stress in DM patients. The aim of this study was to prevent oxidative stress using innovative functional food, namely tempe protein isolates that were isolated from germinated soybean (TPIG) and non-germinated soybeans (TPIN). TPIN, TPIG and commercial soy protein isolate (CSPI) were given 900 mg/kg BW to DM rats for 28 days. The DM rats were modelled by inducing alloxan dose of 110 mg/kg BW intraperitoneally. Results showed there were no significant differences ($p > 0.05$) in feed intake and blood profile. TPIN significantly prevented excessive weight loss and reduced blood glucose ($p < 0.05$) better than TPIG and CSPI. TPIN and TPIG significantly prevented the formation of MDA in the kidney, but they no significant prevented in the liver. Activity of SOD enzyme significantly increased ($p < 0.05$) in both liver and kidney tissues of rats given TPIN and TPIG, and the value was equal to the negative control. Immunohistochemical assay of Cu,Zn-SOD antioxidant content showed that TPIN and TPIG increased in liver and kidney tissues. This study concluded that the administration of TPIG and TPIN could prevent liver and kidney tissues damage by free radicals or reduced oxidative stress conditions.

Keywords: Diabetes, germination, immunohistochemistry, oxidative stress, tempe protein isolate.



Parallel Session

Probiotic And Gut Health (PG)

Curriculum Vitae Invited Speaker

Satoru Fukiya



- Place/Date of Birth : Japan, November 10th 1971
- Present Position : Associate Professor, Research Faculty of Agriculture, Hokkaido University, Sapporo, Japan
- Education
- 1995-2001 Laboratory of Applied Microbiology Department of Agricultural Chemistry, Graduate School of Agriculture, Hokkaido University. Ph.D. in September 2001
- 1990-1995 Department of Agricultural Chemistry, Faculty of Agriculture, Hokkaido University. B.S. in March 1995
- Working Experience
- 2013-2021 : Lecturer, Hokkaido University
- 2005-2013 : Assistant Professor, Hokkaido University
- 2003-2005 : Post-doc Researcher in Japan
- 2001-2003 : Researcher, Kyowa Hakko Kogyo Co. Ltd., Japan
- Research (last five years)
Identification and characterization of bifidobacterial genes for intestinal colonization/survival and elucidation of mechanisms of secondary bile acid production by the intestinal bacteria
- Publications (last five years) :
1. Watanabe *et al.*, Comprehensive evaluation of the bactericidal activities of free bile acids in the large intestine of humans and rodents. *J. Lipid Res.*, **58**, 1143-1152 (2017).
 2. Tawthep *et al.*, Isolation of six novel 7-oxo- or urso-type secondary bile acid-producing bacteria from rat cecal contents. *J. Biosci. Bioeng.*, **124**, 514-522 (2017).
 3. Sakanaka *et al.*, A transposon mutagenesis system for *Bifidobacterium longum* subsp. *longum* based on an IS3 family insertion sequence, ISBlo11. *Appl. Environ. Microbiol.*, **84**, e00824-18 (2018).

4. Lee *et al.*, 12 α -hydroxylated bile acid induces hepatic steatosis with dysbiosis in rats. *Biochim. Biophys. Acta Mol. Cell. Biol. Lipids*, **1865**, 158811 (2020).
5. Song *et al.*, Comparative genomic and physiological analysis against *Clostridium scindens* reveals *Eubacterium* sp. c-25 as an atypical deoxycholic acid producer of the human gut microbiota. *Microorganisms*, *in press* (2021).

Awards and Honors

Encouragement Award of the Society for Biotechnology, Japan (Saito Award) in 2015.

Interactions between the gut microbiota members for production of deoxycholic acid in the intestine

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Abstract

Bile acids are synthesized in the liver and help digestion of lipids in our intestine. In the large intestine, bile acids underwent modifications of their hydroxy groups and are transformed into secondary bile acids by the gut microbiota members. Cholic acid (CA), the most representative bile acid in humans, will be transformed mainly into deoxycholic acid (DCA). DCA works as a host factor to regulate the gut microbiota structure due to its strong bactericidal activity. Also, causal relationships between DCA increase and colon/liver carcinogenesis have been reported. Regardless of the importance of DCA in the health and medical field, the production mechanism of DCA in the intestine is not fully understood. Currently, only a handful of DCA-producing bacteria have been identified and the population of the representative species, *Clostridium scindens*, was estimated approximately 0.0001% of the gut microbiota. In contrast, DCA occupies over 30% of the bile acids in the human fecal sample. We thought the microbial interactions between DCA-producing bacteria and other gut microbiota members are a key factor of the quantitative discrepancy between DCA and DCA producers. In this point of view, we clarified that DCA producers can use the different secondary bile acid, which is produced from CA by other gut microbiota members, as an alternative substrate for the production of DCA. We also revealed that several bacterial species can enhance DCA production by interacting with DCA producers. Detailed results will be presented and discussed at the conference.

Keywords: gut microbiota, bile acid transformation, deoxycholic acid, microbial interaction, secondary bile acid

Curriculum Vitae Invited Speaker

Rina Agustina



| | |
|---------------------|---|
| Place/Date of Birth | : Palembang, Agustus 27 th 1970 |
| Present Position | : Assistant Professor at Department of Nutrition. Head of Human Nutrition Research Center (HNRC) – Indonesian Medical Education and Research Institute (IMERI) Faculty of Medicine, Universitas Indonesia |
| Education | |
| 2012 | Doctor in Human Nutrition (PhD) , Wageningen University, Wageningen, The Netherlands. |
| 2000 | Master of Science in Nutrition (MSc) , SEAMEO-TROPMED Regional Center for Community Nutrition, Faculty of Medicine, University of Indonesia, Jakarta. |
| 1997 | Medical Doctor (MD) , Faculty of Medicine, Gadjah Mada University, Yogyakarta, Indonesia. |
| 1994 | Doctoranda Medicine (Dra) , Faculty of Medicine, Gadjah Mada University, Yogyakarta, Indonesia. |
| Working Experience | |
| 2015-present | : Chair for Human Nutrition Research Center, Indonesian medical education and research Institute (IMERI), Faculty of Medicine Universitas Indonesia. |
| 2013-present | : Academic staff of the Department of Nutrition, Faculty of Medicine, University of Indonesia Jakarta, Indonesia |
| 2017-2020 | : Chair for Doctorate Study Program, Department of Nutrition, Faculty of Medicine Universitas Indonesia. |

- 2014-2016 : Executive Secretary for Doctorate Study program, Department of Nutrition, Faculty of Medicine University of Indonesia
- 2013-2019 : Research Coordinator, Department of Nutrition, Faculty of Medicine Universitas Indonesia.
- 2013-2014 : Deputy Director Resource Management and Marketing, South East Asia Ministry of Education Organization-Regional Center for Food and Nutrition (SEAMEO RECFON) Jakarta Indonesia
- 2000-2016 : Academic staff (lecturer and researcher) at SEAMEO-TROPMED RCCN, University of Indonesia Jakarta, Indonesia
- 2002-2004 : Head Unit of Food Safety Research, SEAMEO-TROPMED RCCN, University of Indonesia

Research (last five years)

- 2016 Principal Investigator
The development and evaluation of health education media on malnutrition prevention of children under five in Sujung Village, District Tirtayasa, Serang, Banten
Funded by: DRPM Universitas Indonesia
- 2016 Principal investigator
The relationship between intake and nutrition status with microbiota and metabolic marker of Padang and Sundanese women in the rural and urban areas: a comparative study
Funded by: DIPA SEAMEO RECFON (Subject n=360)
- 2016 Member
CV Rina Agustina 2019/ 11
The relationship of nutritional factors and usage of nasogastric pipes on parameters of cachexia and quality of life in head and neck cancer patients with radiotherapy
Funded by: Department of Nutrition Faculty of Medicine Universitas Indonesia
- 2016 Principal investigator
Formative qualitative research and quantitative baseline survey for an improved IFA supplementation program for school going adolescent girls in selected districts of West Java Province in Indonesia
Funded by: Micronutrient Initiative
- 2016-2019 Member
Lancet commission on Food system and sustainable diet
Organized by: EAT-Lancet Commission – EAT
- 2016-2019 Lead author
Lancet Indonesian series on Universal Health Coverage
Organized by: FKUI-Lancet, Universitas Indonesia
- 2016-on going Member investigator

- 2017-2019 *Effect of education and supply of drinking water on behaviour changes of healthy hydration of children in Indonesia*
Funded by: Indonesian Hydration Working Group Faculty of Medicine Universitas Indonesia – Danone Research and Development
Principal investigator
- 2017-on going *Effect of balanced and sustainable dietary application on indicator of insulin resistance and level of uric acid of Indonesian obese women*
Funded by: Rumah Sakit UI (Hospital of Universitas Indonesia) Depok and JAICA Japan
Principal investigator
- 2017-on going *Association of diet on body composition, intestinal microbiota, metabolic parameter and epigenetic on various local and foreign ethnicities in Jakarta*
Funded by: IMERI, Faculty of Medicine Universitas Indonesia (Subject n=1000)
Principal investigator
- 2017-on going *Association of consumption and level of advanced glycation end products plasma, inflammation parameter with the risk of central obesity in women with paradox Minangkabau and Sundanese diets* (Subject n=360)
Funded by: DIPA SEAMEO
Principal investigator
- 2017-on going *The relationship of intake and nutritional status with amount of microbiota and metabolic marker in women of Minangkabau and Sundanese in rural and urban area*
Funded by: PITTA DRPM Universitas Indonesia (Subject n=360)
Principal investigator
- 2018-2019 *Iron Folic Acid in Adolescent girls in West Java*
Funded by: PITTA DRPM Universitas Indonesia (Subject n=340)
Policy Brief team
- 2018-2019 *Healthy diets from sustainable production: the case of Indonesia*
Organized by: EAT – Chatham House – FMUI – Ministry of Health RI
Principal Investigator
- 2018-2019 *Quality of Diet, Folic Acid Status, DNA Methylation to Non-Communicable Disease and Quality of Life of Mother-Children in Jakarta*
Funded by: USAID – SHERA, USA (Subject n=200)
Principal Investigator
- 2018-on going *Cohort Study on Serum Folate Status, Genotyping MTHFR 677c→T during Pregnancy and Serum Folate, Homocysteine Status, Mutation of IGF-2 among Indonesian Children In Jakarta*
Funded by: Kemenristek Dikti Indonesian Government (Subject n=200)
Lead Indonesian team
- 2018-on going *ASEAN Maternal Nutrition. Healthy and Smart Golden Generation of Indonesian Adolescent Girls*
Organized by: INMU, Mahidol University

- 2018-on going Principal investigator
Promotion of maternal gut microbiota and psychosocial stimulation on child cognitive development at 6-months of age
Funded by: Savings Brain (Gates Foundation included), Canada
- 2020-on going Principal investigator
A combined of Zinc, Vitamin C, Chromium and Copper supplementation for prediabetes progression: randomized controlled trial among healthy population in Jakarta
Funded by: Blackmores Institute, Australia
- 2020-on going Principal investigator
Pengaruh Suplementasi Probiotik dan Vitamin D dalam Memodulasi Dysbiosis Usus, Status Gizi, Inflamasi dan Imunitas serta Menurunkan Risiko Covid-19 pada Tenaga Kesehatan dengan Obesitas : Uji Klinis Gut-Lung Axis
Funded by: Ministry of Research and Technology

Publications (last five years) :

2021

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2018

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Awards and Honors

1. 2017 Award from Dr Cipto Mangunkusumo General Hospital
2. 2017 Award from Rector University of Indonesia
3. 2015 Award from Rector University of Indonesia, Scientific Award for Lecturer/Researcher UI Tahun 2-15
4. 2014 Finalist Best Research Ristek-Kalbe Science Award 2014
5. 2014 Award form Rector University of Indonesia, for International Journal Publication with impact factor
6. 2013 Investor of HKI achievement, Method and Nutritional Compositions for the Treatment of Diarrhea, No. EP 2604123 A1
7. 2013 Award form Rector University of Indonesia, for International Journal Publication with impact factor
8. 2012 Award from Rector University of Indonesia, for Productive Researcher at the University of Indonesia period 2007-2012
9. 2012 Selected as a featured fellow for the Nevin Schrimshaw International Nutrition Foundation, USA <http://www.inffoundation.org/fellows/featured-fellow.htm>
10. 2012 International Investigator Award, World Congress from North America Society of Pediatrics Gastroenterology Hepatology and Nutrition (NASPGHAN), for abstract entitled: "A Double-Blind, Randomized Trial of *Lactobacillus reuteri* DSM 17938, *Lactobacillus casei* CRL 431 and Calcium on Diarrhea Duration and Severity in Indonesian Children <http://www.wcpghan2012.com/files/ESPGHAN&%20NASPGHAN-new.pdf>
11. 2010 Award from Rector University of Indonesia, for Writer of International Handbook Development, Directorate of Research and Community Service (DRPM) of University of Indonesia, year 2010 for the book titled "Nutrition in Food Industry: Student's Handbook". Jakarta: SEAMEO-TROPMED Regional Center for Community Nutrition University of Indonesia, 2010. ISBN 978-979-98157-9-8
12. 2007 Award from Rector of University of Indonesia, for Writer of International Scientific Journal from Directorate of Research and Community Service (DRPM) of University of Indonesia

Dietary Modulation of Probiotics to Intestinal Infection and Inflammation

Effect of Fermented Tamarillo (*Solanum betaceum* Cav.)-Juice Containing *Weissella confusa* F213 on Gut Microbiota of Healthy Human Subjects

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Abstract

Disturbance of the balance of gut microbiota (GM), which leads to dysbiosis has been proven to cause various diseases. Probiotics are becoming a popular approach to restore dysbiosis of gut microbiota in recent years. The purpose of this study was to determine the effect of the administration of fermented tamarillo juice containing *Weissella confusa* F213 (Tebepro). The study design was a pre-post treatment study that involved 22 healthy subjects. The subject obtained Tebepro for 28 days, consecutively. Fecal and blood samples were collected in 3 successive time intervals, which were before administration, after 28 days of probiotics administration, and after 14 days washed out period. Profile of GM was analyzed by NGS, while SCFAs by HPLC. The results showed that the administration of Tebepro increased Firmicutes and Bacteroides (*Prevotellaceae* and *Ruminococcea*) while Actinobacteria (*Corriobacteriaceae*) was decreased ($P < 0.05$). Tebepro specifically induced the growth of *Blautia-Productus* and *Prevotella corpi*. In addition, Tebepro specifically induced the growth of Bifidobacterium asteroids, even in general Actinobacteria was decreased. Total SCFA was decreasing ($P < 0.05$) after administration of Tebepro. In addition, the propionate content was observed to significantly increased after the washed-out period ($p < 0.05$). The mechanisms behind the SCFAs content may be attributed to the rapid absorption of SCFAs by the epithelial cells. The results of this study indicate that Tebepro modulates human GM, which may be potential in restoring the dysbiosis of GM.

Keywords: Tamarillo, *Weissella confusa*, gut microbiota, human subjects

Safety evaluation of *Weissella confusa* F213 and *Lactobacillus rhamnosus* FBB81, the promising probiotics candidates

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Abstract

Our group has successfully isolated *Weissella confusa* F213 (WCF213) and *Lactobacillus rhamnosus* FBB81 (LrFBB81) which showed probiotics properties. Furthermore, these strains showed functional activities on reducing cholesterol levels *in vivo* and enhancing mucosal integrity *in vitro*. Safety issues of probiotics candidates are mandatory to be evaluated. Our previous study found that WCF213 and LrFBB81 are non-haemolytic strains. Although these strains showed resistance against vancomycin, however, it is due to the differences in cell wall composition as the target of vancomycin. Those findings must be supported by safety assessment *in vivo*. Therefore, this study aimed to evaluate the safety of WCF213 and LrFBB81 using animal models. Acute toxicity assay for evaluating the safety aspect based on OECD guidelines. A total of 30 male and female Wistar rats (\pm 100 gram) were included for acute toxicity assay. Male (n=5) and female (n=5) rats obtained saline sterile (P1). On day 1, five rats (each for male and female) received WCF213 (1×10^{10} CFU/rat) (P2), while other rats received LrFBB81 (1×10^{10} CFU/rat) (P3). All groups were observed for 14-consecutive days. All rats were sacrificed, blood was collected for serum biochemistry testing, and major organs were collected. Acute toxicity assay results showed that there were no significant differences in physiological appearance, weight gain, daily food intake, major organ relative weight, and serum biochemistry among control-, WCF213-, and LrFBB81-groups ($p > 0.05$). These findings indicated that WCF213 and LrFBB81 are safe. Further study on subacute toxicity assay is important to be conducted.

Keywords: probiotic, *Weissella confusa* F213, *Lactobacillus rhamnosus* FBB81, safety assessment, acute toxicity assay

Probiotic and Gut Health

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Abstract

The human gastrointestinal tract (gut) is a vast, complicated ecosystem in which microbiota, nutrition, and host cells all interact extensively, a process critical for gut homeostasis and true host development. The gut microbiota's different bacterial populations serve a variety of roles, including metabolic, barrier, and trophic functions. Because of the strong links between gut microbiota, health, and disease, there has been a lot of interest in utilizing probiotics to regulate the gut microbiota in order to prevent or treat certain diseases. Probiotic bacteria have grown in popularity over the last three decades as a result of the growing body of scientific evidence demonstrating their positive benefits on human health. Antibiotic-associated diarrhea, *Clostridium difficile* colitis, infectious diarrhea, ulcerative colitis, Crohn's disease, pouchitis, and irritable bowel syndrome, among other illnesses, have all been studied with probiotics, either as a single strain or a combination of probiotics. Specific probiotic strains have been shown to be effective in the treatment of rotavirus diarrhea, antibiotic-associated diarrhea, irritable bowel syndrome, and food allergies. Inhibition of pathogen growth through competition for nutritional sources and adhesion sites, release of antimicrobial compounds, and toxin inactivation are some of the modes of action. As a result, probiotics have mostly been used in the prevention and treatment of gastrointestinal infections and antibiotic-associated diarrhea illnesses. Beyond their effect on the microbiota's composition, particular probiotic strains' immunomodulatory potential has been exploited as new techniques to reduce intestinal inflammation, correct gut mucosal dysfunction, and down-regulate hypersensitivity reactions.

Keywords: Probiotic, gut health, gut microbiota, beneficial effects, gastrointestinal infections

Probiotic Bacteria And Their Impact On Human Health

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Abstract

Probiotic bacteria provided various benefit for human health and wellness, for instance combat pathogenic bacteria, alleviate lactose intolerance, therapy agent for food allergy and eczema, and stimulate immune respons. Mostly probiotic bacteria belonged to lactic acid bacteria (LAB) group since they have long history of safe use. The product of probiotic has been more diverse, including probiotic foods, probiotic drugs, medical devices, designer probiotic and directly fed microorganisms for animal use. Therefore, exploring novel uses of probiotic are more promising than ever. Furthermore, the potential use of probiotic bacteria to combat corona virus will also discussed.

Keywords: probiotic bacteria, lactic acid bacteria, human health

The Effect of Consumption Probiotic Chocolate Containing *Lactobacillus plantarum* Dad-13 on Gut Microbiota of Undernourished Children in Lombok

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Abstract

Undernutrition was a condition which denoted by insufficient intake of energy and nutrients for growing and maintaining good health. It could be detected from birth and should be overcome from early stage. Some research showed that undernutrition was associated with the unbalance of gut microbiota composition, usually called as dysbiosis. It can be normalized by intervention using probiotics. *Lactobacillus plantarum* Dad-13 was an indigenous isolate which had the potential as a probiotic. The most common probiotics product using this strain was chocolate probiotics. So, the study to determine the effect of chocolate probiotic containing *Lactobacillus plantarum* Dad-13 on gut microbiota of undernourished children in Lombok was conducted. Three months' observation using Randomized Double-Blind Parallel Placebo Controlled Trial were done between 56 undernutrition children which grouped as placebo and probiotics. Analysis of gut microbiota was performed using 16S rRNA gene sequencing targeting V3-V4 variables region. The results showed that there was significant difference in diversity index and overall gut composition between groups. Both groups had *Prevotella* enterotypes which describe diets high in carbohydrate and fiber. After ingestion, there were significant differences of relative abundance between groups such as Bacteroidetes and Firmicutes in the phylum level. In probiotics group, population of Euryarchaeota, Actinobacteria, Elusimicrobia, Fusobacteria, Proteobacteria and Verrucomicrobia was significantly different. It can be concluded that intervention using probiotics could change most of the composition of gut microbiota by reducing the unfavorable microbiota and normalized the gut composition such as Firmicutes and Bacteroidetes ratio (F/B ratio).

Keywords: Undernutrition, Gut Microbiota, *L. plantarum* Dad-13, Probiotic Chocolate

Probiotics And Intestinal Health

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Abstract

Probiotics are live microorganisms, which actively enhance health of consumers by improving the balance of microflora in the gut when they are ingested in sufficient numbers. The gut microbiota plays an important role in human health. Many studies showed that an imbalance intestinal flora could not only cause intestinal diseases, but also was closely related to chronic metabolic diseases. Accumulating evidence underlined a cross-talk between intestinal microbiota and brain, between intestinal microbiota and liver, and between intestinal microbiota and respiratory tract. Patients with COVID-19 had significant changes in faecal microbiomes, characterized by the enrichment of opportunistic pathogens and the reduction of beneficial commensals. Oral probiotics might have antiviral effects via the gut–lung axis and improve gut health for achieving homeostasis. Major probiotic action mechanisms, including enhancement of the epithelial barrier, increased adhesion to intestinal mucosa, competition with pathogenic microorganisms, production of anti-microorganism substances and immune system modulation. The strains most frequently used as probiotics included lactic acid bacteria and Bifidobacteria. Lactic acid bacteria isolated from Indonesian traditional fermented food, such as *dadih* and *gatot*, had some probiotic properties. Besides having probiotic properties, *Lactobacillus plantarum* Dad-13 and *L. plantarum* Mut-7 could be used as a starter culture for milk fermentation. Consumption of fermented milk containing *L. plantarum* Dad-13, or *L. plantarum* Mut-7 by healthy Indonesian volunteers showed significant increase in the population of *L. plantarum* in their faeces. It proved that these indigenous probiotics survived in the human gastrointestinal tract. The number of *Enterobacteriaceae*, *E. coli* and coliform non *E. coli* in faeces decreased after the consumption of the fermented milk drink containing *L. plantarum* Dad-13 in some subjects. Consuming probiotic powder of *L. plantarum* Dad-13 by overweight adults caused the decrease in *Firmicutes* population and the increase in *Bacteroidetes* population, especially *Prevotella*.

Keywords: *probiotics, gut microbiota, intestinal health*

***Lactobacillus rhamnosus* SKG34 as a Potential Probiotic with Anti-inflammatory Properties for Colitis**

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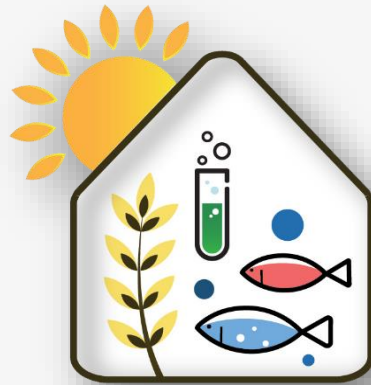
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Abstract

Dysbiosis of the gut microbiota was observed in mice with chronic colitis. *Lactobacillus rhamnosus* SKG34 is a potential probiotic for beneficial effects upon improving lipid profile. However, whether *L. rhamnosus* SKG34 can improve inflammatory bowel diseases (IBD), which is a form of chronic intestinal inflammation, is unknown. Hence, we used *L. rhamnosus* SKG34, to investigate its anti-inflammatory properties in Dextran Sulfate Sodium (DSS)-induced chronic colitis of mice. The study was done in male Balb/C mice, age 10 weeks. Colitis was induced by 2.5% DSS. *Lactobacillus rhamnosus* SKG34 was given every day with dose 1×10^8 CFU/ml. During the intervention period, clinical symptom of colitis was observed, and colon mRNA TNF- α expression of mice was evaluated to know the anti-inflammatory effect. In vivo, *L. rhamnosus* SKG34 exerted anti-inflammatory effects on chronic colitis as they improved clinical parameters including better colitis index score and less haematochezia. They also down-regulated the expression of the pro-inflammatory cytokines TNF- α in the colon of mice. This result supports anti-TNF- α as one of the main treatment in IBD. This study suggests the potential beneficial effect of *L. rhamnosus* SKG34 on IBD.

Keywords: *Lactobacillus rhamnosus* SKG34, colitis, TNF alfa, Dextran Sulfate Sodium, Gut Health



Poster Session

“Mie Lethek”, Indonesian Noodle Made from Fermented Cassava Flour: A Review

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Abstract

Mie lethek is a unique noodle food from Bantul Regency, Yogyakarta, Central Java, Indonesia. This noodle has been produced from generation to generation since the 1940s on a home scale industry. *Mie lethek* is made from a mixture of fermented tapioca and cassava flour without any addition of wheat flour, thus making this noodle gluten free. This dried noodle resembles the texture of vermicelli and has a dull color. The fermentation of cassava flour causes changes in the structure of the cassava starch to have elastic and chewy textures. Changes in the nature of cassava starch are caused by microbial activities during spontaneous fermentation. This study describes the process of *mie lethek* production. The process of *mie lethek* making begins with soaking cassava for three days to facilitate spontaneous fermentation. Then, the fermented cassava flour is mixed with 40% of cassava starch (tapioca). The noodle dough is milled, compacted, and cut with a length of 20 cm, a width of 20 cm, and a thickness of 13 cm. The cut noodle dough is steamed for 30 minutes. The dough is then re-milled, printed, and parsed by pouring water. The last process is drying the noodles under the sun until the moisture content reaches 10-12%. Dried *mie lethek* is packaged and ready to be marketed or cooked according to consumer tastes.

Keywords: Bantul, cassava, *mi lethek*, noodle, spontaneous fermentation.

Labeling System in Digital Marketing in the Development of Processed Seafood Products in Demak Regency

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Abstract

Food labeling is one of the important elements in maintaining competitiveness and realizing food safety. Food labels provide any information that customers need to know and take into account before deciding to buy digitally marketed products. This study was aimed to find out how the labeling system that had been implemented by Micro, Small and Medium Enterprises (MSMEs) for processed seafood in Demak Regency in digital marketing. This research was conducted on 25 MSMEs through interviews and surveys to digital platforms. The results of the study found that only 6 MSMEs had used labels in digital marketing while 19 MSMEs had not used digital (conventional). Limited access of MSMEs to strategic resources such as understanding of marketing digitalization, finance, food processing skills, and food innovation processes, could hamper the labeling system for processed seafood products.

Keywords: food label, digital marketing, MSME

Analysis of Umami Taste in Seaweed-based Seasonings using The Omission Test

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Abstract

Seaweed has high contents of glutamic acid and aspartic acid. The high concentration of these two amino acids can trigger a savory taste, thus it has the potential as the main component of flavoring. The savory or umami taste of seaweed-based flavoring is getting stronger with the addition of components such as salt, sugar, and pepper. Identification of the components that contribute to the umami taste in flavoring formulations can be conducted using omission test method. Omission test is an organoleptic test that can determine components that contribute the most in a formulation. The purpose of this study was to identify the components that play the most dominant role in the umami taste in seaweed-based flavoring formulations. The tests were carried out using three main formulations made from three kinds of seaweed, namely *Sargassum anguifolium*, *Ulva lactuca*, and *Gracilaria longissima* with added components of sugar, salt, and pepper. The omission test was carried out in three stages of removing the components of the seaweed-based flavoring formulation in sequence. Sensory testing was carried out using the multi sample difference test (rating approach) method with seven value scales based on the level of savoriness conducted by 30 panelists. The results showed that the removal of salt from the formulations significantly lowered the umami value of the seaweed-based seasonings, while the removal of sugar and pepper showed insignificant results. In conclusion, salt is a component that contributes to the umami taste and can replace pepper and sugar in all seaweed-based flavoring formulations.

Keywords: Umami, Omission Test, Seaweed, Seasonings

Efficacy of Soy Biopeptide Amongst Adolescents in Pandeglang Districts in Indonesia

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Abstract

The study aimed to analyse the efficacy of a biopeptide hydrolysate in improving the serum iron, serum ferritin and hemoglobin among female adolescents. The biopeptide hydrolysate product is made from soybean and enriched with multi micronutrients including iron after two weeks of consumption. For the product's efficacy study we conducted a one group pretest – posttest design. The biopeptide was given everyday for 14 days. We used photometric test to measure Hb level (Hemocue), immuno assay method for serum ferritin (immulite 2000), and the serum iron with the spectrophotometric method using Ferene (details of the ferene triazine). The serum iron, serum ferritin and hemoglobin were measured twice at prior to administration and after day 14. The efficacy study was conducted in Pandeglang district, Banten. The respondents for the efficacy study were 52 respondents of female adolescent girls who met the inclusion criteria and had completed the trial until day 14. The serum iron was significantly improved after the biopeptide administration from 66.87 ± 32.44 to 103.77 ± 55.87 ($p=0.000$). While on the other hand serum ferritin was significantly improved with the biopeptides administration in respondents with low level of serum ferritin from $13,29 \pm 9,5$ to $17,48 \pm 12,18$ ($p=0,00$) but showed no difference in the group with normal serum ferritin from $28,06 \pm 23,7$ to $29,05 \pm 21,3$ ($p=0,64$). The average haemoglobin level of the respondent before the biopeptide administration was normal 12.21 ± 1.29 and it did not change significantly after the biopeptide administration (12.05 ± 1.31 (0.016)). Hemoglobin did not increase significantly, probably because the hemoglobin was at a normal level

Keywords: soy-biopeptides, serum iron, serum ferritin, hemoglobin

Physicochemical and Microbiological Characteristics of Fruit-Based Kombucha

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Abstract

Kombucha is a healthy drink produced through fermentation of tea by SCOBY (Symbiotic Culture of Bacteria and Yeast). Kombucha is generally made of tea leaf as raw material, but recently many other raw materials were used as the alternatives of tea leaf. This research aim was to investigate the physicochemical and microbiological characteristics of fruits based kombucha. This research used Randomized Block Design with a single factor of types of fruit (red dragon fruit, apple, snake fruit, strawberries, grapes, pear, red guava, and orange). The kombucha samples were then analysed for the physicochemical and microbiological parameters. The obtained data were analysed statistically with Analysis of Variance (ANOVA) and Least Significance Different (LSD) at 5%. The results showed types of fruit possessed significant effects on the physicochemical and microbiological characteristics of kombucha. Snake fruit kombucha showed to have the best characteristics as follow: total bacteria of 1.53×10^9 CFU/ml, total yeast of 4.63×10^8 CFU/ml, pH of 3.07, total sugar of 2.41%, total phenol of 1006.85 $\mu\text{g/ml}$ GAE, total flavonoids of 1.75 mg QE/ml, and IC50 of DPPH scavenging activity of 5.46 $\mu\text{g/ml}$.

Keywords: Kombucha, fruit, physical, chemical, microbiology

Effects Of Frozen Storage Duration on The Physicochemical and Sensory Properties of Cassava Stick

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Abstract

Cassava stick is a processed food made from cassava, which has similar characteristics to french fries. It has a crunchy exterior and a fluffy interior. In this study, a randomized block design with single factor was used as the experimental design. The cassava stick was stored at -20°C for 3 months to investigate its effects on the physical, chemical, and sensory properties of cassava stick. The effects of frozen storage duration were monitored every month with three replications. According to the results, storing cassava stick under frozen storage significantly increased the oil absorption and had no effect on the moisture content. A significant alteration in physical properties was observed through the increase of cassava stick hardness from 1.11 to 2.54 N. Frozen storage duration also influenced the lightness and yellowness, but not the redness of cassava sticks. During storage, fat hydrolysis and oxidation also occurred, marked by a significant increase of free fatty acid (0.06 to 0.14%) and peroxide value (0 to 34.53%) in three months of frozen storage. Thus, this study concludes the frozen storage duration affected the physical and chemical properties of cassava stick. Moreover, cassava sticks stored at -20°C for 3 months was also acceptable for panelists with neutral (4.30) average acceptance, though its acceptance decreased as the storage duration increased.

Keywords: cassava, cassava stick, frozen storage duration

Potency of *Pluchea (Pluchea indica Less)* Leaves to Increase Functional Value of Wet Noodles

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Abstract

Wet noodles are lack of nutritional components that are beneficial for health, thus it is necessary to add other food ingredients that can increase the functional value of wet noodles. One of the food ingredients that can be added in wet noodle formulation is *Pluchea indica Less* leaves, which have been known as sources of antioxidants and used by the community as a traditional medicine to treat various health problems. The use of *Pluchea indica Less* leaves in making wet noodle is expected to increase the functional value of wet noodles. This research aimed to determine the potency of *Pluchea indica Less* leaves in affecting the phytochemical compounds content and functional properties of wet noodles. The use of *Pluchea indica Less* leaves showed to have a potential to increase the phytochemical compounds contents of wet noodles, such as alkaloids, flavonoids, phenolics, saponins, tannins, and cardiac glycosides, which play an important role in the health of human body and maintaining the quality of wet noodle, including antioxidant, anti-warmed over flavor, anti-inflammatory, antidiabetic, and antimicrobial activities. Accordingly, the increase in phytochemical compounds in wet noodles can also affect the functional properties of wet noodles.

Keywords: *Pluchea indica Less*, wet noodle, functional value

The Effect of Pluchea Leaf Powder hot water extract on the Physicochemical and Organoleptic Properties of Wet Noodles

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Abstract

The hot water extract of *Pluchea indica* Less leaf powder has been shown to have antioxidant and antidiabetic activities because it contains phytochemical compounds, such as alkaloids, phenolics, flavonoids, sterols, tannins, phenol hydroquinone, and cardiac glycosides. Therefore, the hot water extract of pluchea leaf powder is potential to be utilized as a functional ingredient in food products. The use of hot water extract of pluchea leaf powder in jelly drinks, soybean milk, and buns appeared to have effects on the physicochemical and organoleptic properties of the products. This research was conducted to determine the effect of hot water extract of pluchea leaf powder on the physicochemical and organoleptic properties of wet noodles. The experiment used a one-factor randomized design, i.e. the concentration of hot water extract of pluchea leaf powder with seven levels, i.e. 0, 5, 10, 15, 20, 25, and 30% (v/v). Parameters tested included physicochemical properties (moisture content, color, texture, cooking loss, and swelling index) and organoleptic properties (taste, aroma, color and texture). The results showed that the addition of hot water extract of pluchea leaf powder had significant effects on the texture, lightness, and organoleptic properties of wet noodles, while no significant difference observed on the moisture content, swelling index, chroma, hue, and cooking loss. The hedonic test results of wet noodles added with 10% hot water extract of pluchea leaf powder resulted in the color, aroma, taste and texture with the scores of 5.62 (slightly like), 5.45 (slightly like), 5.46 (somewhat like), and 6.53 (like), respectively.

Keywords: *Pluchea indica* Less, Wet noodles, physicochemical, organoleptic

The Physicochemical Properties of Breakfast Pork Sausages with Different Filler Proportions of Wheat Flour and Tapioca

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Abstract

Pork is one type of meat that is abundant in Indonesia every year and commonly processed into sausage. The processed pork sausage that is popular in Indonesia is limited to one type called *lapchiong*, whereas the type of breakfast pork sausage is still not widely developed and has a potency to be further innovated. In sausage processing, minced meat is mixed with filler such as tapioca. Nevertheless, the use of tapioca alone yields compact and less chewy sausages. Therefore, the use of tapioca combined with wheat flour is expected to produce a better sausage texture. The study aimed to determine the influence of different proportions of tapioca and wheat flour as fillers on the physicochemical properties of breakfast pork sausages (BPS). The research design used was single factor Randomized Block Design (RBD) with different proportions of wheat flour and tapioca in BPS as follows: 100%:0%, 80%:20%, 60%:40%, 40%:60%, 20%:80%, 0%:100%. The analyzed physicochemical properties included moisture content, water holding capacity (WHC), and texture (hardness, cohesiveness, chewiness, and adhesiveness). The results showed the moisture content of BPS did not significantly different among different filler proportions, but significant differences observed between BPS made with 100% tapioca and 100% wheat flour. The WHC of unboiled and boiled sausage exhibited a similar trend, where the WHC increased along with the increase of wheat flour proportion. The hardness, cohesiveness, and chewiness of BPS slightly decreased with a decrease in tapioca proportion, but the different proportions of filler showed insignificant differences in the adhesiveness of BPS.

Keywords: breakfast sausage, pork, wheat flour, tapioca, filler

Improving the Sensory Properties of Bread Incorporated with *Monascus*-Fermented Durian Seeds and Rice Bran

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Abstract

Bread incorporated with *Monascus*-fermented durian seeds (MFDS) and rice bran (RB) is a functional food which contains bioactive compounds. MFDS contains monacolin K which is able to reduce cholesterol while RB contains non-dietary fiber, oryzanol, and tocotrienol which can prevent hyperglycemic. Although it is beneficial for human health, it has a bitterness and unpleasant aroma that is caused by phenolic compounds in MFDS and fatty acids in RB. Incorporation of bee pollen in this bread is one way to improve the sensory properties of bread since it contains volatile compounds with pleasant taste and aroma such as furan, furfural, and pyrazine. The aim of this study was to observe the effect of different bee pollen concentrations on the sensory properties of bread incorporated with MFDS and RB. This study used Randomized Block Design with six levels of treatment starting from 0%; 0.075%; 0.150%; 0.225%; 0.300%; and 0.375%. Data were analyzed by Analysis of Variance with $\alpha = 5\%$. The result of this research showed that different concentrations of bee pollen significantly affected the sensory properties of bread incorporated with MFDS and RB. The preference score for color ranged from 4.33 to 5.45; aroma ranged from 3.35 to 5.35; taste ranged from 3.33 to 5.33; and overall acceptance ranged from 3.35 to 4.33. As bee pollen concentration increased, preference score for aroma, taste, and overall acceptance increased and preference score for color decreased. The best treatment was obtained by using 0,375% bee pollen.

Keywords: Bread, *Monascus*-Fermented Durian Seeds, Rice Bran, Bee Pollen

Optimised Physicochemical and Organoleptic Properties of Cookies at 70:30 ratio of Modified Cassava Flour and Mung Bean Flour

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Abstract

The aims of this study were (1) to assess the impact of different proportions of MOCAF and mung bean flour on the physicochemical and organoleptic characteristic of cookies, (2) to ascertain the optimal proportion of MOCAF and mung bean flour that generates ideal cookies based on the organoleptic characteristic of cookies. The research design used was Randomized Block Design (RBD) with one factor, which was the proportion of MOCAF and mung bean flour consisting of five levels: 100:0, 85:15, 70:30, 55:45, and 40:60 and the procedures were repeated five times for each level. The parameters tested were moisture content, texture (hardness), spread ratio, color, and organoleptic (preference of color, flavor, hardness, and easiness to swallow). Data were analyzed statistically with ANOVA at $\alpha = 5\%$ to detect any significant difference, continued with DMRT at $\alpha = 5\%$ and the best treatment was determined by spider web graph of the organoleptic properties. The results showed that the higher proportion of mung bean flour, the lower moisture content, the higher spread ratio, the reduced hardness, the less color includes lightness, a^* value, b^* value and chroma, the increased hue, and color, hardness, and taste preferences level increased. The ratio 70:30 of MOCAF and mung bean flour showed the finest treatment and scored significant preference level on a scale of 1 to 7 resulting in a preference for color of 4.86 (slightly like), hardness 5.54 (like), taste 4.68 (slightly like), and ease of swallowing 4.66 (slightly like). At this optimum ratio [70:30] the moisture content was 2.36%, protein content was 6.07%, fat content was 21.54 %, ash content was 2.47%, carbohydrate content was 67.25% and crude fiber content was 0.23%.

Keywords: Modified Cassava Flour, Mung Bean Flour, Cookies

Enhancing the Probiotic, Physicochemical and Organoleptic Properties of Soygurt with Purple Sweet Potato (*Ipomoea batatas* L) Paste

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Abstract

Public awareness of health and consuming healthy products immense during this pandemic era. Soygurt is a type of probiotic beverages made from soy milk fermented using lactic acid bacteria (LAB). Purple sweet potato-PSP (*Ipomoea batatas* L) contains various bioactive compounds which may amplify the health benefits of soygurt once being added at an optimum level. PSP is also a rich source of carbohydrates (starch, sucrose, maltose, and glucose), protein, minerals, and vitamins that supports LAB growth and enhances other soygurt properties. The aim of this experiment was to evaluate the impact of PSP at various concentrations on the microbiology, physicochemical, and organoleptic properties of soygurt. This experiment used a starter containing *Streptococcus thermophiles*, *Lactobacillus bulgaricus*, and *Lactobacillus acidophilus*. The purple sweet potato paste (PSPP) was added at six different concentrations i.e. 0%, 3%, 6%, 9%, 12%, and 15% (w/v) of the total mixture. Statistical analysis with Anova at of 5% showed that the addition of PSPP caused an increase in the total plate count of LAB cells (from 7,99 to 9,75 log cfu/g), pH (from 4,735 to 4,298), and total lactic acid (from 0.267 to 0.466%). The organoleptic evaluation preference tests showed soygurt at 3% and 6% PSPP were accepted by the panelist in terms of its flavor at 5.35 (rather-like) and mouthfeel at 5.15 (rather-like), notwithstanding soygurt with 12% PSPP generated an optimal color with the score of 5.40 (rather-like). In conclusion, the concentration of PSPP significantly affected the probiotic, physicochemical, and organoleptic properties of soygurt.

Keywords: Soygurt, soymilk, purple sweet potato paste

Effect of Concentrations and Types of Stabilizer on the Physical Properties of Carrot Pineapple Velva

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Abstract

Velva is a frozen food product that is similar to ice cream, but velva has lower fat content because it is not added with fat from other ingredients. Velva has a high crude fiber and vitamin contents that come from fruits and vegetables. Pineapple that has a yellow color was chosen to produce velva. The pale yellow color of pineapple is considered to be less attractive; thus, orange carrots were added to make it more attractive for the consumers. The addition of stabilizer is also needed to produce velva with smooth texture and hard-melted characteristic, such as kappa-carrageenan and carboxymethyl cellulose (CMC). The research aimed to examine the effect of various types of stabilizer and their concentrations on the physicochemical properties of the carrot pineapple velva produced, including flow rate, first drip, color (lightness, redness, yellowness, chroma, and °hue), and pH. Based on the results of the study, it was found that the addition of kappa carrageenan with concentrations of 0.25, 0.50, and 1% (b/v) produced velva with the first drop of 132.67-420.83 seconds, flow rate of 1.41-0.55 cm/seconds, lightness of 47.45-47.50, redness of 9.97-10.52, yellowness of 17.50-18.33, chroma of 20.79-21.57, °hue of 58.39-60.73, and pH of 4.53-4.59. The use of CMC with concentrations of 0.1, 0.2, 0.3, and 0.4% (b/v) produced velva with the first drop of 162-386.4 seconds, flow rate of 0.15-1.34 cm/seconds, lightness of 48.92-48.95, redness of 10.12-10.20, yellowness of 16.30-16.58, chroma of 19.24-19.43, °hue of 58.17 – 58.83, and pH of 3.78-4.01.

Keywords: Velva, Pineapples, Carrot, Carboxymethyl Cellulose

The food industry supply chain in the light of COVID-19: the constraint and development of measures to ensure food safety and quality control

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Abstract

Globalization and the opening of international borders are leading to the movement of goods and people and the change of consumer behavior. This is leading to the development of new food-borne disease outbreaks around the world. Recently, the resurgence of covid-19 cases around the world has highlighted the limitations of health surveillance measures, unprecedented effect on the food supply chain and food industry world wise. Amid this recent crisis, population and scientific concern are focusing on the demand for an improvement of food safety and quality control along the food supply chain. It is primordial to solve this constraint, understand the stem of contamination along the food supply chain, and develop new point of care detection methods that are more sensitive, specific, effective, and efficient in the early stage of food-pathogen contamination. These point of care detection methods to be worldwide applicable must be user friendly, convenient, fast, and free from the laboratory analysis constraints. The synergistic implementation of new molecular detection methods combined with the new 3D printing technology led to the production of high end-point and advanced food safety detection biosensors for direct testing of food along the production line and the food supply chain. We highlighted the latest advance research in 3D printed technology for food safety and their application as point of care testing and screening method to guarantee the safety of food delivered to consumers, as well as the trend of 3D printed molecular biosensor devices to enhance the food safety screening performances.

Keywords: food safety, food supply chain, COVID-19, 3D printing, biosensors

Boiling Time Variation Through Functional Characteristics Of Boiled Red Kidney Beans

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Abstract

Chemical components of red kidney beans, starch and protein, are closely related to its functional properties. The starch and protein components are structurally still bound to each other or to other components in a complex structure which can hinder the utilization of the functional properties of red kidney beans in food products. Utilization of the red kidney beans based on its functional properties requires preliminary treatment, namely boiling. Boiling time is an important factor that may affect red kidney beans' functional properties. The purpose of this study was to determine the effect of boiling time on the functional properties of boiled red kidney beans. Six levels of boiling time (0, 3, 6, 9, 12 and 15 min) were applied with three repetitions each. Functional properties tested included protein solubility, water absorption, oil absorption, gel formation, foam capacity and stability, emulsion capacity and stability, and water content. The results showed that boiling decreased protein solubility, foam capacity, and emulsion capacity of red kidney beans, while the foam stability and emulsion stability increased with a longer boiling time. The absorption of water and oil increased up to 9 min of boiling, while the water content increased after 3 min of boiling.

Keywords: red kidney beans, boiling, boiling time, functional properties

Bioavailability And Activity Prediction Of Bioactive Compounds OF RED Fruit (*Pandanus conoideus* Lam.) And Pandan Grape (*Sararanga sinousa* Hemsley) By In Silico Method

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Abstract

Red Fruit (RF) and Pandan grape (PG) contained bioactive compounds that good for health. Many bioactive compounds may differ in bioavailability in the human body caused by the difference of the structures. Those also influenced their bioactivity. Their interaction with other compound in the body including Albumin may influence the availability and activity too. Study focus on intracellular availability and activity of bioactive compounds was time and financial consumes, whereas the development of bioinformation technology offer the solution. The objective of this research is prediction of bio-availability and activity of RF and PG bioactive compounds by *in silico* method based on the SAR (Structure Activity Relationship). Three RF flavonoids and five GP hydroxycinnamic acids were evaluated by *in silico* for their antioxidant or antiglycation activity and bioavailability during binding on HSA (Human Serum Albumin). The compounds were identified by LCMS. The chemical structures were retrieved from PubChem compound database. HSA structure was obtained from UNIPROT. Antioxidant and antiglycation activities were predicted first using PASS then intracellular availability and activity were predicted by docking on HSA. The docking performed by Autodock Vina in Pyrx 0.8 through blind-rigid docking. The molecular interactions were visualized using PYMOL then evaluated further by Ligplot+.

All of RF flavonoid showed $Pa > 0,7$ for antioxidant in general (0.878-0.945), free radical scavenging (0,816-0.978), and lipid peroxidase inhibitor activity (0.813-0.976). Taxifolin had the highest antioxidant activity in general. All ligands bound on HSA that mean all are available in the human body, but the RF flavonoid had higher binding affinity (-7.5 until -8,2 kcal/mol) than GP phenolic acids (-6.0 until -8,1 kcal/mol). It means the flavonoids were more available than the phenolic acid. Taxifolin and Quercetin had more opportunity to show antioxidant activity during docking than Quercetin3-O-Glucose because still have free hydroxyl groups at C3 on ring-C and C7 on ring-A; where the position at C5, C7 on ring-A and C3 on ring-C were important for antioxidant activity. Lysin on 195 and 199 and arginine on 98, 160, 197, 472, and 521 of HSA are the main site of glycation. The GP chlorogenic acid, caffeic acid, 2-hydroxycinnamic acid, and sinapinic acid bound on the lysin. It means those hydroxycinnamic acid play as antiglycation.

Keywords: Prediction, Bioavailability, Activity, Bioactive Compounds, In-Silico Method

Comprehensive analysis of component changes during black tea processing using LC-MS

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Abstract

Catechins are the major polyphenols in tea leaves, and have various bioactivities. In oolong tea and black tea manufacturing, catechins are oxidized, thus some dimers and polymers are formed. However, the chemical structures of these polymers are not identified yet as it was difficult to be isolated. We investigated the mechanisms of polymerization by focusing catechins dimers. However, since no polymerization was observed even when these dimers were further oxidized, the polymer may have been formed by a different mechanism from the formation of these dimers. In this study, our purpose is discovering new key intermediates for polymerization by tracking the changes in compounds during actual tea production by comprehensive analysis using LC-MS and applied to metabolomics analysis. Black tea sample at each production stage was extracted by using water, methanol, chloroform and subjected to UPLC-MS measurement. In Principal Component Analysis (PCA), the plots were grouped by manufacturing stage in the score plot. Thirty-seven markers abundant in the rolling and fermentation process considered from the loading plot of PCA.

Keywords: black tea, catechins, LC-MS, oxidation, Principal Component Analysis

Optimizing The Fermentation Process Of Tamarilo Juice Containing *Lactobacillus rhamnosus* Skg34

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Abstract

Fermented milk is the most popular product to be used as a probiotic carrier. However, there are many probiotic carriers other than milk-based products have been introduced nowadays, such as fruit and vegetable-based products. *Lactobacillus rhamnosus* SKG34 is a potential probiotic strain that has been applied to tamarilo juice containing probiotics. This study aimed to determine the optimal sucrose concentration and fermentation time in the production of tamarilo juice containing probiotic. This study used a complete factorial randomized design with five levels of sugar concentrations (0, 2.5, 5, 7.5, and 10%) and two levels of fermentation time (24 and 48 hours). Parameters observed included total LAB population, total sugar, total soluble solids, total acid, pH, antioxidant capacity, and vitamin C, while the sensory evaluations in the form of hedonic test that included the parameters of color, aroma, taste, and overall acceptance, as well as the sour and sweetness scoring tastes. The results showed that the best tamarilo juice containing probiotic was produced using 7.5% sucrose with 24 hours fermentation time. The LAB population in the final product was 1.47×10^{10} cfu/ml. The tamarilo probiotic juice contained 9.85% of sugar with total soluble solid of 9.27°Brix. The pH of the tamarilo juice was 3.73 with the total acids of 0.59%, antioxidant capacity of 7.49 mg GAEAC/100 ml, and vitamin C of 41.07 mg/100 ml. The tamarilo probiotic juice had a desirable color and aroma with sweet and slightly sour taste.

Keywords: Fermentation, tamarillo, *Lactobacillus rhamnosus*

Gut Microbiota Of Children With Exclusive Breastfeeding In Bali Detected By Specific PCR

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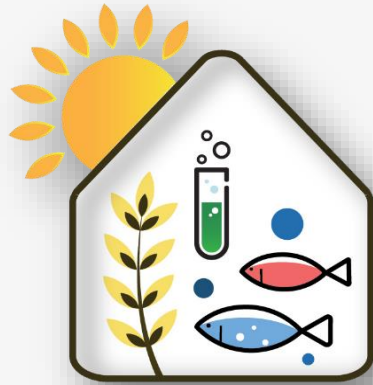
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Abstract

Breast milk is the best nutrition for infants. It contains beneficial substances, one of which is a diverse array of microbiota that can protect against gastrointestinal and respiratory illnesses. This study aimed to describe gut microbiota in children who got exclusive breastfeeding. We performed a cross-sectional study in a daycare in Denpasar during May-October 2019. The study population was children 3-60 months who got exclusive breastfeeding and were in healthy condition. Data were collected from the questionnaire. Stool samples underwent PCR examination to determine species of microbiota (*Lactobacillus* and *Bifidobacterium* species). There were 16 children who included in the study, 11 of them (68.8%) were girls. The median age was 18 (5-49) months with the median duration of breastfeeding was 13 (6-30) months. More than half of the subjects (68.8%) were delivered by c-section. The most common *Bifidobacterium* species found were *Bifidobacterium breve* (75%), *Bifidobacterium longum* (56,25%) and *Bifidobacterium catenulatum* (56,25%). Fifty percent of the subject had 4 or more species of *Bifidobacterium*. The most common *Lactobacillus* species were *Lactobacillus gasserii* (18.75%) and *Lactobacillus paracasei* (18.75%). Only 18.75% of the subject had more than 1 species of *Lactobacillus*. These results showed the dominance of *Bifidobacterium* species in breastfed children.

Keywords: Gut microbiota; exclusive breastfeeding; children; *Lactobacillus*; *Bifidobacterium*



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