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Proceedings of the 6th International Conference of Food, Agriculture, and Natural Resource (IC-FANRES 2021)

It is our pleasure to present to you the Proceedings of the 6thInternational Conference on Food, Agriculture, and Natural Resources (IC-FANRes) 2021. The theme of the conference is “Empowering Local Agriculture and Natural Resources for Global Market in the Post Pandemic World". The conference is organized by Swiss German University (SGU) together with the International Network of FANRes.

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Proceedings of the 6th International Conference of Food, Agriculture, and Natural Resource (IC-FANRES 2021)

PREFACE

It is our pleasure to present to you the Proceedings of the 6thInternational Conference on Food, Agriculture, and Natural Resources (IC-FANRes) 2021. The conference is held with virtual hosting from Tangerang, Indonesia on 4 & 5 August 2021, with the theme “Empowering Local Agriculture and Natural Resources for Global Market in the Post Pandemic World". The conference is organized by Swiss German University (SGU) together with the International Network of FANRes. It is in our pride that this proceeding affiliates with the Proceeding Series of International Atlantis Press Group, which is part of Springer Nature. We are sincerely grateful for the contribution of our 35 reviewers from various institutions in Indonesia, Malaysia, Thailand, and Japan that helped our editorial team in conducting the peer review process.

IC-FANRES was first held in 2015 along with the declaration to strengthen food and natural resources, technology, and policy for sustainable agriculture by leaders of 42 institutions from Indonesia, Korea, Japan, Thailand, Malaysia, and Germany in the FANRES International Network. Since then, IC-FANRES has become a platform for discussion and information transfer of current research achievements, new technological innovation, and practical application in related fields to the development of food and natural resources for sustainable agriculture.

During the short period of global pandemic, enormous change happened in the food and agricultural system, showing more of the importance of local

agriculture and natural resources in supporting global food security and sustainability. The 6th IC-FANRES 2021 aimed at providing a forum for presentation and discussion of the current and new developments in food and natural resources in empowering local agriculture and natural resources for the global market in the post pandemic world. The conference focused on 6 topic discussion:

(1) Herbal, functional food, nutraceuticals, and nutrition for health.
(2) Information system and technology in food and agriculture.
(3) Agricultural and natural resources industrialization for food, health, and energy;
(4) Business, management, and regulatory in food, agriculture, and natural resources;
(5) Eco-, agri-, and food-based tourism, education, and community empowerment;
(6) Food and agricultural waste utilization.

It is in our utmost gratitude that the conference was able to welcome 97 speeches and presentations as well as more than 500 delegations and participants from various institutions in Indonesia, Japan, Germany, Malaysia, USA, Thailand, Korea, Brunei Darussalam, India, and Srilanka. The conference has made possible through the support of
- Governmental agencies: Ministry of Tourism and Creative Economy (Menparekraf), National Research and Innovation Agency (BRIN);
- Academic society: Indonesian Association of Food Technologist (PATPI), Indonesian Society for Functional Food and Nutraceutical (P3FNI); as well as
- Our fellow academic institutions: Universitas Jember, Universitas Khairun Ternate, Universitas Darussalam Gontor, Universitas Mataram, Oklahoma State University, Prefectural University of Hiroshima, Maejo University, Albstadt-Sigmaringen University of Applied Science, Hokkaido University, Osaka University, University of the Ryukyus, and Universiti Tun Hussein Onn Malaysia.

The committee would also like to gratefully acknowledge the significant contributions made by our co-sponsor organizations: PT Sewu Segar Primatama, PT. Deltomed Laboratories, and PT Kaltim Methanol Industri.

We hope with this conference and the proceedings we will be able to produce

We hope with this conference and the proceedings we will be able to pro disseminate and share among members and researchers about more interesting ideas and research results towards a world and region that has increased its global food security index. We also hope this conference will motivate all of us to continue bringing a positive impact in our new world and future.

Best regards,
Maria Dewi Puspitasari Tirtaningtyas Gunawan Puteri, Ph.D.
Chairwoman
The 6th International Conference on Food, Agriculture, and Natural Resources (IC-FANRes) 2021
And
Head of Food Technology Study Program, Swiss German University (SGU)

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Thermal Processing and Chemical Characteristics of Canned Traditional Foods Based on Beef: Rawon, Kuah gandul and Empal gentong

Annisa Kusumaningrum, Aldicky Faizal Amri, Asep Nurhikmat, Agus Susanto, Siswo Prayogi

The traditional food products were produced by home industries need to be packaged to extend the shelf life and to expand the market during the pandemic. The study aims to provide information about thermal processing, chemical characteristics and metal contamination on canned rawon, kuah gandul and empal...

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Design and Implementation of Water Quality Monitoring System (Temperature, pH, TDS) in Aquaculture Using IoT at Low Cost

Novita Dwi Susanti, Diang Sagita, Ignatius Fajar Apriyanto, Cahya Edi Wahyu Anggara, Doddy Andy Darmajana, Ari Rahayuningtyas

This research aims to design and implement a water quality monitoring system in aquaculture that will be implemented in SME. Subang is a city which has a lot of potential fish farming in ponds, one of them is Rojo Koyo SMEs. The farmer has a problem, especially in the rainy season, mortality of fish...

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Manufacturing Process Development of Health Supplement Containing Water Hyacinth (*Eichhornia crassipes*) Extract

Diah Indriani Widiputri, Quincy Juventinus, Silvya Yusri, Febbyandi Isnanda Pandiangan, Jimmy

Water hyacinth (Eichhornia crassipes), WH, is an aquatic plant that usually lives on the surface of lakes, marshes or rivers and often considered to be a weed that brings many negative impacts for the aquatic ecosystem. Previous research has proven the presence of antioxidant activity in the extract...

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The Mechanistic Study on the Effect of *Acacia concinna* and *Cymbopogon nardus* on Lipid Metabolism

Wijitrapha Ruangaram, Eisuke Kato

Obesity is one of the most concerning health problems globally. At the moment, medicinal plants have been widely studied in order to assist in the treatment of obesity instead of the developed drugs. From our previous study,

Thai medicinal plants were tested through screening methods regarding anti-obesogenic...

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Profile of FTIR (Fourier Transform Infra Red) and Comparison of Antioxidant Activity of Coffee with *Tiwai* (*Eleutherine americana* Merr)

Bernatal Saragih, Maulida Rahmawati, Arif Ismanto, Frederic Morado Saragih

Coffee consumption is increasing and it has become part of people's lifestyle, so there is a need for an innovation in coffee making with the addition of local ingredients such as tiwai onions. This study analyzed the chemical profile using FTIR and the antioxidants of coffee, tiwai and their mixtures....

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The Effect of Cinnamon Extract (*Cinnamomum burmanii* L.) Addition Towards the Characteristics of Soy Milk Ice Cream

Melanie Cornelia, Aurelia M. Tunardy, Wenny S. L. Sinaga

Generally ice cream was made from cow's milk, resulting in high calorie and fat. Soy milk was used as an alternative for cow's milk which had several advantages, but soy milk contains beany flavor that some people did not like. Cinnamon (Cinnamomum burmannii L.) extract has a unique aroma and flavor...

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Biopellet Production from the Wastes of Palm Oil Plantation and Processing Plant Through Various Pretreatment Processes: A Review

Diah Indriani Widiputri, Fernanda Ayuyasmin, Evita Herawati Legowo

Indonesia as one of the world's largest palm oil producers is facing one significant problem with the amount of wastes they are producing from different stages in palm oil processing, which are consisted of the oil palm trunk (OPT), oil palm frond (OPF), empty fruit bunches (EFB), mesocarp fibre (MF)...

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The Study of Several Applicable Treatments for Serving Butterfly Pea Flower Drinks

Jesslyn Sofyan, Tabligh Permana, Abdullah Muzi Marpaung

A wide range of serving methods of butterfly pea flower drinks are available in practice. Three typical variables in the serving method are studied in this research. They are pre-treatment of the petal before extraction (fresh, refrigerated for two days, dried at 45°C for 48 hours), the method of extraction...

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Analysis Influence of Consumer Behavior to Purchase Organic Foods in Jakarta

Antonius Siahaan, Jeffry Thiodore

This research aims to prove whether there is positive correlation among theory of planned behavior variables and give suggestions to the organic food producers to create and formulate a preferable marketing strategy, achieve better sales performance and to support organic food growth in Jakarta. A survey...

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Physical and Chemical Properties of Corn-Almond Cookies Affected by Mung Bean Supplementation and Source of Fat

Nur Aini, Budi Sustriawan, Ervina Mela, Lisna Fuji Lestari

Cookies generally contain gluten because they are made from wheat flour obtained from wheat, while there are groups that are intolerant of gluten. Patients with gluten intolerance also tend not to be able to consume casein and lactose intolerance. So, one of the innovations that can be done to make cookies...

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Evaluation of the Ethyl Acetate Extract of the Roots of *Avicennia marina* as Potential Anticancer Drug

Immanuel B. Tanjung, Norma N. Azizah, Ade Arsianti, Amalda S Anisa, Kholis A Audah

In this modern age cancer is still a prevalent disease. Even with

advancements of technology, current treatments for cancer still have vai side-effects that sometimes create more harm to the patient. A complete solution for cancer is still not found yet. Recently, mangroves were shown to be promising...

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Utilization of Banana Peel for Bioethanol Production Using Baker's Yeast Starter

Dedy Eko Rahmanto, Deny Arizal, Nurhayati Nurhayati

Research on the second generation of bioethanol production continues to be developed in the world. Second generation bioethanol has been produced from non starch substrates like cellulose, hemicellulose and bounded lignin as raw material. This research produced bioethanol using Ambon banana peels that...

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Application of *Stenochlaena palustris* in Black Tea and Coffee Beverages Targeting Consumers with Sugar Concern

Filiana Santoso, Natasya Oktavianti, Febbyandi I. Pandiangan, Yanetri A. Nion, Maria D.P.T. Gunawan Puteri

Kelakai is an endemic fern found abundantly in Central Kalimantan. Regardless of its high availability, low economical value, and potential health benefits (natural source of iron, folic acid, antioxidant, antidiabetic, etc.), the utilization of the plant as a food ingredient is still limited. Black...

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Bioconversion of Lignocellulosic Agriculture Waste to an Edible Mushroom, the Functional Food for Healthy Life During Covid 19

Iwan Saskiawan, Atik Retnowati

Production of lignocellulosic biomass is routinely generated by agro-industrial activities in Indonesia. Those materials are disposed of in the environment without any treatment leading to serious environmental pollution problems. These agricultural wastes can be potentially bio converted into edible...

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Aquaculture Employment and Economic Diversification
Digital Technology, Training and Sector Development Options in Brunei

Shahid Anjum, Abidah B.M. Abidin

Facing the question of economic diversification for income and employment enhancement, the answer to the question of whether incorporation of modern digital technology and sectoral training facilities may replace imported labour for local youth, the study taking up the case study of the aquaculture sector...

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A Review on the Potential of Natural Antioxidant Sources to

Improve Oxidative Stability in Edible Oils

Tabligh Permana, Nia Wiradjaja, Hery Sutanto, Vincent Satya Surya

Edible oils have been used widely in food processing, especially processes with thermal treatment such as frying. In the frying process, oils are usually used repetitively and trigger the presence of lipid oxidation which results in the degradation of fatty acids. This degradation of fatty acids then...

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A Review on the Potential Applications of Cocoa Shell in Food Industry

Glynnis Netania, Tabligh Permana, Juli Effendy, Filiana Santoso, Edrick Alvaro Oslo

Cocoa shell is one of the main by-products of cocoa beans. It is separated from the nibs and are disposed of, as it could affect the final quality of cocoa products. As a result, a high amount of waste can be produced during mass production of cocoa beans. Indonesia is one of the largest producers of...

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Modification of Cassava Starch (*Manihot utilissima*) Using Precipitation Method with Addition of NaCl

Ulyarti, Mursyid, Ismanto, I Rahmayani, R Suseno, Nazarudin

Cassava starch has been widely used as a functional ingredient in many food products with some limitations. To improve its usage, cassava starch has been modified to have a better functionality. A lot of starch modification has been applied including alcoholic treatment or known as precipitation method....

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Biodiesel Production from Spent Coffee Grounds Oil

Chelselyn Chuaca, Elza Karenina, Kezia Yusuf, Shafwah Dzahabiyya, Alwan Raihan, Evita Legowo, Hery Sutanto

Biodiesel has been considered as an alternative fuel to replace conventional oil in the world. Biodiesel development has reached blending for 30% and has been implemented by Indonesia since 2020. Sources for biodiesel production vary, as is well known, mostly from CPO, raw vegetable oil, used cooking...

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Effect of Heating Treatment of VCO By-product on Protein, Fat, Free Fatty Acid, Emulsification Capacity, and Fatty Acid Characteristics

Ansharullah, Sitti Aida Adha Taridala, Muhammad Natsir, Eva Nopitasari, Sri Damayanty, Sriyana Herman

Virgin coconut oil (VCO) waste or blondo was a by-product, which still contains many important nutrients, and has a potency to be included for the production of nutritious food products. Blondo still contains a high moisture, and so to extend its shelf life and expand its application, it needs to be...

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Anthocyanin Extraction from *Clidemia hirta* (L.) D. Don Fr and Its Stability During Storage

Gayatri Annisa Larasati, Irvan Setiadi Kartawiria, Abdullah Muzi Marpaung

There have been concerns regarding the use of artificial food colorant, triggering the food industry to develop natural food colorant with nutraceutical properties, which could be solved by anthocyanins. A series of studies to evaluate the potency of harendong bulu (Clidemia hirta (L.) D. Don) fruit...

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Study of Biogas Production From Palm Oil Solid Wastes: A Review

Jean Aldrich M. Piolo, Evita H. Legowo, Diah Indriani Widiputri

In 2021 Indonesia currently provides 58% of global crude palm oil, resulting in enormous amounts of oil palm wastes. The purpose of this research is to determine which palm oil solid waste has the potential to be used as a substrate for biogas production, and what is the optimum method and parameter...

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Supply Chain Resources of Red Chili Based on Food Supply Chain Network in Kulonprogo Indonesia

Susanawati, Muhammad Fauzan, Ivo Mega Candela Fanestia

This study is to describe the structure of the red chili supply chain relationship and describe the resources of the red chili supply chain in

Panjatan District, Kulonprogo Regency. The research location was deterr intentionally with the help of Cluster Sampling in determining farmers' samples. The...

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The Effects of Tomato Concentration on Sensory and Chemical Properties of Jelly Drink

Setiarti Sukotjo, Heru Irianto, Shinta Leonita, Nita Yustika Sari

Tomatoes, which have a limited shelf life must be processed further, one of which will be used as a jelly drink. In Indonesia, tomatoes are relatively inexpensive, but beverage products made from tomatoes are still limited. Jelly drinks are common among the general public, and they also serve as a hunger...

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Prebiotic Potential of Oligosaccharides: *In Vitro* Study of Indonesian Local Honey from *Apis spp.* and *Trigona* spp. Bees

Fitria Susilowati, Mita Nurul Azkia

Oligosaccharide compounds (FOS, GOS) have gained huge commercial interest due to their beneficial properties in human health as prebiotics. This study aims to isolate the oligosaccharides compounds and investigate the prebiotic potential of Indonesian local honey from Apis spp. (KR) and Trigona spp....

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Characteristic of Red Ginger Jelly Stick with Variation Type of Gelling Agent

Titri S. Mastuti, Aurelie F. Setiawanto

Jelly stick is a semi-solid product which is made with the addition of a gelling agent. Jelly sticks have a different texture compared to ordinary jelly. This product is easy to consume, more sticky and chewy. Ginger is widely available in Indonesia, has high antioxidants and can enhance human immunity...

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Empowering Communities of Mango Agribusiness in North Lombok, Indonesia

Zainuri Zainuri, Taslim Sjah

System and sub systems of mango agribusiness in North Lombok, Indonesia have not fully worked well. One of the parts of the weaknesses is on the human side, i.e. the entrepreneurs of the mango agribusiness. Therefore actions need to be taken to this human capital to be empowered with necessary skills...

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Review: Nutrient, Fiber, and Bioactive Content of Fruit Pomace, Major By-product of Juice Industry

Florence Ignatia, Kezia Meivira, Irvan Setiadi Kartawiria, Maria D.P.T. Gunawan-Puteri

The market of the juice industry is increasing globally including in Indonesia and one of the factors that support the developing market of juice is the sufficient supply of raw material. Consequently, the increasing production of juice has resulted in a high amount of solid waste such as under-ripe...

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Profiles of Oligosaccharides Synthesized from Under-Explored Tuber Starches Using *Aspergillus oryzae* Amylase

Achmad Dinoto, Rini Handayani, Sulistiani, Ninu Setianingrum, Mulyadi, Heddy Julistiono

Oligosaccharides are beneficial compounds for human health that are widely used in the food, cosmetic, and pharmaceutical industries. Our knowledge on the synthesis of oligosaccharides from tropical plant sources using amylases of indigenous microorganisms are still limited. This study aims to determine...

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Farmer Decision on Cocoa Farm in North Lombok, Indonesia

Taslim Sjah, Ridwan, Ibrahim, Sri Supartiningsih, Padusung

Agricultural land in North Lombok, Indonesia, provides farmers with several choices of crops to be grown, among others is cocoa. However, farmer reasons for growing this crop is not completely documented. This paper explores farmer reasons for growing the crop and models their decisions. This paper used...

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Identification of Ponorogo Coffee Agro-industry Supply Chain

Devi Urianty Miftahul Rohmah, Arief Rahmawan, Mohammad Fuad

Coffee is one of the plantation commodities that has an important role in economic activities in Indonesia. The important role of coffee in Indonesia's economic activities are as a source of foreign exchange earnings, as a provider of employment, and as a source of income for coffee planters and other...

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Production of Bioethanol from Dragon Fruit Wastes by Using *Aspergillus niger* and *Saccharomycetes cerevisae*

Selvia Sarungu, Karnila Willard, Hamriani Ryka, Simon Tampang, Junaesar Tangke Tasik, Bodhi Dharma, Sitompul Afrida

East Kalimantan are able to produce dragon fruit throughout year, while, East Java are only in raining season. This fruit will be produced abundantly when the peak season comes and often becomes waste. To reduce this cellulosic waste from traditional market, we attempt to convert the dragon fruit waste...

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Increasing of Wet Noodles Quality Using Vegetables Oil

Coating

Nurhayati Nurhayati, Maria Belgis, Jay Jayus, Infidzah S. Velianti

Wet noodles are often used as the main ingredient in making chicken noodles, which is one of the favorite foods like Indonesian. The process of making wet noodles without going through the drying stages makes the noodles easily damaged by microbial growth such as bacteria. This study evaluated the effect...

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Confidence Level to Purchase Halal Food Products Via Ordering Online Application

Nainatul Farzuha Nor, Hartini Ahmad, Ahmad Shabudin Ariffin

The Covid-19 pandemic has turned out to be an opportunity for a recent noticeable increase in online purchase in Malaysia. Muslim consumer who concern about halal product were affected by this drastic purchasing trends. Although there is no evidence to support Muslim consumer to explore how they select...

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The Influence of Green Campaign Towards Consumer Purchase Intention

A Study of "X" Coffee Shop in Jakarta

Patricia Josephine, Robert La Are

Green Campaigns are used to expose any environmental issues to the societies and at the same time to give knowledge about the awareness of green behavior on the environment and will later lead to the intention of

purchasing green products. However, as a report stated, 86% percent of th adult population...

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The Effect of "*Bile*" Banana (*Musa Paradisiaca*) Maturity Level on Microbiological, Chemical and Sensory Quality of Goat's Milk Kefir

Satrijo Saloko, Mutia Devi Ariyana, Nadiah Khoiroh

Goat's milk is processed into kefir with the hope of eliminating the smell of "strong, goaty odour" and extending the shelf life of goat's milk. Kefir is a probiotic drink whose growth can be optimized with the addition of prebiotics in the form of "Bile" bananas. This study aimed to determine the effect...

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Glucose Syrup of Annealing Modified of Cocoyam (Xanthosoma sagittifolium) Starch

Dedin Finatsiyatull Rosida, Ricke Amelia

Glucose syrup is made from the hydrolysis of starch which can be hydrolyzed by acid, enzyme, or a combination of both. The liquefaction process in the production of glucose syrup is controlled by the enzymatic hydrolysis by α-amylase. The gelatinized starch is hydrolyzed into simpler molecules to be...

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Study on the Quality of Fermented Tapioca with Variation Lactic Acid Bacteria (LAB) Types

Baiq R. Handayani, Nurul Hartiwi, Mutia D. Ariyana

Fermentation potentially improves the quality of tapioca. Fermentation of tapioca occurred either spontaneously or with the addition of starters. Lactic acid bacteria widely used as a starter on flour fermentation. This study aimed to determine the effect of the types of Lactic acid bacteria on the characteristic...

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Growth Response and Yield of Shallots to *Trichoderma* Biostimulants and Growth Regulators Substance *Benzyl Amino Purine* (GRS BAP)

Made Sudantha, Suwardji

Shallots are one of the vegetable commodities that have important meaning for the community, both in terms of their high economic value and nutritional content. The productivity of shallots in West Nusa Tenggara is still low compared to the production potential of shallots. One of the causes of the low...

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Identifying Total Economic Value of *Capilong* (*Calophyllum inophyllum)* in Ternate Island–North Maluku-Indonesia

Mardiyani Sidayat, Mila Fatmawati

Beauty leaf tree (Calophyllum inophyllum) or locally called capilong is one of

the plants which have big potential to be used for biofuel raw material. Indeed, almost all parts of this plant have high economic potential and a currently being used for important industrial raw materials, such as the...

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Hypocholesterolemic Effect of Biscuit Made from Purple Sweet Potato Flour, Starch, and Fiber Rich Flour on Rats

Oktavianna Ginting, Elisa Julianti, Rona J. Nainggolan

The solid residue from purple sweet potato (PSP) starch has a high enough dietary fiber and can be processed into fiber rich flour. In this study, biscuits were made from flour, starch and fiber rich flour from PSP in a ratio of 75: 5: 20. The resulting biscuits were then tested for their hypocholesterolemic...

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Analysis of Food Handler's Knowledge of Hygiene and Sanitation Impact on Food Quality

A Study of Lubana Sengkol Restaurant

Fidjria L. Salsabela, Rano Abryanto

As the food and beverage industry in Indonesia has a large demand and supply, the quality and safety of food as well as effectiveness in the production process are important to consider for quality assurance. Food safety is very important to avoid side effects arising from contamination, abuse, and food...

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ABG Point of View in Lemongrass and Ginger Potency for Commercialization as Herbal with Anti-Diabetic Claim in Indonesia

Hinedreana F.M. Pranoto, Maria D.P.T. Gunawan Puteri, Victor Sahat Ringoringo

Diabetes mellitus is a general disturbance of metabolism and has been a major public health issue in Indonesia. Indonesia has numerous medicinal plants that are used in traditional medicine. Lemongrass and ginger are two of the medicinal plants that show anti-diabetic potency, where they are developed...

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Lemongrass and Ginger Potency for Blood Glucose Control

Claudia Christy, Maria D.P.T. Gunawan Puteri, Abdullah Muzi Marpaung

Lemongrass (Cymbopogon citratus) and ginger (Zingiber officinale) are herbs that have been used to flavour food and beverages, in addition, they are also believed to possess health benefits. One of them is their ability to control blood glucose levels. Blood glucose control not only is beneficial for...

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Study of the Influence of Stevia and Fructose to the Physicochemical Characteristics of Mocaf-pedada Biscuits

Jariyah, Sri Winarti, Ulya Sarofa, Maya Regina Subagio

Stevia was known to have potential as a sugar substitute sweetener that can be used in various processed foods, including biscuits. The problem in making biscuits was the use of granulated sugar which can increase human blood glucose and was dangerous for people with diabetes mellitus, so we needed a...

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Evaluation of Bacteriocin Produced by *Pediococcus pentosaceus* Strain 2397 as Natural Preservative for Fish Meatballs Stored at Room Temperature

Usman Pato, Yusmarini Yusuf, Shanti Fitriani, Diky Arma Fauzi, Ghina Ismadiah, Miftahul Hidayah, Windy Sabiliani

Meatballs are one of the most popular processed meats in various countries. The meats commonly used to make meatballs are beef, chicken, and fish. The purpose of this study was to assess the quality of fish meatballs preserved with bacteriocin from Pediococcus pentosaceus strain 2397 during room temperature...

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Product Development of Fried Shallot from Dairi Potentiates as Souvenir

Hadassah Elisabeth, Tabligh Permana, Elisabeth K. Prabawati

Dairi regency is rich with their horticultural plants, especially shallots. But shallots are seasonal plants which affect the price fluctuation even though it has a big potential. The importance of this research is developing a product

from Dairi shallot in order to stabilize the market price of shallot,...

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Characterization of Physicochemical Properties of Powder Coconut Crab Shells (*Birgus latro* L.) from North Maluku

Hamidin Rasulu, Danar Praseptiangga, I Made Joni, Ari Handono Ramelan

Coconut crab (Birgus latro L.) or in North Maluku language called coconut crab is one of the biological natural resources of high economic value. People consume coconut crab dishes that have a taste similar to lobster, but have a distinctive advantage because this animal consumes coconut meat. Utilization...

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Functional Properties of Protein Hydrolysate of Sea Fish and Low Economic Value Hydrolysis Results Using Biduri Protease

Yuli Witono, Livia Wahyuni, Lilik Krisna Mukti, Ardiyan Dwi Masahid, Asrul Bahar

In 2017, The Indonesian fishing productivity reached 6,424,114 tons from the sea and 467,821 tons from freshwaters. Some kinds of sea fish which contain high protein are Crocodile flathead fish (17.86%) and Cardinal fish (18.26%), while kinds of freshwater fish that contain high protein are Common barb...

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Transaction Cost for Marketing of Voor Oogst Kasturi Toba Case in Jember Regency

Wilda A. Safitri, M. Rondhi, Triana D. Hapsari

The tobacco marketing institution has strategic roles (entry point) in driving tobacco agribusiness system and improving farmers' bargaining position. However, the limited information owned by the farmer in marketing the tobacco causes not all farmers to directly sell the tobacco to the warehouse, even...

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Overripe Tempe Stock Prototype Development and Evaluation of Consumer Acceptance for Commercialization Preparation

Elissa Florentina, Stacia Andani Fortunata, Nila K. Hidayat, Maria D.P.T. Gunawan-Puteri

Indonesia is experiencing a growth of sales in health and wellness packaged foods with more consumers aiming to adopt a healthy and balanced diet. Overripe tempe is traditionally used in Central Java as condiment, however it is not well known in other areas of Indonesia. Overripe tempe stock is a food...

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Optimization of Aqueous Extraction of Indonesian Bay Leaf (Syzygium polyanthum Wight) as Powder Seasoning

Gabriella Masaki, Filiana Santoso, Maria D.P.T. Gunawan Puteri

Indonesian bay leaf (Syzygium polyanthum Wight) is one of traditional spices originated from Indonesia which is usually used as spices to add the aroma of

foods. Extraction of the aroma of Indonesian bay leaf could be proposed a more practical usage to its fresh form. This research aims to find the...

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Impact of Storage Temperature on Physiological Changes and Shelf Life of Mango CV. Mahachanok

Napong Kantanet, Pavalee Chompoorat

Mango (Mangifera indica L.) is one of the most popular fruits in Thailand. It is rich in dietary fiber, vitamin C, provitamin A, carotenoids and other phytochemical compounds. Mango is characterized by climacteric fruit and ripen rapidly after harvest. Commercial growers normally harvest mango during...

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Increasing Sorghum Production on Marginal Land in the Framework of Food Procurement Post-Covid-19 Pandemic

Muhammad Hazmi, Iskandar Umarie, Hidayah Murtiyaningsih, Laras Sekar Arum

The Covid-19 outbreak has been going on for more than a year in Indonesia, causing many people to die and lowering the economic level of the community. People's income and food availability decreased. The procurement of staple foods has always relied on the production of rice and corn. Sorghum is a cereal...

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Halal Dark Chocolate Quality: Influence of Tempering Time and Temperature

Addion Nizori, Lamasih Diniaty Simamora, Silvy Leila Rahmi, Fitry Tafzi, Mapegau, Budiyati Ichwan

The quality of the raw cocoa mass used greatly affects the final quality of the chocolate product. Conching and tempering are also important processes in chocolate making to produce high-quality chocolate that customers like. The process includes mixing, cutting and aeration of the chocolate mass during...

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The Effective Adsorption of Phosphate and Nitrate Using Spent Coffee Ground Loaded Iron and the Effect for Plant Growth

Aisyah Humayro, Hiroyuki Harada, Kanako Naito, Atsushi Hashimoto

The aim of this study is to determine the effectiveness of phosphate and nitrate adsorption through several parameters, such as different initial concentrations, kinetic behaviour, the effect of pH, and ratio liquid solid. Fe-SCG showed the adsorption capacity values were 35.82 mg/g for phosphate and...

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The Effects of F/M Ratio on in Treatment of Wastewater from Brewery Slurry by an Anaerobic Sequencing Batch Reactor

Hiroyuki Harada, Endar Hidayat

In this study, the influence of F/M (total organic carbon (TOC)/mixed liqu suspended solids (MLSS)/day) ratio in the anaerobic batch treatment method was performed on the distillation effluent of barley shochu. The operation was to add 0.7 L seed sludge, supply 0.2 L of waste liquid every day and react...

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Physical and Chemical Properties of Corn-Almond Cookies Affected by Mung Bean Supplementation and Source of Fat

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ABSTRACT
Cookies generally contain gluten because they are made from wheat flour obtained from wheat, while there are groups that are intolerant of gluten. Patients with gluten intolerance also tend not to be able to consume casein and lactose intolerance. So, one of the innovations that can be done to make cookies gluten, casein, and lactose-free is to replace wheat flour with corn and almond flour. Corn-almond cookies produced still have a low nutritional value of protein so that supplementation is done with mung bean flour. This research aimed to find out: 1) the effect of mung bean flour supplementation on the quality of corn-almond cookies; 2) the effect of fat types on the quality of corn-almond cookies; 3) the right treatment combination between supplementation of mung bean flour and the type of fat that produces the best quality of corn-almond-based cookies. The design used in this study was Randomized Group Design (RGD). Factors studied included supplementation of mung bean flour (level of 10, 20, and 30%) and sources of fat (margarine, Virgin Coconut Oil (VCO), and combination of margarine and VCO). Based on these factors, nine treatment combinations were obtained, which were repeated three times. Data were analyzed using variance analysis with a level of 5% and further tests of Duncan's Multiple Range Test with a 5% level. The best treatment was chosen by using the effectiveness index test. The results showed that supplementation of mung bean flour increased water content and reduced fat content. While the type of fat increases fat content and dissolved protein levels, and decreases the development volume. The best combination of treatments is cookies with mung bean supplementation of 10% with 100% VCO fat. Physicochemical characteristics of corn-almond cookies produced from the best treatment's combination are having a value of dissolved protein content of 2.35%, fat content of 28.10%, reducing sugar content of 0.21%, moisture content of 2%, ash content of 0.27%, and volume development of 73.23%.

Keywords: *Corn, Cookies, Mung bean, Virgin coconut oil*

1. INTRODUCTION

Cookies are generally made from wheat flour, which contains 80% gluten of the total wheat protein [1][2] . The gluten intolerant group cannot consume cookies from wheat flour, so they need raw materials other than wheat flour, such as corn flour. Corn flour has advantages because of the presence of functional food components such as dietary fiber, Fe, and beta-carotene [3][4]. Corn is also a source of carbohydrates that have a fairly low glycemic index so that when consumed it will not raise blood sugar. However, corn flour which is applied to the manufacture of cookies, produces a less favourable sensory aroma of cookies. To improve the sensory characteristics while increasing the nutritional value, almond flour was added.

Almond flour can be used to improve the sensory aroma of corn cookies while increasing their nutritional value [5]. Generally, gluten intolerant patients also cannot consume products containing casein, a protein in milk because it can cause allergies [6]. In addition, there is a group of sufferers who are lactose intolerant in milk. Thus, the use of almond flour can be used as an alternative to powdered milk (containing casein and lactose) in cookie processing [7]. However, almond flour is expensive, so its addition to cookies is limited.

To increase the nutritional value of cookies, especially the protein content, mung bean flour can be added in the manufacture of cookies. Mung beans contain high protein by 24%db and important mineral sources, including calcium and phosphorus [8]. Thus, the addition

of mung bean also aims to supplement the low protein of corn-almond cookies.

In making cookies, it is necessary to add fat/oil to form a crunchy texture and increase flavour [9]. The type of fat that is usually used is margarine which has a solid texture, bright yellow colour, and does not melt easily. Many types of fat other than margarine can be added in making cookies. Virgin Coconut Oil (VCO) is a type of oil that has a high lauric acid content compared to other vegetable oils. VCO contains 50% lauric acid and 7% caprylic acid [10].

This study aims to: 1) determine the effect of mung bean flour supplementation on the physicochemical properties of corn-almond flour-based cookies; 2) determine the effect of fat type on the physicochemical properties of corn-almond flour-based cookies; 3) determine the right combination of treatment between mung bean flour supplementation and the type of fat that produces corn-almond flour-based cookies with the best physicochemical properties.

2. MATERIALS AND METHOD

The main ingredients used for making cookies are yellow corn flour from Purbalingga Regency, "Khas Jaya Nusantara" almond flour from Tangerang Banten, "Healthy" mung bean flour from Sukamanunggal Surabaya, margarine, VCO "Mutia", refined sugar "Gulaku", baking powder, eggs and salt.

The ingredients for making cookies include corn flour (67%), almond flour (33%), mung bean flour (according to the percentage of supplementation), fat (45% of total flour), eggs (20% of total flour), sugar (40% of total flour), baking powder (1% of total flour) and salt (0.5% of total flour). The method of making cookies refers to the method of [11] with modification of ingredients. Making cookies begins with mixing sugar and fat for 3 minutes to form a cream. Then add eggs and mix until homogeneous, then add corn flour, almond flour, mung bean flour, salt, and baking powder. Mixing is done until all the ingredients are homogeneous, followed by moulding. The next stage is roasting for 20 minutes at 170°C. Cookies that have been cooked are then cooled to room temperature and packaged using plastic until analysed. Analysis was conducted on the volume expansion [12], moisture content using gravimetric method [13], fat content using extraction method[13], soluble protein content, ash content was using thermogravimetric [13], and reducing sugar using ICUMSA method [14].

This research is an experimental study with a factorial randomized block design. The factors studied were the percentage of mung bean flour supplementation consisting of 3 levels (10, 20 and 30%) and the type of fat consisting of 3 rates (margarine, VCO, combination of margarine and VCO (1:1)). These factors were then arranged in a factorial manner so that 9 treatment combinations were obtained, and were repeated 3 times.

The data obtained were analyzed using analysis of variance (F test) at the 5% level. If the results of the analysis have a significant effect, then proceed with Duncan's Multiple Range Test (DMRT) with a level of 5%. Based on the results of physicochemical analysis, the determination of the product with the best cookie formulation was analyzed using an effectiveness index.

3. RESULTS AND DISCUSSION

Table 1 shows that mung bean supplementation has a very significant effect on water content, significantly affects fat content, and has no significant effect on ash content, reducing sugar content, protein content, and expansion volume. Meanwhile, different types of fat had a significant effect on fat content, protein content, and volume of expansion and had no significant effect on water content, ash content, and reducing sugar content. The combination of mung bean supplementation and the type of fat showed no significant effect on all variables.

Table 1. The effect of mung bean flour substitution and the type of fat on the characteristics of cookies

No	Variable	Type of fat	Mung bean supplementation	Interaction
1.	Moisture content	**	ns	ns
2.	Ash content	ns	ns	ns
3.	Fat content	*	*	ns
4.	Reducing sugar content	ns	ns	ns
5.	Soluble protein content	ns	*	ns
6.	Expansion volume	ns	*	ns

Exp: * = very significant effect at the level of 1%
** = significant effect at the level of 5%
ns = non-significant effect

3.1. Moisture Content

Mung bean flour moisture content is 6.25% [7] and its supplementation had a significant effect on the moisture content of cookies, while the type of fat and the combination of them did not have a significant effect. Supplementation with 30% mung bean flour resulted in cookies with the highest moisture content of 2.98%, but it was not significantly different from 20%

supplementation which resulted in 2.93% moisture content in cookies. The lowest water content was found in 10% mung bean flour supplementation, which was 2.16%. The moisture content of cookies increases with the increase in the amount of mung bean flour (Fig 1).

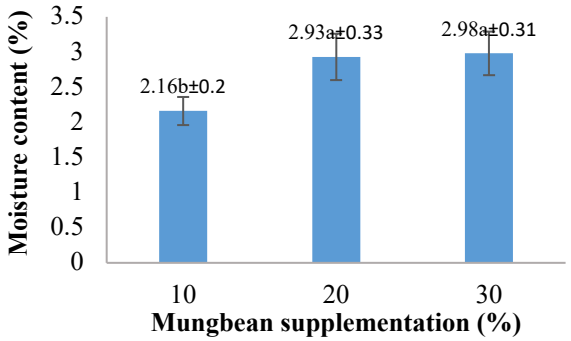

Figure 1. Effect of mung bean supplementation to moisture content of cookies

The result in this study was in compliance to Widjajaseputra et al. (2019), showing that moisture content increased following the increase of mung bean flour content [8]. The increase in moisture content was due to an increase in the amount of protein due to an increase in the amount of mung bean flour. The roasting process results in protein denaturation, where large protein molecules exposed to heat will form a compact network in the form of a matrix [9]. The matrix causes water to be trapped in these protein molecules and cannot escape.

Protein has two types of, that is both hydrophobic and hydrophilic [15]. Protein on mung bean flour, which can be as 22.05%, has more hydrophilic bonds, which has a high-water binding power, so that if the water content of protein in the high mung beans, then allow these cookies water content is also high[16]. The higher the hydrophilic proteins in a food will cause an increase in solubility in liquids because the more hydrophilic group (e.g., lysine, tryptophan, asparagine, glutamine, and histidine) that causes increased water binding capacity [17]

The moisture content of cookies is also influenced by the content of amylose and amylopectin in mung bean flour. The amylose content of mung bean flour is 33%, and amylopectin is 67% [18]. Amylose is easy to absorb and release water. Meanwhile, amylopectin has the property of being difficult to absorb water but the water will be retained when it is absorbed [19][20]. So, the more the amount of mung bean flour added, the higher the moisture content value.

The moisture content of cookies can be affected by the interaction between starch and protein. The decrease in water content can occur due to the bond between starch and protein which causes water to not be bound to the maximum. Hydrogen bonds formed between molecules of starch and water will be reduced by the interaction between starch and protein [20],[21]. According to SNI (01-2973-2011), the water content of the cookies maximum of 5%, so these cookies already fulfil the quality requirements of cookies by the Indonesian National Standard.

3.2. Ash Content

Ash content is a value that indicates the amount or total minerals contained in a product. Mung bean supplementation and different types of fat had no significant effect on the ash content of cookies. The ash content of corn-almond cookies is 0.27-1.17%, as seen in Fig 2. Supplementation of mung beans 10% and the use of margarine resulted in cookies with the lowest ash content of 0.27%.

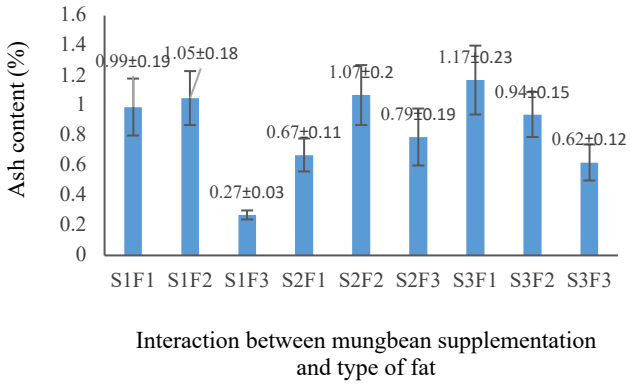

Figure 2. Ash content of corn-almond cookies with soy flour supplementation and types of fat

The higher the supplementation of mung bean flour, the higher the ash content of the product [22]. The increase was because beans had a high ash content of 3.07% compared to) corn flour (0.13%). Mung beans are a source of minerals calcium, phosphorus and iron as 223, 319 and 7.5 mg every 100g. The low ash content of corn flour is due to the separation of the germ in its manufacture, where the germ contains 75% of minerals in corn.

According to the Indonesian National Standard (SNI) (01-2973-2011) the maximum ash content for cookies is 1.5%. Therefore, the ash content of these cookies has met the requirements of the Indonesian National Standard.

3.3. Fat Content

Mung bean supplementation and differences in fat sources had a significant effect on the resulting cookies, but the combination of the two had no significant effect. The highest fat content of 26.2% was produced in 10% mung bean flour supplementation, while the lowest at 23% was found in 30% supplementation (Figure 3).

Increased mung bean supplementation resulted in a decrease in the fat content of cookies. These results are in compliance with Agung et al. (2018) , which showed that the substitution of mung bean flour could reduce the fat content of bagea [23]. This is because mung bean flour has a low fat content. According to Widjajaseputra et al. (2019), the fat content in mung beans is 1.2% [8]. Corn flour has a higher fat content than mung beans, which is 3.80% [3]. Therefore, the greater the added mung bean flour, the lower the fat content.

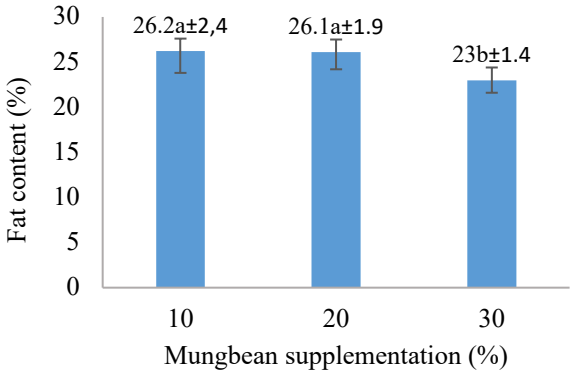

Figure 3. Effect of mung bean supplementation to fat content of cookies

The highest fat content is found in cookies that use VCO, which is 26.8%, while the lowest fat content (23.8%) is produced by using margarine. The higher the proportion of VCO in the manufacture of cookies, the higher the fat content of cookies. This is due to the difference in the amount of fat in margarine and VCO. VCO contains 98% fat, while margarine contains 80% fat. This resulted in the addition of more VCO in the manufacture of cookies, the fat content increased as can be seen in Figure 4.

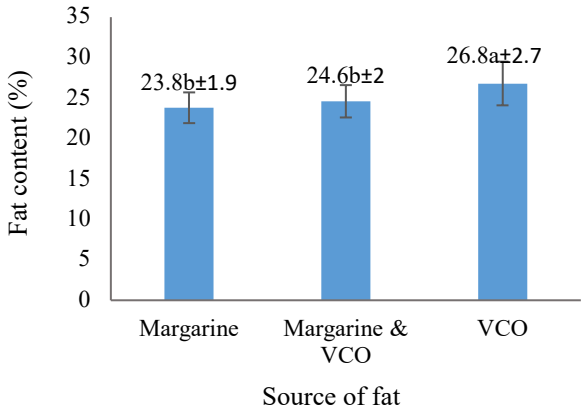

Figure 4. Fat content of cookies was affected by fat source

The fat content of cookies is quite high, but the fat contained in margarine is free of trans fat, while VCO is classified as a healthy oil because almost 50% of its fatty acids are medium chain, so it is easily absorbed. According to Lee et al. (2018), medium chain fatty acids have an advantage over long chain fatty acids is that they are easier to digest and absorb [24]. Medium chain fatty acids can be directly digested in the intestine without hydrolysis and enzymatic processes. So, in this study, although the fat content of cookies has a higher proportion of VCO, it is more easily absorbed and digested by the body.

One of the factors that can affect the fat content of cookies is the type of flour, because each flour has a different oil absorption capacity. Oil absorption is related to protein structure, where the minor components of gluten (lipids and polysaccharides), the proportion of different gluten protein groups and the balance of hydrophilic gluten properties cause differences in oil absorption capacity [25][26]. According to Fairouz et al. (2018), the high absorption of oil is due to the protein content and fat content [27]. The greater the fat or protein content, the greater the oil absorption capacity.

According to El Waseif and Badr (2018), oil absorption is also influenced by amylose content because it has the ability to form complexes with oil (lipids) in the form of amylose-lipids [28]. The higher the amylose content, the higher the oil absorption capacity. The high fat content of cookies affects the resulting texture, especially the crunchiness [29][30]. However, high fat content can also cause the shelf life of cookies to be shorter due to fat oxidation so that cookie packaging needs to be considered to prevent fat oxidation.

These cookies have almost the same fat content, compared to the 25.3% fat content of wheat flour cookies [31] but are higher than cookies from sorghum [32] . This is due to the use of corn flour that has 84% oil absorption capacity compared to 1.5% of wheat flour [25], [33]. This is due to the difference in amylose content, where corn flour has a higher amylose content (30%) compared to wheat flour (25%). According to Widjajaseputra *et al*. (2019), mung bean flour used for supplementation has an amylose content of 33% [8]. These differences, so that it can affect the amount of fat content contained in corn-almond cookies. The fat content of cookies is in accordance with the fat content of Indonesian National Standard (SNI 01-2973-2011) which is at least 5%.

3.4. Reducing Sugar

Mung bean flour supplementation, the use of types of fat, and the combination of the two did not have a significant effect on the reducing sugar content of cookies. The increasing supplementation of mung bean flour and the proportion of VCO in the processing of corn-almond cookies causes the value of reducing sugar content to tend to increase. According to Widjajaseputra *et al*. (2019), mung bean flour has reduced sugar content as much as 6.85% [8].

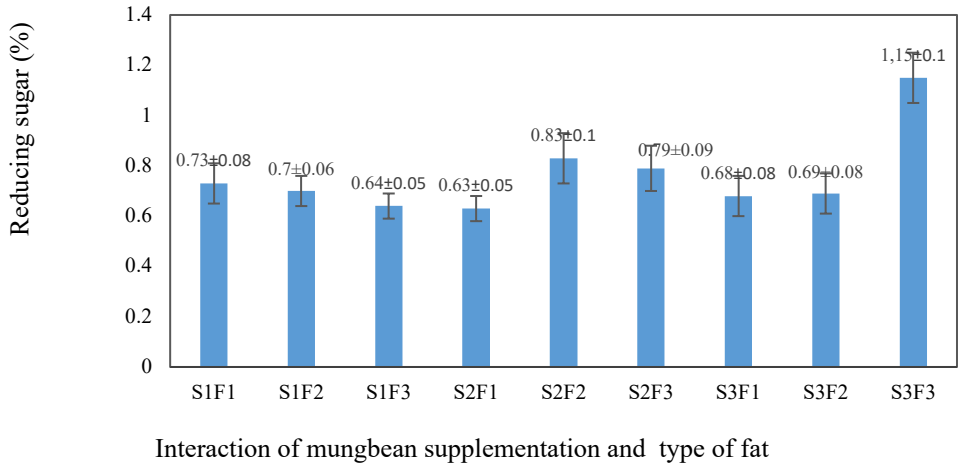

Figure 5. Reducing sugar of corn-almond cookies with soy flour supplementation and types of fat

The reducing sugar content in cookies mostly comes from sugar in the ingredients. In this study the sugar used is granulated sugar which is sucrose. The sucrose content in sugar is 99.3% or more. Heating sucrose causes sucrose to break down into glucose and fructose which is called invert sugar. The increase in reducing sugar levels was due to the inverse process of sucrose into reducing sugar and the inversion process increased in line with the increase in the sucrose content, in addition heating also encouraged hydrolysis of sucrose into reducing sugars, glucose and fructose [34]. According to Indonesia's National Agency of Drug and Food Control, a product can be said to be a low-sugar product if it contains no more than 5% sugar. Referring to these requirements, the corn-almond cookies are included in the low-sugar product.

3.5. Soluble Protein

The type of fat has a significant effect on the soluble protein content of cookies. Increasing the amount of VCO in the cookie formulation increased the soluble protein content of cookies. Cookies with the addition of VCO as a source of fat had the highest soluble protein content, which was 2.57%, as shown in Figure 6.

The increase in soluble protein content is influenced by the reaction between protein and fat in the process of making cookies. Protein will coagulate by heating so that during the roasting process, more protein will coagulate [34][35]. During the coagulation process, fat globules will be formed which can bind proteins and peptides in it so that it can increase protein levels. So that if the VCO or margarine is increased as a source of fat, it will increase the bound protein and also increase the dissolved protein content. The increase in VCO can increase the dissolved protein content because the fat content in VCO is higher than margarine. VCO contains 98% fat content, while margarine contains approximately 80% fat. So, the greater the fat content, the greater the amount of fat that can bind protein.

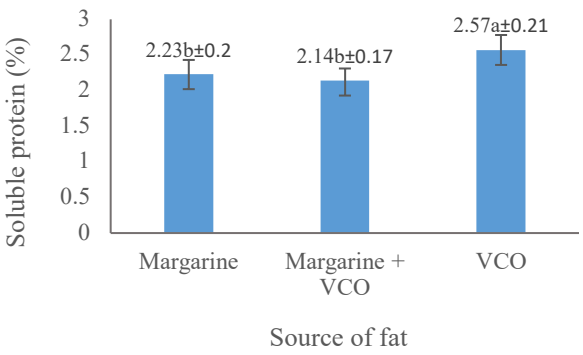

Figure 6. The effect of source fat on the soluble protein of cookies

The protein content in margarine is lower than VCO. Margarine has a protein of 0.6%, while VCO is 1%. The process of making VCO involves breaking the emulsion using enzymes to separate the oil from the coconut milk. According to Amin *et al.* (2017), the breakdown of coconut milk emulsions can occur in the presence of proteolytic enzymes that catalysed protein breakdown reactions by hydrolysing their peptide bonds into simpler compounds [10]. Proteolytic enzymes catalysed peptide bonds in proteins into simpler compounds such as dipeptides and amino acids. Protein hydrolysis that occurs can cause proteins that are initially insoluble to become soluble proteins.

3.6. Expansion Volume

The volume of cookie development is closely related to the ingredients or formulation of cookies used. Different types of fat had a significant effect on the

volume of cookie development, while supplementation with mung bean flour and the combination of the two had no significant effect. As the number of VCOs added increases, the development volume decreases as seen in Figure 7. Cookies with the addition of 100% margarine had the highest expansion volume, namely 81.2%, while cookies with the addition of 100% VCO had the lowest expansion volume, namely 63.6% (Figure 7). One of the factors that affect the volume of cookies development is moisture content.

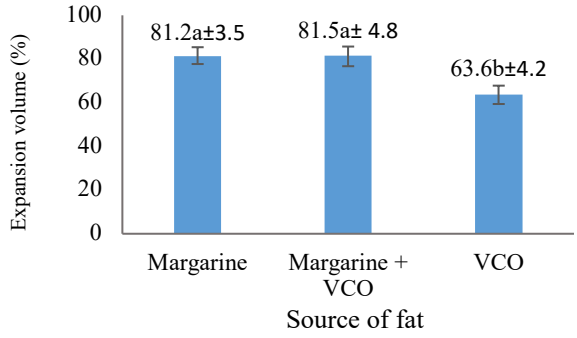

Figure 7. The effect of source fat on the soluble protein of cookies

The decreases in the volume of development can be due to the very small amount of liquid available in cookie dough [24]. This causes less interaction between water and gluten to form a gluten network that can withstand the expanding gases during the baking process. This is due to the low VCO water content as stated in the VCO composition, which is 0.1%. Margarine has a higher moisture content maximum of 16%. At the time of making cookies, the dough added with VCO turned out to be more viscous or denser and easier to shape than the dough added with margarine. According to Bolarinwa *et al.* (2019) cookie dough that has a more viscous consistency has a tendency to expand less when baked [34].

The expansion volume is influenced by protein content, amylopectin content and fat content [34], [36]. This is because the protein is denatured, causing the cookies to be difficult to expand and hard. Starch granules without protein will break easily and the amount of water that enters the starch granules will be more so that the development of starch will increase. This is in line with Mancebo *et al.* (2016) who stated that the volume of cookie development was also caused by the addition of high fat in the formula [37]. The proportion of added fat in the cookie formula affects the bond development of gluten.

Fat in cookies will change the texture, taste, and flavour of the product. The addition of fat can also cause interactions with starch granules and break hydration so that the increase in viscosity of the material becomes low. The mechanism of inhibition is that fat will form a layer on the outside of the starch granules and at the same time inhibit the penetration of water into the granules. Less water penetration will result in high gelatinization and will form cookies that are less fluffy with a denser / compact texture. According to Bolanriwa *et al.* (2019), if too much fat is added, it can cause cookies to widen and break easily, while too little fat makes the texture of the pastry hard and less fluffy [34]. The baking process also affects the swell ability of cookies, because when roasting the water bound in the starch granules is released during oven at a certain temperature so that the water evaporates and the steam formed will push the gel network out and cookies will develop.

Corn flour also plays a role in the development of cookies. According to Aini *et al*. (2016), corn flour contains amylose and amylopectin, this amylopectin content can affect the volume of cookie development, where amylopectin has a structure that easily absorbs water and water will be retained in it if it is absorbed [25]. The existence of these properties will make the starch structure will be hollow when baked due to evaporation of water from the starch molecules so that the volume of cookies will be larger.

The main component in flour that affects the texture of cookies is protein [34],[38]. The protein contained in flour can form gluten when added to water. Gluten can make dough elastic and able to hold gas. If the amount of gluten in the dough is small, the dough is less able to hold gas, so the pores that form in the dough are also small. As a result, the dough does not rise properly. The flour used in this study did not contain gluten, so development was lacking. This is in line with Jan *et al*. (2018) which states that cookies do not require basic ingredients that affect the swelling power so that cookies can be made using flour containing <1% gluten [39].

Cookies have a dough that is less elastic and less stretchy [40][41]. The amount of fat and sugar in the dough gives the dough plasticity and unity with no or very little gluten network formation. Cookies do not require volume expansion like wet cakes and rolls, but must be crispy, not absorbing water quickly, not hard and not crumbling easily. These properties are in accordance with the physicochemical and functional properties of corn flour.

3.7. Selected Formula

The 10% mung bean flour supplementation and the use of VCO produced cookies with the best physicochemical properties. The combination has soluble protein of 2.35%, 28.10% fat content, 0.21% reducing sugar, 2% moisture content, 0.27% ash content, and 73.23% expansion volume. The moisture and fat content of these corn cookies were higher than those of sago cookies that used VCO, while the ash content was lower.

According to Barlina et al. (2012), sago cookies that use VCO have a water content of 0.25%, ash content of 1.35%, and fat content of 19.68% [42]. This is influenced by the use of sago flour and wheat flour, where sago flour has 14% water content, 0.2% fat and 1.4% ash content, meanwhile wheat flour has 12% water content and 1.4% fat. The water and fat content are lower than corn and almond flour, while the ash content is higher.

According to Ratnasari and Yunianta (2015), cookies added with 10% mung bean flour have a protein content of 10.52%, a fat content of 17.52%, a water content of 6.41%, and an ash content of 0.67% [43]. When compared with corn-almond cookies in this study, the fat content value is smaller but the ash content and water content are higher. Meanwhile, Yuliatmoko and Satyatama (2012) state that Lampung taro cookies supplemented with 10% mung bean flour in a previous study are shown to have a water content of 3.9%, ash content of 1.32%, fat content of 24.56%, and protein content of 8.07% [44]. When compared with almond corn cookies with mung bean supplementation as much as 10%, the water content and ash content values of corn-almond cookies were lower than those of taro Lampung cookies. Meanwhile, the fat content of corn-almond cookies was higher. This is influenced by differences in ingredients.

Agung et al. (2015) states that biscuits with the addition of 15% mung bean flour were the most preferred, which had 1.5% ash content, 7.12% water, 14.29% fat, and 3.39% protein content [23]. If seen from these results, the corn-almond cookies have a value of ash and lower water levels, but it has a higher fat content value. Based on a comparison with some cookies that are added or supplemented with mung beans and the use of VCO, it turns out that the cookies in this study have several advantages in terms of their physicochemical variables. Cookies produced in this study have also fulfilled Indonesian National Standard.

4. CONCLUSION

Increased mung bean supplementation in corn-almond cookies improves moisture content and reduces fat content. Different fat sources affect fat content, soluble protein and expansion volume, and the best is VCO. The product with the best formulation is cookies d with 10% mung bean flour supplementation and uses VCO. These cookies have a soluble protein of 2.35%, 28.10% fat, 0.21% reducing sugar, 2% water content, 0.27% ash, and 73.23% expansion volume.

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Dear Nur Aini, Ervina Mela, Budi Sustriawan and Lisna Fuji Lestari

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TITLE: Effect of fat type and mung bean flour supplementation on physical and chemical properties
AUTHORS: Nur Aini, Budi Sustriawan, Ervina Mela and Lisna Lestari

---------- Alignment to the scope of the conference ----------
SCORE: 4 (excellent)
---------- Abstract ----------
SCORE: 4 (excellent)
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Introduction

58

The 6th IC-FANRES 2021 submission 15

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We received your submission to The 6th IC-FANRES 2021 (The 6th International Conference on Food, Agriculture, and Natural Resources 2021):

Authors : Nur Aini, Budi Sustriawan, Ervina Mela and Lisna Lestari
Title : Effect of fat type and mung bean flour supplementation on physical and chemical properties
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Thank you for submitting to The 6th IC-FANRES 2021.

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Assoc. Prof. Mohd. Fadzelly Bin Abu Bakar	Universiti Tun Hussein Onn Malaysia
Dr. Maria Stefanie Dwiyanti	Hokkaido University, Japan

CONFERENCE SCHEDULE

The 6th International Conference on Food, Agriculture, and Natural Resources (IC-FANRES) 2021
4 - 5 August, 2021

GENERAL SCHEDULE

Zoom Link ID: 882 7354 7309 Password: FANRES

Wednesday, 4 August 2021

Time	Activity				
7:30 - 08:00	Zoom meeting is opened				
08:00 - 08:03	National Anthem "Indonesia Raya"				
08:03 - 08:08	Opening by MC				
08:08 - 08:10	Prayer : Somanudin				
08:10 - 08:12	introduction to next session				
08:12 - 08:15	Greetings from Maria D.P.T. Gunawan Puteri, Ph.D., Chairwoman the 6th IC-FANRES 2021				
	OPENING REMARKS				
08:15 - 08:17	introduction to next session				
08:17 - 08:20	**Dr. rer nat Filiana Santoso Rector Swiss German University, Indonesia**				
08:20 - 08:22	introduction to next session				
08:22 - 08:25	**Prof. Tsutomu Morinaga, President Prefectural University of Hiroshima, Japan**				
08:25 - 08:27	introduction to next session				
08:27 - 08:30	**Prof. Dr. Yuli Witono President Food, Agriculture, and Natural Resources International Network**				
08:30 - 08:32	*MC Introduction to Industrial Insight Presentation 1*				
08:32 - 08:55	**Mr. Richard Anthony CEO and President Director PT Sewu Segar Primatama (Re-Juve)**				
08:55 - 09:00	*MC Introduction to Keynote Presentation 1*				
09:00 - 09:30	**KEYNOTE SPEECH 1 Dr. H. Sandiaga Salahuddin Uno, B.B.A., M.B.A. Minister of Tourism and Creative Economy**				
09:30 - 09:35	*Photo Session and MC Introduction to Keynote Presentation 2*				
09:35 - 10:05	**KEYNOTE SPEECH 2 Prof. Dr. Ismunandar, Ph.D. Acting Deputy Head in Strengthening Research and Development of The National Research and Innovation Agency of the Republic of Indonesia**				
10:05 - 10:10	*MC Introduction to Keynote Presentation 3*				
10:10 - 10:40	**KEYNOTE SPEECH 3 Dr. Ir Agung Hendriadi, M.Eng Head of Agency of Food Security, Ministry of Agriculture**				
10:40 - 10:42	*MC Introduction to Press Conference and Industrial Insight Presentation 2*				
10:42 - 10:50	**Mr. Apt. Drs Victor S. Ringoringo, S.E., M.Sc. Chief Bussines Development and RnD PT Deltomed Laboratories (Imugard)**				*Keynotes and Media Admission to Press Conference Room*
10:50 - 10:55	Industrial insight video (KMI)				**PRESS CONFERENCE (10:45 - 11:15, Jakarta GMT +7)**
10:55 - 11:00	*Participant Admission to Breakout Room*				
11:00 - 12:10	***Parallel Session 1***				
	Room A - Herbal, functional food, nutraceuticals, and nutrition for health.	***Room B - Information system and technology in food and agriculture***	***Room C - Agricultural and natural resources industrialization for food, health, and energy.***	***Room D - Food and agricultural waste utilization.***	
Moderator	Ir. Zainuri, PGDip., M.App.Sc., Ph.D	Dr. Maulahikmah Galinium, S.Kom., M.Sc	Dr.Satrijo Saloko	Dr. Irvan Setiadi Kartawira, S.T., M.Sc	
Lead Speakers	***Assoc. Prof. Ardiansyah*** - *Functional properties of dual fermented rice bran to improve metabolic-related diseases in SHRSP*		***Prof. Eiichiro Fukusaki*** - *Application of Metabolomics to High Resolution Phenotype Analysis*	***Dr. Ing. Evita H. Legowo*** - *Agricultural Wastes to Energy*	
	1-003 Dywanti Ariani 1-060 Della Rahmawati	2-004 Novita Susanti 2-014 Widya Nurmayda 2-035 Fitriyono A.	3-002 Annisa Kusumaningrum 3-025 Rindam Latief	6-018 Nurhayati 6-028 Ansharullah	
12:10 - 13:10	***Lunch Break and Networking Session***				
13:10 - 15:10	***Parallel Session 2***				
	Room A - Herbal, functional food, nutraceuticals, and nutrition for health.	***Room B - Business, management, and regulatory, including halal technology, in food, agriculture, and natural resources***	***Room C - Agricultural and natural resources industrialization for food, health, and energy.***	***Room D - Food and agricultural waste utilization.***	
Moderator	Kholis Abdurachim Audah, M.Sc., Ph.D	Arief Rahmawan, M.T., M.B.A.	Asst. Prof.Dr. Pavalee Chompoorat	Dr. Ir. Abdullah Muzi Marpaung, M.P.	
Lead Speakers	***Assoc. Prof. Eisuke Kato*** - *Bioactivity and health effect of natural products: are there any relation with bitter taste?*	***Prof. Dr. Umar Santoso*** - *Role of Food Technology to Strengthen the Product Competitiveness in Global Market*	***Assoc. Prof. Yonathan Asikin*** - *GC-MS based electronic nose profiling of regional brown sugars*	***Dr. Svenja Kloß*** - *Intelligent Packaging Concepts - How intelligent Packaging can reduce food waste*	
	1-006 Wijitrapha Ruangaram 1-007 Bernatal Saragih 1-008 Haslina Haslina 1-009 Melanie Cornelia	4-012 Antonius Siahaan 4-078 Stacia Fortunata 4-047 Devi U.M. Rohmah 4-051 Nainatul Farzuha Nor	3-023 Vincent Satya Surya 3-026 U Ulyarti 3-029 Ratri R. Utami 3-034 Setiarti Sukotjo	6-040 Florence Ignatia 3-070 Jariyah 3-071 Usman Pato 3-082 Muhammad Hazmi	
15:10 - 15:20	***Coffee Break and Networking Session***				
15:20 - 17:10	***Parallel Session 3***				
	Room A - Herbal, functional food, nutraceuticals, and nutrition for health.	***Room B - Eco-, agri-, and food-based tourism, education, and community empowerment.***	***Room C - Agricultural and natural resources industrialization for food, health, and energy.***	***Room D - Food and agricultural waste utilization.***	
Moderator	Muhammad Fathony, Ph.D	Dr. Ir. Yosman Bustaman, M.Buss.	Assoc. Prof. Dr. Ardiansyah	Dr. Yunita Umniyati, M.Sc	
Lead Speakers			***Lisa Heudorfer*** - *Evaluation as a practical treatment for improving microbiological safety of kernels and dried fruits*	***Dr. Kristina Eißenberger*** - *Bio-based packaging materials from renewable or waste resources designed for circularity*	
	1-019 Natasya Oktaviani 1-013 Indah Hairunisa 1-015 Nur Aini 1-017 Kholis A Audah 1-069 Claudia Christy	5-021 Shahid Anjum 5-039 Zainuri 5-043 Hendrik Segah 5-045 Taslim Sjah 5-054 Sayali Jamodkar	3-037 Titri Siratantri Mastuti 3-038 I Putu Suparthana 3-053 Satrijo Saloko 3-079 Maria Gunawan-Puteri	6-024 Edrick Alvaro Oslo 6-027 Chelselyn C. Chuaca 6-044 Elida N., Avif Septian 6-010 Diah Indriani Widiputri	

Thursday, 5 August 2021

Time	Activity				
08:00 - 08:05	Opening MC				
08:05 - 08:10	***OPENING REMARKS*** ***Kholis A. Audah, Ph.D.*** ***Director of Academic Research and Community Service Swiss German University, Indonesia***				
	KEYNOTES SESSION				
08:10 - 08:15	*MC Introduction to Keynote Presentation*				
08:15 - 08:45	**Keynote Speech 1:** **Prof. Patricia Rayas-Duarte** **Cereal Chemist, Oklahoma State University, USA**				
08:45 - 08:50	Industrial insight video				
08:50 - 08:55	*Participant Admission to Breakout Room*				*FANRes Executive Member Admission to Meeting Room*
09:00 - 10:30	***Parallel Session 4***				
	Room A - Herbal, functional food, nutraceuticals, and nutrition for health.	***Room B - Business, management, and regulatory, including halal technology, in food, agriculture, and natural resources.***	***Room C - Agricultural and natural resources industrialization for food, health, and energy.***	***Room D - Food and agricultural waste utilization.***	
Moderator	Diana Lo, STP, MSc, PhD	Dr. Nila Krisnawati Hidayat , S.E., M.M.	Prof. Dr. Ir. Meta Mahendradatta	Dr. Irvan Setiadi Kartawira, S.T., M.Sc	
Lead Speakers	***Assoc. Prof. Mohd. Fadzelly Bin Abu Bakar*** *- Bambangan (Mangifera pajang) an underutilized fruit of Borneo: Recent development as functional food and medicine*		***Dr. Pavalee Chompoorat*** *- Time-temperature effect on chemical properties of okara flour with modelling rheological properties of gluten-free product*	***Prof. Hiroyuki Harada*** *- Research on Biological Treatment and Decolorization of Agricultural Waste*	**FANRes Executive Member Annual Meeting (09:30 -11:00, Jakarta GMT+7)**
	1-036 Fitria Susilowati 1-056 Mutia Devi Ariyana 1-011 A. Muzi Marpaung	4-052 Patricia Josephine 4-062 Mardiyani Sidayat 4-066 Rano Abryanto 4-076 Wilda A. Safitri 4-033 Susanawati	3-042 Achmad Dinoto 3-050 Nurhayati 3-055 Dedin F. Rosida	6-032 Jean Aldrich Piolo 6-046 Elida N., Retno D.R. 6-049 Selvia Sarungu	
10:30 - 10:40	***Coffee Break and Networking Session***				
10:40 - 12:30	***Parallel Session 5***				
	Room A - Herbal, functional food, nutraceuticals, and nutrition for health.	***Room B - Information system and technology in food and agriculture***	***Room C - Agricultural and natural resources industrialization for food, health, and energy.***	***Room D - Agricultural and natural resources industrialization for food, health, and energy.***	
Moderator	Muhammad Fathony, Ph.D	Dr. Maulahikmah Galinium, S.Kom., M.Sc	Dr Ramisah Mohd Shah	Della Rahmawati, S.Si., M. Si.	
Lead Speakers	***Assist. Prof. Maria Stefanie Dwiyanti*** *- Discovering genetic variations associated with high α-tocopherol content in soybean and wild soybean*		***Dr. Sastia Prama Putri*** *- Recent advances on the application of metabolomics for quality improvement of important agricultural products*		
	1-065 Oktavianna Ginting 1-068 Hinedreana F.M.P. 1-077 Lailatul Azkiyah 1-005 Diah Indriani Widiputri	2-057 Rutuja Hinge 2-058 Rutuja Kole 2-059 Pawana Nur Indah 2-063 Putri Sari	3-030 A. Muzi Marpaung 3-061 I Made Sudantha 3-064 Norizah Mhd Sarbon 3-080 N. Kantanet	3-072 Hadassah Elisabeth, 3-074 I Made Joni 3-075 LIvia Wahyuni 6-020 Iwan Saskiawan 6-083 Aisyah Humayro	
12:30 - 13:50	***Lunch Break and Networking Session***				
13:50 - 14:00	*Participant Admission to Main Room*				
14:00 - 14:50	**Best Paper Award, Doorprize**				
14:50 - 15:00	***CLOSING REMARK*** ***Dr. Irvan Setiadi Kartawiria, S.T., M.Sc.*** ***Vice Rector Academic Swiss German University Indonesia***				

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SCHEDULE: ROOM A

Topic 1: Herbal, Functional Food, Nutraceuticals, and Nutrition for Health.

Wednesday, 4 August 2021

Time	Activity					
11:00 - 11:30	Parallel Session 1 (Moderator: Ir. Zainuri, PGDip., M.App.Sc., Ph.D)	**Assoc. Prof. Ardiansyah (Secretary of Perhimpunan Penggiat Pangan Fungsional dan Nutrasetikal Indonesia (P3FNI), Indonesia)**				**Functional properties of dual fermented rice bran to improve metabolic-related diseases in SHRSP**
		Paper ID	*Presenter*	*Affiliation*	*Author*	*Title*
11:30 - 11:50		1-003	Dywanti Ariani	Universitas Jember, Indonesia	Dywanti Ariani, Aida Rena Mareta, Misto and Bowo Eko Cahyono	Identification of Chlorogenic Acid Content of Coffee from Klungkung Jember Plantation Based on Roasting Temperature Variations
11:50 - 12:10		1-060	Della Rahmawati	Osaka University, Japan	Della Rahmawati, Made Astawan, Sastia Prama Putri, Eiichiro Fukusaki	Gas chromatography-mass spectrometry-based metabolite profiling of legumes Tempe and its sensory profile
12:10 - 13:10	*Lunch Break and Networking Session*					
13:10 - 13:40	Parallel Session 2 (Moderator: Kholis Abdurachim Audah, M.Sc., Ph.D)	**Assoc. Prof. Eisuke Kato (Hokkaido University, Japan)**				**Bioactivity and health effect of natural products: are there any relation with bitter taste?**
13:40 - 14:00		1-006	Wijitrapha Ruangaram	Hokkaido University; Japan	Wijitrapha Ruangaram and Eisuke Kato	The Mechanistic Study on The Effect of *Acacia concinna* and *Cymbopogon nardus* on Lipid Metabolism
14:00 - 14:20		1-007	Bernatal Saragih	Universitas Mulawarman; Indonesia	Bernatal Saragih, Maulida Rahmawati, Arif Ismanto, and Frederic Morado Saragih	Profile of FTIR (Fourier Transform Infra Red) and Comparison of Antioxidant Activity of Coffee with Tiwai (*Eleuhterine americana* Merr)
14:20 - 14:40		1-008	Haslina Haslina	Semarang University; Indonesia	Haslina Haslina, Dewi Larasati and Ery Pratiwi	Optimization of Temperature and Extraction Time with Ultrasonic Method to Phythochemical Content of Corn Bran
14:40 - 15:00		1-009	Melanie Cornelia	Pelita Harapan University; Indonesia	Melanie Cornelia, Aurelia Maharani Tunardy, Wenny Silvia Loren Sinaga	The Effect of Addition Cinnamon Extract (*Cinnamomum burmanii* L.) Toward Characteristic of Soy Milk Ice Cream
15:00 - 15:10	*Sponsor Presentation / Video*					
15:10 - 15:20	*Coffee Break and Networking Session*					
15:20 - 15:40	Parallel Session 3 (Moderator: Dedy Hermawan Bagus Wicaksono, Ph. D)	1-019	Natasya Oktaviani	Swiss German University; Indonesia	Filiana Santoso, Natasya Oktavianti and Maria D.P.T. Gunawan Puteri	Application of *Stenochlaena palustris* in Black Tea and Coffee Beverages Targeting Consumers with Sugar Concern
15:40 - 16:00		1-013	Indah Hairunisa	Universiti Tun Hussein Onn Malaysia; Malaysia	Indah Hairunisa, Mohd Fadzelly Abu Bakar and Muhammad Da'I	Phytochemical Screening and Antioxidant Activity of Black Ginger (*Kaempferia parviflora*) and Black Turmeric (*Curcuma caesia*) from Malaysia
16:00 - 16:20		1-015	Nur Aini	Universitas Jendral Soedirman; Indonesia	Nur Aini, Ervina Mela, Budi Sustriawan and Lisna Fuji Lestari	Effect of Fat Type and Mung Bean Flour Supplementation on Physical and Chemical Properties of Corn-Almond Cookies
16:20 - 16:40		1-017	Kholis Abdurachim Audah	Swiss German University; Indonesia	Imanuel Billy Tanjung, Norma Nur Azizah, Ade Arsianti, Amalda Siti Anisa, and Kholis Abdurachim Audah	Evaluation of *Avicennia marina*'s Roots Ethyl Acetate Extract as A Potential Anticancer Drug
16:40 - 17:00		1-069	Claudia Christy	Swiss German University; Indonesia	Claudia Christy, Maria D.P.T. Gunawan Puteri and Abdullah Muzi Marpaung	Lemongrass and ginger potency for blood glucose control
17:00 - 17:10	*Sponsor Presentation / Video*					

Thursday, 5 August 2021

Time	Activity					
09:00 - 09:30	Parallel Session 4 (Moderator: Diana Lo, STP, MSc, PhD)	**Assoc. Prof. Mohd. Fadzelly Bin Abu Bakar (Universiti Tun Hussein Onn Malaysia, Malaysia)**				**Bambangan (*Mangifera pajang*) an underutilized fruit of Borneo: Recent development as functional food and medicine**
		Paper ID	*Presenter*	*Affiliation*	*Authors*	*Title*
09:30 - 09:50		1-036	Fitria Susilowati	UIN Walisongo Semarang; Indonesia	Fitria Susilowati, Mita Nurul Azkia	Prebiotic Potential Oligosaccharides: In Vitro Study of Indonesian Local Honey from Apis spp. and Trigona spp. Bees
09:50 - 10:10		1-056	Mutia Devi Ariyana	University of Mataram; Indonesia	Baiq Rien Handayani, Nurul Hartiwi and Mutia Devi Ariyana	Study on the Quality of Fermented Tapioca with Variation of Lactic Acid Bacteria (LAB) Types
10:10 - 10:30		1-011	Abdullah Muzi Marpaung	Swiss German University; Indonesia	Jesslyn Sofyan, Tabligh Permana, and Abdullah Muzi Marpaung	The Study of Several Applicable Treatments for Serving Butterfly Pea Flower Drink
10:30 - 10:40	*Coffee Break and Networking Session*					
10:40 - 11:10	Parallel Session 5 (Muhammad Fathony, Ph.D)	**Assist. Prof. Maria Stefanie Dwiyanti (Hokkaido University, Japan)**				**Discovering genetic variations associated with high α-tocopherol content in soybean and wild soybean**
11:10 - 11:30		1-065	Oktavianna Ginting	Universitas Sumatera Utara, Indonesia	Oktavianna Ginting, Elisa Julianti and Rona J. Nainggolan	Hypocholesterolemic Effect of Biscuit Made from Purple Sweet Potato Flour, Starch, and Fiber Rich Flour on Rats
11:30 - 11:50		1-068	Hinedreana F.M. Pranoto	Swiss German University; Indonesia	Hinedreana F.M. Pranoto, Maria D.P.T. Gunawan Puteri and Victor Sahat Ringoringo	ABG Point of View in Lemongrass and Ginger Potency for Commercialization as Herbal with Anti-Diabetic in Indonesia
11:50 - 12:10		1-077	Lailatul Azkiyah	Prefectural University of Hiroshima; Japan	Lailatul Azkiyah, Tomoyuki Yoshino	In vitro anticancer activity of encapsulated lemon (Citrus limon) juice concentrate on murine colon carcinoma (Colon-26) cell line
12:10 - 12:30		1-005	Diah Indriani Widiputri	Swiss German University; Indonesia	Diah Indriani Widiputri, Quincy Juventinus, Silvya Yusri, Febbyandi Isnanda Pandiangan and Jimmy	Formulation Process Development of Health Supplement Containing Water Hyacinth (*Eichhornia crassipes*) Extract
12:30 - 14:00	*Lunch Break and Networking Session*					
14:00 - 14:10	*Participant Admission to Main Room*					
14:10 - 14:50	**Best Paper Award, Doorprize**					
14:50 - 15:00	***CLOSING REMARK*** ***Dr. Irvan Setiadi Kartawiria, S.T., M.Sc.*** ***Vice Rector Academic Swiss German University*** ***Indonesia***					

SCHEDULE: ROOM B

Topic 2 : Information system and technology in food and agriculture

Topic 4 : Business, management, and regulatory, including halal technology, in food, agriculture, and natural resources.

Topic 5 : Eco-, agri-, and food-based tourism, education, and community empowerment.

Wednesday, 4 August 2021

Time	Activity					
	Topic 2 : Information system and technology in food and agriculture					
		Paper ID	*Presenter*	*Affiliation*	*Authors*	*Title*
11:00 - 11:30	*Parallel Session 1 (Moderator: Dr. Maulahikmah Galinium, S.Kom., M.Sc)*	2-004	Novita Susanti	Indonesian Institute of Sciences; Indonesia	Novita Dwi Susanti, Diang Sagita, Ignatius Fajar Apriyanto, Cahya Edi Wahyu Anggara, Doddy Andy Darmajana and Ari Rahayuningtyas	Design And Implementation Of Water Quality Monitoring System (Temperature, PH, TDS) In Aquaculture Using IOT At Low Cost
11:30 - 11:50		2-014	Widya Nurmayda	Universitas Jember; Indonesia	Nita Kuswardhani, Ida Bagus Suryaningrat and Syliva Widya Nurmayda	Commodity System Assessment Method of Postharvest Losses on Tomato (*Solanum lycopersicum*) in Jember Regency
11:50 - 12:10		2-035	Fitriyono Ayustaningwarno	Diponegoro University; Indonesia	Fitriyono Ayustaningwarno, Yonathan Asikin	Evolution of Research Trends in Food and Nutritional Sciences: A Sneak Peak of Big-Data Perspective Over The Past 10 Years
12:10 - 13:10	*Lunch Break and Networking Session*					
	Topic 4 : Business, management, and regulatory, including halal technology, in food, agriculture, and natural resources.					
13:10 - 13:40	*Parallel Session 2 (Arief Rahmawan, M.T., M.B.A.)*	**Prof. Dr. Umar Santoso (President of Perhimpunan Ahli Teknologi Pangan Indonesia (PATPI), Indonesia)**				**Peran Teknologi Hasil Pertanian dan Teknologi Pangan untuk Pasar Global pada Masa Paska Pandemic**
		Paper ID	*Presenter*		*Authors*	*Title*
13:40 - 14:00		4-012	Antonius Siahaan	Swiss German University; Indonesia	Antonius Siahaan and Jeffry Thiodore	Analysis Influence of Consumer Behavior To Purchase Organic Foods in Jakarta
14:00 - 14:20		4-078	Stacia Fortunata	Swiss German University; Indonesia	Elissa Florentina, Stacia Fortunata, Nila Hidayat, Maria Gunawan-Puteri	Overripe Tempe Stock Prototype Development and Evaluation of Consumer Acceptance for Commercialization Preparation
14:20 - 14:40		4-047	Devi Urianty Miftahul Rohmah	University of Darussalam Gontor; Indonesia	Devi Urianty Miftahul Rohmah, Arief Rahmawan and Mohammad Fuad	Identification of Ponorogo Coffee Agro-industry Supply Chain
14:40 - 15:00		4-051	Nainatul Farzuha Nor	UNIVERSITI UTARA MALAYSIA; Malaysia	Nainatul Farzuha Nor, Hartini Ahmad, Ahmad Shabudin Ariffin	CONFIDENCE LEVEL INTENTION TO PURCHASE HALAL FOOD PRODUCTS VIA ORDERING ONLINE APPLICATION
15:00 - 15:10	*Sponsor Presentation / Video*					
15:10 - 15:20	*Coffee Break and Networking Session*					
	Topic 5 : Eco-, agri-, and food-based tourism, education, and community empowerment.					
	Parallel Session 3 (Moderator: Dr. Ir. Yosman Bustaman, M.Buss.)	*Paper ID*	*Presenter*		*Authors*	*Title*
15:20 - 15:40		5-021	Shahid Anjum	Universiti Teknologi Brunei; Brunei Darussalam	Shahid Anjum and Abidah Binti M. Abidin	Aquaculture As An Employment Enhancing Economic Diversification for Brunei Darussalam: Digital technology, Training and Sector Development Options
15:40 - 16:00		5-039	Zainuri	Universitas Mataram; Indonesia	Zainuri, Taslim Sjah	Empowering Communities of Agribusiness Mangoes in North Lombok, Indonesia
16:00 - 16:20		5-043	Hendrik Segah	Universitas Palangkaraya; Indonesia	Hendrik Segah	Peatland Ecosystem Protection and Management Plan as An Alternative to SDGs Implementation: A Case Review in Central Kalimantan, Indonesia
16:20 - 16:40		5-045	Taslim Sjah	Universitas Mataram; Indonesia	Taslim Sjah, Ridwan, Ibrahim, Sri Supartiningsih, Padusung	Farmer Decision on Cocoa Farm in North Lombok, Indonesia
16:40 - 17:00		5-054	Sayali Jamodkar	Dr. P.D.K.V.,Akola; India	Sayali S. Jamodkar	HARDENING BASED SKILL AND ENTREPRENEURSHIP PROGRAM FOR RURAL YOUTH OF VIDARBHA REGION
17:00 - 17:10	*Sponsor Presentation / Video*					

Thursday, 5 August 2021

Time	Activity					
	Topic 4 : Business, management, and regulatory, including halal technology, in food, agriculture, and natural resources.					
	Parallel Session 4 (Moderator: Dr. Nila Krisnawati Hidayat , S.E., M.M.)	*Paper ID*	*Presenters*	*Affiliation*	*Authors*	*Title*
09:00 - 09:20		4-052	Patricia Josephine	Swiss German University; Indonesia	Patricia Josephine, Robert La Are	THE INFLUENCE OF GREEN CAMPAIGN TOWARDS CONSUMER PURCHASE INTENTION. A STUDY OF X COFFEE SHOP IN JAKARTA
09:20 - 09:40		4-062	Mardiyani Sidayat	Department of Agribussiness, Faculty of Agriculture, Khairun University, Indonesia	Mardiyani Sidayat and Mila Fatmawati	Total economic value of Beauty Leaf Tree(Capilong) in Ternate Island –North Maluku-Indonesia
09:40 - 10:00		4-066	Rano Abryanto	Swiss German University; Indonesia	Fidjria Lubana Salsabela, Rano Abryanto	Analysis of Food Handler's Knowledge of Hygiene and Sanitation Impact on Food Quality: A Study of Lubana Sengkol Restaurant
10:00 - 10:20		4-076	Wilda A. Safitri	University of Jember; Indonesia	Wilda A. Safitri, M. Rondhi and Triana D. Hapsari	Transaction Cost for Marketing of Voor Oogst Kasturi Tobacco: Case in Jember Regency
10:20 - 10:40		4-033	Susanawati	Universitas Muhammadiyah Yogyakarta; Indonesia	Susanawati, Muhammad Fauzan, Ivo Mega Candela Fanestia	Supply Chain Resources of Red Chili in Kulonprogo Indonesia Based on Food Supply Chain Network
10:40 - 10:50	*Sponsor Presentation / Video*					
10:50 - 11:00	*Coffee Break and Networking Session*					
11:00 - 11:20	*Parallel Session 5 (Moderator: Dr. Maulahikmah Galinium, S.Kom., M.Sc)*	2-057	Rutuja Hinge	Vishwakarma Institute of Technology, Pune; India	Rutuja Hinge and Jyoti Madake	Prow Grow- An Android Application for Farm Machinery Rental System
11:20 - 11:40		2-058	Rutuja Kole	Vishwakarma Institute of Technology, Pune; India	Jyoti Madake and Rutuja Kole	Livestock Health and Feed management in Precision Farming
11:40 - 12:00		2-059	Pawana Nur Indah	UPN "Veteran" Jawa Timur; Indonesia	Risqi Firdaus Setiawan, Nisa Hafi Idhoh Fitriana and Pawana Nur Indah	Welfare Level of Goat Farmers Using Farmer's Exchange Rate Approach in Sidoarjo Regency
12:00 - 12:20		2-063	Putri Sari	University of Jember, Indonesia	Putri Tunjung Sari, Indarto Indarto, Marga Mandala and Bowo Cahyono	MAPPING LAND QUALITY INDEX FOR PADDY FIELDS IN JEMBER REGENCY BASED ON PRINCIPAL COMPONENT ANALYSIS (PCA)
12:20 - 12:30	*Sponsor Presentation / Video*					
12:30 - 14:00	*Lunch Break and Networking Session*					
14:00 - 14:10	*Participant Admission to Main Room*					
14:10 - 14:50	**Best Paper Award, Doorprize**					
14:50 - 15:00	***CLOSING REMARK*** ***Dr. Irvan Setiadi Kartawiria, S.T., M.Sc.*** ***Vice Rector Academic Swiss German University*** ***Indonesia***					

SCHEDULE: ROOM C

Topic 3: Agricultural and natural resources industrialization for food, health, and energy.

Wednesday, 4 August 2021

Time	Activity					
11:00 - 11:30	*Parallel Session 1 (Moderator: Dedy Hermawan Bagus Wicaksono, Ph. D)*	**Prof. Eiichiro Fukusaki (Osaka University, Japan)**				**Application of Metabolomics to High Resolution Phenotype Analysis**
		Paper ID	*Presenter*	*Affiliation*	*Authors*	*Title*
11:30 - 11:50		3-002	Annisa Kusumaningrum	Indonesian Institute of Sciences; Indonesia	Annisa Kusumaningrum, Aldicky Faizal Amri, Asep Nurhikmat, Agus Susanto and Siswo Prayogi	Thermal Processing and Chemical Characteristics of Traditional Food Based on Meat: Rawon, Kuah Gandul and Empal Gentong
11:50 - 12:10		3-025	Rindam Latief	Hassanudin University; Indonesia	Rindam Latief, Syahidah Muslim and Esy Safitry	Shelflife Estimation of Cukke Cake in the Plastic Packaging of Polypropylene Using the Accelerated Shelflife Testing Method Based on the Critical Moisture Content Approach
12:10 - 13:10	***Lunch Break and Networking Session***					
13:10 - 13:40	*Parallel Session 2 (Moderator: Asst. Prof.Dr. Pavalee Chompoorat)*	**Assoc. Prof. Yonathan Asikin (University of the Ryukyus, Japan)**				**GC-MS based electronic nose profiling of regional brown sugars**
13:40 - 14:00		3-023	Vincent Satya Surya	Swiss German University; Indonesia	Tabligh Permana, Nia Wiradjaja, Hery Sutanto and Vincent Satya Surya	A Review on The Potential of Natural Antioxidant Sources to Improve Oxidative Stability of Edible Oils
14:00 - 14:20		3-026	U Ulyarti	Universitas Jambi; Indonesia	Ulyarti, Mursyid, Ismanto and Nazarudin	Modification of Cassava Starch (*Manihot utilissima*) Using Precipitation Method with Addition of NaCl
14:20 - 14:40		3-029	Ratri R. Utami	Balai Besar Industri Hasil Perkebunan; Indonesia	Baharuddin Baharuddin, Maryani Maryani, Suriana Laga, Andi T. Fitriyah and Ratri R. Utami	Organoleptic Properties of Ternate Nutmeg (*Myristica fragrans* Houth)
14:40 - 15:00		3-034	Setiarti Sukotjo	Institut Teknologi Indonesia; Indonesia	Setiarti Sukotjo, Heru Irianto and Nita Yustika Sari	The Effect of Tomato Concentration on Sensory and Chemical Properties of Jelly Drink
15:00 - 15:10	***Sponsor Presentation / Video***					
15:10 - 15:20	***Coffee Break and Networking Session***					
15:20 - 15:50	*Parallel Session 3 (Moderator: Assoc. Prof. Dr. Ardiansyah)*	**Lisa Heudorfer (Albstadt - Sigmaringen University of Applied Science, Germany)**				**Evaluation as a practical treatment for improving microbiological safety of kernels and dried fruits**
15:50 - 16:10		3-037	Titri Siratantri Mastuti	Pelita Harapan University; Indonesia	Titri Siratantri Mastuti, Aurelie Fedora Setiawanto	Characteristics of Red Ginger Jelly stick with Variations Type of Gelling Agent
16:10 - 16:30		3-038	I Putu Suparthana	Universitas Udayana, P3FNI; Indonesia	I Putu Suparthana, Putu Widya Indra Astuti and Nengah Kencana Putra	Enhancement of Local Agricultural Product *Xanthosoma sagittifolium* as the Food Ingredient and Industrial Raw Material
16:30 - 16:50		3-053	Satrijo Saloko	University of Mataram; Indonesia	Satrijo Saloko, Mutia Devi Ariyana and Nadiah Khoiroh	The Effect of "Bile" Banana (Musa Paradisiaca) Maturity Level on Microbiological, Chemical and Sensory Quality of Goat's Milk Kefir
16:50 - 17:10		3-079	Maria Gunawan-Puteri	Swiss German University; Indonesia	Gabriela Masaki, Filiana Santoso, Maria Gunawan-Puteri	Optimization Of Aqueous Extraction Of Indonesian Bay Leaf (Syzygium Polyanthum Wight) As Powder Seasoning

Thursday, 5 August 2021

Time	Activity					
09:00 - 09:30	*Parallel Session 4 (Moderator: Prof. Dr. Ir. Meta Mahendradatta)*	**Dr. Pavalee Chompoorat**				**Time-temperature effect on chemical properties of okara flour with modelling rheological properties of gluten-free product**
		Paper ID	*Presenter*		*Authors*	*Title*
09:30 - 09:50		3-042	Achmad Dinoto	Indonesian Institute of Sciences; Indonesia	Achmad Dinoto, Rini Handayani, Sulistiani, Ninu Setianingrum, Mulyadi and Heddy Julistiono	Profiles of Oligosaccharides Synthesized from Under-Explored Tuber Starches by *Aspergillus oryzae* α-Amylase
09:50 - 10:10		3-050	Nurhayati	University of Jember; Indonesia	Nurhayati Nurhayati, Maria Belgis, Jayus, and Infidzah Shabrina Velianti	Increasing of Food Safety on Wet Noodles Using Coconut Oil Compare with Other Vegetable Oil
10:10 - 10:30		3-055	Dedin Finatsiyatull Rosida	Universitas Pembangunan nasional veteran Jawa Timur; Indonesia	Dedin Finatsiyatull Rosida and Ricke Amalia	GLUCOSE SYRUP FROM MODIFIED STARCH OF COCOYAM (Xanthosoma sagittifolium) USING THE ANNEALING METHOD
10:30 - 10:40	***Coffee Break and Networking Session***					
10:40 - 11:10	*Parallel Session 5 (Moderator: Dr Ramisah Mohd Shah)*	**Dr. Sastia Prama Putri**				**Recent advances on the application of metabolomics for quality improvement of important agricultural products**
11:10 - 11:30		3-030	Abdullah Muzi Marpaung	Swiss German University; Indonesia	Gayatri Annisa Larasati, Irvan Setiadi Kartawiria and Abdullah Muzi Marpaung	Anthocyanin Extraction from *Clidemia hirta* Fruit and Its Stability During Storage
11:30 - 11:50		3-061	I Made Sudantha	University of Mataram, Indonesia	I Made Sudantha and Suwardji	Growth Response and Yield of Shallots to Trichoderma Biostimulants and Growth Regulators Substance Benzyl Amino Purine (GRS BAP)
11:50 - 12:10		3-064	Norizah Mhd Sarbon	Universiti Malaysia Terengganu, Malaysia	Ummul Hani Najwa Raini, Wan Mohd Khairul Wan Mohamed Zin, Adibah Izzati Daud and Norizah Mhd Sarbon	Bio-nanocomposite gelatine films with lemongrass essential oil and zinc oxide nanoparticles: Gas sensing, functional and antimicrobial properties
12:10 - 12:30		3-080	N. Kantanet	Maejo University, Thailand	N. Katanet and Pavalee Chompoorat	Impact of storage temperature on physiological changes and shelf life of mango CV. Mahachanok
12: 30 - 14:00	***Lunch Break and Networking Session***					
14:00 - 14:10	*Participant Admission to Main Room*					
14:10 - 14:50	**Best Paper Award, Doorprize**					
14:50 - 15:00	***CLOSING REMARK*** ***Dr. Irvan Setiadi Kartawiria, S.T., M.Sc.*** ***Vice Rector Academic Swiss German University*** ***Indonesia***					

SCHEDULE: ROOM D

Topic 6: Food and agricultural waste utilization.

Wednesday, 4 August 2021

Time	Activity					
11:00 - 11:30	*Parallel Session 1 (Moderator: Dr. Irvan Setiadi Kartawira, S.T., M.Sc)*	**Dr. Ing. Evita H. Legowo (Swisss German University, Indonesia)**				**Agricultural Wastes to Energy**
		Paper ID	*Presenters*	*Affiliation*	*Authors*	*Title*
11:30 - 11:50		6-018	Nurhayati	Universitas Jember; Indonesia	Dedy Eko Rahmanto, Deny Arizal and Nurhayati Nurhayati	Utilization of Banana Peel for Bioethanol Production Using Baker's Yeast Starter
11:50 - 12:10		6-028	Ansharullah Ansharullah	Universitas Halu Oleo; Indonesia	Ansharullah, Sitti Aida Adha Taridala, Muhammad Natsir, Eva Nopitasari and Sri Damayanty	Effect of Heating Treatment of VCO By-Product on Protein, Fat, Free Fatty Acid, Emulsification Capacity, and Sensory Properties
12:10 - 13:10	***Lunch Break and Networking Session***					
13:10 - 13:40	*Parallel Session 2 (Moderator: Dr. Ir. Abdullah Muzi Marpaung, M.P.)*	**Dr. Svenja Kloß (Albstadt - Sigmaringen University of Applied Science, Germany)**				**Intelligent Packaging Concepts - How intelligent Packaging can reduce food waste**
13:40 - 14:00		6-040	Florence Ignatia	Swiss German University; Indonesia	Maria Dewi Puspitasari Tirtaningtyas Gunawan-Puteri, Kezia Meivira, Irvan Kartawiria and Florence Ignatia	Review: Nutrient, Fiber, and Bioactive Content of Fruit Pomace, Major By-product of Juice Industry
14:00 - 14:20		3-070	Jariyah	UPN "Veteran" Jawa Timur; Indonesia	Jariyah, Sri Winarti, Ulya Sarofa and Maya Regina Subagio	Study of Stevia Leaf Powder and Fructose Syrup For Characteristics of Biscuits Based on Mocaf- Pedada Flour
14:20 - 14:40		3-071	Usman Pato	Riau University; Indonesia	Usman Pato, Yusmarini Yusuf, Shanti Fitriani, Diky Arma Fauzi, Ghina Ismadiah, Miftahul Hidayah and Windy Sabiliani	Evaluation of Bacteriocin Produced by Pediococcus pentosaceus Strain 2397 as Natural Preservative for Fish Meatballs Stored at Room Temperature
14:40 - 15:00		3-082	Muhammad Hazmi	Universitas Muhammadiyah Jember; Indonesia	Muhammad Hazmi, Iskandar Umarie, Hidayah Murtiyaningsih, dan Laras Sekar Arum	INCREASING SORGHUM PRODUCTION ON MARGINAL LAND IN THE FRAMEWORK OF FOOD PROCUREMENT POST-COVID-19 PANDEMIC
15:00 - 15:10	***Sponsor Presentation / Video***					
15:10 - 15:20	***Coffee Break and Networking Session***					
15:20 - 15:50	*Parallel Session 3 (Moderator: Dr. Yunita Umniyati, M.Sc)*	**Dr. Kristina Eißenberger (Albstadt - Sigmaringen University of Applied Science, Germany)**				**Bio-based packaging materials from renewable or waste resources designed for circularity**
15:50 - 16:10		6-024	Edrick Alvaro Oslo	Swiss German University; Indonesia	Tabligh Permana, Glynnis Netania, Juli Effendy, Edrick Alvaro Oslo and Filiana Santoso	A Review on The Potential Application of Cacao Shell in Food Industry
16:10 - 16:30		6-027	Chelselyn Charissa Chuaca	Swiss German University; Indonesia	Chelselyn Charissa Chuaca, Elza Karenina, Kezia Valentina Yusuf, Shafwah Dzahabiyya, Alwan Raihan, Evita Herawati Legowo and Hery Sutanto	Biodiesel Production of Spent Coffee Grounds Oil
16:30 - 16:50		6-044	Elida Novita, Avif Septian	Universitas Jember; Indonesia	Elida Novita, Sri Wahyuningsih, Avif Septian and Hendra Anindiananata Pradana	Variation Composition of Feeding to Organic Matter Reduction and Biogas Production Using Anaerobic Process
16:50 - 17:10		6-010	Diah Indriani Widiputri	Swiss German University; Indonesia	Diah Indriani Widiputri, Fernanda Ayuyasmin Kathalia, and Evita Herawati Legowo	Biopellet Production from the Wastes of Palm Oil Plantation and Processing Plant through Various Pre-Treatment Processes: A Review

Thursday, 5 August 2021

Time	Activity					
09:00 - 09:30	*Parallel Session 4 (Moderator: Dr. Irvan Setiadi Kartawira, S.T., M.Sc)*	**Prof. Hiroyuki Harada (Prefectural University of Hiroshima, Japan)**				**Research on Biological Treatment and Decolorization of Agricultural Waste**
		Paper ID	*Presenter*		*Authors*	*Title*
09:30 - 09:50		6-032	Jean Aldrich Piolo	Swiss German University; Indonesia	Jean Aldrich Piolo, Evita Legowo and Diah Indriani Widiputri	Study of Biogas Production from Palm Oil Solid Wastes
09:50 - 10:10		6-046	Elida Novita, Retno Dwi Rianti	Universitas Jember; Indonesia	Elida Novita, Retno Dwi Rianti and Hendra Pradana	Phytoremediation of Analytic Laboratory Wastewater Using Constructed Wetland with Mexican-sword Plant and Water Hyacinth
10:10 - 10:30		6-049	Selvia Sarungu	Sekolah Tinggi Teknologi Minyak dan Gas Bumi Balikpapan; Indonesia	Selvia Sarungu, Karnila Willard, Hamriani Ryka, Simon Tampang, Junaesar Tangke Tasik, Bodhi Dharma, Sitompul Afrida	Bioethanol Production from Dragon Fruit Waste Using *Aspergillus niger* and *Saccharomycetes cerevisae*
10:30 - 10:40	***Coffee Break and Networking Session***					
10:40 - 11:00	*Parallel Session 5 (Moderator: Della Rahmawati)*	3-072	Hadassah Elisabeth	Swiss German University; Indonesia	Hadassah Elisabeth, Tabligh Permana and Elisabeth K. Prabawati	Product Development of Fried Shallot from Dairi Potentiates as Souvenir
11:00 - 11:20		3-074	I Made Joni	Universitas Padjajaran; Indonesia	Hamidin Rasulu, Danar Praseptiangga, I Made Joni and Ari Handono Ramelan	Characterization of Physicochemical Properties of Powder Coconut Crab Shells (Birgus latro L.) from North Maluku
11:20 - 11:40		3-075	LIvia Wahyunii	University of Jember; Indonesia	Yuli Witono, Livia Wahyuni, Lilik Krisna Mukti, Ardiyan Dwi Masahid and Asrul Bahar	Functional Properties of Protein Hydrolysate of Low Economic Value Sea and Fresh Water Fish Hydrolyzed Using 'Biduri' Protease
11:40 - 12:00		6-020	Iwan Saskiawan	RC for Biology, Indonesian Institute of Sciences; Indonesia	Iwan Saskiawan and Atik Retnowati	Bioconversion of Lignocellulosic Agriculture Waste to An Edible Mushroom, The Functional Food for Healthy Life During Covid 19
12:00 - 12:20		6-083	Aisyah Humayro	Prefectural University of Hiroshima; Japan	Aisyah Humayro, Hiroyuki Harada, Kanako Naito, Atsushi Hashimoto	The Effective Adsorption of Phosphate and Nitrate using Spent Coffee Ground Loaded Iron and The Effect for Plant Growth
12:20 - 12:30	***Sponsor Presentation / Video***					
12:20 - 14:00	***Lunch Break and Networking Session***					
14:00 - 14:10	*Participant Admission to Main Room*					
14:10 - 14:50	**Best Paper Award, Doorprize**					
14:50 - 15:00	***CLOSING REMARK*** ***Dr. Irvan Setiadi Kartawiria, S.T., M.Sc.*** ***Vice Rector Academic Swiss German University*** ***Indonesia***					