

ISSUE #1 2021

agri news

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Sustainable agriculture that drives nation

**Food Delivery Services & Safety
Issues During Pandemic**

**Now You Can Grow
Sweet Strawberry
in lowland tropics**

**UMT Pledges Support
For The Shanghai Declaration**

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What's Inside?

ii Editorial Note

iii Dean's Welcome Note

Research Updates

- 1 Food Delivery Services: At Your Own Risk
- 4 Food Safety Knowledge & Practices Sharing Session With Pusat Tahfiz
- 6 Product Innovation, A Way Of Collaboration
- 8 Fruit & Vegetable Carving As A Food Art Therapy
- 10 'Kuali Hangus?' Nik Aqil Will Answer...
- 11 Sweet Strawberries Growing In Terengganu
- 13 UMT Lead Mutation Breeding in Vanilla to Improving High Value Traits
- 15 Global Sustainable Aquaculture Advancement Partnership
- 16 The Millennium Status Of Coastal Fisheries Management In Malaysia.
- 21 Umt Pledges Support For The Shanghai Declaration
- 22 Students of Diploma in Fisheries in 2021 Maritime Silk Road Training Course on Mariculture Technology, and Global Forum on Sustainable Fisheries Development

News on FPSM Activities

- 24 FPSM Initiates Official Collaboration With Indian Universities; UMT Signs MoU With Mizoram University
- 25 Kelulut Soaring High With The Signing Of A Collaborative Agreement Between UMT & Pharmaniaga Bhd.
- 26 Activity Report 12th MIFT National Food Science & Technology Competition 2021
- 28 Differential Scanning Calorimeter Webinar By Fpsm Senior Science Officer

Announcement (seminar, talk, conference etc)

- 29 Call For Papers : Special Topic Molecular Mechanisms of Bacterial Disease in Cultured Fishes
- 30 Ending the year with a shine ...



A Note from the Editor



Assalamualaikum and good day to our beloved readers.

What a brilliant time to end this year with this inaugural edition of AgriNews, a brand-new digital sharing platform for all faculty members. Kudos to the editorial board members of this newsletter for working very hard to ensure this issue meets its deadline. Thank you to all the hardworking writers for their significant contributions to this newsletter.

In this issue we highlighted several interesting articles from our contributors for the delight read of all readers.

This issue of AgriNews is hopefully the start of a vibrant and critically engaged faculty members creative mind and voice within the faculty. AgriNews is a platform for everybody to express oneself. You can speak your mind and translate them into a wonderful writing. The submission of articles will not be restricted to just our regular team of writers. We want you to write anything from your fascinating work or research that you spent countless hours on that benefited the humankind, your life experiences that worth sharing, your one-in-a-lifetime travelogue or even the magnificent life of your pets. If you don't fancy writing articles, you can always send us your beautiful artwork or stunning photographs for all the readers to be mesmerized by your masterpieces.

On a more somber note, we take a serious look into what is happening globally.

This year and previous year have been a very challenging period for almost every soul in this planet. We never expected that a virus of dubious origin has caused so much chaos globally. Covid 19 which was declared by The World Health Organization (WHO) as a world pandemic on the 11 March 2020, affected every aspect of our life. As of today, Covid 19 vaccine is the only protective barrier for us against the severity of Covid 19 infection.

As an axiom says – tough time never last, tough people do. So let's hope better days will come real soon.

Covid 19 is real. Be safe everybody and keep writing!

Shamsul Bahri
Prof. Dr. Shamsul Bahri Abd Razak
Editor in Chief

**NEVER STOP DOING
WHAT YOU LOVE!**

Dean's Welcome Note

**Prof. Dr. Mohd. Effendy
Abd. Wahid**



Assalamualaikum and Greetings to all,

Welcome to the first issue of AgriNews 2021! I would like to take this opportunity to congratulate our Editorial Team Members on the success of producing this First Issue of our faculty official newsletter. Agrinews was created as a platform to encourage faculty members to share their stories and ideas. The existence of newsletter at the faculty level will provide greater space for faculty members to write of which will benefit both the scholars and public reader. I believed, with the theme 'Sustainable Agriculture that drives the nation', will be able to raise awareness among readers some of the importance issues in agriculture, fisheries, aquaculture and food science which are interrelated in the world's ecology to ensure world food security. Through this platform, FPSM is able to highlight our inhouse expertise to help our government in dealing with the crisis, especially our country is now battling to recover from the effects of the COVID-19 pandemic which has almost crippled the economy and the basic needs of the people. The First Issue of AgriNews also includes the sharing of current research from lecturers and researchers, activities carried out by FPSM for the year 2021 as well as announcements on seminars/ conferences to be held.

I am honored to be given the opportunity to welcome you to browse through this newsletter as an important platform in bringing together scientists and researchers not only from Malaysia but from around the world, to intensify knowledge sharing. After all, that is part of education. Education is not only learning in the classroom but also learning from the people around us. The magazine serves as an important network for many sectors and individuals to discuss strategies in ensuring the sustainability of fisheries, agriculture and food resources in our country.

Therefore, I invite you all to join us on this journey in making our faculty one of the world's leading research hubs by harnessing the potential from our fisheries, agriculture and food resources. Once again, I would like to welcome all of you who read AgriNews and wish happy reading to all readers.

Mohd. Effendy Abd. Wahid
Profesor Dr. Mohd. Effendy Bin Abd. Wahid
Dean, Faculty of Fisheries and Food Science
Universiti Malaysia Terengganu

Food Delivery Services: At Your Own Risk

Dr. Tuan Zainazor Tuan Chilek

Boy, 'Mummy! I'm hungry! I need some burger.'

Sister, 'Me too... I prefer a bowl of salad and mushroom soup.'

Daddy, 'Could you get me a pack of chicken rice?'

Mummy, 'Wow! Amazing demands... How can I cook a number of dishes at one time? Eerrrr!!!'

Boy, 'Just order through food delivery service, Mummy... Fast and easy.'

Recently, this conversation is very common in every family, especially since the Covid-19 pandemic. Due to Movement Control Order (MCO) or known as lockdown, Food Delivery Service (FDS) gives a solution and yet becomes the faster and easier way to get food. In this situation, who should be responsible to deliver safe food in front of our door? Sellers? Restaurant's operator? Food handlers? Food

riders? Or anyone who gets involved in the food supply chain? Or maybe our self as a consumers?

Meal delivery businesses are tremendously growing and very popular in present days due to the current situation and customer's demands. If you're planning to run your own business from home, this is a great idea to start a food delivery business. The meal delivery

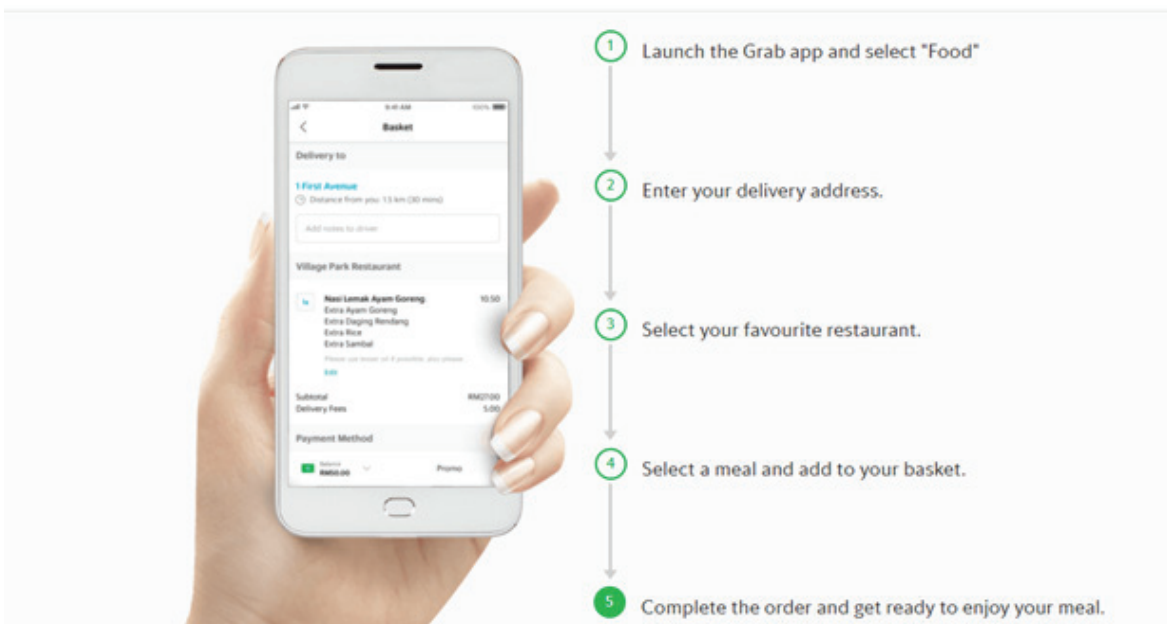


Figure 1: Food Delivery Services [Source; <https://www.grab.com/my/food/>]

is not only focused on restaurants and stall operators but it also involves everyone, especially those who have lost their jobs and want to increase their source of income. As such, many people are creatively produced diverse food products according to consumer’s demands at their homes. This is known as a home-based food product which is not only limited to fresh produce such as fruits and vegetables but also those that are cooked or processed which are Ready-To-Eat. Just name the cuisine or dishes, surely your request is fulfilled and delivered in front of your door. In addition, some foods are processed and packaged such as in plastic bags, pouches, bottles and even cans. For example, varieties of sambal, dishes and drinks are introduced. Furthermore, using social media as a medium to introduce and sell products then goes viral and as powerful marketing. However, most home-based food owners have no foundation or knowledge in food science and technology. Here, the safety of food produced is questionable.

In Malaysia, the quality and safety of food produced are subjected to the Food Laws 1983 & Food

Regulations 1985 and Food Hygiene Regulations 2009 in ensuring safe food for consumption. The guidelines on home-based food have been issued by the Ministry of Health Malaysia [MOH] to outline and provide opportunities for home-based food operators to follow and adopt the concept of food safety to prevent from the food hazards such as physical, chemical and biological hazards. Each step of the food supply chain is supposed to be followed accordingly starting from the selection of raw materials, cooking process, packaging, storage and even delivery. The chain must be controlled to avoid cross-contamination, especially from the pathogenic bacteria. MOH encourages home-based food business owners to register their business under Food Safety and Quality Division so that it can be monitored and training will be provided in enhancing knowledge and practices. Figure 2 shows the responsibility of home-based food owners. In addition, 10 principles of safe food handling and hygiene are illustrated and summarized in Figure 3 in order to ensure that safe products will be produced.

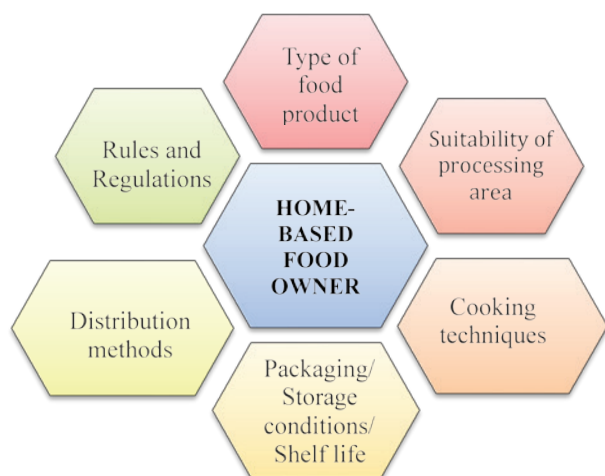


Fig. 2: Responsibility of home-based food owner.

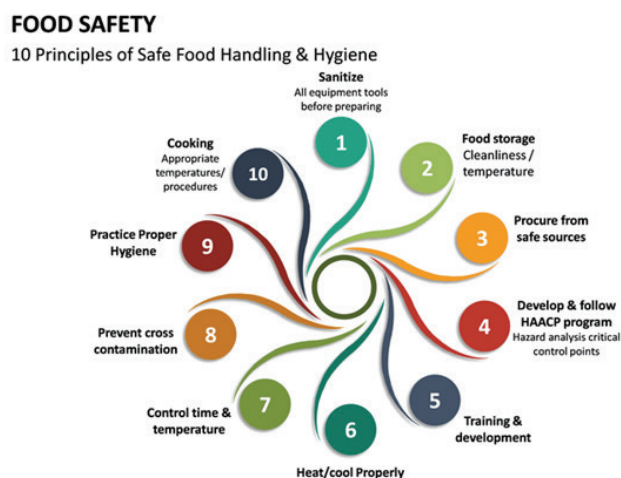


Fig. 3: Ten principles of safe food handling and hygiene [Source; FAO]

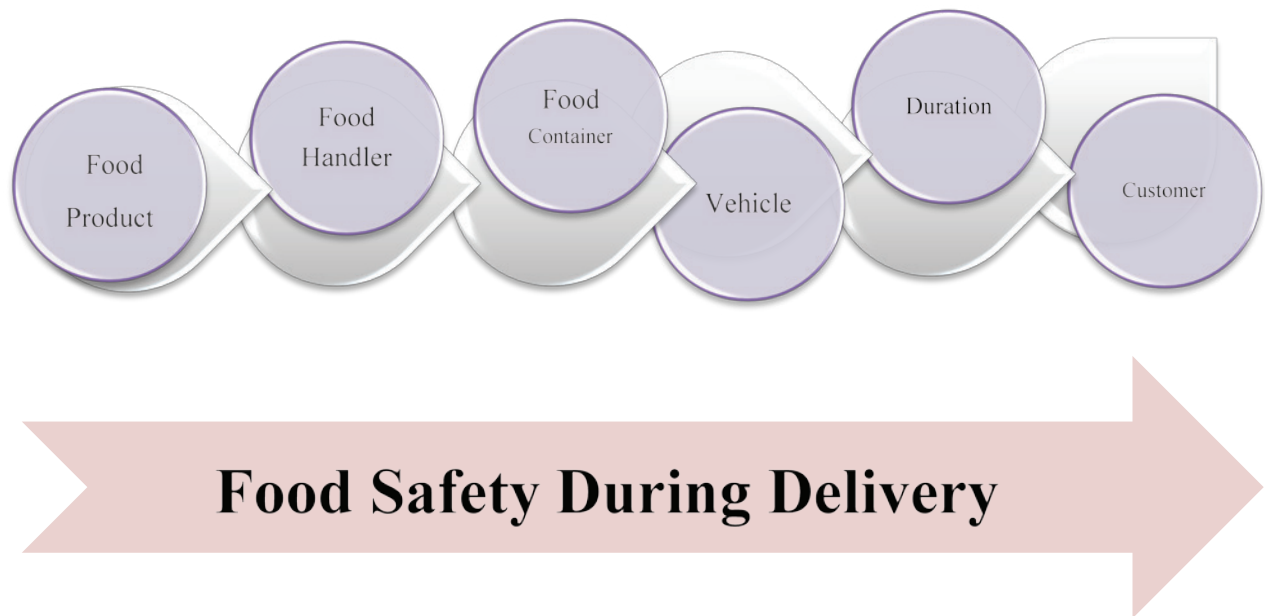


Fig. 4: Food safety during delivery.

Food delivery services generally refer to the delivery of cooked food from retail establishments to the consumer upon placement of order [Figure 1]. Normally, operators of food delivery services do not carry out any handling, cooking or other forms of processing of food. Then, they currently do not require a licence to operate. However, their responsibility is to ensure that the food they deliver is transported in a manner that is hygienic and does not compromise food safety. This includes maintaining the cleanliness of the vehicle, as well as the carrier bag, receptacle and equipment used for the transportation of food [Figure 4].

Consumers play an important role in the control of microbiological risks, both in their food handling

practices and in their demand for an effective, efficient food safety system. As a consumer, awareness of food safety issues, as well as knowledge of good practices to protect their food through preparation, storage and consumption, is essential. The knowledge on how to identify spoilage or contaminated food products should be available. The MOH's campaign such as 'Lihat, Hidu dan Rasa' is very useful to avoid the food poisoning. Therefore, this practice is applicable when receiving the food product from FDS and if it doesn't fulfil our requirement, that product is supposed to be rejected and the complaint can be made. Actually, 'food safety is an everyone's business' in preventing foodborne illnesses starting from farm to fork. In line with this, it was chosen as the theme for World Food Safety Day celebrations for the year 2019.



Figure 1: Training with Pusat Pengajian Tahfiz dan Tarbiah Ribat As-Soffa, Kampung Tuan Mandak, Batu Enam, Kuala Nerus

FOOD SAFETY KNOWLEDGE & PRACTICES: SHARING SESSION WITH PUSAT TAHFIZ

Dr. Tuan Zainazor Tuan Chilek & Prof. Dr. Shamsul Bahri Abd Razak

Food safety is a public health concern and everyone in the food supply chain has their own responsibility in order to provide safe food to the consumer. Knowledge on food safety is not only confined to food vendors such as food stall operators, restaurants and food factories but also consumers as well. In fact, it also involves the whole food producers starting at the farm level throughout the food supply chain either commercially or on a small scale basis. The food safety aspect becomes very important in preventing the occurrence of food poisoning cases.

In line with the concept of food safety itself where food produced at the harvesting level should be ensured for safety before the next process is carried out. This is because if contamination has occurred at the harvesting level, then it is very risky when not handled properly and safely especially those products to be consumed without further heat treatment. Therefore, academia should play a role in providing accurate information to anyone is involved in the food chain regardless of the size of the industry. As such, continuous knowledge transfer has been conducted among the *kelulut* breeders particularly around Kuala

Nerus by Apis Meliponine Special Interest Group, Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu.

As has been implemented in two Pusat Tahfiz as shown in Figure 1 and Figure 2, training and explanation on how to harvest and handle the *kelulut* honey is very important in ensuring that the harvested product is free from contamination especially microbiological contamination. The personal hygiene and practices of the food handler should be in the best condition and applicable. The equipment used is also ensured to be clean and safe. Once harvested, the *kelulut* honey must be placed in a suitable and clean container and kept at the right temperature [chill] to

prevent from quick spoilage. The environment of the hive area must be suitable and should be well maintained to avoid a dirty environment. Dirty and poorly maintained conditions will invite pests such as lizards, frogs, ants, flies and others in the hives that are likely to cause contamination.

Continuous monitoring and training are very important to ensure that what has been taught is carried out and practiced. Periodically meetings are properly arranged to ensure the handling skills of *kelulut* are correctly implemented and new knowledge can be enhanced. Therefore, the safety and quality of the products produced are assured.



Figure 2: Knowledge transfer at Pusat Pengajian Pondok Al Madani, Kampung Bukit Wan, Batu Rakit, Terengganu.



PRODUCT INNOVATION, A WAY OF COLLABORATION

**Dr. Tuan Zainazor Tuan Chilek, Prof. Dr. Shamsul Bahri Abd Razak, Ts. Dr. Faisal Haji Ahmad
Prof. Madya Ts. Dr. Amir Izzwan Bin Zamri**

Food innovation includes the development of new food products, processes, and services. Currently, it's happening rapidly with varieties, interesting and attractive food products. Food companies developed unique, exciting and sustainable foods and beverages for different target markets. For that reason, they are looking for ways to make the products is healthy, nutritious, tasty and even safe for consumption. Normally, established companies have their own expertise working in the product development division. However, many of them collaborate with food institutes and universities to develop a new innovative food product.

To fulfil the needs of industry in the development of new products, a team of researchers comprising lecturers and staff of the Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu successfully innovated various food products based on *kelulut* honey. In line with the MoU between Pharmaniaga Berhad and Universiti Malaysia Terengganu (UMT), a

number of *kelulut* honey-based products were created and exhibited at The Royale Chulan Hotel, Kuala Lumpur held on 9 April 2021 (Figure 1) in conjunction with the MoU ceremony.

The research team has innovated several *kelulut* honey-based products such as Gummy Candy formulated with *kelulut* honey (Figure 2), Chocolate filled with *kelulut* honey ball (Figure 3), *kelulut* honey Bee-pang coated with chocolate (Figure 4), mixed fruit pickles fortified with *kelulut* honey (Figure 5) and a few more products which are in the final stage of innovation. Some of those products have been ready for copyright and others will follow later. Furthermore, a win-win approach concept between industry and university should be done especially in the innovation of food products and make it an excellent way to establish collaboration for the benefit of both parties. Therefore, with such collaboration, UMT's visibility can be further enhanced locally and internationally.



Figure 1: Datuk Seri Ismail Sabri Yaakob with Datuk Seri Noraini Ahmad visiting the exhibition at the MoU ceremony between Pharmaniaga Berhad and UMT held on 9 April 2021 at Royale Chulan Hotel, Kuala Lumpur.



Figure 2: Gummy Candy formulated with kelulut honey.



Figure 3: Chocolate filled with kelulut honey ball.



Figure 4: Kelulut honey Bee-pang coated with chocolate.



Figure 5: Mixed fruit pickles fortified with kelulut honey [left] and gift bouquet of kelulut honey's products [right].

FRUIT & VEGETABLE CARVING AS A FOOD ART THERAPY

**Dr. Tuan Zainazor Tuan Chilek
& Zamani Mohamad**



Globally, a fruits and vegetables carving are a very common and becomes a popular practice in many various places such as restaurant, cruises, hotels, catering and exhibitions halls. Both items are sculpted to decorate food plates, enhancing their elegance and edibility for an events or ceremony purposes. Additionally, it also can be used on a special occasion to decorate the dining table and rooms. Hence, fruits and vegetables carving or any food arts are important to Malaysia, as it provides profit and marketplace to the industry.

Carving is the act of using tools to form and build something from a material by scrapping away part of that material as an artistic work. The technique can be applied to any material that is solid enough to hold and to retain the shape when pieces have been removed from it. Nowadays, in food art such as fruit and vegetables carving are more complex and developed rapidly. It tends to be the art that were focused on especially in ceremony and wedding as centrepiece of the food art also as artistic and decorative in nature.

In food decoration and garnishing, the time and type of item used should be considered in the planning.

Decorated plates are not meant to distract attention from the dishes served to the client or customer. Decorations make meals enjoyable but they shouldn't be overdone. In food carving, fruit and vegetables should be smooth, with the shear lines straight and precise to enhance the looks as a real object. Contrasting colours playing an important role in getting an effective decorating fruits and vegetables such as carrot with orange colour, red with tomatoes and green with cucumbers.

Art therapy can be described as the use of artistic methods to treat psychological disorders and enhance mental health. Art therapy is a technique where the idea that creative expression can foster healing and mental well-being. Some types of creative therapies include dance therapy, drama therapy, music therapy, drawing therapy and writing therapy. In addition, the expression of joy, sadness, emptiness and other feelings can be channelled through carvings of fruits and vegetables of a variety of pleasant colours and shapes. Thus, the soul can be calmed down and positive feelings can be manifested in ourselves successfully. This technique served as the platform for exploring nature-based materials in art therapy.



Fig. 1: A special knives is used for carving (A); The vegetable flower is created and beautifully arranged on the plate (B & C).



Fig. 2: Some carvings of fruits and vegetables with interesting decorations that depict feelings of joy (A), appetizing (B) and sadness (C).



‘KUALI HANGUS?’ NIK AQIL WILL ANSWER...

Nik Aqil Nik Pa

‘**K**uali hangus?’ Intentionally or unintentionally done..! Equipment such as a pan needs to be scorched first before use. What is the secret behind this practice? This tip should be carried out for newly purchased and first-time pans to be used for cooking. The secret is to make sure the smell of the pan material disappears. This is to ensure that the taste of the pan material does not mix in the cooked food. It is also to prevent cooked food from sticking to the surface of the pan. In addition, indirectly it can take care of the quality of such pans to be durable.

Normally, we would see talented chefs cooking using a very inspiring flame that covered the whole pan known as ‘Big fire cook’. This amazing cooking technique is actually required a high skill of expertise to get the maximum impact in terms of the taste and quality of the prepared food. In a ‘Big fire cook’, touch time of flame with cooked dishes depends on the menu provided. The phenomenon of big fire can be triggered

by a combination elements of water, hot oil and high flame intensity that occurs simultaneously. The cook’s oil (burns) gets hotter than water. When water is added it will immediately start to boil, releasing much steam (vapor bubbles). The steam will rise the oil out of the pan into the flame and ignite in mid-air creating a massive fireball. Also, consider that when water is added it increases the total volume of the complete burning liquid. If you want to try this technique of cooking, please get assistance and guide from a professional.

The menus served either in large restaurants or street stalls use this technique specially to attract customers. Among the popular dishes that use this technique are dishes that have oil and little water content such as fried vegetables, *paprik*, flavoured sauce and many more especially Asian cuisine.



Sweet strawberries

SWEET STRAWBERRIES GROWING IN TERENGGANU

Asamoah Frederick Osei & Dr. Siti Nordahliawate Mohamed Sidique

Speak of strawberries in Malaysia, and one place comes to mind – Cameron Highlands. The environmental conditions of Cameron Highlands as known by many, suits strawberry production unlike the rest of the country. Great efforts have therefore been put in place to develop the strawberry industry there as seen today that attract local visitors and tourists. Visits to Cameron Highlands for holidays, to enjoy the ambience, and biodiversity, is highly recommended however, should domestic strawberry lovers continue to travel that far to have a bite of freshly harvested strawberries or continue buying imported and expensive strawberry fruits from shops nearby? Maybe not when we have a cooling system that would be able; to grow strawberries at tropical lowland conditions.

Working on the principle of the rhizosphere temperature having a great influence on plant growth, our team developed a rhizosphere cooling system [RCS] that can mimic low soil temperature. This concept was proven to be enough for strawberry production at lowlands like in Terengganu. Coming from a country that lies in the tropics, with no records of domestic strawberry production, I was skeptical about the success of growing strawberries in the lowland tropics without sophisticated technology or selected strawberry cultivars bred for the tropics. That changed after seeing the strawberry plants grow, bear flowers, and set fruits. This confirmed how influential the rhizosphere temperature is in crop production.

Comparing the sweetness of two popular strawberry cultivars produced using the rhizosphere cooling system showed amazing results. The total soluble solids (TSS) content of fruits of strawberry cultivar Festival was 45.6% higher compared to the value recorded in fruits from Cameron Highlands and cultivar Fortuna was 13.4% higher. TSS is mainly made up of sugars but also includes other compounds. Using the European Union standards for fresh strawberry marketing, 100% of strawberries cultivar Fortuna and 97.5% of strawberries cultivar Festival harvested were marketable.

The demand for strawberries is high and Malaysia's imports was at USD 10 857 000 (RM 45 273 690) in the year 2019 [FAOSTATS]. Plant genetic modification may not always be the solution to bridging the gap to crop production in unfavorable weather conditions. Thus, potential for cooling system and strawberry production under lowland conditions is promising. You would be surprised with the lowland strawberries that are equally as good from Cameron Highlands if not sweeter.



Strawberries grown in Rhizospheres cooling system

Student Profile



Dr. Rosnida Tajuddin visitor from School of Biological Sciences, USM Penang. We had visitors from National Sun Yat Sen University, Taiwan, Khon Kaen University, Thailand, MARDI Serdang researchers and Koperasi Melon Manis Terengganu (KOPMET)

Asamoah is currently pursuing his PhD in Crop Science at UMT. His experiences were as personal assistant to the District Coordinating Director (BNDA-Ghana), operations manager for CODECOM Ltd, an agricultural mechanisation company in Ghana and he took up temporary teaching job in Ghana before coming to UMT. He joined LAPDiM (Laboratory for Pests, Diseases and Microbial Biotechnology) in 2018 and supervise by Dr. Dahlia Sidique. Asmaoah involved with the group in Fungi day, First Southeast Asia Fungal Red List IUCN workshop, mangrove sampling, diseases assessment of crop such as melon, cocoa and paddy funded by Corteva AgriScience, as well as Turtle and Terrapin Conservation. Team up with former researcher Dr. Fazlil Ilahi and Faculty Mr. Handyman, Mr. Mazlan [known as Mat Lan among colleagues] they build the cooling system and ensured that it run perfectly well.



UMT Lead Mutation Breeding in Vanilla to Improving High Value Traits

Dr. Rohayu Ma`arup & Miss Homaa Faezah Moinuddin

Fig. 1. Vanilla breeding program presentation by Dr. Rohayu Ma`arup at Knowledge Transfer Program with Vanilla's farmers on December 2020.

anilla? When we talk about vanilla what is the first thing that comes into our mind? Is it either melty delicious vanilla ice cream or heavenly smell of vanilla body mist or the must have ingredients in our dessert that is vanilla essence besides plenty of other things. Do you have any idea where the vanilla that we consume came from? It is a fact that most of the vanilla flavour in the industry is synthetic. As written by the writer in Smithsonian magazine, today, less than 1% of vanilla flavouring comes from the natural source [Smithsonian Magazine, 2017]. Thus, instead of getting all the benefits from the vanilla bean, we are ruining our health by consuming the synthetic vanilla flavour.

There are about 110 species of vanilla orchids, but only a few species of vanilla are able to produce the vanillin for commercial production. *Vanilla planifolia*, being the only source of natural vanillin, makes it an inevitable part in food industries due to its unique and pleasant aroma. *Vanilla planifolia* Andrews is known for its aroma and flavour. It originates from Central America and viewed as the world's costly spice close to saffron. In Malaysia, the price of *Vanilla planifolia* pods were RM1,100 to RM1,200/ kg [Amani Vanilla Temerloh, 2020]. Increasing demands of vanilla leads to insufficiency of stock for farmers as the plants take

about three years to bloom. In 2019, the world exports of Vanilla exceeded 1.02 billion dollar according to external trade statistics of 75 countries. The USA is the major consumer (44% of world imports), followed by Europe (33.96% of world imports) and Japan (2.35% of world imports) with total value 951 million dollars [TrendEconomy, 2021].

Apart from the plants take about three years to bloom, there is also limited germplasm available for hybrid production naturally. It is known that flowering in plant species is regulated by environmental factors. Hence, mutation breeding may be right choice in assisting the farmers to get new varieties or lines that may increase Vanilla bean productions to meet the increasing demands. Producing new potential Vanilla mutated lines from *Vanilla planifolia* Andrews with expected high vanilla bean production will give more options to farmers. Therefore, mutation breeding research in Vanilla has been started in December 2018 by Dr. Rohayu Ma`arup, Miss Nur Syazwani Ali [an undergraduate] and Dr. Faisal Ahmad [Faculty Fisheries and Food Science, UMT] in collaborate with Mr. Mohamad Feisal Mohamed Norawi [Amani Vanilla Temerloh, Pahang] and Dr. Zaiton Ahmad [Malaysian Nuclear Agency, Bangi].



Fig. 2. A) *Vanilla planifolia* Andrews flower; B) Vanilla beans; C) Processed beans [pods]

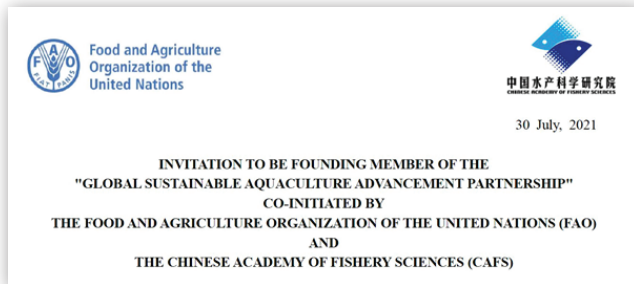
Irradiation is known to exhibit or inhibit the differentiation of cells and growth of plants which helps in producing new plant varieties. Plus, the gamma irradiation has been the most preferred method in improving genetic variation in the germplasm and to develop new varieties in plant breeding. Therefore, thirty cuttings of *Vanilla planifolia* [100 cm length] from Amani Vanilla Temerloh, Pahang was irradiated at Division of Agrotechnology and Biosciences, Malaysian Nuclear Agency, Bangi in December 2018. The source of gamma radiation used was Caesium-137. Each dose of gamma (γ) radiation [0 Gy, 10 Gy, 20 Gy, 30 Gy, 40 Gy and 50 Gy]. In this study, only 0 Gy, 30 Gy, 40 Gy and 50 Gy were survived by more than 50%. The number of shoots for 40 Gy and 50 Gy were the least in this study. The results were consistent with the findings of previous researchers who reported that by increasing the dose of irradiation, plant growth of different crops decreased. The results also revealed the highest protein concentration is in 10 Gy compared to different treatments in M1V1 leaves [1st vegetative generation] and gave the highest number of protein fragments, which detected polymorphisms between the control [0 Gy] and the plants treated. To our knowledge, this is the first report of the protein variation in M1V1 [1st generation] plants of irradiated Vanilla. The presence of genetic diversity is important for improving crop plant. This contributes to the high potential in re-capitalization of Agriculture high value product, as indicated in the Dasar Agromakanan Negara 2.0 that

aim in reducing the country's dependence on food imports. Currently, study lead by Dr. Rohayu Ma`arup on plant regenerated [M1V1; 1st generation and M1V2; 2nd generation] in comparing cytological effects and its impact on morphological and physiological characteristics is in progress for further evaluation these mutation lines. This study in collaboration with Dr. Nurul Aliaa Idris [FSSM, UMT], Miss Homaa Faezah Moinuddin [FPSM, postgraduate] and Dr. Zaiton Ahmad [Malaysian Nuclear Agency, Bangi] under Talent and Publication Enhancement Research Grant [TAPE-RG].

This study is important in order to examine the effects of low doses of γ -radiation in *V. Planifolia* Andrews M1V1 and M1V2 generations mutant lines. Hence, it would produce new potential Vanilla varieties with expected producing high vanilla bean production for farmers which will give more options to farmers in terms of variety choices and preferences in future.

Acknowledgments

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Food and Agriculture
Organisation of the
United Nations



中国水产科学研究院
CHINESE ACADEMY OF FISHERY SCIENCES



SUSTAINABLE
DEVELOPMENT
GOALS

UMT is the founding member of the Global Sustainable Aquaculture Advancement Partnership (GSAAP)

**Najiah Musa, Nadirah Musa, Lee Kok Leong, Alia Syafiqah Aznan,
Wan Nurhafizah Wan Ibrahim, Nur Azna Saari, Laith A. Abdul Razzak,
Abu Hena Mustafa Kamal, Hassan I. Sheikh, Ahasan Habib, Alfian Zein**

Amid the major challenges of climate change impacts, disease controls, competition for resources and space, and increasingly higher environmental and social standards, there is an urgent need for a global partnership of aquaculture entities to align efforts in support of the sustainable growth of global aquaculture. In response to this, the Food and Agriculture Organisation of the United Nations (FAO) and the Chinese Academy of Fishery Sciences (CAFS) have jointly initiated the “Global Sustainable Aquaculture Advancement Partnership [GSAAP]”, as a commitment to contribute towards global sustainable aquaculture through an inclusive and broad partnership in scientific, technological and policy innovations, knowledge sharing and dissemination of successful development approaches and practices.

In recognition of the importance of global partnership to overcome the challenges, UMT has accepted the invitation to be the founding member. Together in this partnership are Asian Institute of Technology (AIT), Thailand; CAFS; Ghent University Aquaculture R&D Consortium, Belgium; Hungarian University of

Agriculture and Life Sciences (MATE); Japan Fisheries Research and Education Agency (JFRA), Institute of Hydrobiology (IHB), Chinese Academy of Sciences; Institute of Oceanology, Chinese Academy of Sciences (IOCAS); Interdisciplinary Center for Aquaculture Research (INCAR), Chile; National Institute of Fisheries Science (NIFS), Korea; Norwegian University of Life Sciences (NMBU); Ocean University of China (OUC); Oceanic Institute (OI) of Hawaii Pacific University; Shanghai Ocean University (SHOU); University of South Bohemia (USB), Czech Republic; University of Stirling, UK; University of Tasmania (UTAS), Australia. The initiative is in line with the goals of the United Nations 2030 Agenda for Sustainable Development. UMT’s long-term academic commitment in aquaculture studies, particularly under the Faculty of Fisheries and Food Science, will be able to make a significant contribution towards promoting sustainable aquaculture worldwide. Malaysian aquaculture is also foreseen to benefit from this partnership through scientific and technological exchanges as well as innovations of aquaculture development policies.

The Millennium Status of Coastal Fisheries Management in Malaysia.

Zahaitun Mahani Zakariah



Introduction

Malaysian states consist of Peninsular Malaysia, Sabah, and Sarawak. The all - over Malaysian coastline is 4,675 km and the coastal areas are bordering two [2] international oceans; namely the Indian Ocean and the South China Sea. The West Coast of Peninsular Malaysia borders the Indian Ocean in the northeast region. While, the East Coast of Peninsular Malaysia, the western coastal part of Sarawak and the western coastal part of Sabah are bordering the South China Sea. The eastern part of the coastal areas of Sarawak and Sabah are facing the Pacific Ocean. The north Sabah borders Sulu Sea, while the east Sabah borders Celebes Sea.

The fishes occupy Malaysian waters within a variety of ecological niches in the coastal environment. The marine environment in Malaysia can be subdivided into

open sea, estuaries, mangroves, mudflats, seagrass and, reefs. Some of these fishes stay within the coastal environment for their whole life history but many enter and occupy the coastal environment for only part of their life cycle. Many of the fishes use the coastal environment as their main breeding and feeding ground. The fish resources move into the coastal environment on a daily basis to feed because the coastal environment is a very important nursery area with lots of juvenile fish. There are fishes that use the coastal environment as a spawning area and subsequently as a nursery area. There are fishes that spawn in the open sea and their pelagic eggs drift into the coastal area where they hatch and the juvenile develop. The coastal environment is not a uniform environment and has a great diversity of niches and subcomponents of the environment.

The Background of the Fisheries Species Data in Marine Malaysian Ecosystem.

The marine fisheries which were recorded by FishBase were 1,367 species as endemic, native, introduced, and reintroduced species; 61 species possibly stray and questionable species; 7 species which are categorized as extirpated, not established, misidentification or error; and 1,435 species which are reported from Malaysian waters. The Malaysian waters have a very diverse biological resource which two thousand species of fishes have been described from the coastal waters of Malaysia [Mohd. Shaari, 1971; Lui et al., 1994]. Fisheries resources include a variety of organisms, from the bony fishes which is taxonomically of the family Pisces, to the shellfish and jellyfishes.

FishBase is a global biodiversity information system on finfishes[<https://www.fishbase.de/home.htm>]. This international agency provides key facts on population dynamics for 200 major commercial species. All information on the finfish's species are currently worldwide acknowledged. The finfish's information are on the facts on taxonomy, biology, trophic ecology, life history, and uses, as well as historical data reaching back to 250 years. As of August 2021, FishBase included descriptions of 34,700 and subspecies, with 324,200 common names, 61,000 pictures, and references to 58,400 works in the scientific literature.

Malaysia is associated with FishBase since 2000 because it has been supervised by a consortium of nine international institutions. One of the nine institutions of the consortium is located in WorldFish in Penang. According to the Honourable Mr. Sim Tze Tzin, Deputy Minister of Agriculture and Agro-based Industry, Malaysia, during his visit at WorldFish headquarters in Penang, Malaysia on Friday, May 10th 2019, "WorldFish renowned scientists could assist Malaysia to thrive in advancing Blue Economy and Blue Growth concept in fisheries and aquaculture". There are two different terms which he stated in his speech; particularly about "Blue Economy" and "Blue Growth". According to the World Bank, the "Blue Economy" term is defined as the "sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of the ocean ecosystem". In 2015, the World Ocean Summit defined sustainable ocean economy occurs when economic activity is in balance with ocean ecosystems. The purpose of the phenomenon is to ensure the ocean economy remain resilient and healthy. According to the Organisation for Economic Co-Operation and Development (OECD), the ocean contributes approximately US\$1.5 trillion (RM6.2 trillion) annually to the overall world economy, and this may more than double by 2030.

TABLE 1: The Meaning of the Selected Vocabularies about the Fisheries Species Occurrence Status

No	The status of fish species occurrence	The meaning of the fish status
1	Endemic	The occurrence native and restricted to a certain place
2	Extirpated	The completely destroyed fish
3	Introduced	The new existence of fish in fisheries community
4	Misidentification	The hardly or wrong identification of fish species
5	Native	A species living within its natural range which it can occupy its natural dispersal systems
6	Reintroduced	The new introduction after it was already introduced
7	Questionable Species	The new species which is unidentified and unknown
8	Stray	The non-local species which are available in an unexpected location.

In 2018, the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) has identified the following nine (9) key industries of the Blue Economy. Those identified industries are (MIDA, 2021);

- Fisheries and Aquaculture;
- Ports, Shipping and Marine Transport;
- Tourism, Resorts and Coastal Development;
- Oil and Gas;
- Coastal Manufacturing;
- Seabed Mining;
- Renewable Energy;
- Marine Biotechnology; and Marine Technology and Environmental Services

The “Blue Growth” is the Food and Agriculture Organization’s (FAO’s) framework for sustainable fisheries and aquaculture and is defined as a strategic, innovative approach to improving the use of aquatic resources while simultaneously increasing social, economic and environmental benefits for communities dependent on fisheries and aquaculture. The focus is

on employment and livelihoods, food security and nutrition, sound fisheries management practices and support to healthy ecosystems, places these communities at the heart of all its policies and activities. Fisheries and aquaculture support the livelihoods of communities around the world. The main goal is to maximize economic and social benefits which is aligned with the 2030 Agenda for Sustainable Development. Global fish supply is expected to reach 190 million tonnes in 2030 (an increase of 36 million tonnes from 2011). The term of “Blue Growth” is apparently associated with the term of “Blue Economy”. The “Blue Economy” is from the United Nations representative and the term is defined as an economy that “comprises a range of economic sectors and related policies that together determine whether the use of ocean resources is sustainable”. Both terminologies are related with the issues of fisheries and aquaculture.

The Fisheries Species in Malaysian Marine Ecosystem.

The inshore open sea is a very important fishing area for the artisanal fishermen. This is an area with large number of small fishes and juveniles of some fishes. This waters area is also where the halfbeaks, (Hemiramphus far) and Garfish (Tylosaurus sp.) are available (Arshad et al., 2015; Chong et. al., 1990; Chowdhury and Yahya, 2012; Jabatan Perikanan Malaysia, 2018). The habitat of the threadfin fish, Eleutheronema tetradactylum, Leiognathus sp. and Secutor sp. This fish is androgynous and the breeding pattern is found in the inshore open sea. Other common species in the open sea are the marketable fish in Malaysia, particularly *Rastrelliger brachysoma* and *R. kanagurta*. The former species breeds in the open sea but its pelagic eggs drift towards the shore where they hatch and later their young develop. The open sea is also the main fishing ground for many of the small mullets such as *Velamugil sehali* and *Liza vaigiensis*. The dogfish (*Chiloscyllium indicum*) and the

black shark (*Eulamia melanoptera*) are common in the coastal waters and caught regularly by fishermen both by trawlers and artisanal fishing gear, especially gillnets. The stingrays, like butterfly ray (*Gymnurapoecilura*) and the stingray (*Dasyatis zugei*) are commonly available in the inshore open sea.

The common blue crab, *Portunus pelagicus* move in and out with the tides at the near shore water in search for food. Most local fishermen set their barrier nets to catch the crab base on this behavioural pattern within the inshore zone. The females ovulated *Rastrelliger brachysoma* release their eggs and later the pelagic eggs drift towards the inshore open sea. Later the eggs hatch within this water and become an important nursery ground for these fish. Apparently, the *R. brachysoma* is more coastal than the *Rastrelliger kanagurta*.

The dogfish [*Chiloscyllium indicum*], black shark [*Eulamia melanoptera*], butterfly ray [*Gymnurapocilura*] and stingray [*Dasyatis zugei*] are regularly caught by fishermen in trawlers and gillnets in the coastal and inshore sea. The common blue crabs, [*Portunus pelagicus*] move in and out with the tides at the near shore water in search for food, as well as breeding and complete their life history within the inshore zone. Most local fishermen know this behavioural pattern very well. Hence, they set their barrier nets to catch the crab based on this behavioural movement pattern.

The estuaries in the marine tropical environment provide a very rich and diverse habitat to the marine coastal organisms. This marine ecosystem is extremely rich in nutrients and are too beneficial for many species of fish. Some of the outstanding examples of the marine fauna in the coastal estuary included sawfish [*Pristis cuspidatus*], mackerel

[*Scoberomorus* sp.], ribbonfish [*Trichiuris* sp.], pomfrets [*Pampus chinensis*] and wolf herring [*Chirocentrus dorab*]. The estuaries are very important as the breeding grounds for a number of important food fishes such as Lates calcarifer, which migrates into the estuaries to breed. Some fishermen are aware of their migratory route and have set gillnets which is targeted during the spawning migration activity. The large female matured Lates sp. with ovulated eggs fetches a very high fish marketing price. Hence, those fishermen who are operating hatcheries are able to provide Lates sp. fry to the aquaculture industry. Many species of prawns occur within the major estuaries, especially on the west coast of Peninsular Malaysia. The nutrients brought down by the river provide a very rich environment for these coastal prawns. In addition to the various species of prawns, many coastal fishermen are currently target the mantid shrimp, *Squilla* sp. are currently fetch a very high price [Arshad et al., 2015].

Conclusion

All the listed fish are recorded as native species. Therefore, there is no data on highly migratory fishes such as marlin, sailfish and tuna which are recorded as Malaysian list of fisheries although these species are seasonally available in Malaysian waters. In fact, there is no list of highly migratory fish species like marlin, sailfish, trevally, dolphinfish and tuna are listed as Malaysian fish species.

Despite of the availability of invasive alien species [IAS] in Malaysian waters, they are not listed in the list of fish resources. The invasive alien species which are recorded from the marine fish species are not from the bony fish but from the invertebrates. The listed IAS in the marine ecosystem are from the crustacea and mollusc resources. of crustacea [red claw crayfish, *Cherax quadricarinatus*] and [marbled crayfish, *Procambarus fallax forma virginalis*] and of mollusc [Pacific Oyster, *Crassostrea gigas*]. It is different situation with the fresh water ecosystem where the

invasive and alien fish species are available. The introduction of any new fish and marine species required special written approval [Import Risk Assessment, IRA] from the Director-General Fisheries Malaysia. Hence, the importation of any species from other countries shall comply with rules and regulations stipulated under the Fisheries Act 1985 and MAQIS Act 2011.



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GLOBAL CONFERENCE ON AQUACULTURE

**AQUACULTURE FOR FOOD AND
SUSTAINABLE DEVELOPMENT**

22-25 September 2021
Shanghai, China
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UMT pledges support for the Shanghai Declaration

Najiah Musa, Nadirah Musa, Lee Kok Leong, Nurul Aqilah Iberahim, Wan Nurhafizah Wan Ibrahim, Alia Syafiqah Aznan, Khairulbariyyah Zakaria, Nur Azna Saari, Mohammad Tajuddin Abdul Manaf, Nor Maisarah Rameli, Nasorriah Nasir

The need to ensure that food is readily available to mankind is of vital concern worldwide. A major source of protein in many countries is derived from the oceans and seas. Capture fisheries are regarded as one of the most important industries and contributors to food security. Nevertheless, many factors are jeopardising the sustainability of marine fish stocks including long-term overfishing and ongoing destruction of vulnerable marine habitats by human and climate factors, which not only affect the feeding areas but also the breeding grounds of many marine species.

It is in this context that aquaculture is being recognised as an alternative to capture fisheries. Realising the critical importance of aquaculture, as well as to discuss and exchange reliable information to further enhance its contribution towards sustainable development, the Food and Agriculture Organisation of the United Nations (FAO) has collaborated with the Ministry of Agriculture and Rural Affairs (MARA) of the People's Republic of China (PRC) and the Network of Aquaculture Centres in Asia-Pacific (NACA) in organising the Global Conference on Aquaculture Millennium +20 (GCA +20) under the theme of "Aquaculture for Food and

Sustainable Development", on 22-25 September 2021. The Shanghai Declaration, a key output of GCA +20, represents a roadmap for optimisation of the roles that aquaculture can play in achieving the United Nations 2030 Agenda for Sustainable Development.

UMT represented by the Vice-Chancellor, Prof. Dr. Mazlan Abd. Ghaffar, pledged support for the Shanghai Declaration together with the FAO, MARA of PRC, NACA, Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) and many renowned world organisations, such as the University of Stirling, Shanghai Ocean University, Zhejiang University, Mississippi State University, Chinese Academy of Fishery Sciences (CAFS), National Institute of Fisheries Science (NIFS, Korea), European Aquaculture Society, and others.

The pledge is in line with the vision and mission of UMT, and in conformity with the roles that the Faculty of Fisheries and Food Science plays towards aquaculture sustainability and food security. The full list of organisations pledged to the declaration, and their respective statements of support are available at <https://aquaculture2020.org/declaration>

Students of Diploma in Fisheries in 2021 Maritime Silk Road Training Course on Mariculture Technology, and Global Forum on Sustainable Fisheries Development

Prof. Dr. Najiah Musa

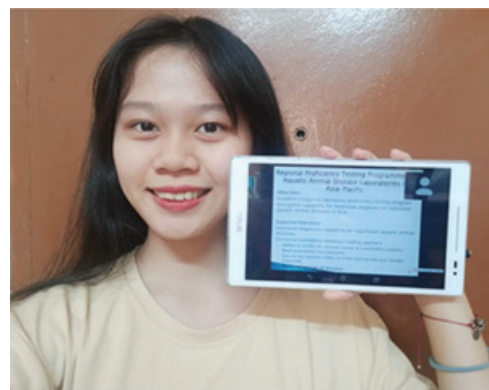


Network of Aquaculture Centres in Asia-Pacific

Twenty one [21] students of Diploma in Fisheries under the Faculty of Fisheries and Food Science have participated in the 2021 Maritime Silk Road Training Course on Mariculture Technology from 18 October to 5 November 2021 via Zoom. The training program was organised by the Department of International Cooperation, Ministry of Science and Technology, People's Republic of China (PRC), and hosted by the renowned Yellow Sea Fisheries Research Institute (YSFRI), Chinese Academy of Fishery Sciences ["Belt and Road" Training Base for Mariculture Technologies, Ministry of Agriculture and Rural Affairs of PRC] and regional intergovernmental organisation, the Network of Aquaculture Centers in Asia Pacific (NACA). This training program aimed to strengthen capacity building of fishery human resources, upgrade management and technology level of aquaculture in marine fisheries, and cultivate highly skilled professionals and management personnel.

There were a total of 255 participants from 28 countries including Bangladesh, Bhutan, Brazil, China, Egypt, the Philippines, France, India, Indonesia, Iran, Ivory Coast, Kenya, Malaysia, Mexico, Myanmar, Nepal, Nigeria, Oman, Pakistan, Peru, Romania, Russia, Singapore, Solomon Islands, Sri Lanka, Thailand, Tunisia and Vietnam. The training contents included

cultivation of various marine species, large-scale breeding, disease prevention and control, feed nutrition, culture model construction, culture technology development, engineering of breeding facilities and equipment, aquatic product quality and safety inspection technology, and others. Lectures were given by 38 experts from 9 research laboratories [ecology, breeding, disease, food, quality inspection, genetic, etc] of YSFRI as well as experts of NACA. Besides, the students also had a live session of the 2021 Global Forum on Sustainable Fisheries Development held in Qingdao, China on 27 October 2021. This fully online training event is an eye-opener about mariculture. It is hoped that our students have benefited greatly from the online participation while staying safe from the ongoing COVID-19 pandemic.



Low Jia Hui (D57456)
Class Representative



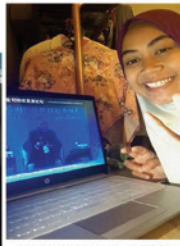
Abu Usaidah Ismail (D57443)



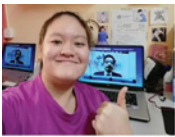
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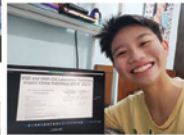
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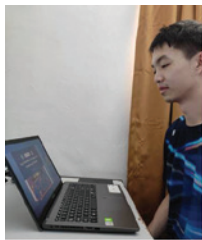
Muhammad Izzah Hakimi Halvickumar (D57459)



Nar Ain Munirah Asmara (D57491)



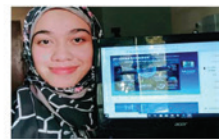
Nur Izati Nurli a/ Zakirri (D57496)



Alan Tak See Ming (D57437)



Peggy Lee (D57571)



Siti Hajer Mohd Rusli (D57589)



Valerie Wee Li En (D57622)



Syaziah Norwahid Syed Akmal Hakim (D57561)



FPSM INITIATES OFFICIAL COLLABORATION WITH INDIAN UNIVERSITIES; UMT SIGNS MOU WITH MIZORAM UNIVERSITY

Dr. Mannur Ismail Shaik

Faculty of Fisheries and Food Science initiated the first official collaborations with Indian universities. UMT signed a Memorandum of Understanding (MoU) with Mizoram University (MZU), India on 10th February, 2021. The signing ceremony was held online through WebEx platform. The MoU documents signed by both universities Vice-Chancellors Prof. Dato' Dr Nor Aieni Mokhtar (UMT) and Prof. KRS Sambasiva Rao (MZU). MZU is located in Aizawl, the capital city of Mizoram state of India. This university was established in the year 2001, the university was ranked the top 100 in 2016, 2017, 2018 and recently secured 25th Rank among all the public universities in India. It offers degrees in different disciplines, including economics, education, engineering, forestry, life and physical sciences, and medical.

The UMT Vice Chancellor Prof. Dato' Dr. Nor Aieni Mokhtar mentioned, this ceremony marks an historical moment in UMT's book as this is the first formal collaboration with an Indian university. It is a privilege for UMT to be associated with such a successful and inspirational university as MZU, who has had some impressive international collaboration. She believes that believe such collaborations between UMT and MZU will offer many benefits to both partners. She hoped that this will help open more opportunities for collaborations with other Indian universities for shared benefits. She mentioned the collaborative activities between UMT and MZU has been ongoing since 2019. Prof. Rao of MZU visited to UMT as a Visiting Professor. During his visit, he shared with UMT the successive models of incubation centres at MZU and also provided proposals to develop Marine Biotech Park and APIS-Beekeeping Incubation Centre. Prof. Rao invited five academic staff and three

students to an international conference in India in 2019, with him sponsoring the costs. In his capacity as General Secretary of the Association of Biotechnology and Pharmacy (ABAP), Prof. Rao has honoured Prof. Shamsul Bahri Abd. Razak of UMT with Fellow Award of ABAP. Based on what Prof. Rao had done before the MoU, UMT can expect more contributions from him now that the partnership is official. UMT will also return the favour to MZU by offering its expertise. It shall be a win-win MoU.

Several collaborative activities will be carried out under this MoU to take advantage of the opportunities offered by the partnership. Student and Staff exchange programme will be implemented between both institutions. Applications for international research grants and journal articles will be jointly published. Among these activities, a Webinar Series on New Horizons in Science and Technology planned to organize shortly. Also planned to conduct Stingless Bee Workshop at Mizoram University. Speakers from MZU have been invited to give talks in 1st South East Asia Meliponine Symposium 2021 of which held on 20th May in connection with Bee Day 2021.

In this MoU signing ceremony, The Deputy Vice Chancellors of Universiti Malaysia Terengganu, Professor Dr. Mazlan Bin Abd Ghaffar, Professor Ts. Dr. Mohd Zamri Bin Ibrahim, Dean FPSM, Profesor Dr. Mohd. Effendy Bin Abd. Wahid, Director, International Center, Profesor Madya Dr. Ahmad Faisal Bin Mohamad Ayob, Deputy Deans of FPSM, Profesor Madya Dr. Hayati Binti Mohd Yusof, Profesor Madya Dr. Mohd Hanafi Bin Idris, MoU Co-coordinators, Prof. Dr. Shamsul Bahri Bin Abd Razak, Prof. HK Laldinpui Fente (MZU), Dr. Mannur Ismail Shaik participated.



WARISAN ASLI KHAZANAH KELULUT



KELULUT SOARING HIGH WITH THE SIGNING OF A COLLABORATIVE AGREEMENT BETWEEN UMT AND PHARMANIAGA BHD

Prof. Dr. Shamsul Bahri Bin Abd Razak

Universiti Malaysia Terengganu has been actively involved in *kelulut* research since 2013. The establishment of a special interest group (SIG) by UMT in 2017 dedicated to pave the new frontiers in *kelulut* research had become a major catalyze not only to the scientific fraternity and local community, but also to the development of *kelulut* industry.

The recent signing of MoU (9th April 2021) between UMT and Pharmaniaga Bhd., a pharmaceutical giant in Malaysia to establish a commercial stingless bee farm in UMT second campus at Bkt Kor marked a significant milestone to the *kelulut* industry in Malaysia. The

increasing awareness of Malaysian public on the benefit of *kelulut* honey toward their health and wellbeing is one of the major factors that moved Pharmaniaga to actively involve and support this new and emerging industry.

This MoU will enable UMT researchers especially members of SIG for Apis and Meliponine UMT to carry out extensive research on various aspect of *kelulut* biology and the improvement of honey quality. With this collaboration Pharmaniaga will be ensured the supply of good quality *kelulut* honey to their customers with the assurance of relevant scientific information from UMT researchers.



UMT won the 2nd runners up for the oratory competition through Vanessa Lim Jia Jia who presented the topic "Sugar Tax: Does it work".

Activity Report 12th MIFT National Food Science & Technology Competition 2021

Dr. Abdul Rais Abdul Rahman

The National Food Science & Technology Competition is held every 2 years organized by the Malaysian Institute of Food Technology. Tunku Abdul Rahman University College, Kuala Lumpur was chosen to host the 12th edition of this competition on 4th to 5th August 2021. Due to the on-going Covid 19 pandemic, the event was held online for the first-time using Zoom platform. Similar to previous reiteration of the event, a total of 5 categories were opened for participation which include post graduate oral, post graduate poster, food product development, food bowl quiz and oratory. Student from 15 public and private universities were involved in this year's event. Universiti Malaysia Terengganu was represented by a total of 22 students from the Food Sciences (Foodservice & Nutrition) and Food Technology programme. UMT won the 2nd runners up for the oratory competition through

Vanessa Lim Jia Jia who presented the topic "Sugar Tax: Does it work". While others were not so fortunate, all of them performed their best in representing UMT through out this competition. Indeed, the students have benefited through this competition in terms of gaining exposure in speaking and presenting confidently in front of a large online audience, gaining and sharing of knowledge relating to the latest trends in food innovation while competing in a healthy manner. We hope that the next reiteration of the National Food Science and Technology Competition will continue to provide a conducive avenue for university students to foster their talents in food innovations, food-based research and establish potential network connections with key industrial entities.

DIFFERENTIAL SCANNING CALORIMETER WEBINAR BY FPSM SENIOR SCIENCE OFFICER

Suhana Muhamad Hanidun,
Senior Science Officer, FPSM

Centre of Research and Field Service - CRAFS [PPPL] and Centre of Talent Development and Innovation [PPBI], Registrar Office, UMT recently co-organizing series of *Webinar Bicara Teknologis Instrumentasi Makmal*. This webinar is a platform for knowledge and experts sharing by UMT technical staffs. This online talk opens to internal and external participants from UMT, especially supporting staffs in C, G & J scheme, academic staffs and also post-graduate and final year students.

Presenting topic entitled Differential Scanning Calorimeter: *Kehangatan dan Kedinginan Terpendam*, Mrs. Fadlina Yusof was the first presenter from FPSM. The webinar was conducted on 10th October 2021 via Cisco Webex. This third Webinar series was attended by 107 participants.

The webinar was started by Introduction of Thermal Analysis which is the crucial theory to be understood before using the Differential Scanning Calorimeter, DSC. Instrumental part and thermogram obtained from DSC analysis were clearly explained. The applications of DSC analysis were shared with many practical examples such as analysis of fats and oil, starch, polymer and also food packaging material selection due to different storage temperature. Then, the session end with an interesting video on sample preparation using aluminium sample pan. This video is hundred percent created by Mrs. Fadlina and her team for Instrumentation in Food Analysis practical class.

This webinar series is a good platform for knowledge and technical skills sharing among UMT technical staffs. More presenters from FPSM are warmly welcomed to shine up their skill and talent.

WEBINAR BICARA TEKNOLOGIS INSTRUMENTASI MAKMAL siri 3
DIFFERENTIAL SCANNING CALORIMETER
KEHANGATAN DAN KEDINGINAN TERPENDAM

PENCERAMAH
Pn. Fadlina Bt. Yusof
Pegawai Sains Kanan
FPSM

MODERATOR
Pn. Nor Faizah Bt. Adam
Pegawai Sains Kanan
FTKKI

Kumpulan Sasaran: Skim C, G, J (Gred 19 - 52)
| Pegawai Akademik | Pelajar Post-grad

10 OKTOBER 2021 (AHAD)
10.00 AM - 11.45 AM

<https://umt.webex.com/umtj.php?MTID=m2dd66b89af473af3a6c3c4d1d974b69>
Event number: 2518 623 5578
Event password: PPPL@2021 (77751202 from phones)

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Pusat Perkhidmatan Penyelidikan dan Lapangan & Pusat Pembangunan Bakat dan Inovasi

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SPECIAL TOPIC

Molecular Mechanisms of Bacterial Disease in Cultured Fishes

Topic Editors

Lixing Huang, HUANYING PANG, Ha
Thanh Dong and Najiah Musa

As the fastest growing food production industry in the world, aquaculture contributes nearly half of the global fish consumption. Over the past three decades, aquaculture has grown at an average annual rate of about 6%. In animal production systems ...

Submission open

Submission Deadline

05 March 2022

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To celebrate the achievement at the end of the year 2021... Yeayyy!

Ending the year with a shine ...

Dr. Tuan Zainazor Tuan Chilek, Dr. Faisal Ahmad & Assoc. Prof. Dr. Amir Izzwan Zamri

Tahniah!
Sekalung Tahniah diucapkan kepada Kumpulan FPSM atas kejayaan yang diperolehi dalam

INNOVASI 21
INTERNATIONAL BUSINESS INNOVATION & IDEAS COMPETITION 2021
Anjuran: UNISZA

Yippie: Brus Or Bakau Putih (*Bruguiera Cylindrica*) Based Pie With Watermelon Rind Filling

Dr. Tuan Zainazor Tuan Chilek
Muhammad Amirun Che Hassan
Muhammad Nor Shazwan Jamzuri
Dr. Faisal Ahmad
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Yippie: Brus Or Bakau Putih (*Bruguiera Cylindrica*) Based Pie With Watermelon Rind Filling

Dr. Tuan Zainazor Tuan Chilek
Muhammad Amirun Che Hassan
Muhammad Nor Shazwan Jamzuri
Dr. Faisal Ahmad
Prof. Madya Dr. Amir Izzwan Zamri

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Golden Bee-Pang: Glutinous Rice-Based Bar incorporated With Stingless Bee (*Kelulut*) Honey

Dr. Tuan Zainazor Tuan Chilek
Dr. Faisal Ahmad
Prof. Madya Dr. Amir Izzwan Zamri
Muhammad Amirun Che Hassan
Muhammad Nor Shazwan Jamzuri

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Iso Bee-Nergy Drinks: A Good and Highly Nutritional Stingless Bee (*Kelulut*) Honey Drinks As A Household Product

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Dr. Faisal Ahmad
Dr. Tuan Zainazor Tuan Chilek
Muhammad Amirun Che Hassan
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Bee-Nergy Sacchet: A Unique Stingless Bee (Kelulut) Honey Energy Sacchet Product

Dr. Faisal Ahmad
Dr. Tuan Zainazor Tuan Chilek
Prof. Madya Dr. Amir Izzwan Zamri
Muhammad Amirun Che Hassan
Muhammad Nor Shazwan Jamzuri

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Anjuran : 

Brusz: An Extruded Noodle-Like Snack Using -Bakau Putih (Bruguiera Cylindrica) Fruit

Dr. Faisal Ahmad
Dr. Tuan Zainazor Tuan Chilek
Prof. Madya Dr. Amir Izzwan Zamri
Muhammad Amirun Che Hassan
Muhammad Nor Shazwan Jamzuri

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Gratitude by Faculty of Fisheries and Food Science for the team members.

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