The 6th FiA Conference 2020
"on Food Science, Nutrition and Health"

WEBINAR, 14-16 October 2020

Book of Abstracts

Organized by :

Indonesian Association of Food Technologists
Patpi
Perhimpunan Ahli Teknologi Pangan Indonesia

SEAFAST CENTER

PUSAT UNGGULAN IPTEKS PERGURUAN TINGGI

Department of Food Science & Technology IPB

Program & Abstracts

International Conference
THE 6th Food Ingredient Asia Conference (FIAC)
"ON FOOD FOOD SCIENCE, NUTRITION AND HEALTH"

WEBINAR, 14-16 October 2020

Organized by:

Indonesian Association of Food Technologists

Southeast Asian Food & Agricultural Science & Technology (SEAFAST) Center
Bogor Agricultural University

Department of Food Science & Technology
Bogor Agricultural University

Organized by:

Department of Food Science & Technology IPB University

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INTRODUCTION TO THE CONFERENCE

INTRODUCTION TO THE CONFERENCE

Organizing Committee Welcoming Remarks

Honorable speakers,
Fellow food technologists,
Distinguished participants,
Ladies and Gentlemen,

Good morning!
Welcome to the 6th Food Ingredient Asia Conference (FiAC) 2020, and thank you for being here with us.

In this COVID-19 pandemic period, sadly, we have to carry out our international conference through a webinar instead of a physical meeting. It is said that a scientist must be an agile learner! Therefore, this situation will not stop us to disseminate, share, and discuss in the globe of food, health, and nutrition. Apart from this, I'd like to convey my greatest respect to those who fight to help to cure, taking care of the patients infected with COVID-19 as well as to those who help to reduce the spread of this virus. I kindly ask, let's take a brief moment of silence for them!

Dear fellow food technologists and participants—as the population continuously grows in parallel to the limited productive lands for cultivating crops, we have to shift our paradigm to a more sustained food consumption. Besides energy and feed, food consumption is one of the domains responsible for the largest share of environmental impact. Ensuring nature's sustainability must be viewed as a fundamental determinant of food security, safety, and human. Therefore, we—as the food scientists and technologists—are expected to pave a way for safer and sustainable food production and consumption in the future. This responsibility lies on each of our shoulders regardless of our national borders.

In the light of international engagement, this 6th Food Ingredient Asia Conference (FiAC) 2020 is our "home" to disseminate and discuss in the scientific fashion about food, health, and nutrition. This conference is organized by the Indonesian Association of Food Technologists (IAFT/PATPI), Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center –and Department of Food Science and Technology (DFST), IPB University. Besides plenary talks, this seminar also facilitates technical sessions (oral and poster presentations) that can be attended by industrial representatives, government officials, academicians/researchers and graduate students. This year, we have selected 84 abstracts to present in the technical sessions. I hope you will enjoy as much as possible the presentations delivered in these sessions! In addition to this conference, for the celebration of World Students' Day that falls on 15th October 2020, we also have the Student Food Product Development competition (FPDC) and Sensory Science workshop. Moreover, on 16th October 2020 which is World Food Day, we also organize a Halal Workshop for industries and academicians. We hope you will not miss this one as well!

To close this remark, I want to express my gratitude to all the speakers and moderators in plenary and technical sessions. I'd also like to thank PT Indofood for supporting activities in this event. Last but not least, I want to convey my biggest appreciation to the people within the organizing committees that have worked together to prepare this conference.
I hope you all enjoy this conference!

Thank you.

Dr.-Ing. Azis Boing Sitanggang, S.TP, MSc
Chair of 6th FiAC 2020

Host Institution Welcoming Remarks

Honorable speakers,
Distinguished participants,
Fellow Food Technologists,
Ladies and Gentlemen,

Assalamualaikum Warohmatullahi Wabarokatuh,

Despite our circumstances, I thank you for attending this conference and I am pleased to warmly welcome all distinguished speakers and our guests in "the 6th FIA Conference 2020 on Food Science, Nutrition and Health". This year's conference will be held through a zoom application, jointly organized by SEAFAST Center and the Department of Food Science and Technology, IPB University; and collaborated with the Indonesian Association of Food Technologists (IAFT/PATPI).

As we all aware of, pandemic period due to Covid-19 has not yet been passed in Indonesia and globally. This pandemic is giving us a force to adapt into some new habits and maintaining our health is mandatory. Consumption of nutritious food and maintaining food safety is forced to become a new habit to increase the immune system as well. The partial restrictions applied in Indonesia with physical distancing have changed the method of conducting seminars and conferences as a web-based scientific activity today and in the future.

In this conference, topics related to the latest developments in food safety, functional food, analytical methods, and food processing will be discussed. Since halal is still being a concern nowadays, we also making it as one of the main topics in this conference and will be delivered in a form of a workshop. Hope that the workshop will immerse participant from food industries with the technical implementation of halal regulation in management system.

Besides, in this conference, we also organize activities that involve students with a major in food technology, called as PATPI-SEAFAST-INDOFOOD Students' Day program. Although we have some limitations on conducting the session of Food Product Development Competition and Sensory Science Workshop, we will always remain committed and highly encourage the students to actively involved in this activity.

Again, I would like to take this opportunity to sincerely thank all the speakers in the plenary, technical sessions, and also all the moderators. I also would like to thank PT Indofood Sukses Makmur Tbk, for supporting the Students' Day Program.

Finally, I wish the conference will run effectively in achieving its goal.

Thank you.

Wassalamualaikum Warohmatullahi Wabarokatuh.

Prof. Dr. Nuri Andarwulan
Director of SEAFAST Center

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CONTENTS

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ORGANIZERS

ORGANIZERS

In order to develop a Food Technology in Indonesia, IAFT (PATPI), an acronym of Indonesian Association of Food Technologists (Perhimpunan Ahli Teknologi Pangan Indonesia), was formed in 1967 at Bogor, West Java. This association is a professional organization that gather experts or professionals in the field of food technology, as well as other related areas. IAFT members come from universities, research centers, government agencies or private sectors and food industries. IAFT is the only Indonesia representative of professional organization in the food field for IUFoST (International of Food Science and Technology). In addition, IAFT becomes a member of FiFSTA (the Federation of Institute of Food Science and Technology in the ASEAN) and gets the recognition of IAFT as Allied Organization No. 27 by the IFT (the Institute of Food Technologists), USA.

PATPI engaged in the field of food technology including the application of basic sciences such as chemistry, physics and microbiology as well as the principles of engineering, economics and management on all food supply chain, start from the farm to table. Food supply chain covers the aspects of raw materials handling, processing, preservation, packaging, storage, distribution, quality control, safety, acceptability, new food product development, also nutrition and public health.

The Southest Asian Food and Agricultural Science and Technology (SEAFAST) Center is a Research Center of Bogor Agricultural University (IPB) established in 2004 as a result of the reorganization and consolidation process at IPB. At IPB, nutrition and food research and education programs have been developed for over 30 years. Previously, there were several Centers associated with nutrition and food science and technology. In 1979, the Food Technology Development Center (FTDC) was established at IPB. In 1985, Inter University Center for Food and Nutrition was established and further developed into Center for Food and Nutrition Studies (CFNS) in 1992. Other centers related to nutrition, food science and technologies were also established; namely the Center for Food and Nutrition Policy Studies (CFNPS; since 1987) and Center for Assessement of Traditional Food (CATF, 1997).

The center is designed to develop a national and regional system of partnerships in the area of food agricultural science and technology development. In general, the SEAFAST Center is directed to bring together the universities, governmental, and business sectors to focus on the improvement of food science and technology issues for Indonesia and where appropriate, in other ASEAN countries. IPB has mandated the SEAFAST Center to be a regional center focusing on improving food quality, nutrition and safety through science and technology. In 15 December 2015, SEAFAST Center LPPM IPB was awarded a recognition from Ministry of Research, Technology and Higher Education as Food Safety Center for Excellence.

Department of Food Science & Technology

The Department of Food Science and Technology at Bogor Agricultural University (IPB) is one of the oldest Departments of its kind in Indonesia. The Department was founded in 1964 under the Faculty of Agricultural Engineering and Technology, previously named as the Department of Agricultural Product Technology. After 1981, the name was changed until now as the Department of Food Science and Technology. The Department has a core competence in the areas of food science and food technology, especially in food chemistry, food microbiology, food process engineering, food analysis, food quality and food safety.

The Department has achieved excellence in teaching and research, and for securing high quality incoming students. The Department is proud of its faculty research performance, curricula, educational process, graduate performance, internal management and organization, and the creation and expansion of mutual partnerships with government and private sectors, nationally and internationally. The Department has adopted the food science curriculum recommended by the United States Institute of Food Technologists (IFT) since 2003. Since 2010, The Department became the first study program approved by IFT outside North America. This adoption and approved status consequently position the Department as a major player in the development of food science and technology education in Indonesia and in the region. The Department of Food Science and Technology has a vision to become a leading higher educational institution with international quality as well as be a trend setter in food science and technology.

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TENTATIVE PROGRAM

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THE 6TH FOOD INGREDIENT ASIA CONFERENCE (FIAC)
"ON FOOD FOOD SCIENCE, NUTRITION AND HEALTH"

WEBINAR, 14-16 OCTOBER 2020

A. OVERALL EVENTS

Time	Date		
	14 October 2020	15 October 2020	16 October 2020
AM	• Opening Events • Plenary Session I • PATPI-SEAFAST-INDOFOOD Students' Day 2020 – Student Food Product Development Competition *(different zoom meeting)*	• PATPI-SEAFAST-INDOFOOD Students' Day 2020 – Sensory Science Workshop • PATPI-SEAFAST-INDOFOOD Students' Day 2020 – Student Food Product Development Competition *(different zoom meeting)* • Technical Session • IAFT/PATPI National Gathering • FIFSTA Annual Meeting	• Halal Workshop
PM	• Technical Session	• Technical Session • Plenary Session II • Closing Events	-

B. DETAILED CONFERENCE ACTIVITIES

DAY 1: Wednesday, 14 October 2020	
Opening – MAIN MEETING ROOM	
08:00-09:00	Registration
09:00-09:15	Opening Remarks • Report from the Committee **Dr.-Ing. Azis Boing Sitanggang** • Remarks by Precident-elect of IUFoST **Prof [E]. Dr. M. Aman Wirakartakusumah, MSc**
09:15-09:30	Official Opening by Rector of IPB University **Prof. Dr. Arif Satria**
Plenary Session I **Moderator : Prof [E]. Dr. M. Aman Wirakartakusumah, MSc** – MAIN MEETING ROOM	
09:30-09:55	Oil palm for the world: International standards, regulations and emerging issues **Prof. Dr. Purwiyatno Hariyadi** – IPB University, ID; Vice chair of CODEX Alimentarius Commission
09:55-10:20	Advanced NMR approaches as a tool for food quality control **Dr. Emmanuel Hatzakis** – Ohio State University, USA

10:20-10:45	Furfuryl alcohol (FFA) formation and mitigation in coffee-based products **Prof. Dr. Michael Murkovic** – Graz University of Technology, Austria		
10:45-11:30	Discussion		
11:30-13:00	**BREAK**		
Technical Sessions – Presenter based on the abstract number – BREAKOUT ROOM			
Time	**Parallel A: Food Science** Moderator: Prof. Dr. Ir. Meta Mahendradatta (University of Hasanuddin)	**Parallel B: Nutrition** Moderator: Dr. Anton Rahmadi (University of Mulawarman)	**Parallel C: Health** Moderator: Dr. Puspo E. Giriwono (SEAFAST Center IPB University)
13:00-13:15	001 **(A-LS1)**	006 **(B-LS1)**	005 **(C-LS1)**
13:15-13:25	002	008	007
13:25-13:35	003	014	018
13:35-13:45	004	015	024
13:45-13:55	009	021	025
13:55-14:05	Discussion	Discussion	Discussion
14:05-14:10	**BREAK**	**BREAK**	**BREAK**
Time	**Parallel A: Food Science** Moderator: Prof. Dr. Winiati Puji Rahayu (SEAFAST Center IPB University)	**Parallel B: Nutrition** Moderator: Robi Andoyo, Ph.D (University of Padjajaran)	**Parallel C: Health** Moderator: Prof. Dr. Yuli Witono (University of Jember)
14:10-14:25	016 **(A-LS2)**	061 (B-LS2)	070 **(B-LS3)**
14:25-14:35	010	026	028
14:35-14:45	011	027	034
14:45-14:55	013	030	036
14:55-15:05	017	031	040
15:05-15:15	Discussion	Discussion	Discussion
15:15-15:30	**BREAK**	**BREAK**	**BREAK**
Time	**Parallel A: Food Science** Moderator: Prof. Dr. Harsi D. Kusumaningrum (IPB University)	**Parallel B: Nutrition** Moderator: Dr.rer.nat. Agus Wijaya (Sriwijaya University)	**Parallel C: Health** Moderator: Prof. Dr. Elisa Julianti (University of Sumatera Utara)
15:30-15:45	073 **(A-LS3)**	056 **(B-LS3)**	077 **(C-LS3)**
15:45-15.55	019	033	045
15:55-16:05	022	037	046
16:05-16:15	023	038	047
16:15-16:25	029	039	048
16:25-16:35	032	043	049
16:35-16:45	079	082	081
16:45-16:55	080	084	083
16:55-17:05	Discussion	Discussion	Discussion

DAY 2: Thursday, 15 October 2020			
PATPI-SEAFAST-INDOFOOD Students' Day 2020 – MAIN MEETING ROOM			
09:00-10:00	Measurement beyond liking: The secrets of QDA upon good sensory practices **Dr. Dede Robiatul Adawiyah** – IPB University		
10:00-11:00	Move beyond the laboratory: Validity and realibility for trained consumers **Dr.-Ing. Dase Hunaefi** – IPB University		
11:00-11:10	**BREAK**		
11:10-12:30	**FIFSTA Annual Meeting –** BREAKOUT ROOM FIFSTA		
13:00-14.30	**PATPI Annual Meeting –** BREAKOUT ROOM PATPI		
Technical Sessions – Presenter based on the abstract number – BREAKOUT ROOM			
Time	**Parallel A: Food Science** Moderator: Prof. Dr. Yudi Pranoto (University of Gadjah Mada)	**Parallel B: Nutrition** Moderator: Dr. Nancy D Yuliana (IPB University)	**Parallel C: Health** Moderator: Prof. Dr. Teti Estiasih (University of Brawijaya)
11:10-11:25	041 **(A-LS4)**	044 **(B-LS4)**	012 **(C-LS4)**
11:25-11:35	042	055	052
11:35-11:45	050	057	053
11:45-11:55	051	058	054
11:55-12:05	063	062	059
12:05-12:15	Discussion	Discussion	Discussion
12:15-13:00	**BREAK**	**BREAK**	**BREAK**
Time	**Parallel A: Food Science** Moderator: Dr. Muzi Marpaung (Swiss-German University)	**Parallel B: Nutrition** Moderator: Dr. Melanie Cornelia (Pelita Harapan University)	**Parallel C: Health** Moderator: Dr. Dian Herawati (SEAFAST Center IPB University)
13:00-13:15	068 **(A-LS5)**	020 **(B-LS5)**	035 **(C-LS5)**
13:15-13:25	065	064	060
13:25-13:35	066	067	071
13:35-13:45	069	074	075
13:45-13:55	072	078	076
13:55-14:05	Discussion	Discussion	Discussion
14:05-14:15	**BREAK**	**BREAK**	**BREAK**
Plenary Session II **Moderator : Prof. Dr. Ratih Dewanti Hariyadi** – MAIN MEETING ROOM			
14:15-14:40	Probiotic, prebiotic, and symbiotic: An update **Prof. Dr. Lilis Nuraida** – SEAFAST Center IPB University, ID		
14:40-15:05	Process development of functional foods **Prof. Dr. Chin-Kun Wang** – Chung Shan Medical University, TW		
15:05-15:30	Discussion		
15:30-15:40	**BREAK**		
15:40-15:50	Awards announcement : GSRPC, FPDC, Best presenters for three (3) parallel classes		
15:50-16:00	Closing remarks by Head of DFST IPB University **Dr. Feri Kusnandar**		
16:00-16.10	Closing remarks by Precident of IAFT/PATPI **Prof. Dr. Umar Santoso**		

DAY 3: Frday, 16 October 2020	
08:30-08:55	Registration
08:55-09:00	Opening by Moderator **Dr. Dias Indrasti** – SEAFAST Center IPB University
Session I	
09:00-09:30	The Importance of Halal Food Management in Indonesia **Ir. Nur Wahid, M.Si -** Head of LSP MUI
09:30-10:00	Halal Assurance System (HAS) and Requirements of Halal Certification in Indonesia **Evrin Lutfika, S.TP -** Director of Operation - Indonesia Halal Training and Education Center (IHATEC)
10:00-10:30	Discussion
Session II	
10:30-11:00	Halal Critical Points of Materials and Its Halal Supporting Documents **Dr. Nancy Dewi Yuliana** - Dept. Food Science and Technology & Halal Science Center, IPB University
11:00-11:30	Discussion + closing **Dr. Dias Indrasti** – SEAFAST Center IPB University

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SPEAKERS' PROFILES

SPEAKERS' PROFILES

❖ Prof. Dr. Purwiyatno Hariyadi, MSc., CFS*)

Prof. Dr. Purwiyatno Hariyadi is Prof. Purwiyatno Hariyadi is Professor of Food Process Engineering in the Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University. He was the Director of SEAFAST Center, IPB University, from 2005 to 2015 and now ia a senior scientist at the Center. He was president of the Indonesian Palm Oil Society from 2005 to 2009. Dr Hariyadi's research interests are in food processing and engineering; especially in the field of thermal processing and fat/oil processing and modification. He is a member of the Indonesian Academy of Sciences (AIPI) and fellow of the International Academy of Food Science and Technology (IAFoST). In 2017, he was elected as Vice-Chairperson of the Codex Alimentarius Commission, the FAO/WHO Joint Food Standards Program. He completed his BS in Food Technology from IPB University (in 1984); Master (1990) and PhD (1995) in Food Processing with a minor in Chemical Engineering, from the Department of Food Sciences, University of Wisconsin, Madison, USA.

***) Certified Food Scientist**, the Institute of Food Technologists (IFT, USA)

❖ Dr. Emmanuel Hatzakis

Dr. Emmanuel Hatzakis obtained his BSc in chemistry in 2000, MSc in organic chemistry in 2004 and PhD in food analysis in 2007, at the University of Crete in Greece. From 2008 to 2010 he worked as a postdoctoral Research Associate in University of Arizona at the College of Pharmacy and from 2010 to 2012 he was Research Associate Professor in University of North Carolina at Wilmington. Then he became the NMR Director in Pennsylvania State University and in August 2016 he joined the department of Food Science and Technology at The Ohio State University as Assistant Professor. His research interests include applications of liquid and solid state Nuclear Magnetic Resonance (NMR) Spectroscopy in Food Science, Structure Determination and Metabolomics. He is developing novel analytical tools for food evaluation and he applies NMR spectroscopy for the discovery and characterization of compounds with high commercial and nutritional value that can be produced from low cost sources, such as food industry waste. In addition, he uses a multi-disciplinary research approach that combines spectroscopy, metabolomics, gene expression profiles and microbial analysis to investigate the interaction between nutrition and microbiome and how this is related to health and disease.

❖ Prof. Dr. Michael Murkovic

Prof. Dr. Michael Murkovic was born in Graz in 1959 and was studying Technical Chemistry at Graz University of Technology with a focus on Biotechnology. He finished his Diploma and PhD in the field of Biotechnology in 1989. As a postdoc he stayed for one year in Switzerland at ETH Zürich and continued his professional career in the pharmaceutical company Biochemie-Kundl (now Sandoz) in Austria. In 1993 he moved back to Graz and started working as a food chemist at the Institute of Biochemistry and Food Chemistry at Graz University of Technology. His research focus is in the formation of carcinogenic compounds that are formed during cooking and the influence of antioxidants on the formation of these compounds. He is specialized in liquid chromatography and mass spectrometry and habilitated in 2002 and became associate professor in the field of food chemistry. He has published ca. 100 manuscripts in reviewed scientific journals. He is teaching food chemistry and food biotechnology at Graz University of Technology, Medical University of Graz, and University of Applied Sciences. Besides his university affiliation at TU Graz he is active in the Food Chemistry Division of EuChemS (European Chemical Society) and is currently chairman of the Austrian food chemists.

❖ Prof. Dr. Lilis Nuraida

Prof. Dr. Lilis Nuraida is a lecturer at the Department of Food Science and Technology, IPB University. She also serves as Program Manager of Southeast Asia Food & Agricultural Science & Technology (SEAFAST) Center IPB. As a researcher, she focuses her research in the area of beneficial use of lactic acid bacteria, including their health benefit, their role in non-lactic food fermentation and their activity in inhibiting spoilage and pathogenic bacteria. Her research papers have been published in national and international journals as well as presented in national and international conferences. Prof. Nuraida actively provides training on food microbiology and safety related courses for food industries and government institutions. She also involved in developing guidance for production of safer food for Small Enterprises, Food Vendors and School Canteen, under coordination of National Agency for Drug and Food Control, Ministry of Health and Ministry of Education and Culture.

❖ Prof. Dr. Chin-Kun Wang

Prof. Dr. Chin-Kun Wang is a distinguished professor in Chung Shan Medical University, Former President of International Society for Nutraceuticals and Functional Foods (ISNFF), Fellow of International Academy of Food Science & Technology; ISNFF, honorary president of Nutrition Society of Taiwan, Chair, Global Incident Alert Network, Global Harmonization Initiative. He got his MD, Ph.D. degree from National Taiwan University and worked at Chung Shan Medical University in 1993. In 1996, he promoted as a full professor, and then took the positions of the Chair, Dean, Vice President and President in Chung Shan Medical University. His research work is focused on human clinical trials and human metabolism of medicine, nutritional supplement, nutraceuticals, herbs, and functional foods. He got the National Award of Biomedicine for his great contribution to the medical education in 2008. He was also honored as 2012-20 Who's who in the world, Who's who in Asia, and 2009-2010, 2011-19 Who's who in Medicine and Healthcare. He also got the awards of outstanding research from several societies from 2009 to 2020. Dr. Chin-Kun Wang was the former president of Nutrition Society of Taiwan (from 2009 to 2012). For food safety and nutrition, he promoted the legislation for school sanitary law and national nutrition law. During the food safety problem in Taiwan, he jointed as a director of ILSI Taiwan and Chair of Global Harmonization Initiative to communicate with the media and press. He believes that scientific evidence is the best support for food safety and world nutrition problem. In the future, he tries his best to work together with the scientists around the world by network.

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MODERATORS' PROFILES

MODERATORS' PROFILES

Prof [E]. Dr. M. Aman Wirakartakusumah, MSc is an emeritus professor at Dept. of Food Science and Technology, IPB University. He obtained his doctoral degree from Wisconsin-Madison, USA in 1981 majoring Food Engineering. He was the Head of Department of Food Science and Technology (1987-1989), Dean of Faculty of Agricultural Engineering and Technology (1989-1995), and Rector of IPB University (1998-2002). In 2004-2008, Prof. Aman was Indonesia Ambassador to UNESCO, Paris-France. For international engagements, he has been acting as Fellow of IAFoST, was Chairman of IUFoST Education Committee, Scientific Director of ILSI SEA, and also involved in Codex Alimentarius Commission FAO/WHO. At the moment, he is the Chairman of Engineering Commission, the Indonesia Academy of Sciences, and Advisor to the Indonesian Association of Food Technologists; and also serves as Executive Director of IPMI International Business School, Indonesia.

Prof. Ratih Dewanti-Hariyadi is a Professor in Food Microbiology at the Department of Food Science and Technology and the Southeast Asian Food & Agriculture Science and Technology (SEAFAST) Center, Bogor Agricultural University (IPB), Indonesia. Her research includes characterization, survival, control and development of detection methods of bacterial pathogens in foods (mainly Salmonella, Staphylococcus aureus, Vibrio parahaemolyticus, Cronobacter sakazakii). In the country, she has been a consultant for the National Agency for Drug and Food Control since 2001 and currently is consulting on the revision of microbiological standards in foods and also member of the fresh food safety working group in Food Security Agency's (BKP). She lead the technical subcommittee for the development of analytical standard methods for food contaminants for the Ministry of Agriculture (2007-2102) and occasionally serves in the ad hoc committees for the National Standardization Agency. She also became Lead Auditor for ISO 22000: 2005, Microbiological Risk Analysis, and the Hazard Analysis Critical auditor. In 2007 she was appointed a member of the International Commission on Microbiological Specifications for Foods (ICMSF), world expert institute that compiles world food safety microbiology recommendations. She is also the Vice Chair of the South East Asia Affiliate of the International Association for Food Protection (IAFP). Professor Dewanti-Hariyadi is the head of Food Science Study Program, Post Graduate School, IPB. She earned her PhD in Food Microbiology with a minor in Bacteriology from the University of Wisconsin, Madison, US in 1995.

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LIST OF MODERATORS FOR TECHNICAL SESSIONS

LIST OF MODERATORS FOR TECHNICAL SESSIONS

- Prof. Dr. Ir. Meta Mahendradatta
  Department of Food Science and Technology, Faculty of Agriculture, University of Hasanuddin, Makassar, Indonesia
  Email: meta_mahendradatta@yahoo.com

- Dr. Anton Rahmadi
  Department of Agricultural Product Technology, University of Mulawarman
  Email: arahmadi@unmul.ac.id

- Dr. Puspo Edi Giriwono
  Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia
  Southeast Asian Food and Agricultural Science and Technology Center, IPB University, Indonesia
  Email: pegiriwono@apps.ipb.ac.id

- Prof. Dr. Winiati Pudji Rahayu
  Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia
  Southeast Asian Food and Agricultural Science and Technology Center, IPB University, Indonesia
  Email: wini_a@hotmail.com

- Robi Andoyo, Ph.D
  Department of Food Industrial Technology,Faculty of Agrocultural Industry Technology, Padjadjaran University, Indonesia
  Email: r.andoyo@unpad.ac.id

- Prof. Dr. Yuli Witono
  Department of Agricultural Product Technology, Faculty of Agricultual Technology, University of Jember
  Email: yuliwitono.ftp@unej.ac; ylwitono@yahoo.com

- Prof. Dr. Harsi Dewantari Kusumaningrum
  Departement of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia
  Email: harsikusumaningrum@yahoo.com

- Dr. rer. nat. Ir. Agus Wijaya, M.Sc
  Department of Agricultural Product Technology, Faculty of Agricultual Technology, Sriwijaya University
  Email: agus_wijaya@hotmail.com

- Prof. Dr. Elisa Julianti
  Departement of Food Science and Technology, Faculty of Agriculture, University of Sumatera Utara, Medan, Indonesia
  Email: elisa1@usu.ac.id

- Prof. Dr. Yudi Pranoto
  Faculty of Agricultural Technology, University of Gadjah Mada
  Email: pranoto@ugm.ac.id

- Dr. Nancy D Yuliana
  Department of Food Science and Technology, IPB University, Bogor, Indonesia
  Halal Science Center, IPB University, Bogor, Indonesia
  Email: nancy_dewi@apps.ipb.ac.id

- Prof. Dr. Teti Estiasih
  Department of Food Science and Technology, Faculty of Agricultural Technology, University of Brawijaya
  Email: teties@yahoo.co.id

- Dr. Muzi Marpaung
  Food Technology Department, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia
  Email: abdullah.muzi@sgu.ac.id

- Dr. Melanie Cornelia
  Department of Food Technology, Pelita Harapan University
  Email: melanie.cornelia@uph.edu

- Dr. Dian Herawati
  Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia
  Southeast Asian Food and Agricultural Science and Technology Center, IPB University, Indonesia
  Email: dianherawati@yahoo.com

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TECHNICAL SESSIONS

TECHNICAL SESSIONS

Code	Tittle of Paper
Parallel A : Food Science	
001 (A-LS1)	**PROTEIN SOURCE BEVERAGES'S CONSISTENCY IS MORE IMPORTANT OVER NUTRITIONAL ASPECT FOR BREASTFEEDING MOTHER IN PONJONG, GUNUNG KIDUL, INDONESIA** *Dwi Larasatie Nur Fibri[1*], Andreas Wahyu Nugroho[1]* [1] Department of Food and Agricultural Product Technologyy, Faculty of Agricultural Technology, Gadjah Mada University, Indonesia
002	**OPTIMIZATION OF PROTEIN EXTRACTION FROM INDONESIAN WHITE LIMA BEAN (*Phaseolus lunatus*) AND ITS APPLICATION AS BINDER IN CHICKEN MEATBALL** *Gigih Prakoso Jati[1], Bambang Dwi Wijatniko[1*], Agnes Murdiati[1]* [1] Department of Food and Agricultural Product Technology, Faculty of Agricultural Technology, Gadjah Mada University, Indonesia
003	**APPLICATION OF NATURAL PRESERVATIVES ATUNG (*Parinarium glaberimum, Hassk*) TO THE NUTRITION OF FISH SAUCE ENZYMATIC FROM THE WASTE OF TUNA LOIN PRODUCTION IN THE VILLAGE OF PARIGI, DISTRICT OF SERAM NORTH OF MOLLUCAS CENTRAL** *Trijunianto Moniharapon [1] and Fredy Pattipeilohy [2]* Department of Fishery Technology
004	**PHYSICOCHEMICAL CHANGES ON SORGHUM FLOUR MODIFIED WITH DIE-LESS EXTRUSION-ENZYMATIC TREATMENT** *Sukmawati Usman[1*], Maggy Thenawidjaja Suhartono[1], Endang Yuli Purwani[2], Azis Boing Sitanggang[1,3]* [1] Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia [2] Center for Postharvest Research and Development, Indonesian Agency for Agricultural Research and Development, Bogor, Indonesia [3] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
009	**PRODUCTION OF CELLOBIOSE FROM CASSAVA PEELS USING CELLULASE AND ITS PREBIOTIC ACTIVITY TOWARD *Lactobacillus plantarum*** *Ilham Marvie[1], Azis Boing Sitanggang*[1], Slamet Budijanto[1]* [1] Department of Food Science and Technology, IPB University

010	**ANALYSIS OF VOLATILES IN BEEF, PORK, AND CHICKEN MEATBALLS BY SPME-GC-MS** *Agy Wirabudi Pranata[1,4], Nancy Dewi Yuliana[2,4*], Noviyan Darmawan[3,4,] Lia Amalia[1,4]* [1] Graduate School of Food Science, IPB University, Bogor, Indonesia [2] Department of Food Science and Technology, IPB University, Bogor, Indonesia [3] Department of Chemistry, IPB University, Bogor, Indonesia [4] Halal Science Center, IPB University, Bogor, Indonesia
011	**THE EFFECT OF FERMENTED WHITE CORN FLOUR AND WHEAT FLOUR FORMULATION ON THE QUALITY OF COOKIES** *Jessica Selvira[1], Rahmawati[1], Rijanti Rahaju Maulani[2*], Dase Hunaefi[3], Dede Saputra[4]* [1]Study Program of Food Technology, Faculty of Food Technology and Health, Sahid University, Jakarta [2]Study Program of Postharvest Technology, School of Life Science and Technology, Institut Teknologi Bandung [3]Food Science and Technology Department, Faculty of Agriculture Technology, IPB University, Bogor [4]Department of Food Technology, Bina Nusantara University, Jakarta
013	**STRATEGY OF INCORPORATING SAGO WORM (*Rhynchophorus ferrugineus*) INTO DRIED NOODLE FORMULATION AS AN ADDITIONAL PROTEIN SOURCE** *Widya Agustinah[1*], Kenny Bunawidjaya[1]* [1] Food Technology Study Program, Faculty of Biotehnology, Atma Jaya Catholic University of Indonesia
016 (A-LS2)	**REVIEW ON USAGE OF POMACE FROM FRUIT JUICE INDUSTRY IN INDONESIA FOR FOOD PRODUCT DEVELOPMENT** *Maria Dewi Puspitasari Tirtaningtyas Gunawan Puteri[1]*, Kezia Meivira[1], Irvan Setiadi Kartawiria[2]* [1] Study Program of Food Technology, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia [2] Study Program of Chemical Engineering, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia
017	**PREPARATION OF DOUBLE EMULSION W/O/W OF VITAMIN C WITH TWO DIFFERENT EMULSIFIERS IN THE OUTER AQUEOUS PHASE** *Marcellina I. Permatasari[1], M. Yusuf Sulaeman[1], and Bambang Nurhadi[1,2,*]* [1]Food Technology Department, Faculty of Agric. Industrial Technology, Padjadjaran University, Indonesia [2]Study Centre of Agric. Technology Development, Faculty of Agric. Industrial Technology, Padjadjaran University, Indonesia

019	**DEVELOPMENT OF ALGINATE-BASED ANTIBACTERIAL EDIBLE FILMS** *Giyatmi Giyatmi[1*], Hari Eko Irianto[2], Mohammad Sabariman[1], and Bintang Anggoro[1]* [1] Study Program of Food Technology, Sahid University, Jakarta [2] Research and Development Center for Marine and Fisheries Product Processing and Biotechnology
022	**THE USE OF THE LEMON PEPPER AS A NEW FLAVORING IN CULINARY PREPARATION** *Erika Pardede[1*], Ferlando J. Simanungkalit[2], Johan B. Manik[3]* [1.2,3] Department of Technology of Agricultural Products, The University of HKBP Nommensen, Medan, Indonesia
023	**PROFILE OF SWEET POTATO FERMENTATION USING *Leuconostoc mesenteroides* AS A STARTER** *Neti Yuliana[1*], Dewi Sartika[1], Sutikno[1], Edo Jatmiko[1]* [1] Agroindustrial Product Technology, Agriculture Faculty, University of Lampung
029	**NEW NOVEL OF PROBIOTIC: PROFILE INDEX OF INDIGENOUS TAPAI YEAST AS PROBIOTIC CANDIDATE** *N. Nurhayati[1,2*], Achmad Subagio[1,2], Ika Wahyuni[3], Heru Widyatmoko[3]* [1] Department of Agricultural Technology, Faculty of Agricultural Products Technology, University of Jember, Indonesia [2] Center for Development of Advanced Science and Technology - University of Jember, Indonesia [3]Graduate School of Biotechnology, University of Jember, Indonesia
032	**ETHNOBOTANY PRODUCTION OF COCONUT OIL USING DRY AND WET METHODS** *Handayani Nurma[1], Nurhayati Nurhayati[2]** [1]Graduate School of Master Agro-industrial Technology, Faculty of Agricultural Technology, University of Jember, Indonesia [2]Department of Agricultural Products Technology, Faculty of Agricultural Technology, University of Jember, Indonesia
041 (A-LS4)	**EFFECT OF FERMENTATION AND INTERMITTENT MIXING SEQUENCE ON PHYSICOCHEMICAL CHARACTERISTICS OF OKARA-ENRICHED FISH CRACKERS** *Nor Afizah Mustapha[1,2]*, Engku Nur Sabiha Afini Che Engku Adnan[1], Mohd Zafri Hassan[3], Nor Khaizura Mahmud @ Ab Rashid[1], Wan Zunairah Wan Ibadullah`, Nur Hanani Zainal Abedin[1,2] and Ismail Fitry Mohamad Rashedi[1]* [1] Faculty of Food Science and Technology, Universiti Putra Malaysia, Malaysia [2] Halal Products Research Institute, Universiti Putra Malaysia, Malaysia [3] Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, Malaysia

042	**EFFECTIVENESS OF YEAST, *Acetobacter aceti,* AND MANGOSTEEN RIND EXTRACT ON PHYSICOCHEMICAL PROPERTIES IN DRIED COCOA BEANS** *Nijma Nurfadila[1,2], Sutrisno[1], Usman Ahmad[1], Samsudin[3]* [1)] Study Program of Postharvest Technology, Faculty of Agricultural Technology, IPB University, Bogor, Indonesia [2)]Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP), Bogor, Indonesia [3)]Research Center for Industrial Plants and Fresheners (BALITTRI), Sukabumi, West Java, Indonesia
050	**PHYSICOCHEMICAL CHARATERISTIC OF SNAKEHEAD FISH (*Channa striata)* PROTEIN DISPERSION SYRUP AS A FOOD SUPPLEMENT** *Irwan[1], Gabriella Sherly Rombe[1], Meta Mahendraddata[1*], Muhammad asfar[1], Andi Rahmayanti Ramli[1], Suriyani Tawali[2], Abu Bakar Tawali[1*]* [1]Department of Food Science and Technology, Faculty og Agriculture Hasanuddin University, Makassar, Indonesia [2]Department of Community Medicine, Faculty of Medecine Hasanuddin University, Makassar, Indonesia
051	**THE EFFECTIVENESS OF TYPES AND COMBINATION OF ACID IN THE PROCESSING OF EFFERVESCENT POWDER OF PULAI LEAVES (*Alstonia scholaris L. R. Br.*)** *Silvi Leila Rahmi[1*], Indriyani[2]* [1,2] Department of Agricultural Product Technology, Faculty of Agriculture, Jambi University
063	**NON-GLUTEN NOODLE BASED ON UBI JALAR FLOUR *(Ipomoea batatas)* WITH ADDITION OF SAGU STARCH AND UWI STARCH** *Karsi Ambarwati[1*], Elvira Syamsir[1], Sedarnawati Yasni[1]* [1] Department of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
065	**PHYSICOCHEMICAL CHARACTERIZATION OF FOUR SELECTED INDONESIAN MANGROVE FRUITS** *Indah Rosulva[1], Purwiyatno Hariyadi[2], Slamet Budijanto[3], Azis B.Sitanggang[4]* Department of Food Science, IPB University
066	**RHEOLOGICAL APPROACH FOR CRITICAL CONCENTRATION PREDICTION OF COMMERCIAL LOW METHOXYL PECTIN (LMP)** *Uray Ulfah Nabilah[1], Eko Hari Purnomo[2*], Aziz Boing Sitanggang[23]* [1] Graduate School of Food Science, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia [2] Department of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia [3] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Bogor, Indonesia

068 (A-LS5)	**PRELIMINARY DESIGN OF TOFU FACTORY WASTEWATER TREATMENT WITH OZONATION METHOD** *Ignatius Y.P. Welerubun[1*], Kris Tri Basuki[1], Dhita Ariyanti[1], N. Aziz[2], D. Gemarefa[1]* [1] Sekolah Tinggi Teknologi Nuklir – Badan Tenaga Nuklir Nasional [2] Pusat Teknologi Bahan Bakar Nuklir – Badan Tenaga Nuklir Nasional
069	**PHYSICAL CHARACTERIZATION OF PROTEIN-BASED RED PALM OIL-IN-WATER EMULSIONS** *Vallerina Armetha[1], Purwiyatno Hariyadi[1,2,*], Azis Boing Sitanggang[1,2], Sri Yuliani[3]* [1] Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University, Indonesia [2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia [3] Indonesian Agency for Agricultural Research and Development, Bogor, Indonesia
072	**INFLUENCE OF FERMENTATION CONDITIONS ON THE PHYSICO-CHEMICAL AND SENSORY PROPERTIES OF ARABICA COFFEE FROM KERINCI REGION OF INDONESIA** *Addion Nizori[1*], Elkanah Jayanti, Surhaini, Ika Gusriani and Mursyid* Technology of Agricultural Product Department, Jambi University, Indonesia
073 (A-LS3)	**QUALITY DETERIORATION AND SHELF LIFE DETERMINATION OF PURWACENG COFFEE BASED ON PACKAGING VARIATION USING ACCELERATED SHELF LIFE TESTING (ASLT)** *Alan S.U.[1], Endy S.[2], Wagiman[3], Jumeri M. W.[1]** [1]Lab. of Bioindustry, Department of Agroindustrial Technology, Gadjah Mada University [2]Lab. of System Analysis, Department of Agroindustrial Technology, Gadjah Mada University [3]Lab. of Waste and Byproduct Engineering, Department of Agroindustrial Technology, Gadjah Mada University
079	**EVALUATION OF THE QUALITY OF CANNED MACKEREL "ARSIK" DURING STORAGE** *Alfany Miserwin Suhada Mendrofa[1], Elisa Julianti[1,2]*, and Rona Joharmi[1]* [1]Departement of Food Science and Technology, Faculty of Agriculture, Universitas Sumatera Utara Medan-Indonesia
080	**PHYSICAL AND FUNCTIONAL PROPERTIES OF PURPLE SWEET POTATO STARCH AS AFFECTED BY ISOLATION METHODS** *Elisa Julianti[1,2]*, Zulkifli Lubis[1], Ridwansyah[1], Era Yusraini* [1)]Department of Food Science and Technology, Faculty of Agriculture Universitas Sumatera Utara, Medan-Indonesia

Parallel B : Nutrition	
006 (B-LS1)	**POTENTIALS OF AMINO ACIDS AND PROTEINS FOR STUNNING CHILD FROM INDONESIAN DIET: A REVIEW** *Vira Putri Yarlina[1], Mohammad Djali[1], Robi Andoyo[1]* [1]Department of Food Industrial Technology,Faculty of Agrocultural Industry Technology, Padjadjaran University, Indonesia
008	**STUDY THE CHARACTERISTICS OF RICE SUPPLEMENTS MADE BY FORMULATING THE COMPOSITION OF SKIM MILK, FERROUS FUMARATE, AND THIAMINE** *Asep Dedy Sutrisno1** [1] Food Technology Departemen, Engineering Faculty, Pasundan University, Bandung
014	**CONTRIBUTION OF SCHOOL CANTEEN SNACKS TO THE IRON FULFILLMENT IN HIGH SCHOOLS IN MALANG** *Adelya Desi Kurniawati[1*], Wahyu Winariyanti[1], Dedi Iskandar Putra[1], Titis Sari Kusuma[1]* [1] Nutrition Department, Faculty of Medicine, Brawijaya University
015	**REDUCTION SUGAR AND TOTAL ACID IN VEGETABLE YOGURT USING *Lactobacillus satsumensis* EN 38-32 AMYLOPROTEOLITIC ENZYME AT STORAGE** *Tatik Khusniati,[1] Salma Hania Auliya,[2] Tri Aminingsih[2] and Sulistiani[1]* [1]Microbiology Division, Research Center for Biology, Indonesian Institute of Sciences, Cibinong, Indonesia [2]Department of Chemistry, Faculty of Mathematic and Natural Sciences, Pakuan University, Bogor
020 (B-LS5)	**THE EFFECTS OF DIFFERENT GERMINATION METHODS ON BIOACTIVE COMPOUNDS IN GERMINATED BROWN RICE** *Hadi Munarko[1], Azis Boing Sitanggang[1,2,*], Feri Kusnandar[1,2], Slamet Budijanto[1,2]* [1]Department of Food Science and Technology, IPB University, Indonesia [2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
021	**PROTEIN-RICH GETUK PRODUCT DEVELOPMENT** *Sedarnawati Yasni* IPB University, Bogor – Indonesia
026	**THE EFFECTS OF DRYING ON BIOACTIVITY OF GINGER (*Zingiber officinale*): A META- ANALYSIS STUDY** *Hesti Kurniasari, Wahyudi David, Ardiansyah** Department of Food Technology, Universitas Bakrie, Jakarta, Indonesia

027	**A META-ANALYSIS STUDY: FERMENTED AND NON-FERMENTED RICE BRAN** *Opin Oktavia[1], Wahyudi David[1], Slamet Budijanto[2], Ardiansyah[1,*]* [1] Department of Food Technology, Universitas Bakrie, Jakarta, Indonesia [2] Department of Food Science and Technology, IPB University, Bogor, Indonesia
030	**THE SOCIOLOGY OF PUBLIC FOOD; NEW CONCEPT ON THE ROOT OF PEOPLE'S FOOD SECURITY (The Environmental Principles Approach)** *Mortaza A Syafinuddin Hammada[1], Sennahati[2]* [1] Lecturer at Universitas Cokroaminoto Makassar and Member of Indonesian Environmental Scientists Assosiation (IESA) [2] Lecturer at Universitas Cokroaminoto Makassar
031	**BLOOD GLUCOSE RESPONSE OF ROBUSTA COFFEE WITH DIFFERENT ROASTING LEVEL: LIGHT AND DARK** *Elsera Br Tarigan[1,2], Dian Herawati[1,3], Puspo Edi Giriwono[1,3*]* [1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia [2]Indonesian Industrial and Beverages Crops Research Institute (IIBCRI), Indonesia [3]Southeast Asian Food and Agricultural Science and Technology Center, IPB University, Indonesia
033	**INVESTIGATION AND COMPARISON OF PHYSICOCHEMICAL CHARACTERISTICS OF NON-AGED AND 4-MONTH AGED MULBERRY WINE PREPARED FROM THREE DIFFERENT WINE MAKING TECHNIQUES** *Resha Shrestha[1], Siriwan Panprivech[2], Kamolnate Kitsawad[1], and Viyada Kunathigan[1*]* [1] Department of Food Biotechnology, Faculty of Biotechnology, Assumption University, Bangkok, Thailand [2] Department of Agro-Industry, Faculty of Biotechnology, Assumption University, Bangkok, Thailand
037	**SPECTROPHOTOMETRIC STUDY OF COMMON MORNING GLORY (*Ipomoea purpurea*) EXTRACT AT PH 4 TO 8 DURING STORAGE** *Abdullah Muzi Marpaung* Food Technology Department, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia
038	**CONSUMER ACCEPTABILITY OF SPECIAL WAFER DERIVED FROM PREGELATINIZED CASSAVA FLOUR** *Winda Haliza, Ayu Kusuma, Endang Yuli Purwani* Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor, Indonesia

039	**PROFILING VOLATILE AND NON-VOLATILE COMPOUND OF EXCELSA COFFEE (*Coffea liberica* var. dewevrei) GROWN IN WONOSALAM SUB-DISTRICT, EAST JAVA PROVINCE** *Michael Oscarius Loisanjaya[1], Nuri Andarwulan[1,2], and Dian Herawati[1,2],** [1]Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University [2]Southeast Asian Food and Agricultural Science and Technology Center, IPB University
043	**FORMULATION OF ANALOGUE RICE MADE OF WHITE CORN *(Zea Mays Ceratina)* AND MUNG BEANS *(Vigna Radiata L)* FLOUR AS AN ALTERNATIVE FOOD IN MAINTANING A COMPLETE NUTRITION** *Ariani Rumitasari[1], Abu Bakar Tawali[1], Amran Laga[2], Jumriah Langkong[3], Meta Mahendradatta[4]* Food Science and Technology Study Program, Department of Agricultural Technology, Faculty of Agriculture, Hasanuddin University
044 (B-LS4)	**THE DIET EFFECT ON THE COMPOSITION OF INTESTINAL MICROFLORA AND STRATEGIES TO RESTORE EUBIOSIS** *Trinoviyani[1], Lilis Nuraida[1, 2], Ratih Dewanti-Hariyadi[1,2]* [1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia [2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
055	**THE POTENTIAL OF CELERY YOGURT AS A FUNCTIONAL FOOD** *Ambar Rukmini[1], Lily Arsanti Lestari[2], Aninditya Ratnaningtyas* [1] Food Technology Study Program, Faculty of Science and Technology, Widya Mataram University [2] Department of Nutrition, Faculty of Medicine, Nursurig and Public Health, Gadjah Mada University
056	**THE CHANGE OF BILE SALT STIMULATED LIPASE DURING 6 MONTHS OF LACTATION AND ITS CORRELATION WITH MACRONUTRIENTS IN CHINESE HUMAN MILK** *Ratna Nurmalita Sari[1]*, Jiancun Pan[2], Xiaoyang Pang[1], Shuwen Zhang[1], Liu Liu[1], Yuanyuan Li[2], Shilong Jiang[2], Lu Jing[1], Lv Jiaping[1]* [1] Key Laboratory of Agro-Food Processing and Quality Control, Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, Beijing, China [2] R&D Center, Hailongjiang Feihe Dairy Co., Ltd, Beijing, China

057	**SUBSTITUTION OF RED PALM OLEIN OIL (RPOO) IN INSTANT VERMICELLI OIL SEASONINGS ON VITAMIN A CONTENT, PHYSICAL CHARACTERISTICS AND PRODUCT LEVEL** *Habieb Febriansyah[1], Budiyanto[1*], Devi Silsia[1]* [1] Department of Agricultural Technology, Faculty of Agriculture, Bengkulu University
058	**CHANGES THE ALLERGENICITY OF *KEMBUNG* FISH (*Rastrelliger* Spp.) DURING DRIED SALTED AND WET SALTED (PINDANG) PROCESSING** *Nindya Atika Indrastuti*1, Nurheni Sri Palupi2,3, Nur Wulandari2,3* [1]Departmnet of Food and Nutrition Technology, Faculty of Halal Food Science, University of Djuanda [2]Department of Science and Technology, Faculty of Agriculture Technology, IPB University [3]SEAFAST Center, IPB University
061 (B-LS2)	**PREVENTING VITAMIN C PHOTOOXIDATION IN BEVERAGE MODEL SYSTEM BY VIRGIN COCONUT OIL-RICE BRAN OIL NANOEMULSION** *Yuli Perwita Sari[1], Sri Raharjo*[1], Umar Santoso[1], Supriyadi[1]* [1] Department of Food and Agricultural Product Technology, Faculty of Agricultural Technology, Universitas Gadjah Mada, Indonesia
062	**THE DEVELOPMENT OF PROTEIN-RICH GETUK WITH SPICY FLAVOR** *Agnes Juniarti C *, Sedarnawati Yasni , Didah Nur Faridah* [1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia
064	**EFFECTS OF COOKING ON YIELD, TOTAL CAROTENOID, AND COLOR OF LONG, CONE-SHAPED TONGKALANGIT BANANA (*Musa troglodytarum*) PUREE** *E. Moniharapon[1], H. C. D. Tuhumury[1*], A. Souripet[1]* [1]Departement of Agricultural Product Technology, Faculty of Agriculture, Pattimura University, Maluku, Indonesia
067	**A META-ANALYSIS STUDY: USE OF STARTER CULTURE IN COCOA BEANS *(Theobroma Cacao. L)* FERMENTATION** *Nafila Chaerunnisa Misbakh, Laras Cempaka, Wahyudi David** Department of Food Technology, Universitas Bakrie, Jakarta, Indonesia
074	**SPME-GC/MS METHOD DEVELOPMENT FOR RAW BEEF VOLATILE FINGERPRINT** *Lia Amalia[1,3], Nancy Dewi Yuliana[1,3,]*, Feri Kusnandar[1,3], Purwantiningsih[2], Agy Wirabudi Pranata[1,3]* [1] Graduate School of Food Science, IPB University, Bogor, Indonesia Department of Food Science and Technology, IPB University [1] Department of Chemistry, IPB University [3] Halal Science Center, IPB University

078	**THE PROPORTION OF MEAT AND TAPIOCA FLOUR TO PRODUCE THE HEALTHY HIGH PROTEIN MEATBALLS** *Marini Damanik, Ida Duma Riris, Moondra Zubir, Esi Emilia, Izzatul J. Sihaloho, Angel Fransisca Manurung* Medan State University
082	**META-ANALYSIS: THE EFFECT OF FRYING TIME ON FATTY ACIDS COMPOSITION OF PALM OIL AFTER FOOD FRYING BY DEEP FAT FRYING METHOD** *Hanifah Nuryani Lioe*, Novia Wijaya* Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia
084	**CHARACTERIZATION OF EDIBLE FILM MADE OF PECTIN FROM NUTMEG AND PALMITIC ACID** *Payung Layuk, Meivie Lintang, Stevie Karouw* North Sulawesi Assessment Institute for Agricultural Technology
Parallel C : Health	
005 (C-LS1)	**THE SENSITIVITY EVALUATION OF *mt-DNA* GENE *Dehydrogenase subunit 5* (*ND5*), *D-Loop*, and *Cytochrom b* (*Cty-b*) TO DETECT PORK (*Sus scrofa*) DNA ISOLATE AND DNA FRAGMENT IN MEATBALL USING PCR TECHNIQUE** *Joni Kusnadi[1,2*], Noval Audi Ashari[1]* [1]Department of Agricultural Product Technology, Faculty of Agricultural Technology, University of Brawijaya, Indonesia [2]Central Laboratory of Life Science, University of Brawijaya Malang, Indonesia
007	**DETECTION OF RAT (*Rattus norvegicus*) DNA FRAGMENT USING SPECIES-SPECIFIC PRIMERS *mt-DNA 12S rRNA* and Cytochrome b (*Cyt-b)* WITH POLYMERASE CHAIN REACTION (PCR) TECHNIQUE** *Ersita Putri Aisah[1], Joni Kusnadi[1,2*]* [1]Department of Agricultural Product Technology, Faculty of Agricultural Technology, University of Brawijaya Malang [2]Central Laboratory of Science, University of Brawijaya Malang
012 (C-LS4)	**DIGESTION KINETICS STUDY OF BISCUITS MADE FROM KAPAS BANANA FLOUR USING LOGARITHM OF SLOPE (LOS) METHOD** *G. Pramafisi[1], Y. Cahyana[2]* [1] Food Technology Department, Faculty of Agric. Industrial Technology, Padjadjaran University [2] Laboratory of Food Chemistry, Department of Food Technology, Padjadjaran University

018	**EFFECTS OF *Etlingera elatior* AND *Kaempferia galanga* EXTRACTS ON HUMAN LYMPHOCYTE PROLIFERATION IN VITRO** *Novi Safriani[1,2], Fransisca Zakaria Rungkat[1], Nancy Dewi Yuliana[1]*, Endang Prangdimurti[1]* [1] Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University [2] Department of Agricultural Product Technology, Faculty of Agriculture, Universitas Syiah Kuala, Aceh
024	**IDENTIFICATION OF FOOD NATURAL ANTIMICROBE COMPOUND FROM WARU LEAVES (*Hisbicus Tillacaeus L.*) EXTRACT BY GC-MC** *Dewi Sartika[1], Samsu Udayana Nurdin[1], Neti Yuliana[1], Susilawati, and Wahyudi[2]* [1]Lecturer of THP Department, Faculty of Agriculture, University of Lampung [2]Alumni of THP Department, Faculty Of Agriculture, University of Lampung
025	**ANTIOXIDANT CAPACITY AND ANGIOTENSIN CONVERTING ENZYME-INHIBITORY ACTIVITY FROM JOB'S TEARS *(Coix lacryma-jobi L.)* PROTEIN** *Hamidatun[1], Maggy Thenawidjaja Suhartono[1], Endang Yuli Purwani[2], Nurheni Sri Palupi[1], Sudathip Sae-tan[3]** [1] Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University, Indonesia [2] Indonesian Center for Agricultural Postharvest Research and Development, Indonesia [3] Department of Food Science and Technology, Faculty of Agro-Industry, Kasetsart University, 50 Ngamwongwan Rd. Ladyao, Chatuchak, Bangkok, Thailand
028	**EFFECT OF VARIOUS THERMAL MODIFICATION ON FUNCTIONAL AND PASTING PROPERTIES OF CORN STARCH** *Herlina Marta[1*], Yana Cahyana[1], Sarah Bintang[1]* [1] Food Industrial Technology Department, Faculty of Agricultural Industrial Technology, Padjadjaran University, Bandung, Indonesia
034	**α-GLUCOSIDASE INHIBITORS FROM *Syzygium polyanthum* LEAVES AS REVEALED BY NMR- AND HPLC-METABOLOMICS** *Nancy Dewi Yuliana[1,4*], Mohamad Ana Syabana[1,2], Irmanida Batubara[3,4], Dedi Fardiaz[1]* [1] Department of Food Science and Technology, IPB University, Bogor, Indonesia. [2] Department of Food Technology and Indonesia Center of Excellence for Food Security, Sultan Ageng Tirtayasa University, Serang, Indonesia. [3] Department of Chemistry, IPB University, Bogor, Indonesia [4] Tropical Biopharmaca Research Center, IPB University, Bogor, Indonesia

035 (C-LS5)	**MALONALDEHYDE LEVEL OF ADMINISTRATION ETHANOL EXTRACT OF PURPLE SWEET POTATO VAR. *Ayamurasaki* IN DOCA-SALT HYPERTENSIVE RATS** *Irma Sarita Rahmawati[1], Soetjipto[2], Annis Catur Adi[3], Aulanni'am[4]* [1]Department Nutrition, Faculty of Medical, Brawijaya University, Indonesia [2] Department Biochemistry, Faculty of Medical, Airlangga University, Indonesia [3]Department Nutrition, Faculty of Public Health, Airlangga University, Indonesia [4]Faculty of Veterinary Medicine, Brawijaya University, Indonesia
036	**ANTIOXIDANT ACTIVITY, TOTAL PHENOL AND FLAVONOID CONTENT OF RICE CONJUGATED WITH MIXTURES OF TURMERIC, CINNAMON AND GUAVA LEAF USING FREE RADICAL GRAFTING METHODS** *Samsu Udayana Nurdin[1]*, Elisa Handayani[1], Siti Nurdjanah[1], Fibra Nurainy[1]* [1]Department of Agriculture Product Technology, Faculty of Agriculture, University of Lampung
040	**VALIDATION OF PORCINE DNA ANALYSIS METHOD FOR FOOD PRODUCTS BY USING SELECTED PRIMER AND EXOGENOUS INTERNAL POSITIVE CONTROL IN REAL-TIME PCR** *Heryani*[1], Siti Nurjanah[2], Didah Nur Faridah[3] , Raafqi Ranasasmita[4]* [1] Halal Laboratory of LPPOM MUI, Indonesia [2] SEAFAST Center IPB, Department of Food Technology, IPB University, Indonesia [3] SEAFAST Center IPB, Department of Food Technology, IPB University, Indonesia [4] Halal Laboratory of LPPOM MUI, Indonesia
045	**POTENTIAL OF PROBIOTICS TO REDUCE THE RISK OF CARDIOVASCULAR DISEASE** *Andi Dahlan[1], Lilis Nuraida[1,2*], and Puspo Edi Giriwono[1,2]* [1]Departement of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Indonesia [2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
046	**PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITIES OF BEE POLLEN EXTRACTS FROM STINGLESS BEES *(Trigona spp.).* IN DIFFERENT SOLVENT** **IL. Kayaputri[1], B. Nurhadi[2], D. M. Sumanti[2], Mahani[2], Zaida[2], Sarah Az Zahra[2]* [1]Department of Agriculture, Padjadjaran University [2]Department of Food Industrial Technology, Faculty of Agriculture Industrial Technology, Padjadjaran University

047	**THE POTENTIAL OF LACTIC ACID BACTERIA IN PRODUCING BIOACTIVE PEPTIDE AS ANTIOXIDANT IN FERMENTED MILK** *Afifah Puji Hastuti[1], Lilis Nuraida[1,2] and Hanifah Nuryani Lioe[1]* [1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia [2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
048	**POTENTIAL COMPOUNDS FROM CASHEW LEAF (*Anacardium occidentale* L) AS ANTIVIRAL-SARS-CoV-2: IN SILICO STUDY** *Willy Wijayanti[1], Nancy Dewi Yuliana[2*], Endang Prangdimurti[2], Setyanto Tri Wahyudi[3]* [1] Graduate School of Food Science, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia [2] Department of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia [3]Department of Physics, Faculty of Mathematics and Natural Sciences, IPB University, Bogor, Indonesia
049	**INDIGENOUS INDONESIAN PLANTS AS A SOURCE OF ANTIOXIDANTS TO TREAT GASTROINTESTINAL DISORDERS** *Diny A Sandrasari[1,2], Nuri Andarwulan[1,3], Didah Nur Faridah[1], Fitria Nur Annisa Dewi[4]* [1]Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University [2]Department of Food Science, Faculty of Food Science and Health, Sahid University, Jakarta, Indonesia [3]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University [4]Primate Animal Study Center, IPB University, Bogor, Indonesia
052	**AUTHENTICITY ASSESSMENT OF BEEF, PORK, BUFFALO AND WILD BOAR MEAT USING COLORIMETRIC, IMAGE ANALYSIS AND MUSCLE TISSUE MICROSTRUCTURE ANALYSIS** *Fayca Rudhatin Swartidyana[1], Joko Hermanianto[1], Nancy Dewi Yuliana[1*], I Ketut Mudite Adnyane[2]* [1] Department of Food Science and Technology, IPB University [2] Department of Anatomy, Physiology and Pharmacology, Faculty of Veterinary Medicine, IPB University
053	**PREDICTIVE MICROBIOLOGY: CONTROLLING BIOSAFETY OF RETAIL COMMODITY USING RTU AND CHROMOGENIC MEDIA** *Nurhayati Nurhayati[1,2*], Maria Belgis, Enny Suswati, Umi Purwandhari[3]* [1]Department of Agricultural Product Technology, Faculty of Agricultural Technology, University of Jember, East-Java, Indonesia [2]Faculty of Medicine, University of Jember, East-Java, Indonesia [3]Department of Agricultural Industry Technology, Faculty of Agricultural, University of Trunojoyo, Madura, Indonesia

054	**PRODUCTION OF BIOACTIVE COMPOUNDS BY LACTIC ACID BACTERIA** *Hendry Noer Fadlillah[1,3], Lilis Nuraida[2*]* [1]Food Science, IPB University [2]SEAFAST Center IPB [3]International University Liaison Indonesia
059	**DESIGN OF WASTE WATER TREATMENT PLANT FOR HOSPITAL** *Nizar Kamil Perwira[1], Kris Tri Basuki[1*], Nofriady Aziz[3], Nuradam Effendy[2]* [1] Polytechnic Institute of Nuclear Technology BATAN, Yogyakarta [2] Pusat Teknologi Bahan Bakar Nuklir, Serpong [3] Pusat Reaktor Serba Guna BATAN, Serpong
060	**WASTE WATER TREATMENT OF HOSPITAL FOR DRINKING WATER SCALE WITH OZONATION METHOD** *Nuradam Effendy[1], Kris Tri Basuki[2*], Nizar Kamil Perwira[2], Nofriady Aziz[3]* [1] Pusat Reaktor Serba Guna BATAN, Serpong [2] Polytechnic Institute of Nuclear Technology BATAN, Yogyakarta [3] Pusat Teknologi Bahan Bakar Nuklir, Serpong
070 (C-LS2)	**QUANTIFICATION OF LACTIC ACID AS SECONDARY METABOLITE OF LACTIC ACID BACTERIA ISOLATED FROM MILK AND ITS DERIVATIVED PRODUCTS** *Fifi Afiati[1], Fitri Setiyoningrum[1], Gunawan Priadi[1], Vania Qyasaty[2]* [1]RC Biotechnology – LIPI, Jl. Raya Bogor, Km. 46 Cibinong 16911 [2]Brawijaya University, Malang
071	**AWARENESS OF MILLENNIALS CONSUMERS IN KEBUMEN REGENCY TOWARDS INFORMATION ON LABEL AND EXPIRE DATE OF FOOD PRODUCT** *Dinda Rana Athaya[1*], Lilis Nuraida[1,2], Nugraha Edhi Suyatma[1]* [1] Department of Food Science and Technology, IPB University, Bogor, Indonesia [2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, and Department of Food Science and Technology, IPB University, Indonesia
075	**KNOWLEDGE AND PERCEPTION ABOUT PROBIOTICS AMONG UNIVERSITY STUDENTS IN JAKARTA METROPOLITAN AREA** *Krisa Refita[1]*, Lilis Nuraida[1,2], Hanifah Nuryani Lioe[1]* [1]Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University, Bogor, Indonesia [2]Southeast Asian Food and Agriculture Science and Technology (SEAFAST) Center, IPB University, Bogor, Indonesia
076	**ANALYSIS OF CORRELATION BETWEEN TOTAL CHLOROPHYLL CONTENT AND COLOR INTENSITY IN BAMBU DURI (*Bambusa bluemana*) LEAVES EXTRACT** *Ni Made Sri Wahyuni[1], Luh Putu Wrasiati[1]*, Amna Hartiati[1]* [1]Department of Agroindustrial Technology, Faculty of Agricultural Technology, Udayana University

077 (C-LS3)	**CONTINUOUS PRODUCTION OF TEMPE-BASED BIOACTIVE PEPTIDES IN ENZYMATIC MEMBRANE REACTOR (EMR)** *Azis Boing Sitanggang[1,2*], Julius Sumitra[1], Slamet Budijanto[1,2]* [1] Dept. Food Science and Technology, IPB University [2] SEAFAST Center, IPB University
081	**MICROBIOLOGICAL, CHEMICAL, AND SENSORY CHARACTERISTICS OF RUSIP PRODUCTS FROM BANGKA** *Lutfi Yulmiftiyanto Nurhamzah[1], Hanifah Nuryani Lioe[1]*, Dede Robiatul Adawiyah[1,2], Harsi Dewantari Kusumaningrum[1]* [1] Departement of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia [2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
083	**META-ANALYSIS: THE EFFECT OF FRYING TIME ON PALM OIL QUALITY AFTER FOOD FRYING BY DEEP FAT FRYING METHOD** *Hanifah Nuryani Lioe*, Feri Kusnandar, Michael Adi Muryanto* Departement of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Indonesia

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PS-001

OIL PALM FOR THE WORLD: International Standards, Regulations and Emerging Issues

Purwiyatno Hariyadi

Dept of Food Science & Technology, Faculty of Agricultural Engineering & Technology, IPB University
SEAFAST center, IPB UNIVERSITY
Codex Alimentarius Commission

ABSTRACTS

Driven by an increase in global population and economic growth, the demand for vegetable oil over the next decade will continue to increase. According to recent estimates, the global vegetable oil market is expected to increase with a CAGR of 5.1% up to 2024. Palm oil plays an important role in meeting the increasing demand for vegetable oils, accounting for more than 31% of global supply. In addition, among other vegetable oils, palm oil is considered to have the potential to meet increasing global demand due to its relatively higher productivity and lower production costs. Palm oil is truly vegetable oil for the world.

At present, palm oil is the most traded vegetable oil in the world and around 85% of palm oil is used for food applications. Consequently, the need for compliance with the latest international standards, regulations and the ability to appropriately respond to emerging issues related to palm oil has always been a major concern in the palm oil industry. In this presentation, international standards related to nutrition and safety aspects of palm oil and emerging global issues of consumer concern related to palm oil will be discussed.

PS-002

Advanced NMR approaches as a tool for food quality control

Emmanuel Hatzakis[1,2]*

[1]Department of Food Science and Technology, Ohio State University, Columbus, OH, USA
[2]Foods for Health Discovery Theme, Ohio State University, Columbus, OH, USA
Corresponding author: chatzakis.1@osu.edu

ABSTRACT

Despite its unique advantages, NMR spectroscopy is still an underutilized method for the assessment of food quality [1]. NMR can be a powerful tool for food compositional analysis, whereas its combination with statistics and machine learning techniques can be used for the comparison of spectral patterns and the identification of biomarkers. We used NMR and metabolomics to evaluate the impact of roasting on the composition of the lipid fraction of coffee [2]. Additionally, we combined multidimensional NMR with chemometric analysis to analyze pomegranate juice and build models for monitoring its authentication, in terms of varietal classification and the detection of adulteration [3].

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PS-003

Furfuryl Alcohol (FFA) formation and mitigation in coffee-based products

Michael Murkovic, Reni Swasti, Abdullatif Albouchi

Graz University of Technology, Institute of Biochemistry, Functional Food Group, Austria
Petersgasse 12/2, 8010 Graz
Corresponding author: michael.murkovic@tugraz.at

ABSTRACT

Furfuryl alcohol is a compound that is not commonly found in foods in higher concentrations, except in roasted coffee. The reason for this single occurrence is not clearly solved but it is definitely related to the high temperatures of roasting. The temperature at which furfuryl alcohol is formed at higher concentrations is in the range of the roasting temperature which can be up to 270 °C.

Furfuryl alcohol can be activated to a highly reactive compound by sulfotransferases in the human metabolism. This sulphated compound can react with the DNA forming adducts and induce mutations. As coffee is practically the only known commodity which contributes to the exposure the purpose of the experiments was to investigate the formation and measure the concentrations in coffee which will be a contribution to estimate the exposure to furfuryl alcohol.

In the standardized coffee brews the concentration of furfuryl alcohol is in the range of 55 to 68 µg/ml. Furfuryl alcohol is extracted quantitatively during brewing. The formation kinetics show a peak quickly after the onset of roasting and a decrease after a few minutes. This decrease can be attributed to evaporation and polymerisation. The furfuryl alcohol emission during roasting, is high (up to 57%) leading to a lower amount of furfuryl alcohol determined in samples roasted under these conditions.

The maximum concentration of furfuryl alcohol is reached faster with higher roasting temperatures. It has to be pointed out that the highest amount of furfuryl alcohol observed was at 240 °C (512 µg/g) and that the amount of furfuryl alcohol produced at 180 °C was the lowest in the experiments described here (92 µg/g).

PS-004

Gut microbiota and health: Current and emerging application of probiotics, prebiotics and synbiotics

Lilis Nuraida[1,2]

[1]Department of Food Science and Technology
[2]Southeast Asia Food & Agricultural Science & Technology (SEAFAST) Center IPB University
Corresponding author: lnuraida@apps.ipb.ac.id

ABSTRACT

Beneficial roles of the intestinal microbiota in maintaining human health is expanding rapidly since the first concept suggested by Eli Metchnikoff in 1908. In humans, the gastrointestinal (GI) tract harbors approximately 10^{14} bacterial cells with more than 1,000 different species which provide many functions that are crucial for the hosts' well-being. The role of beneficial bacteria in maintaining health is exerted through structure and hystological function, metabolic function and protective function. Particular changes in the intestinal ecosystem alter balance of the gut microbiota causing dysregulation of the microbiota (dysbiosis) that often associated with various disease states. Bidirectional signaling between the gastrointestinal tract and the brain known as the brain–gut axis (GBA) has been considered as vital for maintaining homeostasis. Potential anatomic communications has also been established between gut microbiota and lung, a gut–lung axis (GLA) that indicate a link between gut microbiota and lung immunity. The evidence of the interaction of the microbiota and pathophysiological processes of disease within the human host has increase the interest in application of beneficial microorganism to act as mediators in health and disease. The beneficial bacteria which have been associated with health known as probiotics include lactic acid producing genera such as *Bifidobacterium* and *Lactobacillus.* Health beneficial effect of probiotic is already well recognized for general gut health, lactose intolerance, antibiotic-associated diarrhea, and immunity. Current research suggests that the health benefits of probiotic extends beyond intestinal disorders with potential application on global burdens such as obesity and type-2 diabetes, cardioprotective effect and cancer. Some probiotic bacteria have also been reported inhibiting respiratory viruses by immunomodulatory mechanisms. Beside probiotics, prebiotics defined as substrates that are selectively utilized by host microorganisms conferring a health benefit, have considered to have prominent roles in restoring commensal gut microbiota. Health beneficial effects of prebiotics are also evolving including benefits to the gastrointestinal tract, cardiometabolism, mental health and bone. A mixture of prebiotic and probiotic called synbiotic is considered to exert stronger effect.

Keywords: *dysbiosis, gut microbiota, health, probiotics, prebiotics*

PS-005

Process development of functional foods

Chin-Kun Wang

Chung Shan Medical University

ABSTRACT

Food industry in the past was the major push for industry. Traditional food industry provided food to consumers. For developing countries, tradition food industry is not enough to satisfy the need of the society. How to enhance the life quality after consuming food has been the major goal of current food industry.

The promotion of life quality has been the future direction of current food industry. Life quality is closely associated with the health. To catch this future, the interaction and cooperation between food industry and health care is very important. The interaction between the health care and food industry was very weak. After establishing the connection, food industry can get the support of health care. The connection and interaction were encouraged by the government and was also based on the social need. About health care, hospital was the major organization unit. Good interaction between food industry and health organization could bring both benefits to the consumers.

Take the example of Taiwan, hospitals especially medical university hospitals provide such a connection for food industry. During the cooperation, new opportunities and new products are well developed. The health organization needs to give support for the food industry. Incubation and innovation center usually play the central role for such an interaction. Of course, the newest medical care instruments are very suitable for the diagnosis and evaluation of the health care. Chung Shan Medical University Hospital, providing 2 sets of human PET, one animal PET and nuclear instruments, they are very useful and helpful for the clinical evaluation of new food products. On the other side, the food industry also promotes the grants for basic medical researches. Functional foods from basic research, advanced animal proof and clear evidence in human subjects are required. Interaction between different fields is sometimes required by the social developments. Government plays an initial role for the cooperation and interaction. Incubation and innovation system is very good as a media for different fields.

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Parallel A: Food Science

001 (A-LS1)

PROTEIN SOURCE BEVERAGES'S CONSISTENCY IS MORE IMPORTANT OVER NUTRITIONAL ASPECT FOR BREASTFEEDING MOTHER IN PONJONG, GUNUNG KIDUL, INDONESIA

Dwi Larasatie Nur Fibri[1], Andreas Wahyu Nugroho[1]*

[1] Department of Food and Agricultural Product Technologyy, Faculty of Agricultural Technology, Gadjah Mada University, Jl. Flora, Bulaksumur, Yogyakarta 55281
*Corresponding author: dwifibri@ugm.ac.id

ABSTRACT

The protein consumption of breastfeeding mothers in Ponjong, Gunung Kidul district, Special Region of Yogyakarta province, Indonesia has not met the Nutrition Adequacy standard. This study aims to develop protein source beverage with high preferences and emosensory characteristic. Four formulas were developed with variation of protein content and consistency to meet the Nutrition Adequacy Rate of nursing mothers by 17%, 24%, 9%, and 14%. The physical properties of the beverages' consistency were tested with a viscometer, the emosensory properties of the drinks were tested on six-points scale for hedonic, emotional, and desire aspects by breastfeeding mothers in Ponjong. Data were then analyzed using one-way ANOVA and Duncan's post hoc test. Based on sensory analysis, it was found that the filtered formulas were more preferred both in texture (low consistency), taste and overall liking even though the protein content are lower. From an emotional aspect, the filtered formula generally generates higher positive emotions and lower negative emotions. This shows that for breastfeeding mothers in Ponjong still prioritize sensory aspects, especially consistency compared to nutritional value aspects even though they know that they need to meet nutrition adequacy for breastfeeding mother, especially extra protein. This research suggests food industry to meet sensory characteristics, not only taste, but also texture before nutritional aspect.

Keywords: Protein beverage, consistency, emosensory, emotional test

002

OPTIMIZATION OF PROTEIN EXTRACTION FROM INDONESIAN WHITE LIMA BEAN (*Phaseolus lunatus*) AND ITS APPLICATION AS BINDER IN CHICKEN MEATBALL

Gigih Prakoso Jati[1], *Bambang Dwi Wijatniko*[1*], *Agnes Murdiati*[1]

[1] Department of Food and Agricultural Product Technology, Faculty of Agricultural Technology, Gadjah Mada University, Yogyakarta 55281
*Corresponding author: bambangdw92@ugm.ac.id

ABSTRACT

White lima bean is one of the member of legumes with high productivity as it easily to grow at marginal land. In addition, white lima bean protein is projected to susbtitute soy bean protein with similarity in functionality. Protein isolate form white lima bean posed some functionalities and feature that can be applied for improving the quality of some food product, such as food binder. The objective of this study was to determine the optimum condition of protein isolation from white lima bean and investigate its functionality which is projecting its utilization based on its properties. White lima bean protein was isolated from deffated white lima bean powder with some pH level in order to determine the optimum protein solubility. Subsequently, the protein isolated was freeze dried, followed by evaluation of functional properties, and its physical properties as binder in chicken meatball

This study revealed that protein extraction of white lima bean with pH 10 exerted the highest protein solubility. White lima bean protein extract indicated promising emulsion capacity and stability with 63,75% and 51,25% respectively. In other hand, foaming capacity and stability was 31,33% and 23,33% respectively. Combination white lima bean protein extract and soy protein isolate with ratio 50:50 as binder in chicken meatball showed compact microstructure, prefered color and weight gain in which similar to chicken meatball with 100% soy bean protein binder. This finding suggested a potential utilization as binder in processed meat products as indicated by its emulsifying and foaming feature.

Keywords: White lima bean, protein isolate, functional properties, physical properties, binder

003

APPLICATION OF NATURAL PRESERVATIVES ATUNG (*Parinarium glaberimum, Hassk*) TO THE NUTRITION OF FISH SAUCE ENZYMATIC FROM THE WASTE OF TUNA LOIN PRODUCTION IN THE VILLAGE OF PARIGI, DISTRICT OF SERAM NORTH OF MOLLUCAS CENTRAL

Trijunianto Moniharapon [1] and Fredy Pattipeilohy [2]

Department of Fishery Technology
[*] Corresponding author: tjmoniharapon@gmail.com, frepat2259@gmail.com

ABSTRACT

The purpose of this research is to know the influence of natural preservative application of Atung (*Parinarium glaberimum*, Hassk) on washing tuna red meat, salt concentration and long fermentation with pineapple extract (3:1) to nutrients and calorie value of fish sauce. Fish soy sauce nutrient treatment without atung, the concentration of salt 15% with fermentation length 3 days (K1) is: water content of 61.42%, protein content 5.68%; 0.32% fat content; ash content of 5.86%; and carbohydrate content of 10.19%; With a calorie value of 66.4 kcal. Fish sauce the same treatment before but the duration of fermentation 4 days (K2) sorted is: 63.26%; 5.36%; 0.72%; 5.53%; 8.55%; With a calorie value of 62.1 kcal. Fish soy sauce treatment without atung, 20% salt concentration with the length of fermentation 3 days (K3) sorted is: 63.34%, 5.62%; 1.08%; 5.87%; 9.31%; With a calorie value of 69.4 kcal. Fish sauce the same treatment before but with the duration of fermentation 4 days (K4) sorted is: 60.42%; 5.53%; 0.71%; 5.94%; 12.22%; With a calorie value of 77.4 kcal. Fish sauce Nutrition without atung treatment, salt concentration 20% and duration of fermentation 2 days (K5) sorted is: 62.32%; 3.51%; 0.61%; 4.92%; 9.39%; With a calorie value of 57.1 kcal; and fish-sauce nutrient treatment with atung, salt concentration of 20% and duration of fermentation 2 days (K6) sorted is: 57.66%; 3.62%; 0.30%; 5.91%; 10.07%; With a calorie value of 57.5 kcal.

Keywords: Natural preservatives of Atung, pineapple extract, fish sauce enzimatic, nutrition and calorie value, Parigi Wahai in North Seram Molucas

004

PHYSICOCHEMICAL CHANGES ON SORGHUM FLOUR MODIFIED WITH DIE-LESS EXTRUSION-ENZYMATIC TREATMENT

Sukmawati Usman[1*], *Maggy Thenawidjaja Suhartono*[1], *Endang Yuli Purwani*[2], *Azis Boing Sitanggang*[1,3]

[1] Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Campus IPB Darmaga 16680, Indonesia
[2] Center for Postharvest Research and Development, Indonesian Agency for Agricultural Research and Development, Bogor 16111, Indonesia
[3] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Campus IPB Darmaga 16680, Indonesia
[*] Corresponding author: sukmawatius.chm@gmail.com

ABSTRACT

As a source of carbohydrate and protein, native sorghum flour still has a poor property for food application such as bread and cake. This study was aimed to modify sorghum flour through physical (i.e., extrusion) combined with enzymatic treatment to induce physicochemical changes of starch. It is also expected, that complex between starch and the sorghum protein body (i.e., kafirin) will be destructed, thus free kafirin can be functional for sorghum dough expansion. Sorghum flour were modified by die-less extrusion and thermostable α-amylase at three different feed moisture levels (20%, 30% and 35%) and in combination with four enzyme concentrations (0.1%, 0.5%, 1% and 1.5%). Through different treatments, the solubility and swelling power of the modified sorghum flours were increased. Moreover, the pasting viscosities of treated flours were lower than the native, but with higher setback viscosities. Through SEM observation, the enzymatic modification could induce morphological changes in the surface of starch granule as indicated by pore formation. The modified flours did partially lose its birefringence properties after the modification process. Conclusively, this study could show such modification strategy is possible to facilitate improvement of the physical characteristics of sorghum flour especially useful for specific food application.

Keywords: Extrusion, alpha-amylase, modified flour, pasting property, sorghum

009

PRODUCTION OF CELLOBIOSE FROM CASSAVA PEELS USING CELLULASE AND ITS PREBIOTIC ACTIVITY TOWARD *Lactobacillus plantarum*

Ilham Marvie[1], *Azis Boing Sitanggang**[1], *Slamet Budijanto*[1]

[1] Department of Food Science and Technology, IPB University
[*] Corresponding author: boing.lipan@apps.ipb.ac.id

ABSTRACT

Cassava peel (*Manihot utilissima sp*) is one of the wastes from the cassava processing industry. Exploration of the use of cellulose in cassava peel is carried out to obtain greater added-value and answer industry needs, one of which is cellobiose as an alternative source of prebiotics. Cellobiose is obtained through the hydrolysis of cellulose with the cellulase enzyme. This research aims to produce cellobiose with the correct hydrolysis timeliness and to test the potential of cellobiose produced using the probiotic bacteria *Lactobacillus plantarum*. The methods used in this study include the characterization of raw materials, extraction of cellulose, hydrolysis of cellulose, measurement of total sugar, and reducing sugar of hydrolysis products, hydrolysis reaction kinetics, probiotic growth ability and determination of prebiotic activity scores. The hydrolysis process has conditions pH 4.8, temperature 37^{o}C, agitation speed of 150 rpm, and observed for 24 hours of hydrolysis time. This research uses cassava peel of ulujami varieties (UJ 17), and ratim varieties (RTM). The results showed that cellobiose was identified in the results of intermediate hydrolysis of the cassava peel flour and the degree of polymerization value close to 2.00. The use UJ 17, and RTM varieties as hydrolysis substrates did not give a significant difference based on the degree of polymerization formed for 6-12 hours. Cellobiose can grow *Lactobacillus plantarum*. Hydrolysis products from RTM 22 gave higher prebiotic activity scores than UJ 17 varieties at the same cellulase concentration.

Keywords: Cassava peel, cellobiose, cellulose, cellulose, prebiotic

010

ANALYSIS OF VOLATILES IN BEEF, PORK, AND CHICKEN MEATBALLS BY SPME-GC-MS

Agy Wirabudi Pranata[1,4], Nancy Dewi Yuliana[2,4], Noviyan Darmawan[3,4,] Lia Amalia[1,4]*

[1] Graduate School of Food Science, IPB University, Bogor, Indonesia
[2] Department of Food Science and Technology, IPB University, Bogor, Indonesia
[3] Department of Chemistry, IPB University, Bogor, Indonesia
[4] Halal Science Center, IPB University, Bogor, Indonesia
[*]Corresponding author: nancy_dewi@apps.ipb.ac.id

ABSTRACT

Adulteration of beef meatball with pork or chicken meat often occurs for economic reasons. In this study, the volatile compounds of meatballs made from beef, chicken, and pork were analyzed by SPME-GC-MS combined with multivariate data analysis methods. SPME (Solid Phase Micro extraction) is used by either immersing the fiber in the sample or by placing the fiber in the headspace of the sample. Principal component analysis (PCA) was applied for data interpretation. Analysis by PCA was able to visualize, classify and group the samples based on the meatball's materials. It was found that 1,3-Hexadiene, 3-ethyl-2-methyl-, (Z)- and 2-Nonenal, (E)- were only detected in beef meatball. -Hepten-2-ol, 6-methyl-; 11- Dodecen-2-one; β-Terpineol; Thiazole, 2,4,5-trimethyl-; Diethyltoluamide; and Lauric Acid were only found in pork meatballs, while 1,3-Dodecane; 3,5-Dimethylheptane; 3,7- Dimethylnonane; Cyclohexanol, 2-tert-butyl-; Acetophenone were only present in chicken meatballs. Analysis of volatiles using SPME is a simple, sensitive, and fast method, which does not alter the original volatile chemical composition.

Keywords: Meatball, chicken, beef, pork, SPME-GC-MS

011

THE EFFECT OF FERMENTED WHITE CORN FLOUR AND WHEAT FLOUR FORMULATION ON THE QUALITY OF COOKIES

Jessica Selvira[1], Rahmawati[1], Rijanti Rahaju Maulani[2], Dase Hunaefi[3], Dede Saputra[4]*

[1]Study Program of Food Technology, Faculty of Food Technology and Health, Sahid University, Jakarta
[2]Study Program of Postharvest Technology, School of Life Science and Technology, Institut Teknologi Bandung
[3]Food Science and Technology Department, Faculty of Agriculture Technology, IPB University, Bogor
[4]Department of Food Technology, Bina Nusantara University, Jakarta
[*]Corresponding author: yanti.rm@gmail.com

ABSTRACT

This research aims to study the effect of fermented white corn flour formulation as a result of Response Surface Method (RSM) optimization and wheat flour in cookie making. The formulations ratio of fermented white corn flour and wheat flour tested were: 0%:100%; 20%:80%; 40%:60%; 60%:40%; and 80%:20%. The quality of cookies was determined by physical quality (hardness), chemical quality (moisture content, ash, protein, fat, carbohydrates, and crude fiber), and organoleptic (hedonic quality includes color, aroma, taste, and texture). The results showed that the higher of fermented white corn flour formulation of the RSM optimization results, the lower the level of hardness of cookies, ash content, and protein content, because the water content tended to increase. The use of fermented white corn flour as a result of RSM optimization can improve the color of cookies, but the higher the formulation used, the lower the panelists' preference for the aroma, taste, and texture of cookies. The use of fermented white corn flour as a result RSM optimization of 20% can produce the quality of cookies that are close to the quality of cookies made from 100% wheat flour. The quality characteristics of the cookie produced are 3462.42 gF texture, 2.13% moisture content, 2.47% ash content, 7.36% protein content, 25.72% fat content, and 62.32% carbohydrate content. From the panelist test results, the character of the color and texture of the cookies made with the 20% fermented white corn flour formulation is preferred.

Keywords: Cookies, fermented white corn flour, formulation, Response Surface Method, wheat flour

013

STRATEGY OF INCORPORATING SAGO WORM (*Rhynchophorus ferrugineus*) INTO DRIED NOODLE FORMULATION AS AN ADDITIONAL PROTEIN SOURCE

Widya Agustinah[1*], *Kenny Bunawidjaya*[1]

[1] Food Technology Study Program, Faculty of Biotehnology, Atma Jaya Catholic University of Indonesia
[*] Corresponding author: widya.agustinah@atmajaya.ac.id

ABSTRACT

Edible insect has received a growing interest globally as a potential source of high protein supplement. Despite its high nutritional content, it received a negative sensory perception in its appearance, flavor and texture. Certain insect, such as the larva phase of a coconut red beetle (*Rhychophorus ferrugineus*) which grows inside the sago palm and is known as sago worm, is part of a local wisdom in eastern part of Indonesia and has been consumed by the locals with minimum processing. Incorporating sago worm into dried noodle would be an alternative to improve the nutritional content of such popular food among most people in Indonesia without evoking the fear of eating the whole insect. The objective of this study was to explore the strategy to utilize sago worm into dried noodle formulation to increase the protein content and improve the sensory acceptance of the final product. Sago worms were fed with coconut husks for a week, then washed, boiled, cleaned, and dried. The sago worm flour was used to substitute the wheat flour in making noodle formulation of 10%, 20% and 30%. The analyses included the proximate, mineral, sensory evaluation, and shelf life. The sago worm flour contained 8% water, 50% protein, 24% lipid, 10% crude fiber, 2% ash, 0.4% calcium and 0.4% phosphorus. Formulation 30% was accepted for its taste, aroma and aftertaste before and after being informed about the sago worm content. The increasing sago worm flour in noodle formulation lowered the color and elasticity acceptance. Addition of seasoning to the cooked noodle could improve the hedonic score of all attributes in all formulation. The shelf life of formulation 30% was 2 months. In conclusion, 100 g of noodle formulation 30% contributed to 25% daily value of protein intake which received the highest score of taste.

Keywords: Sago worm flour, high protein, processing, sensory evaluation, shelf life

016 (A-LS2)

REVIEW ON USAGE OF POMACE FROM FRUIT JUICE INDUSTRY IN INDONESIA FOR FOOD PRODUCT DEVELOPMENT

Maria Dewi Puspitasari Tirtaningtyas Gunawan Puteri[1], Kezia Meivira[1], Irvan Setiadi Kartawiria[2]*

[1] Study Program of Food Technology, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia, 15143
[2] Study Program of Chemical Engineering, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia, 15143
[*] Corresponding author: maria.gunawanputeri@sgu.ac.id

ABSTRACT

The market of juice industry is increasing globally including in Indonesia and supply of the raw material is one of the factors that support the market of juice. Consequently, the production of juice has resulted in a high amount of solid waste such as pomace which is the largest proportion of solid waste and usually discarded or slightly used as animal feed and become a serious environmental problem, also an economical burden for the company. However, pomace can be utilized as functional and healthy ingredients in food product development due to its healthy compounds such as dietary fiber and antioxidant and can be obtained at lower price. Pomace processing may benefit the fruit juice industry as the market of fruit juice pomace is predicted to grow in the upcoming years and therefore it is important to look upon pomace potency to be utilized. This review will explain the production and consumption of fruits in Indonesia, the fruit juice industry in general and Indonesia, the process that resulted pomace and the usual treatment, the nutrient and dietary fiber content of fruit pomace, the processing and the potential usage of fruit juice pomace for food product development in Indonesia.

Keywords: Juice industry, pomace, indonesia, food product

017

PREPARATION OF DOUBLE EMULSION W/O/W OF VITAMIN C WITH TWO DIFFERENT EMULSIFIERS IN THE OUTER AQUEOUS PHASE

Marcellina I. Permatasari[1], M. Yusuf Sulaeman[1], and Bambang Nurhadi[1,2,]*

[1]Food Technology Department, Faculty of Agric. Industrial Technology, Universitas Padjadjaran, Jl. Raya Bandung Sumedang km. 21. Jatinangor Sumedang 40600. Indonesia
[2]Study Centre of Agric. Technology Development, Faculty of Agric. Industrial Technology, Universitas Padjadjaran, Jl. Raya Bandung Sumedang km. 21. Jatinangor Sumedang 40600. Indonesia
*Correspondence author: Bambang.nurhadi@unpad.ac.id

ABSTRACT

Vitamin C is one of common bioactive compound widely known and used by many people, especially in Indonesia. The weakness of vitamin C stability are sensitive with extreme pH, temperature, oxygen and direct light. Because of that, the encapsulation of vitamin C with W/O/W emulsion can be the solution for maintaining the stability of vitamin C. This study is aimed to emulsify Vitamin C in the inner aqueous phase of water-in-oil-water (W/O/W) emulsions with soybean oil as the oil phase. Two type of emulsifier Tween 80 and WPC-Pectin in the outer aqueous phase used to compare their stability during storage. The result of this research showed that emulsion with WPC-Pectin had bigger droplet size than emulsion with tween 80 after 14 day storage. Morphology of W/O/W emulsion with Tween 80 can be described as W/O/W when emulsion with WPC Pectin cannot be described as W/O/W Emulsion. It means that tween 80 is a better emulsifier than WPC Pectin to stabilized the W/O/W emulsion at all.Content in abstract in 12 pt Times New Roman, normal, single space, max 300 words. Single paragraph abstract is required.

Keywords: Double emulsion, tween 80, vitamin C, W/O/W, WPC-Pectin

019

DEVELOPMENT OF ALGINATE-BASED ANTIBACTERIAL EDIBLE FILMS

Giyatmi Giyatmi[1], Hari Eko Irianto[2], Mohammad Sabariman[1], and Bintang Anggoro[1]*

[1] Study Program of Food Technology, Sahid University, Jakarta
[2] Research and Development Center for Marine and Fisheries Product Processing and Biotechnology
*Corresponding author: giyatmi@hotmail.com

ABSTRACT

The aim of this research is to develop an environmentally friendly packaging of alginate-based antibacterial edible films. The antibacterial sources used are extracts from basil leaves, green betel, and lemongrass. Concentration levels of those extracts which were studied to obtain optimal levels were 0.5%, 1.5% and 1.5%. The edible films obtained were evaluated physically, mechanically and microbiologically including parameters of Water Vapor Transmission Rate (WVTR), solubility, tensile strength, elongation, brightness, thickness, moisture content, Scanning Electron Microscope (SEM) test and antibacterial clear zone test. Experiment was conducted by applying a completely randomized double factor design. Data analysis techniques employed was analysis of variation (ANOVA) followed by Duncan's Multiple Range Test (DMRT) with a significant level of 95%. The results showed that the antibacterial sources and concentration level of leaf extracts had a significant effect on the quality and antibacterial properties of alginate-based edible films. Overall the combination of treatments that produce the best alginate-based antibacterial edible film is green betel with an extract concentration level of 1.5%.

Keywords: antibacterial extract, edible film, green betel, edible film alginate

022

THE USE OF THE LEMON PEPPER AS A NEW FLAVORING IN CULINARY PREPARATION

Erika Pardede[1], Ferlando J. Simanungkalit[2], Johan B. Manik[3]*

[1.2,3] Department of Technology of Agricultural Products, The University of HKBP Nommensen, Medan, Indonesia
[*] Corresponding author: erikalrp@yahoo.de

ABSTRACT

Lemon pepper (*Zanthoxylum acanthopodium* DC.) is a perennial plant of Rutaceae family belong to endemic plant in North Sumatera region, which fruit has been traditionally used as flavoring agent for traditional cuisine. Its berry fruits are known to be excellent ingredient, for they give an extraordinary flavor as results of typical fragrance which comes after crushing the fruits, and a spicy bitter and burning taste when eaten. Lemon pepper still has a vast unexploited potential in creative cooking. In this work, we reviewed the vernacular names, medicinal properties and traditional uses of lemon pepper and we explored some alternative culinary uses for this aromatic plants.

Keywords: Lemon pepper, flavoring, culinary

023

PROFILE OF SWEET POTATO FERMENTATION USING *Leuconostoc mesenteroides* AS A STARTER

Neti Yuliana[1], Dewi Sartika[1], Sutikno[1], Edo Jatmiko[1]*

[1] Agroindustrial Product Technology, Agriculture Faculty, University of Lampung
[*] Corresponding author: neti.yuliana@ fp.unila.ac.id

ABSTRACT

This study aimed to know the fermentation profile of yellow sweet potato (total lactic acid bacteria, total non-lactic acid bacteria, total lactic acid, pH, total exopolysaccharides, and morphology changing on starch granules) using *Leuconostoc mesenteroides* as a starter. The sample's withdrawal was performed at 0, 24, 48, and 72 hours. The results showed that during 72 hours fermentation time, there was a quadratically decreased of pH (minimum at pH 3.80), a linearly increased of total lactic acid (0.0023% /h), reducing sugars (0.26 mg/ml/h), crude EPS (0.017 g/l/h), and total Lactic Acid Bacteria (LAB) (maximum at log 8.40 cfu/ml), as well as a decreased of non-Lactic Acid Bacteria. *Leuconostoc mesenteroides* had significant effect on granule of yellow sweet potato. There was an alteration of starch granules at the end of fermentation time (at 72 hours).

Keywords: EPS, fermentation profile, sweet potato, Leuconostoc mesenteroides

029

NEW NOVEL OF PROBIOTIC: PROFILE INDEX OF INDIGENOUS TAPAI YEAST AS PROBIOTIC CANDIDATE

N. Nurhayati[1,2], Achmad Subagio[1,2], Ika Wahyuni[3], Heru Widyatmoko[3]*

[1] Department of Agricultural Technology, Faculty of Agricultural Products Technology, University of Jember, Jember 68121, Indonesia
[2] Center for Development of Advanced Science and Technology - University of Jember, Jember 68121, Indonesia
[3]Graduate School of Biotechnology, University of Jember, Jember 68121, Indonesia
*Corresponding author: nurhayati.ftp@unej.ac.id

ABSTRACT

Yeasts have been developed as starter for bioprocess such as fermentation of food and beverages, agents for the biocontrol of food spoilage. The others are being considered as novel probiotic organisms that can tolerate acidic conditions with very low pH. These researchs aimed to determine the tapai yeast strain for probiotic developing. Tapai is one of the fermented products made from starchy food such as glutinous rice, cassava and other ingredients using yeast. Cassava tapai "Sari Madu" was obtained from Jember Regency. Producing of these tapai used yeast starter merck "Sari madu". The yeast "Sari Madu" was isolated using malt extract agar medium. The fermenting profile index of yeast was analyzed using 20 C AUX kit. There were four isolates of dominant yeast i.e A, B, C and D isolates. The fermenting profile index of four isolates was able to assimilate carbon-D-glucose, glycerol, calcium 2-keto-gluconate, L-arabinose, D-xylose, adonitol, xylitol, D-galactose, inositol, D-sorbitol, methyl-αD- glucopyranoside, N-acetyl-glucosamine, D-celiobiose, D-lactose, D-maltose, D-saccharose, D-trehalose, D-melezitose, D-raffinose. Based on the result of test kit showed respectively A, B, C, and D were *Candida guilliermondii*, *Trichosporon mucoides*, *Cryptococcus humicola* and *Candida utilis*.

Keywords: Fermented food, profile index, tapai, yeast probiotic

032

ETHNOBOTANY PRODUCTION OF COCONUT OIL USING DRY AND WET METHODS

*Handayani Nurma[1], Nurhayati Nurhayati[2]**

[1]Graduate School of Master Agro-industrial Technology, Faculty of Agricultural Technology, University of Jember, Jember 68121, Indonesia
[2]Department of Agricultural Products Technology, Faculty of Agricultural Technology, University of Jember, Jember 68121, Indonesia
*Corresponding author: nurhayati.ftp@unej.ac.id

ABSTRACT

Ethnobotany mentioned that coconut oil have been a part of traditional medicine from ancient times and was used as oilment in all kinds of illness. Athletes, body builders and dieting person used coconut oil. That is because coconut oil contains less calories than other oils, and is easily converted in to energy and no lead to accumulation of fat in the heart and arteries. Beside that, coconut oil can be boost energy and endurance to enhances the performance of athletes. The material for making oil is mature coconut fruit was obtained from the Agropolitan market at Senduro Lumajang Regency. This study determined the ethnobotany production of coconut oil use wet and dry method. Wet method was conducted by extraction of coconut milk then cooking the milk to evaporate the water so the oil was extracted from coconut protein cake (was called "blondo"). Dry method was conducted by drying the grated coconut until less than 5% (3.37%) of water content, then pressure dried coconut using hydraulic press (39-427 bar). The results showed that ripe mature coconut produced the higher oil yield. Producing coconut oil used wet method have to use stainless steel or cast iron frying pan. Characteristics of coconut oil were i.e clear colour, typical coconut aroma. Producing of coconut oil used wet method can result 15.77% w/w of yield, 11.67% w/w of protein cake (*blondo*), 0.06% of water content and 0.9195 g/cm^3 of oil density. While producing of coconut oil used dry method can result 21.56% w/w of oil yield, 33.24% w/w of bagasse cake, 0.04% of water content and 0.9191 g/cm^3 of oil density.

Keywords: Blondo, coconut oil, density, medium chain fatty acid

041 (A-LS4)

EFFECT OF FERMENTATION AND INTERMITTENT MIXING SEQUENCE ON PHYSICOCHEMICAL CHARACTERISTICS OF OKARA-ENRICHED FISH CRACKERS

Nor Afizah Mustapha[1,2], Engku Nur Sabiha Afini Che Engku Adnan[1], Mohd Zafri Hassan[3], Nor Khaizura Mahmud @ Ab Rashid[1], Wan Zunairah Wan Ibadullah`, Nur Hanani Zainal Abedin[1,2] and Ismail Fitry Mohamad Rashedi[1]*

[1] Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[2] Halal Products Research Institute, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[3] Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[*] Corresponding author: nor_afizah@upm.edu.my

ABSTRACT

Fish crackers is a popular snack in Malaysia and South-East Asian region. A high-quality cracker needs to have a good product expansion and crispy texture. Developing fish crackers containing high fiber not only increases its nutritional quality, but it may decrease product quality in term of reduced expansion and harder texture. Converting insoluble fiber to soluble fiber and controlling the mixing sequence are important processing factors in producing well homogenized cracker dough with excellent final product quality. The conversion of fiber can be achieved via microbial fermentation process. Therefore, the study aims to investigate the effect of okara fermentation and intermittent mixing sequence on the physicochemical characteristics of okara-enriched fish crackers. Both fermented and non-fermented okara were tested. Two different mixing sequence were evaluated, namely, sequence A (fish-starch-okara-ice) and sequence B (fish-okara-starch-ice). The dough and fried crackers were analyzed in terms of cooking yield, color, oil and water absorption, expansion and textural properties. The findings indicated that fermentation and mixing sequence B produced dough and fried crackers with the highest linear expansion, crispiness and water absorption index, but the lowest in hardness and bulk density. However, the crackero showed high oil absorption index. Fermentation produced crackers with darker color. These findings were attributed to the presence of higher percentage of soluble fiber and higher degree of Maillard reaction that occurred during frying process. The addition of okara prior to starch allow for enough hydration of the fiber. In conclusion, the combined effect of both factors leads to good product expansion with improved textural properties.

Keywords: Okara, fermentation, fish crackers, intermittent mixing sequence, expansion

042

EFFECTIVENESS OF YEAST, *Acetobacter aceti*, AND MANGOSTEEN RIND EXTRACT ON PHYSICOCHEMICAL PROPERTIES IN DRIED COCOA BEANS

Nijma Nurfadila[1,2], *Sutrisno*[1], *Usman Ahmad*[1], *Samsudin*[3]

[1)] Study Program of Postharvest Technology, Faculty of Agricultural Technology, IPB University, Bogor 16680, Indonesia
[2)]Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP), Bogor 16134, Indonesia
[3)]Research Center for Industrial Plants and Fresheners (BALITTRI), Sukabumi, West Java, Indonesia

ABSTRACT

Artificial fermentation for unfermented cocoa beans is important to increase the quality of physicochemical properties of cocoa beans. The research aimed to: 1) determine the effects of yeast, acetic acid bacteria and mangosteen rind extract combinations on physicochemical properties in dried cocoa beans and 2) select the best combination as fermentation starter to increase physicochemical quality in cocoa beans. Two yeast isolates (*Issatchenkia orientalis* BIO 211291 and BIO 211288) were combined with *Acetobacter aceti* FNCC0016 and mangosteen rind extract in fermentation process. The highest number of cocoa beans was positive control (119) and negative control (113 kernels); meanwhile the lowest (104 kernels) was sample with *I. orientalis* BIO 211288 + *Acetobacter aceti.* As much as 75% samples were grade B. As much as 58% of samples were II-B grade based on total of slaty kernels (< 8%). All samples included controls were I - B grade based on total of moldy kernels. The highest percentage of moisture content was found in 1st day (5.42%), while the lowest was samples in 3rd days postfermentation (4.21%). The highest percentage of total titrated acid was positive control (11.50%), followed by *I. orientalis* BIO 211291 + MRE (9.50%) and *I. orientalis* BIO 211288 + *A. aceti* (9.45%). The highest percentage of total reduced sugar was sample with *Issatchenkia orientalis* BIO 211288 + *Acetobacter aceti* (2.80%), while the lowest of those was *A. aceti* + MRE (2.33%). All samples had pH value (> 6). The best combination as fermentation starter to increase phycochemical in dried cocoa beans was *I. orientalis* BIO 211291 + BIO 211288 + *A. aceti* + MRE, *I. orientalis* BIO 211288 + *A. aceti*, and *I. orientalis* BIO 211291 + MRE.

050

PHYSICOCHEMICAL CHARATERISTIC OF SNAKEHEAD FISH (*Channa striata)* PROTEIN DISPERSION SYRUP AS A FOOD SUPPLEMENT

Irwan[1], Gabriella Sherly Rombe[1], Meta Mahendraddata[1], Muhammad asfar[1], Andi Rahmayanti Ramli[1], Suriyani Tawali[2], Abu Bakar Tawali[1*]*

[1]Department of Food Science and Technology, Faculty og Agriculture Hasanuddin University, Makassar, Indonesia
[2]Department of Community Medicine, Faculty of Medecine Hasanuddin University, Makassar, Indonesia
[*] Corresponding author: abubakar_tawali@yahoo.com, metamahendradatta@gmail.com

ABSTRACT

Snakehead fish (Channa striata) is a very rich source of albumin protein. Albumin plays a role in boosting immunity, as an antioxidant and accelerates wound healing. Snakehead fish dispersion syrup is a food supplement made with the addition of protein concentrate from snakehead fish and the addition of honey and other ingredient that is served in the form of a liquid syrup. This product is designed for people who have difficulty taking supplements in capsule form, such as children to the elderly. This study aimed to determine the physicochemical characteristics of the syrup dispersion product. This research was devided into two stages. The first stage was the process of making snakehead fish protein concentrate and dispersion syrup. The second stage was analysis of physicochemical characteristics. The physicochemical characterization of dispersion syrup was conducted to obtain information on proximate, albumin content, and particle size . The results of the chemical characteristics analysis showed that the syrup dispersion contained 63.69% of moisture content, 0.31% of protein, 0.06% of fat, 10.97% of carbohydrates, 0.01% of ash, 1054.53 µg /g of albumin and has particle size of 665 nm.

Keywords : Snakehead fish, albumin,dispersion syrup, concentrate protein, food supplement

051

THE EFFECTIVENESS OF TYPES AND COMBINATION OF ACID IN THE PROCESSING OF EFFERVESCENT POWDER OF PULAI LEAVES (*Alstonia scholaris L. R. Br.*)

Silvi Leila Rahmi[1], Indriyani[2]*

[1,2] Department of Agricultural Product Technology, Faculty of Agriculture, Jambi University
Jl. Tribrata Km 11 Pondok Meja Kab. Muaro Jambi
[*] Corresponding author: silvi@unja.ac.id

ABSTRACT

Pulai plant *(Alstonia scholaris* L. R. Br.) is one type of plant that has the potential to be used as raw material in functional food processing. The types of bioactive compounds found in these plants include alkaloids ditain, ekitamin, ekitenin, ekita midin, alstonin, eklycerin, echitin, porphyrin, triterpenes, ursulic acid, lupeol, and picrinin. The potential of the pulai plant as a raw material for functional food has been investigated into several beverage products, including brewed drinks, instant drinks, and powdered drinks. However, there are weaknesses in the after-taste of the product. Processing of effervescent powder drink is an attempt to overcome these drawbacks. The formation of carbon dioxide gas in effervescent products is influenced by the type and composition of the acid used in the product. The specific objective of this study was to measure the effectiveness of the type and combination of acids in the processing of pulai effervescent powder drink. Randomized block design was used in this study with eight levels of treatment, namely: without acid; citric acid; tartric acid; malic acid; citric acid and tartric acid; citric acid and malic acid; tartric acid and malic acid; citric acid, tartric acid, and malic acid. The results showed that the most effective type of acid was malic acid without combination. This treatment resulted in an effervescent powder drink with an antioxidant activity value of 22.20 %; water content 2.48 %; pH 6.0; solubility time 55 seconds; foam height 2.95 cm; ^{0}hue 75,7; effervescent score of 4.56 (gas formed); sparkle 3,4 (slightly felt); taste 3.12 (rather like); color 3.32 (rather like); overall acceptance 3,2 (rather like); and comparison score of 4.04 (similar as R).

Keywords: Pulai, effervescent-powder, acid-combination-type

063

NON-GLUTEN NOODLE BASED ON UBI JALAR FLOUR *(Ipomoea batatas)* WITH ADDITION OF SAGU STARCH AND UWI STARCH

Karsi Ambarwati[1], Elvira Syamsir[1], Sedarnawati Yasni[1]*

[1] Department of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
[*] Corresponding author: karsi_ambarwati@apps.ipb.ac.id

ABSTRACT

Sweet potato flour can be used as a basic ingredient in noodles making to replace wheat flour, which the current availability in Indonesia is the result of imports. The presence of starch in various types of tubers acts as a binder that can replace the function of gluten so that non-gluten products can be produced. The criteria for good noodles are having strong and elastic texture. Some studies suggest that using a different flour will produce a varied texture of noodles. The research aims to make non-gluten noodles using sweet potato flour as the basic ingredient. The research design used in this study was a randomized block design with three replications. Sweet potato flour was used as a basic ingredient in dry noodles making. Two types of starch, namely *sago* starch and *uwi* starch, were used to replace gluten which acts as a binder. The optimization of sweet potato noodles processing used two different variables, namely the difference in extruder heating temperature and addition of water to the sweet potato noodle dough. Two different sets of extruder temperature were used, they are (90 ^{o}C, 90 ^{o}C, 95 ^{o}C, 95 ^{o}C) and (95 ^{o}C, 95 ^{o}C, 95 ^{o}C, 95 ^{o}C) in each zone. The addition of water to the dough was carried out in two different levels, namely 40% and 35%. The analysis carried out was the flour character and the physical form of sweet potato noodles. The recommended processing method for sweet potato noodles is 15% addition of sago starch, 40% addition of water, and extruder heating temperature of 95 ^{o}C in four zones. This formula produced noodles with L, a, b, values respectively 35.03, 2.68, and 7.85, moisture content 10.93%, cooking loss 32.066%, hardness 3868.8 g, elasticity 47.40, and stickiness -62.614 g.

Keywords: Noodles, sago starch, uwi starch, texture, and sweet potato

065

PHYSICOCHEMICAL CHARACTERIZATION OF FOUR SELECTED INDONESIAN MANGROVE FRUITS

Indah Rosulva[1], Purwiyatno Hariyadi[2], Slamet Budijanto[3], Azis B. Sitanggang[4]

Department of Food Science, IPB University
* Corresponding author: [1] ilakeyku@yahoo.com, [2] phariyadi@apps.ipb.ac.id,
[3]slamet.budijanto@gmail.com [4]boing.lipan@apps.ipb.ac.id

ABSTRACT

Mangrove is a plant that consists of various variants that are found in coastal areas and processed by local people to be used as food. Most of the mangrove food processing in Indonesia comes from mangrove fruit. To extend the shelf life of fruit and make it easier to apply in the processing process, flour is one of the solutions to preserve and maintain the characteristics of mangrove fruit. Flour has low water content and more flexible in application to various types of food processing. The aim of this research was to examine the physicochemical characteristics of the mangrove flour from mangrove fruit variants of *Avicennia* sp., *Bruguiera* sp., *Rhizophora* sp., and *Sonneratia* sp. This research includes characterization of the physical properties of the fruit and characterization of the physicochemical properties of mangroves fruit and flour. Results are likely to be useful in recognizing the potential of mangrove fruit flour for development as a food model.

Keywords: Mangrove flour, Bruguiera sp., Rhizophora sp., Avicennia sp., Sonneratia sp

066

RHEOLOGICAL APPROACH FOR CRITICAL CONCENTRATION PREDICTION OF COMMERCIAL LOW METHOXYL PECTIN (LMP)

Uray Ulfah Nabilah[1], Eko Hari Purnomo[2], Aziz Boing Sitanggang[23]*

[1] Graduate School of Food Science, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
[2] Department of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
[3] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Bogor, Indonesia
[*] Corresponding author: ekohari_p@yahoo.com

ABSTRACT

The critical concentration is essential parameter in product formulations that use pectin as thickening and gelling agent. This study aimed to predict the critical concentration of three types of commercial Low Methoxyl Pectin (LMP) through rheological approach. The rheology parameters of LMPs at concentration between 0.1 and 3% (w/v) were measured by using Anton Paar^{TM} rheometer and Ostwald viscometer. Consistency index (k), zero shear viscosity ($\mu_{0,}$) apparent viscosity (μ_{app}) were plotted again concentration (c) whereas specific viscosity (μ_{sp}) were plotted again dimensionless number ($c[\mu]$) . The results showed that the flow characteristic changed from Newtonian to shear thinning when the concentration of LMP increased from low to high concentration. The critical concentrations of three types of LMP pectin were around 1% (w/v). This study provides an important insight for the food and pharmaceutical industry using LMP in their formulation.

Keywords: Pectin, hydrocolloid, rheology, critical concentration

068 (A-LS5)

PRELIMINARY DESIGN OF TOFU FACTORY WASTEWATER TREATMENT WITH OZONATION METHOD

Ignatius Y.P. Welerubun[1], Kris Tri Basuki[1], Dhita Ariyanti[1], N. Aziz[2], D. Gemarefa[1]*

[1] Sekolah Tinggi Teknologi Nuklir – Badan Tenaga Nuklir Nasional
[2] Pusat Teknologi Bahan Bakar Nuklir – Badan Tenaga Nuklir Nasional
[*] Corresponding author: yudhaputraxm@gmail.com

ABSTRACT

Tofu is a food that is often consumed in Indonesia. Every 100 g of tofu contains macronutrients such as 7.8 g protein, 4.6 g fat, and 1.6 g carbohydrates. Tofu also contains micronutrients like phosphorus, potassium, calcium, vitamin B, and vitamin E. The process of making tofu produces liquid waste. Based on one of the tofu factories in Indonesia with a capacity of 1500 L/day of liquid waste, the quality of COD, BOD, and Total Coliform is 5964.48 mg/L, 734.1 mg/L, and 59.13 MPN/100 mL. The purpose of this study is to obtain the unit dimensions of the tofu liquid waste treatment system using the ozonation method so that the water released is by the available quality standards. The research was carried out by studying the liquid waste treatment using the ozonation method until the wastewater treatment system was obtained and then calculating the output of the system design. Based on the calculation results, the dimensions of the tank are cylindrical. The equalization tank diameter is 0.5 m with depth is 0.8 m. The coagulation tank diameter is 0.874 m with depth is 0.874 m. The flocculation tank diameter is 0.762 m with depth is 0.762 m. At the bottom of the flocculation tank, there is a conical sedimentation zone which has the same diameter as the flocculation tank diameter with a depth is 0.164 m. The ozonation tank diameter is 0.6 m with a depth of the zone is 1.007 m. Water can be released directly or collected in a tank with a diameter of 1.44 m and a depth of 1.74 m. The treatment system produces water with the quality of COD, BOD, and Total Coliform of 178.67 mg/L, 24 mg/L, and 0 MPN/100 mL, which values are by quality standards so that they can be released.

Keywords: Tofu wastewater, dimension, quality standards, ozonation

069

PHYSICAL CHARACTERIZATION OF PROTEIN-BASED RED PALM OIL-IN-WATER EMULSIONS

Vallerina Armetha[1], *Purwiyatno Hariyadi*[1,2,*], *Azis Boing Sitanggang*[1,2], *Sri Yuliani*[3]

[1] Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University, Indonesia, 16680
[2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia, 16680
[3] Indonesian Agency for Agricultural Research and Development, Bogor, Indonesia, 16680
[*] Corresponding author: phariyadi@apps.ipb.ac.id

ABSTRACT

The formation of an oil-in-water emulsion has the potential to increase the stability of the bioactive component of red palm oil (RPO). Consequently, a kinetically stable emulsion is required to be an effective carrier system for RPO. This study aims to analyze the physical characteristics and its stability of the protein-based RPO (oil-in-water) emulsions as a carrier system for RPO. The systems studied were emulsions utilizing several types of whey protein emulsifiers (such as two types of WPC and one type of WPI) with an emulsifier-to-oil-ratio (EOR) level from 0.06 to 0.39 and high oil phase content (30%), fabricated by a high energy formation technique using a rotor-stator homogenizer. The results showed that the physical stability of the emulsions produced was affected by the type of whey protein used and the level of EOR tested. Emulsions with a higher EOR level were found more physically stable. The best stability (stable for 5.5 months at room temperature 30 ± 2 ° C) was obtained from the emulsion using WPC emulsifiers contain protein content >76 % at the EOR level of 0.39. This emulsion has an average hydrodynamic diameter of the smallest droplets of 400.7 nm and a creaming index of 0 % at two weeks of storage.

Keywords: Creaming stability, emulsion stability index, red palm oil, whey protein

072

INFLUENCE OF FERMENTATION CONDITIONS ON THE PHYSICO-CHEMICAL AND SENSORY PROPERTIES OF ARABICA COFFEE FROM KERINCI REGION OF INDONESIA

Addion Nizori[1], Elkanah Jayanti, Surhaini, Ika Gusriani and Mursyid*

Technology of Agricultural Product Department, Universitas Jambi, Jambi, 36122, Indonesia
[*] Corresponding author: addion_nizori@unja.ac.id

ABSTRACT

Coffee quality can depend on several factors such as the varieties cultivated, the processing after the harvesting phase, geographical origin, and climatic factors. Fermentation is one of the post harvest technology that influence coffee chemical and sensory properties. This study was to determine the effect of fermentation time into physicochemical and sensory properties of Arabica coffee from Kerinci region Indonesia. Research design used was randomized complete design with 5 combination of treatments which are 12, 20, 28, 36 and 44 hours fermentation with 3 replicates. The results shows fermentation time have a significant effects on moisture content, pH, antioxidant activity, sensory and colour changed, however were not significant changed on caffeine content. Based on the results 12 hours of fermentation time more preferred by consumers.

Keywords: *Anaerobic fermentation, coffee processing, antioxidant*

073 (A-LS3)

QUALITY DETERIORATION AND SHELF LIFE DETERMINATION OF PURWACENG COFFEE BASED ON PACKAGING VARIATION USING ACCELERATED SHELF LIFE TESTING (ASLT)

*Alan S.U.[1], Endy S.[2], Wagiman[3], Jumeri M. W.[1]**

[1]Lab. of Bioindustry, Department of Agroindustrial Technology, Gadjah Mada University
[2]Lab. of System Analysis, Department of Agroindustrial Technology, Gadjah Mada University
[3]Lab. of Waste and Byproduct Engineering, Department of Agroindustrial Technology, Gadjah Mada University
*Corresponding author: jumerimw@ugm.ac.id

ABSTRACT

Purwaceng coffee is a varian of coffee products that has benefits for human health, especially to keep stability of energy. The benefits of purwaceng coffee can be obtained if they consumed in a good quality. The quality of purwaceng coffee has significantly related with their shelf life without any toxicity. However, many purwaceng coffee producer still predicts the shelf life manually without scientific method, which has relatively low accuration. Therefore, many studies have been conducted to overcome that poblem in order to extend their shelf life. Packaging-based prediction used since that method could detemine the shelf life of the poduct adequtely. The aim of this study is to analysis quality deterioration of purwaceng coffee and determine their shelf life based packaging variation. The packaging used in these research were PAP 0.11, Al foil 0.05, PP 0.05, PP 0.03, and PE 0.03. The quality deterioration of purwaceng coffee was measured by 6 parameters, namely water content, water activity (Aw), weight, pH, colour, and antioxidant activity. Water content was determined by thermogravimetry method, colour by chromameter, and determination of antioxidant activity was carried out by DPPH method. Futhermore, the product shelf life test based on packaging variations was performed using the critical moisture content method. The longest shelf life of coffee product was reached by alumunium packaging which has shelf life of 322 days and permeability value of 0.27 g H_2O/mmHg.m^2.day. In addition, Their shortest shelf life was reached by PE 0.03 packaging which has shelf life of 173 days permeability value of 0.47 g H_2O/mmHg.m^2.day. The ANNOVA test showed that type of packaging used was had a significant effect on the quality of purwaceng coffee.

Keywords: Packaging, purwaceng coffee, shelf life

079

EVALUATION OF THE QUALITY OF CANNED MACKEREL "ARSIK" DURING STORAGE

Alfany Miserwin Suhada Mendrofa[1], Elisa Julianti[1,2], and Rona Joharmi[1]*

[1]Departement of Food Science and Technology, Faculty of Agriculture, Universitas Sumatera Utara Medan-Indonesia
*Corresponding author: elisa1@usu.ac.id

ABSTRACT

Arsik is a traditional Batak dish in North Sumatra which is made from fish with a mixture of traditional spices and has a low shelf life. In this research, an innovation was carried out to produce mackarel arsik with a long shelf life by packaging it in cans. This research aims to study the effect of spices addition in different percentage (10,20, and 30%) on the shelf life of mackerel fish arsik in cans during storage (1,2,3, and 4 weeks). The results showed that during storage the amount of spices added had a significant effect ($p < 0.05$) on moisture content, fat content, protein content, color hedonic value, and color index of canned mackerel fish, however, there was no significant effect ($p > 0.05$) on pH, hedonic value of aroma, taste, and texture. The amount of spices as much as 20% produces mackerel shredded fish with acceptable quality for 4 weeks of storage. There was no mold growth, gas formation, and can inflateation for 4 weeks of storage, which indicates that the mackerel shredded product in tin packaging is still acceptable and safe. Canned mackerel fish chips have become food creations with a longer shelf life.

Keywords: Mackerel, canning, fish shade soup

080

PHYSICAL AND FUNCTIONAL PROPERTIES OF PURPLE SWEET POTATO STARCH AS AFFECTED BY ISOLATION METHODS

Elisa Julianti[1,2], Zulkifli Lubis[1], Ridwansyah[1], Era Yusraini*

[1)]Department of Food Science and Technology, Faculty of Agriculture
Universitas Sumatera Utara, Medan-Indonesia
*Corresponding author: elisa1@usu.ac.id

ABSTRACT

Purple sweet potato (PSP) is one type of tubers that has the potential to be used as a source of starch. Extraction of starch using different methods of isolation will produce starches with different physical and functional properties. In this study, the extraction and isolation process of starches were carried out using water, sodium metabisulfite 2000 ppm, and citric acid 2000 ppm. The resulting starch was analyzed for its physical characteristics including the granule shape and size, as well as its functional properties such as water and oil absorption index, swelling power, viscosity of starch paste and gelatinization temperature. The results showed that the starch produced from citric acid isolation had a smaller granule size, and a higher water and oil absorption index, swelling power, paste viscosity, and gelanitization temperature.

Keywords: Purple sweet potato; isolation methods, starch, functional properties

Organized by:

Supported by:

Parallel B: Nutrition

006 (B-LS1)

POTENTIALS OF AMINO ACIDS AND PROTEINS FOR STUNNING CHILD FROM INDONESIAN DIET: A REVIEW

Vira Putri Yarlina[1], *Mohammad Djali*[1], *Robi Andoyo*[1]

[1]Department of Food Industrial Technology,Faculty of Agrocultural Industry Technology, Padjadjaran University, Jatinangor 45363, Sumedang, Indonesia
* Corresponding author: vira.putri.yarlina.unpad.ac.id

ABSTRACT

Stunting is a condition of malnutrition in the presence of low nutrition. Low nutrition disrupts the quality of child growth. Indonesia have approximately 30% prevalence of child stunting indicated that 3 child stunting of 10 children. Indonesia is a country that has foods that are rich in nutritional value, including tempeh, tofu, soy milk, eggs, and beans. Nutrients needed during a child's growth are protein, carbohydrates, fats, and vitamins. In child stunting lack of nutrition are protein and amino acid absorption. Child stunting has weaknesses in the amino acids such as leucine, tryptophan, and lysine. The amino acids and proteins are found in Indonesian foods such as essential amino acids and non-essential amino acids. It can meet the nutritional requirements of a child's growth. The method used is a review of several articles related to stunting children. Foods source in Indonesia provides benefits to reduce the risk of stunting due to the presence of amino acids and proteins that meet the needs of stunting children in Indonesia.

Keywords: Child stunting, amino acids, protein, indonesia food source

008

STUDY THE CHARACTERISTICS OF RICE SUPPLEMENTS MADE BY FORMULATING THE COMPOSITION OF SKIM MILK, FERROUS FUMARATE, AND THIAMINE

Asep Dedy Sutrisno[1*]

[1] Food Technology Department, Engineering Faculty, Pasundan University, Bandung
* Corresponding author: asepdedysutrisno@yahoo.com

ABSTRACT

Rice is a staple food ingredient as a source of carbohydrate, but low in micronutrients such as thiamine (vitamin B1), riboflavin (vitamin B2), iron, and calcium, even though these nutritional components are needed by the human body, so as to complete nutritional needs it should be an effort to add supplements to it. This study aims to explore the manufacture of rice supplements by formulating the composition of skim milk, ferrous fumarate and thiamine. The experimental research design used a factorial pattern, the first factor was the concentration of skim milk with a variation of 20 %; 30 %; and 40 %, the second factor is the concentration of ferrous fumarate with a variation of 200 ppm; 300 ppm; and 400 ppm, and the third factor is the concentration of thiamine with a variation of 300 ppm; 400 ppm; and 500 ppm. Rice supplements that have been formulated are added to rice at the time of cooking and the rice is tested for protein, calcium, iron and thiamine stability as well as their organoleptic effects. The results showed that rice supplements were added or fortified at the time of cooking, the presence of protein, calcium, iron, showed a significant response. However, the results of the stability test for protein, calcium, iron, and thiamine content measured from rice before and after cooking that showed a stable response or there was no significant loss / decline. Based on the results of the organoleptic test on the color parameters the response was not significantly different, while the organoleptic test for the taste and aroma parameters showed a significantly different response.

Keywords: Formulating, supplements, skim milk, ferrous fumarate, thiamine

014

CONTRIBUTION OF SCHOOL CANTEEN SNACKS TO THE IRON FULFILLMENT IN HIGH SCHOOLS IN MALANG

Adelya Desi Kurniawati[1], Wahyu Winariyanti[1], Dedi Iskandar Putra[1], Titis Sari Kusuma[1]*

[1] Nutrition Department, Faculty of Medicine, Brawijaya University
[*] Corresponding author: adel.kurniawati@ub.ac.id

ABSTRACT

Iron deficiency anemia is the most common type of anemia, and the prevalence of anemia due to iron (Fe) deficiency in Indonesia reaches 22.7% in girls and 12.4% in boys. Inadequate dietary iron, impaired iron absorption, bleeding, or loss of body iron in the urine may be the cause of anemia. Indonesian student spent 7-8 hours/day which mostly the iron daily intake influenced by school canteen snacks. This study aims to determine the contribution of Fe content in school canteen snacks in high school canteens in Malang. This research is an analytic observational study using a cross sectional design with quantitative iron analysis techniques with the AAS (Atomic Absorption Spectrometry) method. The research sample was carried out by purposive sampling at 10 high schools consisting of the junior high school group and the high school group according to the inclusion criteria. The samples of snacks studied were fried chicken, fried tempe, and noodles. The average Fe content in school snacks was analyzed using the independent T-test in the junior and senior high school groups. The iron content in fried tempe and noodle showed a significant difference with p> 0.05, while the iron content in fried chicken in the two school groups did not show different results. However, the percentage contribution of Fe to the Nutritional Adequacy Rate is still very small, namely 0.03-2.56% for fried chicken, 0.05-4.46% for fried tempeh, and 0.26-11.89% for noodles.

Keywords: Anemic, iron, school snack, school canteen

015

REDUCTION SUGAR AND TOTAL ACID IN VEGETABLE YOGURT USING *Lactobacillus satsumensis* EN 38-32 AMYLOPROTEOLITIC ENZYME AT STORAGE

Tatik Khusniati,[1] Salma Hania Auliya,[2] Tri Aminingsih[2] and Sulistiani[1]

[1]Microbiology Division, Research Center for Biology, Indonesian Institute of Sciences
Jl Raya Jakarta Bogor Km 46, Cibinong 16911
[2]Department of Chemistry, Faculty of Mathematic and Natural Sciences, Pakuan University, Bogor
*Corresponding author: tatikkhusni@gmail.com

ABSTRACT

Vegetable yogurt is suitable to be developed, because it is good for human health, including humans who have lactose intolerance and vegetarians. This study aims to determine the content of reduction sugar and total acid of vegetable yogurt using the *L.satsumensis* EN 38-32 amyloproteolytic enzyme in storage. The α-amylase and protease activity were detected sequentially by the Miller and Horikoshi method, while the reduction sugar and total acid were detected by the Bernfeld and AOAC methods. Data were analyzed by ANOVA with three replications. The results showed that the longer the storage time, the lower the reduction sugar and the higher the total acid of vegetable yogurt. The sugar reduction in vegetable yogurt based on the juice of pasta flour on green bean, soybean, oyster mushroom, button mushroom and milk yogurt as a comparison, using the *L.satsumensis* EN 38-32 amyloproteolytic enzyme on day 0, 7,14, 21, 28, respectively, were 0.0456-0.0521, 0.0353-0.0396, 0.0252-0.0301, 0.0211-0.0293 and 0.0452-0.0488%, while the total acids of the vegetable yogurt that use enzyme were 0.490-0.704, 0.499-0.715, 0.3330-0.5910, 0.2100-0.5550 and 0.500-0.901%. The soy yogurt with the amyloproteolytic enzyme had more reduction sugar content than milk yogurt, while yogurt made from green bean, oyster mushroom and button mushroom that use this enzyme had less reduction sugar contents. All total acids in the vegetable yogurt that use enzyme had a value that meets SNI 2981: 2009 yogurt. So that based on the content of reduction sugar and total acid, soy yogurt which uses the *L.satsumensis* EN 38-32 amyloproteolytic enzyme was better to be an alternative milk yogurt than other vegetable yogurts in the same treatment.

Keywords : Amyloproteolytic enzyme, L. satsumensis EN 38-32, reduction sugar, total acid, vegetable yogurt

020 (B-LS5)

THE EFFECTS OF DIFFERENT GERMINATION METHODS ON BIOACTIVE COMPOUNDS IN GERMINATED BROWN RICE

Hadi Munarko[1], Azis Boing Sitanggang[1,2,], Feri Kusnandar[1,2], Slamet Budijanto[1,2]*

[1]Department of Food Science and Technology, IPB University, Indonesia
[2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Indonesia
*Corresponding author: boing.lipan@apps.ipb.ac.id

ABSTRACT

Enhancing the bioactive compounds and improving the physicochemical properties of brown rice could be obtained by germination process. To produce germinated brown rice (GBR) usually conducted by two methods, i.e. by the simple soaking method and partial soaking method. The application of membrane bioreactor for GBR production could be used as an alternative technology instead of manual immersion. This study aimed to evaluate the application of membrane bioreactor to produce germinated brown rice both in full soaking and partial soaking methods. Germination was conducted in four ways, i.e. manual and reactor full soaking methods by soaked brown rice in the water; and manual and reactor partial soaking by immersed brown rice for 24 h followed by atmospheric germination (RH 97%, room temperature). The process was completed after 72 h and analyzed for sprout length, total phenolic content, total flavonoid, antioxidant activity, and γ-oryzanol content. The results showed that different germination technology significantly affected the characteristics of GBR. Germination by manual full soaking methods had the lowest sprouted length (2.90 ± 1.24 mm), whereas reactor full soaking showed the highest sprouted length (14.58 ± 1.55 mm). The sprout length in partial soaking methods was lower than in reactor full soaking might be due to the existence of the root. Partial germination showed higher total phenolic content, total flavonoid content, and antioxidant activity than that in full soaking methods, which found observed both in manual and reactor soaking. In contrast, germination by full soaking methods was less effective to enhance the bioactive compounds in GBR. In conclusion, the use of membrane bioreactors in combination with atmospheric germination for GBR production was more effective to enhance the bioactive compounds.

Keywords: Atmospheric germination, bioactive compound, bioreactor membrane, manual soaking, sprout

021

PROTEIN-RICH GETUK PRODUCT DEVELOPMENT

Sedarnawati Yasni

IPB University, Bogor – Indonesia
*Corresponding author : sedarnawati@yahoo.com

ABSTRACT

Some people who work tend to choose to consume ready-to-eat food which leads to reduced consumption of vegetables and fruits. The results of the study stated that there was a change in the pattern of disease in the community which was marked by a change in the pattern of infectious diseases into degenerative and metabolic diseases. Therefore we need functional food that can prevent or reduce various kinds of degenerative diseases. The development of getuk which is made from cassava, green beans and shredded snakehead fish fillets aims to increase levels of protein, fiber, and minerals, especially Fe and Ca. Substituting part of the amount of cassava with green beans will produce high protein getuk products (9.07%), and the addition of shredded snakehead fish fillets soaked in pineapple juice (15 minutes) also has the potential to form peptides that act to inhibit activity of alpha-glucosidase. Therefore, getuk rich in protein can be consumed by diabetics, so it is suspected that getuk products have potential as an antidiabetic (antihyperglycemic). Apart from the protein contained in getuk, there was 17.84% Fe and 114.61% Ca. The Ca content in getuk can be recommended for people consumption with osteoporosis, especially women who have menopause. This innovative getuk product not only has high protein but also a fiber content of 5.40% has the potential to prevent colon cancer as well.

Keywords : Getuk, snakehead fish, cassava, green beans

026

THE EFFECTS OF DRYING ON BIOACTIVITY OF GINGER (*Zingiber officinale*): A META- ANALYSIS STUDY

*Hesti Kurniasari, Wahyudi David, Ardiansyah**

Department of Food Technology, Universitas Bakrie, Jakarta, Indonesia
*Corresponding author: ardiansyah.michwan@bakrie.ac.id

ABSTRACT

Drying is a well-known methods that used in processing and preserving of ginger. The purpose of this study was to know the effect of drying on bioactivity of ginger by a meta-analysis study. 113 articles journal that appropriate with the research topic and criteria and resulted 13 articles journal that suitable to analyze with Confident Interval. The drying method gives different effects on the optimum parameters of ginger characteristics. The highest value of total phenolic compounds resulted by freeze drying, total flavonoids by vacuum drying, and 6-gingerol by microwave drying. Furthermore, the highest antioxidant activity of ginger was obtained by freeze drying. Finally, drying has different effects on ginger in term of bioactivity, therefore to choose the best method, it needs to adjust with the purpose of the process and the final product criteria.

Keywords: Antioxidant, bioactive compound, drying, ginger, meta-analysis

027

A META-ANALYSIS STUDY: FERMENTED AND NON-FERMENTED RICE BRAN

Opin Oktavia[1], Wahyudi David[1], Slamet Budijanto[2], Ardiansyah[1,]*

[1] Department of Food Technology, Universitas Bakrie, Jakarta, Indonesia
[2] Department of Food Science and Technology, IPB University, Bogor, Indonesia
[*] Corresponding author: ardiansyah.michwan@bakrie.ac.id

ABSTRACT

The fermentation process has been utilized to enhance the nutritional quality of rice bran. Several studies suggest that fermented rice bran has higher bioactivity compared to non-fermented rice bran. The aim of the present studies were analyzed whether fermented rice bran has higher nutrition quality and bioactivity compare to non-fermented rice bran by meta-analysis. From 210 retrieved articles, 11 articles were passed the screening process and analysed with Confidence Interval. The results of analysis showed that protein and fiber content were higher in fermented rice bran than non-fermented rice bran. The main point of the study showed that total phenolic content and antioxidant activity of fermented rice bran by using *R. oligosporus* and *R. oryzae* were higher compare to non-fermented rice bran. In summary, fermentation can be an option to enhance the nutritional value, TPC, and antioxidant activity of rice bran.

Keywords: Antioxidant activity, fermented rice bran, meta analysis, total phenolic content

030

THE SOCIOLOGY OF PUBLIC FOOD; NEW CONCEPT ON THE ROOT OF PEOPLE'S FOOD SECURITY (The Environmental Principles Approach)

Mortaza A Syafinuddin Hammada[1], *Sennahati*[2]

[1] Lecturer at Universitas Cokroaminoto Makassar and Member of Indonesian Environmental Scientists Assosiation (IESA)
[2] Lecturer at Universitas Cokroaminoto Makassar

ABSTRACT

The issue of food security is not an isolated issue. The shift in people's food choices is something that has a cultural dimension. Unfortunately, this symptom is allowed to last very long. Now, the effect of shifting people's food choices is causing serious economic pressure. This paper seeks to find other approaches to find a solution to the people's food problem. The threat of food shortage should be seen from various angles. One of them is a social perspective. One of the most important social aspects that is often neglected in strengthening food security is the pattern of the people's food transformation. The study hereinafter referred to as the sociology of food in this paper confirms that people who lose their food transformation pattern will find it difficult to generate food security. Vice versa, when finding the right transformation pattern will have food security.

Keywords: Public food, food security, food resilience, food transformation, cultural dimension, environmental principles

031

BLOOD GLUCOSE RESPONSE OF ROBUSTA COFFEE WITH DIFFERENT ROASTING LEVEL: LIGHT AND DARK

Elsera Br Tarigan[1,2], Dian Herawati[1,3], Puspo Edi Giriwono[1,3]*

[1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor 16680, Indonesia
[2]Indonesian Industrial and Beverages Crops Research Institute (IIBCRI), West Java, Indonesia
[3]Southeast Asian Food and Agricultural Science and Technology Center, IPB University, Indonesia
[*] Corresponding author: pegiriwono@apps.ipb.ac.id

ABSTRACT

This study aimed to investigate chlorogenic acid, caffeine and blood glucose responses of Robusta coffee brew from the bean roasted at light and dark levels. Blood glucose assays were conducted in single-blind to ten healthy subjects. Coffee brew were consumed with and without references (glucose and white bread). The chlorogenic acids of light roasted coffee brew to dark roasted coffee brew decreased 39% (3-CQA), 41% (4-CQA) and 44% (5-CQA). The roasting levels did not influence caffeine content in the coffee brew. Inhibition activity of light roasted coffee brew to α-glucosidase was 85% higher than that of dark roasted. In short term, coffee brew did not suppress the blood glucose absorption and the carbohydrate hydrolysis, and did not triggers glycogenolysis or gluconeogenesis, based on the iAUC value ($P>0.05$). However, light roasted coffee brew might expand the glucose absorption from blood to tissues compared to that of dark roasted and food reference.

Keywords: Robusta, chlorogenic acid, caffeine, α-glukosidase, glucose absortption

033

INVESTIGATION AND COMPARISON OF PHYSICOCHEMICAL CHARACTERISTICS OF NON-AGED AND 4-MONTH AGED MULBERRY WINE PREPARED FROM THREE DIFFERENT WINE MAKING TECHNIQUES

Resha Shrestha[1], Siriwan Panprivech[2], Kamolnate Kitsawad[1], and Viyada Kunathigan[1]*

[1] Department of Food Biotechnology, Faculty of Biotechnology, Assumption University, Bangkok, Thailand
[2] Department of Agro-Industry, Faculty of Biotechnology, Assumption University, Bangkok, Thailand
[*] Corresponding author: viyadaKnt@au.edu

ABSTRACT

Winemaking techniques and the aging process of wine are important to the quality of wine. This study was investigated and compared the effect of different winemaking practices on physicochemical characteristics among non-aged and 4-month aged of *Morus alba Linn* (*cv.* Chiang Mai 60) wines. Hand press juice (HPJ), hand press juice with pulp (HPP) and cold press juice (CPJ) were prepared from fresh mulberry fruit which were fermented using *Saccharomyces cerevisiae* (Premier rouge) and then bottled and aged for 4 months in the cold room (12±2˚C). The pH, total titratable acidity (TTA), alcohol content, reducing sugar, color measurements, total phenolic content (TPC), total flavonoid content (TFC), antioxidant capacity and total anthocyanin content (TAC) were observed. The results showed significant differences on the chemical parameters (TTA, alcohol content, reducing sugar, TPC, TFC and TAC) among three treatments of mulberry wines without aging. Among all wine making techniques used, HPP and CJP method produced wine that have similar level of TFC, and color intensity which was higher than the wine prepared by HPJ method. The HPJ method resulted in the wine that have significantly lower level of TPC, TAC, and TFC than the other two techniques. In addition, after aged the mulberry wines for 4 months, the wine made with different technique had significantly lower level of TPC, antioxidant capacity, TAC, TFC and color hue than the non-aged mulberry wine made from the same technique.

Keywords: Cold pressed, physicochemical analysis, antioxidant, anthocyanin

037

SPECTROPHOTOMETRIC STUDY OF COMMON MORNING GLORY (*Ipomoea purpurea*) EXTRACT AT PH 4 TO 8 DURING STORAGE

Abdullah Muzi Marpaung

Food Technology Department, Faculty of Life Sciences and Technology, Swiss German University, Tangerang, Indonesia, 15143
* Corresponding author: bangmuzi@yahoo.com; abdullah.muzi@sgu.ac.id

ABSTRACT

Common morning glory (*Ipomoea purpurea*) is one of the sources of polyacylated anthocyanin, a group of anthocyanin that has relatively high color stability at a pH range of food. Commonly, the study of anthocyanin stability is limited to observe the color intensity and anthocyanin content. This study aimed to reveal the shift of visible light absorbance of the aqueous extract of morning glory extract at pH 4 to 8 during storage at a room temperature with no light for 21 days. The spectrophotometric data was used to determine the color quality of the extract including color intensity, violet index, browning index, and the intensity of red, purple, and blue hue. Based on the spectrogram, the extract can be categorized in two groups. The first group, extract at pH 4 and 5, showed relatively higher color stability, slight decrease of violet index, slight increase of browning index, and slight hypsochromic shift. The second group, extract at pH ≥ 6, showed lower color stability, sharp decrease of violet index, high increase of browning index, and wide hypsochromic shift. The wide hypsochromic shift in the extract at pH ≥ 6 might indicate the occurrence of the deacylation of polacylated anthocyanin to unacylated anthocyanin.

Keywords: Anthocyanin, ipomoea purpurea, spectrophotometry, stability

038

CONSUMER ACCEPTABILITY OF SPECIAL WAFER DERIVED FROM PREGELATINIZED CASSAVA FLOUR

Winda Haliza, Ayu Kusuma, Endang Yuli Purwani

Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian
Jl. Tentara Pelajar No. 12, Cimanggu, Bogor 16114, Indonesia
* Corresponding author: windahaliza@pertanian.go.id

ABSTRACT

The identification of key extrinsic (marketing) and intrinsic (sensory) product attributes that influence consumer acceptance will need to be identified and incorporated into the development of new gluten-free foods. Involving the consumer in the process of developing and marketing gluten-free foods through market research provides for a more systematic means of managing consumer knowledge in new food product development. The objective of this research was to assess consumers' interest and acceptability for the new products "Special Wafer Derived from Pregelatinized Cassava Flour". The method of this research was to invite consumers to provide their options about these products into google forms that are distributed randomly. Results revealed that 70% of consumers who responded were more than 39 years old on average. More than 70% of consumers who respond desperately need healthy snacks for their daily lives with specific nutritional content. Less sugar, gluten-free, and good taste also greatly affect to a willingness to pay for the product. When combined with a sense of special wafers that can be accepted by the tongue, it is likely the market will be willing to pay more. It is likely that the target market of gluten-free products will extend in the future to not just include people with celiac disease but also those who desire products without allergens or other ingredients that may negatively influence their health. More needed accurately strategic marketing decision making when bringing gluten-free foods to the market.

Keywords: Wafer, pregelatinized, cassava flour, gluten-free, market research

039

PROFILING VOLATILE AND NON-VOLATILE COMPOUND OF EXCELSA COFFEE (*Coffea liberica* var. dewevrei) GROWN IN WONOSALAM SUB-DISTRICT, EAST JAVA PROVINCE

Michael Oscarius Loisanjaya[1], *Nuri Andarwulan*[1,2], *and Dian Herawati*[1,2,*]

[1]Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University
[2]Southeast Asian Food and Agricultural Science and Technology Center, IPB University
* Corresponding author: dian@apps.ipb.ac.id

ABSTRACT

Coffee was known as a beverage containing various bioactive and volatile compounds, which is known to have a beneficial impact on human health and flavor. Therefore, the potential sources of bioactive and dominant flavor compounds in coffee species are important to profile. This study's objective is to understand the profile of volatile and non-volatile compounds in green and roasted excelsa coffee coming from different plantation conditions and several post-harvest processing methods. For that purpose, analysis by using HPLC and GC-MS performed, then continued by the profiling process through principal component analysis. The pH, total dissolved solids, and moisture content of the coffee beans were also analyzed. The result shows a sample from the highest altitude has more 5-CQA, alkanes, and pyrazine content, but lower in trigonelline, caffeine, aldehydes, and carboxylic acid content. For different post-harvest processing effects, green honey samples have the highest concentration of CQAs and volatiles compounds in total, while natural coffee has the highest alkaloids content. After roasting, components such as 5-CQA and trigonelline are degraded, but the formation of 3-CQA, 4-CQA, theobromine, and volatile compounds is observed. This research result hopefully could provide supporting information for the sensory evaluation test and bioactivity potential of excesla coffee.

Keywords: Bioactive compounds, caffeine, excelsa coffee, post-harvest processing, volatile compounds

043

FORMULATION OF ANALOGUE RICE MADE OF WHITE CORN *(Zea Mays Ceratina)* AND MUNG BEANS *(Vigna Radiata L)* FLOUR AS AN ALTERNATIVE FOOD IN MAINTANING A COMPLETE NUTRITION

Ariani Rumitasari[1], Abu Bakar Tawali[1], Amran Laga[2], Jumriah Langkong[3], Meta Mahendradatta[4]

Food Science and Technology Study Program, Department of Agricultural Technology,
Faculty of Agriculture, Hasanuddin University
* Corresponding author: arianirumitasari29@gmail.com, abubakar_tawali@yahoo.com,
amranlaga@gmail.com, metamahendradatta@gmail.com

ABSTRACT

Rice has been the only staple food for the majority of Indonesian. The demand for rice is increasing yearly as population growth. One alternative in achieving national food security is by food diversification. The aim of this study was to formulate an alternative food source as analogue rice made of white corn (Zea mays ceratina L) and mung beans (Vigna radiata L) to improve nutrition in rice. The specific objective of this study was to obtain physical characteristics and the best formulation as well as chemical analysis of the best of analogue rice formulated. This research was carried out in two stages. The first stage was to obtain the best formulation of physical analysis and sensory analysis of analogue rice. These formulations were evaluated for sensory characteristic using hedonic method. The physical analysis was also conducted for these formulations. The results obtained in the first stage were physical analysis of bulk density, water absorption, swelling power and cooking time compared to rice which ranged from 0.571 to 0.790 (g/ ml), 33.3 to 63.9%, 8, 1-34.7%, and the cooking time was faster than ordinary rice which was ± 3 minutes. The best formulation based on sensory evaluation was analogue rice produced from a ratio of 50% white corn and 50% mung beans. The chemical profile of the analogue rice was 8.4% of water content, 1.6% of ash content, 13.6% of protein, 1.3% of fat, 75.1% of carbohydrate, 5.7% of food fiber, 376 kcal of calories, 5.1 mg/100 g of iron, and, 0.57 mg/100 g vitamin B1.

Keywords : Analogue rice, food diversification, white corn, mung beans

044 (B-LS4)

THE DIET EFFECT ON THE COMPOSITION OF INTESTINAL MICROFLORA AND STRATEGIES TO RESTORE EUBIOSIS

Trinoviyani[1], *Lilis Nuraida*[1, 2], *Ratih Dewanti-Hariyadi*[1,2]

[1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Darmaga, Bogor 16680, Indonesia
[2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Bogor 16680, Indonesia
Corresponding author: lnuraida@gmail.com

ABSTRACT

The gastrointestinal tract of humans contains a complex and dynamic population of microorganisms called “the gut microbiota". The majority of phyla in the intestinal microflora consist of *Bacteroidetes*, *Firmicutes*, *Actinobacteria*, *Proteobacteria*, *and Cerrucomicrobes*, where the dominant phyla are *Bacteroidetes* and *Firmicutes*. The condition of a balanced intestinal microflora is known as eubiosis, while the opposite condition is dominated by pathogenic bacteria called eubyosis. The composition of the intestinal microflora is influenced by several factors including age, nutrition, infection sensitivity, degree of acidity (pH), interactions between component of microflora, host immunological status, and the type of diet consumed. Among these factors, the most influential one is diet. People who consume the high fat and protein diet generally have a composition of the gut microbiota dominated by the *Bacteroidetes* phylum, however the intestinal microflora of people who consume high carbohydrate and fiber diet are generally rich in the *firmicutes* phylum. Dysbiosis is caused by the large number of unfavorable bacteria such as *Bacteroidetes, Proteobacteria, Clostridium coleatum, C. perfringens and E. coli*. These bacteria can increase lipopolysaccharide (LPS) and inflammatory cytokines, being the initial formation of infections, thus leading to the development of several chronic diseases such as obesity, type 2 diabetes mellitus, atherosclerosis, and cirrhosis. The developed strategies for changing and enriching the intestinal microflora in eubiotic condition are using probiotics, prebiotics, and synbiotics. These strategies have been scientifically proven to restore the abundance of beneficial bacteria such as *Bifidobacteria* and *Lactobacillus*.

Keywords: Diet, dysbiosis, eubiosis, gastriontestinal, microbiota

055

THE POTENTIAL OF CELERY YOGURT AS A FUNCTIONAL FOOD

Ambar Rukmini[1], Lily Arsanti Lestari[2], Aninditya Ratnaningtyas

[1] Food Technology Study Program, Faculty of Science and Technology, Widya Mataram University
[2] Department of Nutrition, Faculty of Medicine, Nursurig and Public Health, Gadjah Mada University
[*] Corresponding author: ambar_rukmini@yahoo.co.uk

ABSTRACT

Celery yogurt is a fermented product containing celery extract; made from cow's milk and pasteurized celery extract, then fermented using *Lactobacillus bulgaricus* and *Streptococcus thermophilus* bacteria. This research was conducted to determine the potential of celery yogurt as a functional food, especially to maintain the stability of blood pressure and cholesterol levels. Celery yogurt was intervened to Wistar rats which were fed a diet in high oxidized fat (containing 15% egg yolk and 18% cooking oil which is no longer suitable for use) as much as 1.8 ml / 100 gram body weight or high salt (containing 8% NaCl). This study used 45 Wistar rats which were divided into nine groups. Group K1, K2, and K3 respectively were given standard feed without or with plain or celery yogurt intervention; K4, K5, and K6 respectively were fed a diet high in oxidized fat without or with plain or celery yogurt intervention; K7, K8, and K9 respectively were given a high salt feed without or with plain or celery yogurt intervention. All rats were also given drinking water ad libitum. Lipid profile analysis and blood pressure of the rats were performed once a week. In-vivo tests that have been conducted have shown that celery yogurt can significantly reduce blood pressure, triglyceride levels, total cholesterol, and LDL cholesterol, and increase HDL cholesterol levels. Thus, it can be said that celery yogurt is effectively used as a functional food that inhibits dyslipidemia and hypertension or maintains a lipid profile and blood pressure, despite consuming oxidized fats or foods with high salt content. Based on some literature, products containing probiotics also have the potential to act as a virus blocker. Thus, in addition to having celery yogurt potential as a functional food, it also has potential effect to increase the body's immune system to prevent Covid-19 attacks.

Keywords: Celery yogurt, functional food, dyslipidemia, hypertension, immune system

056 (B-LS3)

THE CHANGE OF BILE SALT STIMULATED LIPASE DURING 6 MONTHS OF LACTATION AND ITS CORRELATION WITH MACRONUTRIENTS IN CHINESE HUMAN MILK

Ratna Nurmalita Sari[1], Jiancun Pan[2], Xiaoyang Pang[1], Shuwen Zhang[1], Liu Liu[1], Yuanyuan Li[2], Shilong Jiang[2], Lu Jing[1], Lv Jiaping[1]*

[1] Key Laboratory of Agro-Food Processing and Quality Control, Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, Beijing, China
[2] R&D Center, Hailongjiang Feihe Dairy Co., Ltd, Beijing, China
[*] Corresponding author: ratnanurmalitasari@gmail.com

ABSTRACT

Bile salt stimulated lipase (BSSL) is the most abundant lipase in human milk which plays a pivotal role in new-born fat digestion, especially in the first six months of life. Lipid as the main energy supply for infant was very depending on BSSL activity for obtaining optimal lipid absorption under immature digestion track and pancreatic system condition. Due to the important role of BSSL, this research was addressed to study the effect of lactation period and gender on BSSL activity and the correlation of BSSL with macronutrients content in Chinese human milk. Cross sectional and longitudinal study were used to investigate the BSSL activity and concentration pattern during 6 months of lactation. A declining pattern of both BSSL activity and concentration was observed as lactation stage progressed. The BSSL concentration significantly declined during 6 months. The significant differences of BSSL activity and concentration were also observed in human milk for different gender. Male babies had breastmilk with less BSSL concentration rather than female babies. Protein had positive correlation with BSSL activity and concentration, while carbohydrate had non- significant negative correlation. However, no correlation observed between fat content and BSSL.

Keywords: Bile salt stimulated lipase, human milk, lactation period, gender, macronutrients

057

SUBSTITUTION OF RED PALM OLEIN OIL (RPOO) IN INSTANT VERMICELLI OIL SEASONINGS ON VITAMIN A CONTENT, PHYSICAL CHARACTERISTICS AND PRODUCT LEVEL

Habieb Febriansyah[1], Budiyanto[1], Devi Silsia[1]*

[1] Department of Agricultural Technology, Faculty of Agriculture, Bengkulu University
Coresponding author : budiyanto@unib.ac.id

ABSTRACT

The study aimed to evakuate the effect of red palm olein oil substitution on instant vermicelli oil seasoning to physical, sensory characteristics and vitamin A of the seasoning. Completely randomized design (CRD) with one factor was used in the study. Four samples of original 3.40g oil seasoning of instant vermicelli were substituted with 0%, 25%, 50%, 75%, and 100% of red palm olein oil respectively. The dependent variables in thes study were vitamin A content, color, preference in taste, aroma, color, and overall preference of icntant vermicelli. The result indicate that the color of vermicelli oil seasoning effected by red palm olein oil substitution (RPOO). Color preference significanty improved with increasing RPOO substitution. Overall preference of the vermicellis were not significantly different with RPOO substitution up to 75%. However score attributes of aroma & taste tend to decreased with increasing RPOO substitution. Based on 75 % substitution of RPOO on 3,40g seasoning oil, one portion of instant vermicelli could have addition of 102,54 µg RE.

Keywords: Red palm oil, vitamin A, substitution, vermicelli

058

CHANGES THE ALLERGENICITY OF *KEMBUNG* FISH (*Rastrelliger* Spp.) DURING DRIED SALTED AND WET SALTED (PINDANG) PROCESSING

Nindya Atika Indrastuti[*1], *Nurheni Sri Palupi*[2,3], *Nur Wulandari*[2,3]

[1]Departmnet of Food and Nutrition Technology, Faculty of Halal Food Science, University of Djuanda
[2]Department of Science and Technology, Faculty of Agriculture Technology, IPB University
[3]SEAFAST Center, IPB University
Corresponding author : nindya.atika@gmail.com

ABSTRACT

Identification and characterization of various types of fish allergens have been carried out, but there have been no studies related to the effects of traditional fish processing steps on the changes on its allergenicity, especially for dried salted and wet salted (*pindang*) of *kembung* fish (*Rastrelliger* spp .) in Indonesian traditional fish processing. The aim of this study was to evaluate the changes in the allergenicity of *kembung* fish during processing steps of dried and wet salted fish. Molecular weight testing was carried out by using SDS-Page as well as IgE-specific testing by ELISA on the protein extract of raw fish, dried salted fish, fried salted fish, *pindang*, and fried *pindang*. The SDS-Page electrophoresis test showed that the processing of dried salted and wet salted couldn't remove the protein bands related to parvalbumin protein (10-13 kDa) and other polypeptides related as major allergens in fish (24, 40 and 50 kDa) . ELISA showed that the changes in the degree of allergenicity of *kembung* fish in dried salted processing steps were different from the wet one. Based on this study, it is known that the allergenicity of *kembung* fish treated by *pindang* is higher than the dried salted processing.

Keywords: Allergenicity, dried salted fish, frying, kembung fish, wet salted fish

061 (B-LS2)

PREVENTING VITAMIN C PHOTOOXIDATION IN BEVERAGE MODEL SYSTEM BY VIRGIN COCONUT OIL-RICE BRAN OIL NANOEMULSION

Yuli Perwita Sari[1], *Sri Raharjo**[1], *Umar Santoso*[1], *Supriyadi*[1]

[1] Department of Food and Agricultural Product Technology, Faculty of Agricultural Technology, Universitas Gadjah Mada, Bulaksumur, Yogyakarta 55281, Indonesia
* Corresponding author: sraharjo@ugm.ac.id

ABSTRACT

Vitamin C or L-ascorbic acid is a water-soluble vitamin and mainly added in a beverage. It was easily oxidized by high pH, temperature, heavy metal ions, and photooxidation. This research aimed to investigate the effect of virgin coconut oil-rice bran oil (VCO-RBO) nanoemulsion on photooxidation of vitamin C in beverage model system. The oil phase was VCO: RBO (3:7, v/v), surfactant (Tween 80) to oil ratio was 2.5:1 and distilled water was used as the aqueous phase. This nanoemulsion was produced by emulsion phase inversion. One and 5% (v/v) of VCO-RBO nanoemulsion were added to a system containing vitamin C (450 and 1800 ppm), erythrosine (0-120 ppm) and citric acid (to adjust pH 2.5 and 3.5) in distilled water. A fluorescent lamp illuminated the system at 3200 lux intensity or in the dark up to 2 hours. Vitamin C in samples was analyzed in every 30 minutes. The presence of light and erythrosine as sensitizer can degrade vitamin C in beverage model system at 1 mg vitamin C/min, effectively. The increasing of erythrosine concentration gave a significant effect on decreasing of vitamin C in a dose-dependent manner. By using 1 and 5% (v/v) of VCO-RBO nanoemulsion, the degradation of vitamin C in beverage model system can be prevented. In more acidic condition (pH 2.5), the 5% (v/v) of VCO-RBO nanoemulsion in beverage model system was more useful to prevent vitamin C photooxidation than in pH 3.5. It suggests that VCO-RBO nanoemulsion can be added in beverage model system to avoid the photooxidation of vitamin C.

Keywords: Vitamin C, photooxidation, nanoemulsion, model beverage

062

THE DEVELOPMENT OF PROTEIN-RICH GETUK WITH SPICY FLAVOR

*Agnes Juniarti C *, Sedarnawati Yasni , Didah Nur Faridah*

[1]Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Darmaga, Bogor 16680, Indonesia
* Corresponding author: agnesj.chastelyna@gmail.com

ABSTRACT

Getuk is traditional processed food made of steamed cassava with addition of sugar. Along with culinary culture variation, the making of getuk diverse into variety of form in Indonesia sort of getuk lindri, fried getuk, getuk ketek, and brown sugar getuk. These several kind of Gethuk remain made of cassava and sugar add-on, the variance merely on the food coloration or the frying process. The research aim to develop traditional gethuk by enhancing protein from mung bean and stavia sugar, besides diverse the chosen product with condiment flavor. At the early stage, 5 base formula with varied mung bean concentration (F1)10%, (F2)20%, (F3)30%, (F4)40%, and (F5)50%, examined to select the most likeable one. Then the selected one assorted into ginger and cinnamon flavor. The analyzing were examine the color, texture, protein levels and organolemptic test. Based on chromameter test with L, a, b notation Hunter and °Hue" parimeter, 5 base formula's color levels doesn't indicate significant dissimilarity (yellowish green and slight bright). Solidity levels tested thru texture analyzer is 1,99 gf, not so much different 1,99 gf. Protein levels from F1 to F5 are 1,16%, 3,39%, 5,71%, 7,06%, 8,41%. Selected base formula based on the one with highest protein levels because on color and texture analyzer doesn't specify significant distinction. Out of 5 fomulas, F3, F4 dan F5 is continued to organoleptic test. It result F4 is the most likeable than the other two. F4 extend further examination by adding ginger and cinnamon flavor with each's high and low concentration. After the flavor addition, organoleptic test is reexamined to determine the more likeable concentration. The outcome is the lower concentration more likeable for both flavor, and the addiotion of flavor is more favored than without flavor.

Keywords: Getuk, cassava, protein

064

EFFECTS OF COOKING ON YIELD, TOTAL CAROTENOID, AND COLOR OF LONG, CONE-SHAPED TONGKALANGIT BANANA (*Musa troglodytarum*) PUREE

E. Moniharapon[1], H. C. D. Tuhumury[1], A. Souripet[1]*

[1]Departement of Agricultural Product Technology, Faculty of Agriculture, Pattimura University. Jl. Ir. M. Putuhena, Kampus Poka Ambon, Maluku, Indonesia 97233
[*] Corresponding author: hcdtuhumury@gmail.com

ABSTRACT

One important species of bananas in eastern Indonesia, especially the Moluccas, is Fe'i banana, locally known as "pisang tongkalangit" (*Musa troglodytarum* L.), bananas with erect bunches facing up the sky. There are two types of "tongkalangit" banana: long fruit, cone-shaped bunch and short, small, round-shaped fruit. The fruit of some clones is exceptionally high in beta carotene, which conveys significant health benefits. Banana puree is one of the value-added products that can be applied to these nutrient-rich bananas cultivars. This study aimed to determine the yield, total carotenoid content, and colour of the long, cone-shaped tongkalangit banana puree with different cooking methods and time. Six levels of treatments, i.e. control, steaming 5 mins, steaming 10 mins, boiling 5 mins, boiling 10 mins, grilling 5 mins, and grilling 10 mins were applied in this particular study. Results showed that the highest yield of puree obtained when the banana was grilled for 5 mins (69.93%), and the highest total carotenoid content in puree was found to be 151.04 ppm (grilling 10 mins). The longer was the cooking time; the higher was the total carotenoid content for each cooking method. Cooking caused a decrease in the brightness of the puree. The degree of redness (a value) and yellowness (b value) of the puree showed a similar trend. The longer the banana was steamed and boiled, the lower was its redness and yellowness. On the contrary, the values increased along with increasing grilling time.

Keywords: Cooking, color, tongkalangit banana, total carotenoid, yield

067

A META-ANALYSIS STUDY: USE OF STARTER CULTURE IN COCOA BEANS *(Theobroma Cacao. L)* FERMENTATION

*Nafila Chaerunnisa Misbakh, Laras Cempaka, Wahyudi David**

Department of Food Technology, Universitas Bakrie, Jakarta, Indonesia
*Corresponding author: wahyudi.david@bakrie.ac.id

ABSTRACT

Fermentation is a crucial process in processing cocoa bean, this will trigger the flavour as well as colour change in chocolate. The addition of starter culture is expected to improve the quality of cocoa beans. The purpose of this study is to compare the types of starters used in the fermentation of cocoa beans through a meta-analysis. This study used 24 related articles that were screened from 110 that could be analyzed using Confidence Interval and heterogenity also significancy test. The p value and I2 showed that the articles used in lactic acid bacteria (LAB) and acetic acid bacteria (AAB) profile were heterogeneous. Meanwhile, the articles used in yeast profile, lactic acid, acetic acid and pH were homogeneous. The significancy test shows that with the addition of starter culture could affect the yeast profile (ES: 0,470; 95% CI: 0,371 to 0,569; P=0,0); LAB profile (ES: 0,747; 95% CI: 0,600 to 894; P=0,0); AAB profile (ES: 0,808; 95% CI: 0,663 to 0,953; P=0,0); acetic acid (ES: 0,189; 95% CI: 0,01 to 0,368; P=0,039) and pH (ES: 0,109; 95% CI: 0,001 to 0,218; P=0,049). Therefore, the use of starter cultures needs to be adjusted to the metabolite profile and characteristics of the final product.

Keywords: Cocoa bean, fermentation, starter culture, microorganism profile, metabolite, meta analysis

074

SPME-GC/MS METHOD DEVELOPMENT FOR RAW BEEF VOLATILE FINGERPRINT

Lia Amalia[1,3], Nancy Dewi Yuliana[1,3,], Feri Kusnandar[1,3], Purwantiningsih[2], Agy Wirabudi Pranata[1,3]*

[1] Graduate School of Food Science, IPB University, Bogor, Indonesia Department of Food Science and Technology, IPB University
[1] Department of Chemistry, IPB University
[3] Halal Science Center, IPB University
*Corresponding author: nancy_dewi@apps.ipb.ac.id

ABSTRACT

The price of raw beef is relatively expensive in Indonesia, triggering the occurrence of food fraud with cheaper meat, such as wild boar and even rats. This has led to the development of effective, easy and inexpensive analytical methods for raw beef authentification. A method based on Solid-phase microextraction (SPME) combined with gas chromatography and mass spectrometry detection (GC–MS) was developed to provide volatile compound fingerprinting of raw beef. Method optimization is needed to obtain more diverse and higher quantity of volatile compounds peak intensities. The SPME was performed using a. Divinylbenzene/Carboxen/Polydimethylsiloxane (DVB/CAR/PDMS) fiber. The procedures were optimized in term of column type selection, extraction temperature, length of extraction, the amount of samples and with or without NaCl addition. The best results was obtained using 8 g of raw meet with the addition of NaCl (2 ml), extracted for 40 min at 45^{o}C, and using DB-WAX column. The GC chromatogram and the MS spectra of the most optimum method showed that there were 30 peaks detected. The identified compounds were Hexanal, Ethanol, 2-(vinyloxy)-, D-Limonene, Dodecane, 3-Octanone, 3-Buten-1-ol, 3-methyl-, 1-Pentanol, Octanal, Acetoin, 2,3-Octanedione, 3-Methyl-5-isoxazolol, 5-Hepten-2-one, 6-methyl, 1-Hexanol, n-Decanal, Acetic acid, 1-Octen-3-ol, 1-Heptanol, Benzaldehyde, Acridine, 9-methyl-, 1-Octanol, Dimethyl sulfoxide, Butyrolactone, Cyclooctyl alcohol, Benzaldehyde, 3-ethyl-, 2,4-Decadienal, 2,6-Bis(1,1-dimethylethyl)-4-(1-oxopropyl)phenol, Phenol, Heptadecanal, p-Vinylguaiacol. SPME coupled to GC-MS was shown as a fast and reliable method for determination of volatile compounds in raw beef.

Keywords: SPME-GC-MS, development, raw beef

078

THE PROPORTION OF MEAT AND TAPIOCA FLOUR TO PRODUCE THE HEALTHY HIGH PROTEIN MEATBALLS

Marini Damanik, Ida Duma Riris, Moondra Zubir, Esi Emilia, Izzatul J. Sihaloho, Angel Fransisca Manurung

Medan State University

ABSTRACT

The purpose of this study was to determine the physical, chemical, and sensory characteristics of chicken meatballs to find the proportion of tapioca flour and chicken meat to form meatballs.. This study used a randomized block design (RBD) method with 5 treatments and 2 replications as a group. The substitution treatments for tapioca fruit flour and chicken meat consisted of 20%, 25%, 30%, 40%, and 50%. The parameters observed included chemical analysis consisting of moisture, ash content, protein and fat. While the physical analysis consists of a texture test (elasticity), as well as a hedonic sensory test (appearance, color, aroma, and texture). The results showed that the fat content at each concentration showed a difference in fat content where at a concentration of 20%, 25%, 30%, 40%, 50% respectively 0.07%, 0.08%, 0.08%, 0.095% , 0.09%. Meanwhile, the protein was 12.3%, 10.9%, 9.3%, 8.1%, 7.2%. and the results for moisture at each concentration of 69.75%, 70.00%, 66.06%, 61.78%, 55.21%. for the ash content in the meatballs in each concentration 0.045%, 0.04% 0.04%, 0.20%, 0.03%. The conclusion obtained from the results of this study is that a good proportion is used to make meatballs at a concentration of 25% and 30% in accordance with SNI standards.

082

META-ANALYSIS: THE EFFECT OF FRYING TIME ON FATTY ACIDS COMPOSITION OF PALM OIL AFTER FOOD FRYING BY DEEP FAT FRYING METHOD

Hanifah Nuryani Lioe, Novia Wijaya*

Departement of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Darmaga IPB campus, Bogor 16680, West Java, Indonesia
*Corresponding Author: hanifahlioe@apps.ipb.ac.id

ABSTRACT

Food processing by deep fat frying can have an effect on fatty acids composition of palm oil. Changes in the composition of fatty acids include increasing, decreasing, and formation of new fatty acids. The purpose of this study was to conduct a meta-analysis using data from various published literatures which reported the results of research on the effect of deep fat frying time for 40 hours on the fatty acids composition of palm oil by obtaining cumulative effect size (D+) and 95% confidence interval. Treatment of 40 hours frying time was the time of batch (deep fat) frying in repeated frying using a new sample of potatoes for each repeat of 2.5 – 8 minutes frying. The data from the literatures used in the meta-analysis were data that had sample sizes, mean values, and standard deviations or standard errors. Quantitative data from 19 literatures obtained by the PRISMA method, was processed by Hedges'd meta-analysis. Frying time for 8 h or less had a strong effect on the fatty acids composition, especially C16:0, C18:0, and C18:2 with D+ values 0.97, 1.33, and -1.73, respectively. This frying time also affected MUFA (D+ -1.97), PUFA (D+ -3.00), and SFA (D+ 2.56). Frying time more than 8 h greatly affected the trans fatty acid concentration with D+ reaching 10.98. In general, the longer the frying time, the greater the effect on the composition of palm oil.

Keywords: Deep-fat frying, fatty acids composition, frying time, palm oil, meta-analysis

084

CHARACTERIZATION OF EDIBLE FILM MADE OF PECTIN FROM NUTMEG AND PALMITIC ACID

Payung Layuk, Meivie Lintang, Stevie Karouw

North Sulawesi Assessment Institute for Agricultural Technology
*Corresponding Autho: playuk21@gmail.com

ABSTRACT

The development of biopolymers as a packaging material is increasingly needed to reduce environmental pollution due to the use of synthetic plastics which are biologically difficult to break down. Nutmeg contains pectin which can be used as a base for making edible films. The aim of the study was to determine the characterization of the edible film from the pectin of nutmeg with the addition of palmitic acid and glycerol as a plasticizer. The results showed that the increase in the concentration of pectin and palmitic acid tended to significantly increase the thickness of the edible film, the elongation rate and the tensile strength of the film, but it could decrease the water vapor transmission rate and the film solubility. The best treatment was a concentration of 30% wet pectin (w / v) and palmitic acid 0.04% (w / w) which resulted in the lowest water vapor transmission rate of 2.39 (g / mm / m^2 hour).

Keywords : Nutmeg, pectin, edible film

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005 (C-LS1)

THE SENSITIVITY EVALUATION OF *mt-DNA* GENE *Dehydrogenase subunit 5* (*ND5*), *D-Loop*, and *Cytochrom b* (*Cty-b*) TO DETECT PORK (*Sus scrofa*) DNA ISOLATE AND DNA FRAGMENT IN MEATBALL USING PCR TECHNIQUE

Joni Kusnadi[1,2*], *Noval Audi Ashari*[1]

[1]Department of Agricultural Product Technology, Faculty of Agricultural Technology, University of Brawijaya, Jl. Veteran, Malang, Indonesia
[2]Central Laboratory of Life Science, University of Brawijaya Malang, Jl. Veteran, Malang, Indonesia
[*]Corresponding author: joni.kusnadi@gmail.com, jkusnadi@ub.ac.id

ABSTRACT

The utilization of *mt-DNA* primers on previous study specific to detect DNA pork fragments. This study aims were to evaluate the sensitivity of *mt-DNA* primers (*ND5*, *D-Loop*, and *Cyt-b*) in pork DNA isolates and its meatball products. The sensitivity analysis was conducted in pork DNA isolates with concentrations (10, 1, 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}, and 10^{-6} ng/µ) and its meatballs product with variation of pork content (0%, 0.01%, 0.05%, 0.1%, 0.5%, 1%, and 5%). Furthermore, the DNA fragment amplification process was carried out using PCR technique. The amplification results showed that *ND5* and *Cyt-b* primers were more sensitive because they were able to amplify DNA with concentrations up to 10^{-3} ng/µl compared to *D-Loop* which was only able to amplify with concentrations up to 10^{-2} ng/µl. The sensitivity results using meatballs showed that *ND5* was the most sensitive primer in detecting meatballs with concentration of pork up to 0.01%. It can be concluded that *ND5*, *Cyt-b*, and *D-Loop* primers are able to detect pork DNA fragment with high sensitivity. The *ND5* primer gave the most sensitive amplification results because it was able to detect pork DNA fragments with the lowest concentration and meatball with the lowest pork content.

Keywords: DNA, mt-DNA, sensitivity, primer, pork

007

DETECTION OF RAT (*Rattus norvegicus*) DNA FRAGMENT USING SPECIES-SPECIFIC PRIMERS *mt-DNA 12S rRNA* and Cytochrome b (*Cyt-b)* WITH POLYMERASE CHAIN REACTION (PCR) TECHNIQUE

Ersita Putri Aisah[1], *Joni Kusnadi*[1,2*]

[1]Department of Agricultural Product Technology, Faculty of Agricultural Technology, University of Brawijaya Malang
[2]Central Laboratory of Science, University of Brawijaya Malang
Jl. Veteran, Malang 65145
[*]Corresponding author: joni.kusnadi@gmail.com, jkusnadi@ub.ac.id

ABSTRACT

A pair of species-specific *mt-DNA* primer *12S rRNA* has been designed based on rat (*Rattus norvegicus*) DNA sequences. In this study, the specificity test of *12S rRNA* primer was carried out and compared to *Cyt-b* primer to detect rat DNA fragment. Samples used in this research were non-halal animals meat consisted of rat, dog, pig and halal animals meat consisted of cow, chicken, sheep, and horse. Furthermore, DNA was isolated from animal meat using modification of chloroform isoamyl alcohol method then quantitatively tested for its DNA concentration and purity. Animal DNA isolates were amplified using *12S rRNA* and *Cyt-b* primers with PCR technique. PCR result was analyzed using agarose gel electrophoresis 1.5%. The amplification results showed that *12S rRNA* primer produced DNA band of 228 bp length and *Cyt-b* primer produced DNA band of 603 bp length. The amplification results showed that both of *12S rRNA* and *Cyt-b* primers were specific to detect rat DNA fragments. Thus, both of primers are recommended to be further tested for sensitivity and applied to processed meat products such as meatballs, sausages, and corned beef.

Keywords: 12S rRNA, mt-DNA, PCR, Primer

012 (C-LS4)

DIGESTION KINETICS STUDY OF BISCUITS MADE FROM KAPAS BANANA FLOUR USING LOGARITHM OF SLOPE (LOS) METHOD

G. Pramafisi[1], Y. Cahyana[2]

[1] Food Technology Department, Faculty of Agric. Industrial Technology, Padjadjaran University
[2] Laboratory of Food Chemistry, Department of Food Technology, Padjadjaran University
[*] Corresponding author: y.cahyana@unpad.ac.id

ABSTRACT

Banana, especially the green one, is a great source of starch and can be utilized to be processed into many products including biscuits. Digestible banana flour is reported to consist of rapidly and slowly digestible starch. The flour application in biscuit may change its digestibility due to moisture and heat treatment during baking. Therefore, this study was conducted to measure whether or not the flour still contains both the rapidly and slowly digestible starch following baking to biscuit dough. The digestibility was measured on starch extracted from biscuits. Two parameters i.e. the digestion extent and the rate constant were studied using a logarithm of slope (LOS) method. The digestibility curve of the starch was obtained by digesting the starch using α-amylase enzyme for 120 minutes. By plotting the changes of maltose concentration and the time changes in natural logarithm form (ln (dc/dt)) against time the LOS plot for the starch was obtained. Using this LOS plot the value of rate constant (k) and the concentration of product formed, in this case is the concentration of digested starch, in the end of reaction ($C\infty$) can be obtained. The digestibility phase (rapid and slow phase) can also be observed. Result shown that banana starch extracted from biscuits exhibited two phases of digestion with the rate constants at rapid (k_1) and slower phase(k_2) being respectively 6.02 x 10^{-2} min^{-1} and 0.72 x 10^{-2} min^{-1}. The total digestible starch (Tot $C\infty$) was approximately 14.68% to which the amount of digestible starch at slower phase ($C_2\infty$) contributed more significantly than that at rapid phase ($C_1\infty$). Our result demonstrates that banana flour applied in biscuit preserves its characteristics of rapidly and slowly digestible starch. LOS plot can be used to reveal the present of different starch fraction possessing different reactivity to amylase.

Keywords: Banana, flour, starch, digestibility, LOS plot

018

EFFECTS OF *Etlingera elatior* AND *Kaempferia galanga* EXTRACTS ON HUMAN LYMPHOCYTE PROLIFERATION IN VITRO

Novi Safriani[1,2], Fransisca Zakaria Rungkat[1], Nancy Dewi Yuliana[1], Endang Prangdimurti[1]*

[1] Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University
[2] Department of Agricultural Product Technology, Faculty of Agriculture, Universitas Syiah Kuala, Aceh
[*]Corresponding author: nancy_dewi@apps.ipb.ac.id

ABSTRACT

Etlingera elatior and *Kaempferia galanga* are rich in various bioactive compounds with the wide range of polarity that have beneficial effects on health, including as immunomodulators. Immunomodulator is substances or compounds that can modulate the function and activity of the immune system. One of the immunomodulator functions is to enhance lymphocyte cell proliferation activity so that active effector cells will be produced. The aim of this study was to evaluate the effects of *E. elatior* and *K. galanga* extracts on human peripheral lymphocyte proliferation in vitro. Dried and powder *E. elatior* flowers and *K. galanga* rhizomes were extracted with the comprehensive extraction method in duplicate to obtain several fractions with different polarity. The combination of solvents used was hexane, hexane-acetone, acetone, acetone-water, and water. There were 34 of *E. elatior* fractions and 32 of *K. galanga* fractions collected according to specified time intervals and subjected to proliferation activity testing. Measurement of lymphocyte cell proliferation activity was carried out using MTT test, expressed as stimulation index (SI). The results showed that acetone fractions exhibited the highest lymphocyte cell proliferation stimulation index for both *E. elatior* and *K. galanga* (1.92 to 2.02 and 1.86 to 2.03, respectively), followed by hexane and water fractions. Whereas hexane-acetone and acetone-water fractions of both *E. elatior* and *K. galanga* reduced the level of SI compared to control (RPMI media).

Keywords: E.elatior, K. galanga, human lymphocyte proliferation, comprehensive extraction

024

IDENTIFICATION OF FOOD NATURAL ANTIMICROBE COMPOUND FROM WARU LEAVES (*Hisbicus Tillacaeus L.*) EXTRACT BY GC-MC

Dewi Sartika[1], Samsu Udayana Nurdin[1], Neti Yuliana[1], Susilawati, and Wahyudi[2]

[1]Lecturer of THP Department, Faculty of Agriculture, University of Lampung
[2]Alumni of THP Department, Faculty Of Agriculture, University of Lampung
[*]Corresponding author: dewi.sartika@fp.unila.ac.id

ABSTRACT

Chicken is the most common source of animal protein in Indonesia due to its high protein content and low price. However, because of not standardized process,chicken meats sold in traditional market is mostly contaminated by phatogens bacteria such as *Eschericia coli*. Previous research indicated of waru (*Hibiscus tilianceus L.*) inhibited *Eschericia coli* growth. Therefore in this research, we aimed 1) to study whether antimicrobial activity of extracts of waru by GCMS, 2) to find out the activity of waru that have antimicrobial activity against *Eschericia coli* contaminant. The results showed that antimicrobial activity of waru and teak leave extracts depends on the respective proportion in the blend. Increasing of antimicrobial activity was observed when waru and leafs extract concentration wa increase in the mixture. The results of research showed that content of the leaves of waru was dominated by Phytol (38%); methyl ester (22,1%); Pentadecanoic acid,14-methyl-,Squalence (6,58%); Bis (2-ethylhexyl) phthalate (5,94%); and ester compound, that had an antimicrobe potency.

Keywords: *Agent chicken meat., Eschericia coli, natural antimicrobial, waru leaves*

025

ANTIOXIDANT CAPACITY AND ANGIOTENSIN CONVERTING ENZYME-INHIBITORY ACTIVITY FROM JOB'S TEARS *(Coix lacryma-jobi L.)* PROTEIN

*Hamidatun[1], Maggy Thenawidjaja Suhartono[1], Endang Yuli Purwani[2], Nurheni Sri Palupi[1], Sudathip Sae-tan[3]**

[1] Department of Food Science and Technology, Faculty of Agricultural Technology, Bogor Agricultural University, Darmaga Campus, Bogor 16002, West Java, Indonesia
[2] Indonesian Center for Agricultural Postharvest Research and Development, Jln. Tentara Pelajar No.12, Bogor 16114, Indonesia
[3] Department of Food Science and Technology, Faculty of Agro-Industry, Kasetsart University, 50 Ngamwongwan Rd. Ladyao, Chatuchak, Bangkok, Thailand
*Corresponding author: fagists@ku.ac.th

ABSTRACT

Protein from cereal has been known to have several bioactivities, namely antidiabetic, anticancer, immunomodulator, angiotensin-converting enzyme (ACE)-inhibitor, and antioxidant capacity. Little information is available on the bioactivity of the job's tears *(Coix lacryma-jobi L.)* protein. This study aimed to investigate the antioxidant capacity and ACE-inhibitory activity of job's tears protein. Proteins from job's tears flour were sequentially fractionated using distilled water, 0.5 M NaCl, 70% ethanol, and 0.1 M NaOH. The major protein fraction obtained from extraction by 70% ethanol was 0.49 mg protein/g flour while protein soluble 0.1 M NaOH was 12.29 mg protein/g flour. SDS-PAGE results showed protein soluble 70% ethanol has molecular sizes of 17 to 40 kDa while protein soluble 0.1 M NaOH has molecular sizes of 17 to 104 kDa. The protein soluble 70% ethanol exhibited the highest content of DPPH assay (0.18 µmol TE/mg protein), $ABTS^{\bullet+}$ assay (1.22 µmol TE/mg protein), and ACE-inhibitory activity (38.58%), as compared to that of other protein fractions ($P<0.05$). Amino acids composition of hydrophobic residue from protein soluble 70% ethanol are attributed to high antioxidant capacity. The results provide insights about the potential of job's tears protein as antioxidant and ACE inhibitory activity in food applications.

Keywords: ACE inhibitory activity, antioxidant, job's tears

028

EFFECT OF VARIOUS THERMAL MODIFICATION ON FUNCTIONAL AND PASTING PROPERTIES OF CORN STARCH

Herlina Marta[1], Yana Cahyana[1], Sarah Bintang[1]*

[1] Food Industrial Technology Department, Faculty of Agricultural Industrial Technology, Padjadjaran University, Bandung, Indonesia 45363

ABSTRACT

Native corn starch has a limited application, in order to improve its application in food industry, corn starch has to be modified. The present study, native corn starch has modified using several thermal modification methods, such as heat-moisture treatment (HMT), heat-pressure treatment (HPT), microwave-heating treatment (MHT), and osmotic-pressure treatment (OPT). The result showed that all modification treatments altered granule morphology, pasting and functional properties of native corn starch. After modification, granule surface of native corn starch become rough and presence some cracks. Furthermore, several starch granules in modified starch were agglomerated and cohesive. All modified starch showed a decrease in swelling volume and an increased in water absorption capacity, gel strength and syneresis compared the native starch. Thermal treatment induced an increase in pasting temperature and a reduction in breakdown and setback viscosity (except MHT). OPT showed in the pronounced change of pasting temperature, peak and breakdown viscosity.

Keywords: Corn starch, thermal modification, pasting properties, functional properties

034

α-GLUCOSIDASE INHIBITORS FROM *Syzygium polyanthum* LEAVES AS REVEALED BY NMR- AND HPLC-METABOLOMICS

Nancy Dewi Yuliana[1,4], Mohamad Ana Syabana[1,2], Irmanida Batubara[3,4], Dedi Fardiaz[1]*

[1] Department of Food Science and Technology, IPB University, Bogor, Indonesia
[2] Department of Food Technology and Indonesia Center of Excellence for Food Security, Sultan Ageng Tirtayasa University, Serang, Indonesia
[3] Department of Chemistry, IPB University, Bogor, Indonesia
[4] Tropical Biopharmaca Research Center, IPB University, Bogor, Indonesia
[*] Corresponding author: nancy_dewi@apps.ac.id

ABSTRACT

Type 2 diabetes mellitus (T2DM) is one of high prevalence degenerative diseases in Indonesia. Unhealthy diet was reported as one of the triggers for T2DM, while food-based plants have been reported to reduce the risk. *Syzygium polyanthum* leaves (daun salam) are well-known condiments in Indonesian dishes. It is also traditionally used to cure diabetes. However, its scientific evidence is limited. This research aimed to identify compounds responsible for α-glucosidase inhibitor activity of the leaves' extract using metabolomics approach. The dried leaves of *S. Polyanthum* were fractionated using an accelerated solvent extractor with *n*-hexane, *n*-hexane/acetone combination (4/1, 3/2, 2/3, 1/4), acetone, acetone/water combination (4/1, 3/2, 2/3, 1/4), and water as elution solvent. The fractions were collected, dried and divided into two parts. Half volume of each fraction was subjected to α-glucosidase inhibition analysis, while another part was used for chemical profiling using NMR and HPLC. ^{1}H-NMR and HPLC data together with bioactivity data were subjected to OPLS analysis to identify compounds strongly correlate to the activity. The most active fraction was subjected further to 2D NMR and UHPLC-HRMS for clearer identification. It was found that epigallocatechin-3-gallate (EGCG) and myricertin-3-O-rhamnoside (myricitrin) were present in the most active fraction and strongly associated with the activity of *S. polyanthum*. This result was supported by docking analysis which showed that myrcitrin and particularly EGCG, had binding energy and inhibition constant close to that of acarbose. Further confirmation by testing reference compounds is recommended to further validate this result.

Keywords: Syzygium polyantum, daun salam, α-glucosidase inhibitor, diabetes, *OPLS*

035 (C-LS5)

MALONALDEHYDE LEVEL OF ADMINISTRATION ETHANOL EXTRACT OF PURPLE SWEET POTATO VAR. *Ayamurasaki* IN DOCA-SALT HYPERTENSIVE RATS

Irma Sarita Rahmawati[1], Soetjipto[2], Annis Catur Adi[3], Aulanni'am[4]

[1]Department Nutrition, Faculty of Medical, Brawijaya University, Malang, 65145, Indonesia
[2] Department Biochemistry, Faculty of Medical, Airlangga University, Surabaya, 60115, Indonesia
[3]Department Nutrition, Faculty of Public Health, Airlangga University, Surabaya 60115, Indonesia
[4]Faculty of Veterinary Medicine, Brawijaya University, Malang, 65145, Indonesia
[*] Corresponding author: irma_sr@ub.ac.id

ABSTRACT

There is an increasing amount of evidence that oxidative stress related to hypertension can damage the function of diverse structures such as aorta. It is a well-established fact that chlorogenic acid and anthocyanine found in purple sweet potato generates bioactive compound with antihypertensive and antioxidant activities. The present study sought to investigate antioxidant activity of extract ethanol of purple sweet potato (EP) in *deoxycorticosterone acetate* (DOCA–salt)–induced hypertensive rats (*Rattus norvegicus*). The rats were orally administrated a 95% ethanol extract of purple sweet potato (var. *Ayamurasaki*) (EP) in a daily dose of 200 and 400 mg/kg body weight for 4 weeks. Aorta total malondialdehyde (MDA) and histopathology of aorta abdominal were examined. Aorta injury was observed in DOCA-salt hypertensive group rats compared to normotensive group rats, as aorta MDA significantly increased ($P < 0.05$). In contrast, treatment of DOCA-salt hypertensive rats with different dose of EP significantly reduced the total aorta MDA, as well as repair kidney damage, suppressed smooth muscle cell proliferation and lessen aorta wall thickening compared to controls. This is the first report that demonstrated blood pressure lowering and antioxidative effects of an ethanol extract of purple sweet potato, containing chlorogenic acid, in a DOCA–salt model of hypertension.

Keywords: Extract ethanol of purple sweet potato (EP), DOCA–salt, chlorogenic acid, antioxidant, malondialdehyde (MDA)

036

ANTIOXIDANT ACTIVITY, TOTAL PHENOL AND FLAVONOID CONTENT OF RICE CONJUGATED WITH MIXTURES OF TURMERIC, CINNAMON AND GUAVA LEAF USING FREE RADICAL GRAFTING METHODS

Samsu Udayana Nurdin[1], Elisa Handayani[1], Siti Nurdjanah[1], Fibra Nurainy[1]*

[1]Department of Agriculture Product Technology, Faculty of Agriculture, University of Lampung
* Corresponding author: samsu.udayana@fp.unila.ac.id

ABSTRACT

This study was aimed to determine antioxidant activity, total phenol, and flavonoids content of rice conjugated with various mixtures of turmeric, cinnamon, and guava leaf using the free radical grafting (FRG) method . The treatments were arranged in a Complete Randomized Block Design (CRBD) with a single factor namely proportion of turmeric, cinnamon, and guava leaf in the mixture (without herbal mixture (C1), 1.00g:0.50g:1.50g (C2); 1.33g:0.67g:1.00g (C3); 1.67g:0.83g:0.50g (C4);, 2.00g:1.00g:0.00g (C5); and 1.00 g:0.50g:1.50g without the FRG method (C6M) with four replications. The homogeneity of the data was tested using Bartlett test and data addivity was tested using Tuckey test. Analysis of variance was applied to test the effect of the treatments and to obtain an estimated error of variance. The data then were tested further using the Least Significant Difference (LSD) test that was performed at a 5% significance level. The results showed that the proportion of herbal significantly affected the antioxidant activity, total phenol and flavonoid content of rice conjugated with turmeric, cinnamon and guava leaf usingFRG method. The herbal mixture of C3 has the highest antioxidant activity (27.256% DPPH method) and 28.082% (ABTS method) whereas total phenols and flavonoid content reached 66,000 ppm (GAE) and 48,500 ppm (EE), respectively.

Keywords: Antioxidant, cinnamon, flavonoid, guava leaf, phenols, rice, turmeric

040

VALIDATION OF PORCINE DNA ANALYSIS METHOD FOR FOOD PRODUCTS BY USING SELECTED PRIMER AND EXOGENOUS INTERNAL POSITIVE CONTROL IN REAL-TIME PCR

Heryani[*1], *Siti Nurjanah*[2], *Didah Nur Faridah*[3] , *Raafqi Ranasasmita*[4]

[1] Halal Laboratory of LPPOM MUI, Jl. Pemuda No. 5, Bogor, 16161, Indonesia
[2] SEAFAST Center IPB, Department of Food Technology, IPB University, Bogor, 16002, Indonesia
[3] SEAFAST Center IPB, Department of Food Technology, IPB University, Bogor, 16002, Indonesia
[4] Halal Laboratory of LPPOM MUI, Bogor, 16161, Indonesia
* Corresponding author: heryani@halalmui.org

ABSTRACT

Porcine DNA analysis is commonly applied in the halal certification process and post-market monitoring. The absence of a standardized method requires that such approach to be validated. This study will validate porcine DNA analysis method in real-time PCR by verifying selected primer and exogenous internal positive control in terms of specificity, sensitivity, linearity, PCR efficiency, and robustness. We evaluate specificity of 23 positive samples (porcine-containing) and 23 negative samples (absent in porcine). In positive samples, the porcine gelatin capsule showed the highest true positive result (Ct 35.69 ± 0.95), but porcine collagen and collagen peptide caused false-negative results. Three negative samples showed false-positive results with Ct greater than 42.26. This method is sensitive to detect 0.01 ng/µL as LOD point, with Ct 33.29 ± 0.92, having linearity (r^2) of 0.996 and PCR efficiency (ε) 96.32. This method is robust since amplification could occur regardless several changes in master mix types and volume, concentration of primer and probe, and annealing temperature. This method also resistant to several inhibitors, such as alginate, cellulose, EDTA, calcium ions, collagen peptide, and polysaccharides at 1 µg/µL concentration. The added internal positive control is useful in detecting potential inhibitor.

Keywords: Validation, porcine, DNA, internal positive control, real-time PCR

045

POTENTIAL OF PROBIOTICS TO REDUCE THE RISK OF CARDIOVASCULAR DISEASE

Andi Dahlan[1], Lilis Nuraida[1,2], and Puspo Edi Giriwono[1,2]*

[1]Departement of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
[2]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Bogor, Indonesia
*Corresponding author : lnuraida@gmail.com

ABSTRACT

Probiotics are live microorganisms that, when given in adequate amounts, confer various health benefits to the host. Probiotics have been recognized for their several health-promoting properties such as preventing and reducing diarrhea symptoms, modulating the immune system, preventing allergy reactions, lowering cholesterol level, overcoming lactose intolerance, and preventing various illnesses such as colitis, type 2 diabetes mellitus, liver steatosis, *Salmonella* infection, *Helicobacter pylori* infection, stomach inflammation, cancer, and tooth decay. Recently, the cholesterol-lowering ability of probiotics has gained more attention both *in vitro*, animal test, and human clinical trials. The prominent probiotic bacteria are *Lactobacillus* and *Bifidobacteria*. Many studies have proven that probiotics can effectively lower blood lipid profile, such as lowering total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), Triglycerides (TG), while increasing high-density lipoprotein cholesterol (HDL-C). The cholesterol-lowering activities of probiotics have been reported to originate from deconjugation of bile acid by bile salt hydrolase (BSH), co-precipitation of cholesterol with deconjugated bile, cholesterol binding to the cell wall and cholesterol assimilation, cholesterol conversion into coprostanol, and inhibition of cholesterol synthesis by probiotic-derived short-chain fatty acid (SCFAs).

Keywords: Probiotics, hypocholesterolemia, cardiovascular

046

PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITIES OF BEE POLLEN EXTRACTS FROM STINGLESS BEES *(Trigona spp.)*. IN DIFFERENT SOLVENT

*IL. Kayaputri[1], B. Nurhadi[2], D. M. Sumanti[2], Mahani[2], Zaida[2], Sarah Az Zahra[2]

[1]Department of Agriculture, Padjadjaran University
[2]Department of Food Industrial Technology, Faculty of Agriculture Industrial Technology, Padjadjaran University
* Corresponding author: indira.lanti@unpad.ac.id

ABSTRACT

Bee pollen from stingless bee (*Trigona spp.*) is one of the natural products that has the potential as a source of antioxidants with phytochemical compounds that are more diverse than other species. The extraction method for bee pollen would be maceration with water and ethanol 70% as the polar solvent, ethyl acetate as the semipolar solvent, and n-hexane as the nonpolar solvent. This study aims to determine the effect of of each solvent on the phytochemicals and antioxidant activities of stingless bee's bee pollen (*Trigona spp.*). *Phytochemical screening, and test the antioxidant activity with* DPPH (2-diphenyl-1-picrylhidrazyl) radical capture method *been done*. The test results shows that variations in polar, semi-polar, and non-polar solvents influence the amount of yield, phytochemical content of compounds, and antioxidant activity. Aquades extract has the highest yield of 19.07%, presumably most of the active components contained in bee pollen are polar. The results of the antioxidant activity test showed that the solvent that produced an extract with a strong category was ethanol 70% with an IC_{50} value of 151.53 ppm. Phytochemical screening results showed extracts with 70% ethanol solvent containing the most compounds namely alkaloids, phenolics, flavonoids, saponins, and triterpenoids.

Keywords: Antioxidant, bee pollen, extraction, phytochemical screening, solvent

047

THE POTENTIAL OF LACTIC ACID BACTERIA IN PRODUCING BIOACTIVE PEPTIDE AS ANTIOXIDANT IN FERMENTED MILK

Afifah Puji Hastuti[1], Lilis Nuraida[1,2] and Hanifah Nuryani Lioe[1]

[1] Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor, Indonesia

[2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center,IPB University, Bogor, Indonesia

[*] Corresponding author : lnuraida@gmail.com

ABSTRACT

Free radicals are atom or molecules that containing one or more unpaired electrons. Free radicals will attract electrons from other compounds to achieve stability when reactivity in the body increase. These reactions occur in a chain and cause cells damage and also oxidative stress. Oxidative stress is a condition that occurs because of an imbalance between free radicals and antioxidants in the body. In these conditions, antioxidants are needed to inhibit oxidation reactions by free radicals. Some lactic acid bacteria (LAB) are reported to be able to produce bioactive peptides as antioxidants in fermented milk, such as *Lactobacillus kefiri, Lactobacillus rhamnosus, Lactobacillus casei, Lactobacillus delbrueckii, Lactobacillus bulgaricus, Streptococcus thermophilus, Leuconostoc lactis* and *Lactobacillus helveticus.* Milk contains protein which is a source of bioactive peptides that have potential as antioxidant. During fermentation process, LAB is able to hydrolyze protein into free amino acids and molecule of peptides based on the differences in the protease enzymes produced by each species. LAB has 3 main parts of the proteolytic system, the first part is the protease in the cell envelope proteinase (CEP) contained in the LAB's cell wall as the initial hydrolysis stage of proteins or polypeptides into smaller oligopeptides or peptides. The second part is the transport system that carries oligopeptides into the cell, and the third part is the intracellular protease. Bioactive peptides produced by LAB can be derived from early stage hydrolysis by CEP outside cells and originate from intracellular protease activity which is released into the environment during autolysis. Bioactive peptides which are considered as antioxidant in fermented milk have been detected from the parent proteins β-casein dan κ- casein with molecular size of peptide ≤ 3 kDa. The antioxidant activity of peptides that have potential as antioxidant depend on amino acid sequence, amino acid composition, and concentration. However, antioxidant activity of fermented milk and unfermented milk are different. The antioxidant activity in fermented milk depend on specific strain, time of fermentation, and type of substrate that used in the fermentation process.

Keywords: Antioxidant, bioactive peptide, fermented milk, hydrolysis, lactic acid bacteria

048

POTENTIAL COMPOUNDS FROM CASHEW LEAF (*Anacardium occidentale* L) AS ANTIVIRAL-SARS-CoV-2: IN SILICO STUDY

Willy Wijayanti[1], *Nancy Dewi Yuliana*[2*], *Endang Prangdimurti*[2], *Setyanto Tri Wahyudi*[3]

[1] Graduate School of Food Science, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
[2] Department of Food Science and Technology, Faculty of Agriculture Engineering and Technology, IPB University, Bogor, Indonesia
[3]Department of Physics, Faculty of Mathematics and Natural Sciences, IPB University, Bogor, Indonesia
[*] Corresponding author: nancy_dewi@apps.ipb.ac.id

ABSTRACT

The recent coronavirus (SARS-CoV-2) has caused millions of infections and more than hundreds of thousands of deaths. In this study, we aimed to analyze the potential of several compounds contained in cashew leaf to inhibit SARS-CoV-2 based on molecular docking. Taking RNA-depending RNA-polymerase (RdRp) as the target protein (receptor), the molecular docking between 27 compounds (ligand) and target protein was done by molecular docking software which is AutoDock Vina. This docking obtained the binding energy and reported through the dissociation constant (Kd). The smaller Kd, the higher affinity which indicate the binding of ligand and receptor was more strong. The result showed that all compounds other than Antocyanidins have a lower Kd within the range 1.96E-5 to 3.22E-8 compared to Remdesivir as control with the Kd of 5.24E-6. This analysis revealed the top five compounds with the highest potential inhibitors of SARS-CoV-2 at the molecular level are Amentoflavone (3.22E-8), Epicatehin-3-gallate (1.42E-7), Quercetin-3'-xyloside (1.97E-7), Orientin 2"-O-gallate (1.97E-7), and Agathisflavone (2.73E-7). This study will provide new lead compounds and target for further in vitro and in vivo research.

Keywords: Cashew leaf, molecular docking, SARS-CoV-2

049

INDIGENOUS INDONESIAN PLANTS AS A SOURCE OF ANTIOXIDANTS TO TREAT GASTROINTESTINAL DISORDERS

Diny A Sandrasari[1,2], Nuri Andarwulan[1,3], Didah Nur Faridah[1], Fitria Nur Annisa Dewi[4]

[1]Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University
[2]Department of Food Science, Faculty of Food Science and Health, Sahid University, Jakarta, Indonesia
[3]Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University
[4]Primate Animal Study Center, IPB University, Bogor, Indonesia

ABSTRACT

Gastrointestinal tract, a part of the human digestive system is an important organ that is vulnerable to different disorders which contribute substantially on worldwide morbidity and mortality rates, including in Indonesia. The majority of the people in Indonesia are still using indigenous plants as medicine to treat these infections or diseases. This study aims to inventory Indonesian indigenous plants and determine their potential level in treating gastrointestinal disorders. The plants are inventoried through searching national, international literature and Indonesian medicinal plants books. Manual library search by Google Scholar and database search engine from PubMed, ScienceDirect and Scopus. Furthermore, determining the level of potential plants were analyzed by comparing the value of total phenolic content with antioxidant activity using XLSTAT program. Obtained results from the literature search showed that 54 species of indigenous Indonesian plants of 32 families were recorded as being used by the Indonesian population to treat gastrointestinal disorder. Gastrointestinal disorders that heavily utilize indigenous plants are diarrheal, constipation, gastric ulcer and gastritis. Parts of plants are most widely used in sequence are the leaves (40%), fruit (24%), rhizomes (18%), seeds (9%), flowers (5%) and stems (4%). Zingiberaceae was the most dominant family reported to be used for the treatment of these infections (10 plants). Indonesian indigenous plants containing bioactive compounds such as alkaloids, flavonoids, saponins, tannins, steroids, terpenoids and phenolics that can serve as a source of antioxidants to treat gastrointestinal disorders. Five Indonesian indigenous plants with the most potential as a source of antioxidants to cope with gastrointestinal disorders is Zingiber officinale L, Annona muricata, Phyllanthus niruri, Curcuma longa and Curcuma xanthorrizha.

Keywords : *Plant, indigenous, antioxidant, gastrointestinal*

052

AUTHENTICITY ASSESSMENT OF BEEF, PORK, BUFFALO AND WILD BOAR MEAT USING COLORIMETRIC, IMAGE ANALYSIS AND MUSCLE TISSUE MICROSTRUCTURE ANALYSIS

Fayca Rudhatin Swartidyana[1], Joko Hermanianto[1], Nancy Dewi Yuliana[1], I Ketut Mudite Adnyane[2]*

[1] Department of Food Science and Technology, IPB University
[2] Department of Anatomy, Physiology and Pharmacology, Faculty of Veterinary Medicine, IPB University
[*] Corresponding author: nancy_dewi@apps.ipb.ac.id

ABSTRACT

The development of authenticity analytical methods in meats has become increasingly important to evaluate their quality in relation to different factors such as origin, type of muscle, adulteration and authenticity. In this study, colorimetric, image analysis and tissue muscle microstructure methods were implemented to characterize and classify meat and muscle types from halal and non halal species. Two types of muscle (*Semitendinosus* and *Vastus lateralis*) and four types of meat (beef, pork, buffalo and wild boar) were selected. Multivariate data analysis (PCA, principal component analysis) was used to observe classification pattern among species using the most appropriate color parameter data from chromameter measurement, those are L*, a*, b*, h, C*. Similar analysis was conducted for colour intensity from meat images taken by Nikon D4600. Light source was light-emitting diode (LED) lamp. The result showed that PCA successfully classified meat from different species and different muscle type. Specifically at chromameter, pork had highest lightness (L*) value than others. Buffalo revealed higher redness (a*), whilst beef had higher yellowness (b*), and wild boar had higher chroma (relative saturation, C*) value. *Vastus L.* had a thicker colour. Besides that, beef, buffalo and wild boar had similar colour. At image analysis, pork had highest L* value also, and the colour of wild boar meat was resembled with beef and buffalo. Whereas, 6 textural features in image analysis (Angular Second Moment, Contrast, Correlation, Homogeneity, Energy and Dissimilarity) had not been able to classify types of meat and muscle well. In the next step, the microstructure of muscle tissue analysis using hematoxylin-eosin staining technique revealed the differences of skeletal muscle fibre area in cattle, buffalo, pig and wild boar. The muscle fibre area was higher in all muscles of cattle, then buffalos, pigs and wild boars respectively.

Keywords: Meat, color, image analysis, muscle microstructure, multivariate data analysis

053

PREDICTIVE MICROBIOLOGY: CONTROLLING BIOSAFETY OF RETAIL COMMODITY USING RTU AND CHROMOGENIC MEDIA

Nurhayati Nurhayati[1,2], Maria Belgis, Enny Suswati, Umi Purwandhari[3]*

[1]Department of Agricultural Product Technology, Faculty of Agricultural Technology, University of Jember, East-Java, Indonesia

[2]Faculty of Medicine, University of Jember, East-Java, Indonesia

[3]Department of Agricultural Industry Technology, Faculty of Agricultural, University of Trunojoyo, Madura, Indonesia

*Corresponding author: nurhayati.ftp@unej.ac.id

ABSTRACT

Food safety is a complex matter for the food chain from farm to fork. Microbial contamination in food products not only causes decay but can also cause foodborne diseases. This study conducted a predictive comparison of the safety of frozen retail products from microbial contaminants using RTU (ready to use) media and chromogenic media. Frozen retail products was represented by processed fish products. This is because fish is a preferred source of protein for bacteria. Sampling was conducted using simple random sampling. Products was modeled by storage at freezing temperature, refrigerator temperature and room temperature. It was known that enteric bacteria contamination on frozen fish products reaches 2 cfu/g, while according to SNI, the contamination allowed for *Escherichia coli* is less than 3 cfu/g. Frozen processed fish retail products at room temperature storage can be contaminated by microbes during second day storage. Storage at freezing temperature or refrigerator temperature did not contaminated during fourth day temperature. Population of enteric bacteria contamination on processed frozen fish products during room temperature storage reach 10^3 cfu/g (3.75 $\log_{10}$ cfu/g). Investigations using chromogenic media had different results using RTU media with a difference value of up to 1 log cycle. Investigations using RTU have validation values for fellow target microbes up to 80.16% compare than chromogenic media. Therefore it is advisable to carry out investigations with reference to one method so that it is not confusing. Each method can be used to view the result profile of each.

Keywords: Chromogenic, foodborne, frozen fish product, room temperature

054

PRODUCTION OF BIOACTIVE COMPOUNDS BY LACTIC ACID BACTERIA

Hendry Noer Fadlillah[1,3], Lilis Nuraida[2]*

[1]Food Science, IPB University
[2]SEAFAST Center IPB
[3]International University Liaison Indonesia
*****Corresponding author: lnuraida@gmail.com

ABSTRACT

Consumer's awareness to the healthier food is increasing. Nowdays, food is not only to satisfy hunger and to provide basic nutrients, but it can also provide additional benefits beyond basic nutrition to improve wellbeing. The latest function is expressed by functional foods. Functional food has important role to reduce the risk of chronic diseases, such as cardiovascular disease, Alzheimer, cancer, etc. It becomes opportunity for industries to produce healthier products. Many traditional fermented foods have been consumed for long times and recently many researches showed that many fermented foods have health beneficial effect. Fermentation has been reported being able to increase the functionality of food. During fermentation of various foods, lactic acid bacteria (LAB) can produce several bioactive compounds such exopolysaccharides, conjugated linoleic acid (CLA), Gamma-Amino Butyric Acid (GABA), bioactive peptide, vitamin and bacteriocin. LAB fermentation are also able improve bioavailability of isoflavone, by converting glucoside form into aglycone one; and minerals, by antinutrient degradation and/or pH reduction. Production of bioactive compounds during fermentation depend on several factors, including substrates, cultures, process, and environment condition.

Keywords: Lactic acid bacteria, isoflavones, GABA, bioactive peptide, exopolysaccharide

059

DESIGN OF WASTE WATER TREATMENT PLANT FOR HOSPITAL

Nizar Kamil Perwira[1], *Kris Tri Basuki*[1*], *Nofriady Aziz*[3], *Nuradam Effendy*[2]

[1] Polytechnic Institute of Nuclear Technology BATAN, Yogyakarta
[2] Pusat Teknologi Bahan Bakar Nuklir, Serpong
[3] Pusat Reaktor Serba Guna BATAN, Serpong
*****Corresponding author: nofriadyaziz@gmail.com

ABSTRACT

Many methods have been done to treat hospital waste water before it's disposed into the environment because it's containing high organic matters and chemical compounds so it's harmful for environment. In this research, we designed Wastewater Treatment Plant (WWTP) so the output will fulfill environmental quality standard and can be disposed into the environment. The design of WWTP uses chemical and physical process to reduce high chemical compounds and organic matters in hospital waste water. The purpose of this research is to design WWTP in hospital, determine the output waste from WWTP and can be used as a basis in the calculation of WWTP. The research method is to design WWTP and calculation result output of design WWTP (Waste Water Treatment Plant). The WWTP design is consist of equalization bath, bath coagulation, chlorination and sump. Based on the result, one of waste water of hospital in Indonesia with discharge is 60 m^3/day, the result BOD is 44.87 mg/L, COD is 19.24 mg/L, and TSS is 56.68 mg/L. Waste water of hospital processed from this WWTP can to be disposed into environment based on Minister of Health decree.

Keywords: WWTP, chlorination, quality standards

060

WASTE WATER TREATMENT OF HOSPITAL FOR DRINKING WATER SCALE WITH OZONATION METHOD

Nuradam Effendy[1], *Kris Tri Basuki*[2*], *Nizar Kamil Perwira*[2], *Nofriady Aziz*[3]

[1] Pusat Reaktor Serba Guna BATAN, Serpong
[2] Polytechnic Institute of Nuclear Technology BATAN, Yogyakarta
[3] Pusat Teknologi Bahan Bakar Nuklir, Serpong
*****Corresponding author: nofriadyaziz@gmail.com

ABSTRACT

Waste water from the hospital is containing organic compounds, chemical compounds and pathogenic microorganisms. Various studies have been done to process the hospital waste to fit quality standards so it can be disposal into the environment, but in this research, we conducted waste water treatment of hospital for drinking water using ozonation so the output not only fulfills as environmental quality standards, but it's expected output of hospital can be used as drinking water. Ozone is used as a disinfectant for killing microorganisms and water. The purpose of this research is to know the characteristics of wastewater in the hospital, know the results processed use the design of the hospital with ozonation if it is appropriate with drinking water standards. The research method is to study treatment of hospital waste water so that we can obtain WWTP and calculation result output of design WWTP (Waste Water Treatment Plant). The WWTP design made consisting of equalization bath, bath coagulation, ozonation bath and sump. Based on result, one of waste water of hospital in Indonesia with discharge is 28 m^3/day, the result BOD is 0.75 mg/L, COD is 2.4 mg/L, TSS is 18.94 mg/L, TDS is 1.81 mg/L and Total Coliform is zero. Waste water of hospital processed from this WWTP can be used as drinking water based on Minister of Health decree.

Keywords: WWTP, microorganism, drinking water

070 (C-LS2)

QUANTIFICATION OF LACTIC ACID AS SECONDARY METABOLITE OF LACTIC ACID BACTERIA ISOLATED FROM MILK AND ITS DERIVATIVED PRODUCTS

Fifi Afiati[1], Fitri Setiyoningrum[1], Gunawan Priadi[1], Vania Qyasaty[2]

[1]RC Biotechnology – LIPI, Jl. Raya Bogor, Km. 46 Cibinong 16911
[2]Brawijaya University, Malang
*****Corresponding author: afiati.biotek@gmail.com

ABSTRACT

Lactic acid is a widely used secondary metabolite product. Titrated Total Acid (TTA) analysis is one of method to learn quantification process of lactic acid as a secondary metabolite of Lactic Acid Bacteria (LAB). The TTA test was carried out on 158 isolates from 11 samples with 2 replications using culture supernatant. The test was started with preparing growth media then rejuvenating the culture. NaOH 0.1 N, oxalic acid 0.1 N, and PP 1% indicator were prepared as reagents for analysis. As the result, the smallest TAT value is shown in the 1-Sa-L sample with a TAT value of 0.41% and the largest TAT value is shown in the KGL-5 sample with a TAT value of 1.56%.

Keywords: Lactic acid, lactic acid bacteria, total acid test, Secondary metabolite

071

AWARENESS OF MILLENNIALS CONSUMERS IN KEBUMEN REGENCY TOWARDS INFORMATION ON LABEL AND EXPIRE DATE OF FOOD PRODUCT

Dinda Rana Athaya[1], Lilis Nuraida[1,2], Nugraha Edhi Suyatma[1]*

[1] Department of Food Science and Technology, IPB University, Bogor, 16680, Indonesia
[2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, and Department of Food Science and Technology, IPB University, Bogor, 16680, Indonesia
[*] Corresponding author: ranadindaath@gmail.com

ABSTRACT

Label in food packaging should provide necessary information to the consumers regarding nutrition and safety of the product. This study aimed to evaluate awareness of millennial consumers on the information written in the label of packaged foods and the expired date. The research was conducted in Kebumen Regency, involving 185 respondents aged 18-24 years and 133 respondents aged 25-40 years. This study used an online survey using Google Forms application which was distributed through social media. The result showed 35,8% respondents of aged 18-24 years and 72,20% respondents of aged 25-40 years stated that they always read labels before purchasing packaged foods. Respondents of aged 18-24 years considered expire date, nutrition fact and product brand as the top three very important information on food labels whereas product registration number (MD/ML/PIRT) was considered as least important in choosing particular food products. Meanwhile, respondents of aged 25-40 years considered expire date, food health claim and nutrition fact as the top three very important information on food labels. Both groups consider the expire date information was the most important information among other information on the package. Most of the respondents stated that they always read expire date information and affected their purchase decision. However, there are still respondents who choose to buy products with no expiration date and choose to keep eating expired products that they find in their home because the condition of the product looks good. Statistical analysis showed gender, education and income did not relate to the frequency of consumers reading the label and expiration date information.

Keywords: Food labels, millennial, date label, expired date, packaged foods

075

KNOWLEDGE AND PERCEPTION ABOUT PROBIOTICS AMONG UNIVERSITY STUDENTS IN JAKARTA METROPOLITAN AREA

Krisa Refita[1], Lilis Nuraida[1,2], Hanifah Nuryani Lioe[1]*

[1]Department of Food Science and Technology, Faculty of Agricultural Technology, IPB University, Bogor, Indonesia, 16002
[2]Southeast Asian Food and Agriculture Science and Technology (SEAFAST) Center, IPB University, Bogor, Indonesia, 16002
* Corresponding author: krisa_reff@apps.ipb.ac.id

ABSTRACT

Probiotics are well-known to their health benefit to human. Probiotic applications include supplements and functional foods. Despite the rise of global consumer interest and demand of the product, reported studies regarding the knowledge and perception towards probiotics are still limited. This research aimed to investigate the existing knowledge and perception about probiotics among students enrolled in colleges in Greater Jakarta region, particularly to find out differences of the variable between life and health science-based student group (LHS) and a group of students having neither life nor health science subjects (N-LHS). Cross-sectional study was conducted among 200 college students within 18–35 years of age. The data was collected through self-administered questionnaire distributed online using google form. The information collected included knowledge about probiotics, consumption practice, and perception regarding buying decision. The results showed that the students with science background tend to have better knowledge on probiotic, its benefit and handling of the products. Most of respondent has experienced in consuming probiotic or cultured products, but only few consumed probiotic supplement. However the consumption was mostly when needed. The products that were mostly consumed was fermented drink followed by yoghurt with probiotic claim. The respondents' decision in buying probiotic product or cultured products was affected by flavors, followed by probiotic claim. The background of the respondents significantly affected their consumption of probiotic products/cultured products.

Keywords: Probiotics, knowledge, perception, cross-sectional survey, university students

076

ANALYSIS OF CORRELATION BETWEEN TOTAL CHLOROPHYLL CONTENT AND COLOR INTENSITY IN BAMBU DURI (*Bambusa bluemana*) LEAVES EXTRACT

Ni Made Sri Wahyuni[1], *Luh Putu Wrasiati*[1]*, *Amna Hartiati*[1]

[1]Department of Agroindustrial Technology, Faculty of Agricultural Technology, Udayana University
* Corresponding author: wrasiati@unud.ac.id

ABSTRACT

Bambu duri leaves are known to contain many bioactive compounds, one of which is chlorophyll. Chlorophyll is a green pigment found in leaves which is often used as a natural food colorant. This study aims to: (i) determine the effect of temperature and maceration time on total chlorophyll content and color intensity of bambu duri leaf extract, (ii) the correlation between total chlorophyll content and color intensity (L, a*, b*). This study used a factorial randomized block design with two factors. The first factor is the maceration temperature consisting of 30, 45, and 60°C. The second factor is the maceration time consisting of 24, 36, and 48 hours. Data were analyzed by analysis of variance and continued with the Tukey's test. Correlation analysis using Pearson correlation analysis. The results showed that the interaction between temperature and maceration time had a very significant effect on the total chlorophyll content and color intensity of the bambu duri leaf extract. Correlation analysis between total chlorophyll content and color intensity (L, a*, b*) showed r = -0.989, r = -0.971, and r = 0.981. These results indicate that there is a very strong relationship between total chlorophyll content and color intensity (L, a *, b *) of bambu duri leaf extract.

Keywords: Bambusa blumeana, total chlorophyll, correlation, color intensity

077 (C-LS3)

CONTINUOUS PRODUCTION OF TEMPE-BASED BIOACTIVE PEPTIDES IN ENZYMATIC MEMBRANE REACTOR (EMR)

Azis Boing Sitanggang[1,2*], *Julius Sumitra*[1], *Slamet Budijanto*[1,2]

[1] Dept. Food Science and Technology, IPB University
[2] SEAFAST Center, IPB University
[*] Corresponding author: boing.lipan@apps.ipb.ac.id

ABSTRACT

In our previous study, it was shown that tempe-based bioactive peptides prepared from batch-wise papain hydrolysis, and filtered through UF membrane could increase both antioxidant- and Angiotension-I converting enzyme (AICE) inhibitory activity. Because the limitations of batch production (*i.e.*, unproductive time and batch-to-batch product quality oscillation), within this study, production of these bioactive peptides was done continuously using the developed enzymatic membrane reactor (EMR).The investigation was focused especially on the influences of enzyme-to-substrate (*E/S*) ratio and residence time τ. Based on the rejection level (R > 99.99%) and transmembrane pressure (TMP) increase during papain filtration, 10 kDa MWCO PES membrane was selected, and used for further investigations. Reacting conditions with E/S: 10% and τ = 9 h, N = 300 rpm and T = 40^{o}C were found as the optimum operational conditions to obtain the highest functional activities of hydrolysates in terms of antioxidant- and AICE inhibitory activity. The values of IC_{50} for antioxidant and AICE inhibition were 0.2359±0.0080 and 0.1293±0.0032 mg/mL, respectively. In conclusion, through the developed reactor system, it is feasible to produce tempe-based bioactive peptides with enhanced antioxidant and AICE inhibitory activity.

Keywords: Angiotension-I converting enzyme (AICE), antioxidant, enzymatic membrane reactor (EMR), functional ingredient, papain

081

MICROBIOLOGICAL, CHEMICAL, AND SENSORY CHARACTERISTICS OF RUSIP PRODUCTS FROM BANGKA

Lutfi Yulmiftiyanto Nurhamzah[1], Hanifah Nuryani Lioe[1], Dede Robiatul Adawiyah[1,2], Harsi Dewantari Kusumaningrum[1]*

[1] Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor 16680, West Java, Indonesia
[2] Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, IPB University, Bogor 16680, West Java, Indonesia
*Corresponding Author: hanifahlioe@apps.ipb.ac.id

ABSTRACT

Rusip is a fermented anchovy product from Bangka Belitung province which is made by adding salt and palm sugar up to 25% and 10% of the fish weight, respectively. This product undergoes anaerobic fermentation for approximately two weeks by lactic acid bacteria. The aim of this study was to characterize the microbiology and chemistry of rusip products from different producers, as well as indicators related to the umami taste intensities. There were six rusip products obtained from six different producers. Samples were first analyzed for total plate count and total lactic acid bacteria. Then, these samples were analyzed for proximate, pH, total acid, total salt, total sugar, free glutamic acid, nucleotide (AMP), and amino acid composition. Samples were also extracted using aquabidest with a ratio of 1:10 (material: water) to obtain water soluble extract (WSE). WSEs were evaluated by sensory test and also analyzed for their RP-HPLC profiles at 214 nm. The results of chemical, microbiological, and sensory analyses were analyzed using Principal Component Analysis to determine the samples mapping and characteristics related to their umami taste intensities. The Rusip RZY had the highest total microbes, namely 4.87 log CFU/g, while the highest total lactic acid bacteria was 6.77 log CFU/g which was found in the Rusip TBG. The concentration ranges of free glutamic acid and nucleotide of rusip products were 5.79 - 8.99% db and 1.67 - 2.55% db, respectively. The range of protein concentrations from the proximate analysis results was 28.94 - 44.54% db, while the total amino acid concentrations from the HPLC analysis were 25.14 - 45.84% db. The results of sample mapping using PCA showed four groups of rusip with different characteristics. From the PCA mapping, it was proven that the umami taste intensity of rusip products was influenced by the total lactic acid bacteria and the concentrations of glutamic acid, nucleotide, crude protein and NaCl.

Keywords: Glutamic acid, lactic acid bacteria, nucleotide, rusip, umami

083

META-ANALYSIS: THE EFFECT OF FRYING TIME ON PALM OIL QUALITY AFTER FOOD FRYING BY DEEP FAT FRYING METHOD

Hanifah Nuryani Lioe, Feri Kusnandar, Michael Adi Muryanto*

Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, IPB University, Bogor 16680, West Java, Indonesia
*Corresponding Author: hanifahlioe@apps.ipb.ac.id

ABSTRACT

Palm oil is well known to be used in various frying processes, especially deep fat frying in atmospheric condition. During the deep fat frying process, the oil will experience a decrease in quality due to the application of relatively high temperature at 150-190^{0}C. Palm oil will undergo hydrolysis, oxidation, and polymerization during the frying process, leading to chemical and physical changes of the oil. The purpose of this study was to do a meta-analysis using the data from literatures to know the effect of deep fat frying time to the quality of palm oil used for potato frying (repeated frying). The literatures used in this study were publications in the last 20 years. The data consisting of mean value and standard deviation/standard error from literatures were used for the Hedges'd meta-analysis. Various palm oil quality parameters, including total polar component, free fatty acid, peroxide value, iodine value, anisidine value, total oxidation, specific extinction, total polymer component, viscosity, and colour were analyzed to obtain cumulative effect size value (D+) and 95% confidence interval. Based on the literature research with PRISMA principle, there were 36 sources used for the meta-analysis. Meta-analysis result mentioned a significant effect of frying time that has been seen at the first 8 h frying, on the quality degradation of palm oil according to total polar component, free fatty acid, peroxide value, anisidine value, total oxidation, specific extinction, total polymer component, viscosity, Lovibond yellow and iodine value parameters with cumulative effect sizes more than 1.0, meanwhile on Lovibond red, the significant effect appeared after 16 h.

Keywords: Deep fat frying, frying time, oil quality, palm oil, meta-analysis

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LIST OF SPEAKERS & MODERATORS

LIST OF SPEAKERS & MODERATORS

No.	Full Name	Company/Organization	Country	E-mail
1	Dr. Anton Rahmadi	University of Mulawarman	Indonesia	arahmadi@unmul.ac.id
2	Dr. Dian Herawati	SEAFAST Center IPB University	Indonesia	dianherawati@yahoo.com
3	Dr. Emmanuel Hatzakis	Ohio State University	USA	chatzakis.1@osu.edu
4	Dr. Feri Kusnandar	DFST IPB University	Indonesia	f.kusnandar@gmail.com
5	Dr. Melanie Cornelia	Pelita Harapan University	Indonesia	melanie.cornelia@uph.edu
6	Dr. Muzi Marpaung	Swiss German University	Indonesia	abdullah.muzi@sgu.ac.id
7	Dr. Nancy D Yuliana	DFST IPB University	Indonesia	nancy_dewi@apps.ipb.ac.id
8	Dr. Puspo Edi Giriwono	SEAFAST Center IPB University	Indonesia	pegiriwono@apps.ipb.ac.id
9	Dr. rer. nat. Ir. Agus Wijaya, M.Sc	Sriwijaya University	Indonesia	agus_wijaya@hotmail.com
10	Prof [E]. Dr. M. Aman Wirakartakusumah, MSc	IUFoST	Indonesia	aman_wira@yahoo.com
11	Prof. Dr. Arif Satria	IPB University	Indonesia	rektor@apps.ipb.ac.id
12	Prof. Dr. Chin-Kun Wang	Chung Shan Medical University	Taiwan	wck@csmu.edu.tw
13	Prof. Dr. Elisa Julianti	University of Sumatra Utara	Indonesia	elisa1@usu.ac.id
14	Prof. Dr. Harsi Dewantari Kusumaningrum	DFST IPB University	Indonesia	harsikusumaningrum@yahoo.com
15	Prof. Dr. Ir. Meta Mahendradatta	University of Hasanuddin	Indonesia	meta_mahendradatta@yahoo.com
16	Prof. Dr. Lilis Nuraida	SEAFAST Center IPB University	Indonesia	lnuraida@gmail.com
17	Prof. Dr. Michael Murkovic	Graz University of Technology	Austria	michael.murkovic@tugraz.at
18	Prof. Dr. Purwiyatno Hariyadi	IPB University; Vice chair of CODEX Alimentarius Commission	Indonesia	phariyadi@apps.ipb.ac.id
19	Prof. Dr. Ratih Dewanti Hariyadi	DFST IPB University	Indonesia	rdewantih@yahoo.com
20	Prof. Dr. Teti Estiasih	University of Brawijaya	Indonesia	teties@yahoo.co.id
21	Prof. Dr. Umar Santoso	IAFT/PATPI	Indonesia	umar_santoso@yahoo.com
22	Prof. Dr. Winiati Pudji Rahayu	SEAFAST Center IPB University	Indonesia	wini_@hotmail.com
23	Prof. Dr. Yudi Pranoto	University of Gadjah Mada	Indonesia	pranoto@ugm.ac.id
24	Prof. Dr. Yuli Witono	University of Jember	Indonesia	yuliwitono.ftp@unej.ac; ylwitono@yahoo.com
25	Robi Andoyo, Ph.D	Padjajaran University	Indonesia	r.andoyo@unpad.ac.id

Organized by:

Department of Food Science & Technology IPB University

Supported by:

LIST OF PARTICIPANTS

LIST OF PARTICIPANTS

No.	Full Name	Company/Organization	Country	E-mail
1	Abdullah Muzi Marpaung	Swiss German University	Indonesia	bangmuzi@yahoo.com
2	Addion Nizori	University of Jambi	Indonesia	addion_nizori@unja.ac.id
3	Adelya Desi Kurniawati	University of Brawijaya	Indonesia	adel.kurniawati@ub.ac.id
4	Adi Prima Saragih	PT Lautan Luas Tbk	Indonesia	adiprima13@yahoo.com
5	Afifah Puji Hastuti	IPB University	Indonesia	afifapeha21@gmail.com
6	Agnes Juniarti Chastelyna	IPB University	Indonesia	agnesj.chastelyna@gamil.com
7	Agy Wirabudi Pranata	IPB University	Indonesia	agywirabudi@gmail.com
8	Ahmad Fadil Hilmi	Institut Teknologi Bandung	Indonesia	ahmadfadil_dhilz@yahoo.co.id
9	Alfany Miserwin Suhada Mendrofa	Universitas Sumatera Utara	Indonesia	alfanymendrofa24@gmail.com
10	Amalina Qurratu Ayun	IPB University	Indonesia	amalinaqurratuayun1994@gmail.com
11	Ambar Rukmini	University of Widya Mataram	Indonesia	ambar_rukmini@yahoo.co.uk
12	Andi Dahlan	IPB University	Indonesia	andi_dahlan@apps.ipb.ac.id
13	Anny Sulaswatty	Indonesian Institute of Sciences	Indonesia	annisul2020@gmail.com
14	Anny Yanuriati	University of Sriwijaya	Indonesia	annyyanuriati@fp.unsri.ac.id
15	Ardiansyah	Bakrie University	Indonesia	ardiansyah.michwan@bakrie.ac.id
16	Ariani Rumitasari	Hasanuddin University	Indonesia	arianirumitasari29@gmail.com
17	Asep Dedy Sutrisno	Pasundan University	Indonesia	asepdedysutrisno@yahoo.com
18	Azis Boing Sitanggang	IPB University	Indoensia	boing.lipan@apps.ipb.ac.id
19	Bambang Dwi Wijatniko	Gadjah Mada University	Indonesia	bambangdw92@ugm.ac.id
20	Dewi Sartika	University of Lampung	Indonesia	dewikincai@yahoo.com
21	Dinda Rana Athaya	IPB University	Indonesia	ranadindaath@gmail.com
22	Diny A Sandrasari	IPB University	Indonesia	dinysandra@gmail.com
25	Dwi Larasatie Nur Fibri	Gadjah Mada University	Indonesia	dwifibri@ugm.ac.id
26	Edwin Thomas Apituley	Pattimura University	Indonesia	edwin.apituley.mail@gmail.com
27	Elisa Julianti	Universitas Sumatera Utara	Indonesia	elisa1@usu.ac.id
28	Elsera Br Tarigan	IPB University	Indonesia	elseraborutarigan@gmail.com
29	Erika Pardede	Universitas HKBP Nommensen	Indonesia	erikalrp@yahoo.de
30	Ersita Putri Aisah	University of Brawijaya	Indonesia	ersitaaaputriaisah@gmail.com
31	Erynola Moniharapon	Pattimura University	Indonesia	parinaria@yahoo.com
32	Evelyn Djiuardi	International University Liaison Indonesia	Indonesia	evelyn.djiuardi@gmail.com
33	Evelyn Djiuardi	International University Liaison Indonesia	Indonesia	evelyn.djiuardi@iuli.ac.id
34	Faizah Yusky Zamzami	Univesitas of Jember	Indonesia	faizah.zamzami@gmail.com
35	Fajri Helmi	Pemerintah Kota Bukittinggi	Indonesia	fajrihelmi@gmail.com
36	Fayca Rudhatin Swartidyana	IPB University	Indonesia	faycadyana@gmail.com
37	FIFI AFIATI, MSi	Indonesian Institute of Science	Indonesia	afiati.biotek@gmail.com
24	Forita Dyah Arianti	BPTP JAWA TENGAH	Indonesia	dforita@yahoo.com
38	Gabriella Sherly Rombe	Hasanuddin University	Indonesia	rombesherly53@gmail.com

No.	Full Name	Company/Organization	Country	E-mail
39	Giffary Pramafisi Soeherman	Universitas Padjadjaran	Indonesia	sgiffary@gmail.com
40	Giyatmi	Sahid University	Indonesia	giyatmi@hotmail.com
41	Habieb Febriansyah	University of Bengkulu	Indonesia	budiyanto@unib.ac.id
42	Hadi Munarko	IPB University	Indonesia	hadi_munarko@apps.ipb.ac.id
43	Hamidatun	IPB University	Indonesia	hamidah.foodtech@gmail.com
44	Hanifah Nuryani Lioe	IPB University	Indonesia	hanifahlioe@apps.ipb.ac.id
45	Hanna Widya Pramandari	Siloam Hospital Lippo Village	Indonesia	hanna.pramandari@siloamhospitals.com
46	Hasrul Abdi Hasibuan	IPB Universiry	Indonesia	hasibuan_abdi@yahoo.com
47	Hendry Noer Fadlillah	IPB University	Indonesia	hendryfadlillah@apps.ipb.ac.id
48	Herlina Marta	Padjadjaran University	Indonesia	herlina.marta@unpad.ac.id
49	Hermin Hardyanti Utami, M.T	Universitas Muslim Indonesia	Indonesia	Tamifti@umi.ac.id
50	Heryani	LPPOM MUI	Indonesia	heryani@halalmui.org
51	Hesti Kurniasari	Bakrie University	Indonesia	hestiknsr@gmail.com
52	I Dewa Gede Putra Prabawa	IPB University	Indonesia	dewa.pprabawa@gmail.com
53	Ignatius Yudha Putra Welerubun	STTN-BATAN	Indonesia	yudhaputraxm@gmail.com
54	Ika Wahyuni	University of Jember	Indonesia	202520101004@students.unej.ac.id
55	Ilham Marvie	IPB University	Indonesia	ilham_marvie@apps.ipb.ac.id
56	Indah Rosulva	IPB University	Indonesia	ilakeyku@yahoo.co.id
57	Indira Lanti K	Padjadjaran University	Indonesia	indira.lanti@unpad.ac.id
58	Irma Sarita Rahmawati	Brawijaya University	Indonesia	irmas86@gmail.com
59	Jessica Selvira	Sahid University Jakarta	Indonesia	jejessicavira1996@gmail.com
60	Joni Kusnadi	Halal Examination Agency	Indonesia	joni.kusnadi@gmail.com
61	Jumeri M. Wikarta	Gadjah Mada University	Indonesia	jumerimw@ugm.ac.id
62	Karseno	Jenderal Soedirman University	Indonesia	karseno@unsoed.ac.id
63	Karsi Ambarwati	IPB University	Indonesia	karsi_ambarwati@apps.ipb.ac.id
64	Kiky Chily Arum Dalu	University of Jember (Fresh Graduate)	Indonesia	kikychily.arumdalu@gmail.com
65	Koh Yew Ming	Malaysia Institute of Food Technology (MIFT)	Malaysia	koh.mift@gmail.com
66	Krisa Refita	IPB University	Indonesia	krisa.reff@gmail.com
67	Laras Cempaka	Bakrie University	Indonesia	laras.cempaka@bakrie.ac.id
68	Lia Amalia	IPB University	Indonesia	lia_arifin@yahoo.com
69	Lina Elfita	UIN Jakarta	Indonesia	lina.elfita@uinjkt.ac.id
70	Lutfi Yulmiftiyanto Nurhamzah	IPB University	Indonesia	lutfiyulmiftiyanto@gmail.com
71	Made Widdi Ellinda Patra	BPOM	Indonesia	lindaditda@gmail.com
72	Maria Dewi Puspitasari Tirtaningtyas Gunawan Puteri	Swiss German University	Indonesia	maria.gunawanputeri@sgu.ac.id
73	Marini Damanik	Universitas Negeri Medan	Indonesia	marini@unimed.ac.id
74	Michael Oscarius Loisanjaya	IPB University	Indonesia	michael_oscarius@apps.ipb.ac.id
75	Mortaza A Syafinuddin Hammada	University of Cokroaminoto Makassar	Indonesia	dinmandar@gmail.com
76	Muhammad Yusuf Sulaeman	Padjadjaran University	Indonesia	mysulaeman@gmail.com

No.	Full Name	Company/Organization	Country	E-mail
77	Nabhan Fadlan	Sunan Ampel Islamic State University of Surabaya	Indonesia	Nabhanpmi99fadlan@gmail.com
78	Nafila Chaerunnisa Misbakh	Bakrie University	Indonesia	nafila.misbakh@gmail.com
79	Nancy Dewi Yuliana	IPB University	Indonesia	nancy_dewi@apps.ipb.ac.id
80	NETI YULIANA	University of Lampung	Indonesia	neti.yuliana@fp.unila.ac.id
81	Ni Made Sri Wahyuni	Udayana University	Indonesia	wahyuni15.sw@gmail.com
82	Nijma Nurfadila	IPB University	Indonesia	n.nurfadila@yahoo.co.id
83	Nindya Atika Indrastuti	Djuanda University	Indonesia	nindya.atika@gmail.com
84	NOFRIADY AZIZ	Pusat Reaktor Serba Guna BATAN	Indonesia	nofriadyaziz@gmail.com
85	Nor Afizah Mustapha	Universiti Putra Malaysia	Malaysia	nor_afizah@upm.edu.my
86	Novi Safriani	IPB University	Indonesia	novisafriani@unsyiah.ac.id
87	NURHAYATI	University of Jember	Indonesia	nurhayati.ftp@unej.ac.id
88	NURMA HANDAYANI	University of Jember	INDONESIA	handayani.nurma317@gmail.com
89	Opin Oktavia	Bakrie University	Indonesia	oktaviaopin@gmail.com
90	Payung Layuk	AIAT of North Sulawesi	Indonesia	playuk21@gmail.com
91	Ratna Nurmalita Sari	Chinese Academy of Agricultural Sciences	Republic of China	ratnanurmalitasari@gmail.com
92	Recha Shrestha	ASSUMPTION UNIVERSITY OF THAILAND	THAILAND	reshashrestha.au@gmail.com
93	Rijanti Rahaju Maulani	Indonesian Institute of Science	Indonesia	yanti.rm@gmail.com
94	Rika Puspita Sari MZ	Muhammadiyah University of Palembang	Indonesia	rikapuspitamz@gmail.com
95	Sakina Yeti Kiptiyah	Gadjah Mada University	Indonesia	sakinayetikiptiyah@gmail.com
96	Samsu Udayana Nurdin	University of Lampung	Lampung	samsu.udayana@fp.unila.ac.id
97	Sari Apriliana	IPB University	Indonesia	sariapriliana96@gmail.com
98	Sedarnawati Yasni	IPB University	Indonesia	sedarnawati@yahoo.com
99	Silvi Leila Rahmi	University of Jambi	Indonesia	silvi@unja.ac.id
100	Sintya	Pasdesa	Indonesia	archangela123456@gmail.com
101	Sri Sugiwati	Research Center for Chemistry	Indonesia	srisugiwati123@gmail.com
102	Sukmawati Usman	IPB University	Indonesia	sukmawatius.chm@gmail.com
103	Tatik Khusniati	Indonesian Institute of Sciences	Indonesia	tatikkhusni@gmail.com
104	Trijunianto Moniharapon	Department of Fishery Technology	Indonesia	tjmoniharapon@gmail.com
105	Trinoviyani	IPB University	Indonesia	threenoviyanidj@yahoo.com
23	Tyas Utami	Gadjah Mada University	Indonesia	tyas_utami@ugm.ac.id
106	Uray Ulfah Nabilah	IPB University	Indonesia	unabilah95@gmail.com
107	Vallerina Armetha	IPB University	Indonesia	armetha_vallel@apps.ipb.ac.id
108	Vicky Permatasari Almira Ichsan	Al Azhar University Indonesia	indonesia	vickypermatas@gmail.com
109	Vira Putri Yarlina, STP., M.Si	Padjadjaran University	Indonesia	vira.putri.yarlina@unpad.ac.id
110	Wanti Dewayani	BPTP Suawesi Selatan	Indonesia	wanti.abid@gmail.com
111	Widya Agustinah	Unika Atma Jaya	Indonesia	widya.agustinah@gmail.com
112	Willy Wijayanti	IPB University	Indonesia	willywijayanti@gmail.com
113	Winda Haliza	Balai Besar Litbang Pascapanen Pertanian	Indonesia	windahaliza@pertanian.go.id

No.	Full Name	Company/Organization	Country	E-mail
114	Yuli Perwita Sari	Gadjah Mada University	Indonesia	yuli.perwita.s@mail.ugm.ac.id
115	Yuliana Reni Swasti	Universitas Atma Jaya Yogyakarta	Indonesia	yulianareni@gmail.com

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