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agri news

Sustainable agriculture that drives nation

TEROKAAN SELUAS LAUTAN DEMI KELESTARIAN SEJAGAT

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Malaysian Slipper Lobster Varieties Unveiled

Mushroom Magic: Turning Harvests into Value-added Noodles

Two Gold Medals for FPSM at 2nd International Laboratory Innovation Seminar, NaLIS 2024

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What's Inside?

agri news Issue 6, 2024

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A Note from the Editor

Jun 30, 2024

Dear esteemed readers,

Welcome to this edition of our Faculty AgriNews Bulletin! As we celebrate the end of another productive semester, we are excited to share a collection of insightful and innovative articles highlighting the outstanding work and international activities of our faculty members.

We begin with a deep dive into the versatility of sorghum, a resilient crop with multifaceted applications. Our researchers have uncovered new ways to utilize sorghum in food products and more, showcasing its potential for sustainable agriculture. From the fields to the oceans, we explore the fascinating world of the Malaysian Slipper Lobster. This article provides an in-depth look at the biology and commercial viability of this unique marine species, emphasizing the importance of sustainable seafood practices. Our next feature focuses on the tiny yet mighty planktons, which play a critical role in aquatic ecosystems and global carbon cycling. The article underscores the need to protect these microorganisms to maintain ecological balance and health. Innovation in food science is exemplified by our work on mushrooms. Our researchers are transforming mushroom harvests into nutritious, value-added noodles, highlighting the potential of mushrooms to enhance food security and provide sustainable dietary options.

In an excellent example of sustainability, our lab staff have developed Citrus Green Soap using used cooking oil and kaffir lime. This eco-friendly product reduces waste and offers a greener alternative to commercial soaps, combining scientific ingenuity with environmental responsibility.We then turn our attention to organic fertilizers, exploring their numerous benefits and applications. This article highlights their role in promoting soil health, sustainable farming practices, and improved crop yields, reinforcing our dedication to environmentally sound agricultural practices.Additionally, we are pleased to share exciting international activities undertaken by our faculty members. Their involvement in global conferences, collaborative research projects, and international workshops enriches our academic environment and strengthens our global network and impact. These activities underscore our commitment to fostering international cooperation and sharing our expertise worldwide.

We hope you find this newsletter both inspiring and informative. The achievements and endeavors highlighted here are a testament to the hard work and dedication of our faculty, staff, and students. Let's continue to support each other and celebrate these accomplishments as we strive to advance agricultural sciences and contribute to a sustainable future.

Happy reading.

Best regards,.

Prof. Dr. Shamsul Bahri Abd Razak
Editor-in-chief, AgriNews

Exploring the Wide Range of Sorghum-Derived Products: A Showcase of Diversity

By Assoc. Prof. Ts. Dr. Khairi Mohd Zainol and Athirah Hanum Abd Aziz

Introduction

Sorghum is a type of plant that belongs to the grass family. It's the fifth most important cereal crop, like grains such as wheat, rice, maize (corn), and barley. People who live in dry areas often rely on sorghum as a main food, especially in places where it's hard to grow other crops. Every year, about 60.4 million tons of sorghum are grown globally, with 30.4 million tons coming from Africa.

One cool thing about sorghum is that it can handle tough conditions like not having much water, bad soil, and changes in temperature. It doesn't need a lot of special plant food either, which makes it really helpful for making sure there's enough food in places that don't get much rain. In Africa, it's the second most important grain, and around 300 million people there rely on it for their daily meals.

But sorghum isn't just for people to eat. It's also used as food for animals around the world. So, whether you're in Africa, Central America, South Asia, or somewhere else, you might find sorghum being grown and used in different ways!

In India, sorghum is a big deal because it's an important crop for both food and animal feed in the hot and dry parts of the country. But nowadays, fewer people are eating sorghum because it's easier to get rice and wheat from the government and because it's easier to cook those grains. In India, most of the sorghum is used to make flatbreads called "roti" or "chapatti."

In Ethiopia, sorghum is important too. It's like the third most essential type of grain they eat, after teff and maize. Lots of people who don't have a lot of resources rely on sorghum to survive. They grow it all over the country. They even use the leaves and stems of the plant to feed animals, and the stems are used for things like making firewood and building homes and fences. However, in some places like northern China and southern Russia, sorghum is a big part of people's meals. About 85% of the sorghum grown there is used directly for food for people. Sorghum is also used to make sugar and ethanol, which is a type of fuel in countries like China, United States, and Philippines. They take the sorghum and turn

it into these useful things that can be used in different ways.

Figure 1: Raw sorghum

Figure 2: Sorghum powder

From the vast fields of USA and Nigeria to the rugged landscapes of Ethiopia and Sudan, sorghum stands tall as one of the world's leading crops. Mexico and India also join the ranks of sorghum powerhouses, with China, Argentina, Brazil, and Niger following closely behind. But sorghum's influence isn't limited to its role as a staple food source; it's emerging as a boundless resource with the potential to yield high-value grains, sustainable oil, and crucial mechanical components. Across numerous nations, researchers are delving into the multifaceted potential of sorghum, uncovering its secrets to produce a spectrum of products that ingeniously impact our everyday lives.

Uses of sorghum

Sorghum dominates the world of agricultural marvels, working its magic in a variety of fields of production, from biomass to food. The complex bioactivity of this extraordinary grain is unravelled to reveal a tapestry of phenolic elements, including phenolic acid, flavonoids, stilbenes, and tannins. A variety of essential vitamins, including the B-complex, A, D, E, and K, as well as crucial minerals like potassium, phosphorus, magnesium, and zinc, round out this list.

Beyond its unassuming exterior, sorghum has remarkable functional abilities that have a significant positive impact on human health by protecting against chronic diseases. Analysing epidemiological data, we discover that proanthocyanins, a type of tannin found in sorghum, act as strong antioxidants and actively prevent the development of cancer and inflammation. The grain's high fibre content is also a plus because it helps those with celiac disease as well as those with normal blood sugar and cholesterol levels.

The story does not, however, end there. Sorghum's positive effects can be seen in the animal kingdom as well because its phytochemicals improve cardiovascular health. As we set out on this exploratory journey, it quickly becomes clear that sorghum's many varied qualities are nothing short of astounding, leaving their mark on the vitality of both people and animals.

Sorghum's Grains: Nourishing Versatility at Its Core

At the heart of sorghum's remarkable adaptability lies its grains – tiny powerhouses harvested from mature sorghum plants. Packed with a treasure trove of essential nutrients including protein, dietary fiber, B vitamins, iron, and

magnesium, these grains serve as nature's gift to our well-being.

Fueling a myriad of possibilities, sorghum grains form the bedrock of a wide spectrum of goods, shaping the culinary landscape both past and present. Their remarkable flexibility has earned them a hallowed place in traditional and contemporary cuisines alike. Ground into a fine flour, sorghum takes on a new identity, emerging as a potent gluten-free alternative to standard wheat flour. This flour is the backbone of gluten-free baking, crafting an array of delectable treats such as bread, pancakes, muffins, and pastries that cater to diverse dietary needs.

Sorghum's influence doesn't stop there. As whole grains, these little gems find their way into an array of dishes, from vibrant salads to comforting soups and fragrant pilafs. Found commonly in the culinary traditions of Africa, India, and the Middle East, sorghum stands as a testament to its global culinary appeal. Its gentle flavor and satisfyingly chewy texture make it an ideal foundation for both sweet indulgences and savory delights.

Sorghum's Green Footprint and Culinary Charisma

Industries are affected by sorghum, paving the way for a future that is greener and more sustainable. Stalks and leftover components are given new life in the industrial world, helping to create bioplastics, paper, textiles, and building materials. These uses are proof of sorghum's natural adaptability and offer glimmering hope for reducing the environmental cost of various industries.

However, sorghum's journey does not end there. Enter the world of sweet sorghum varieties to create a story of delicious indulgence. Sorghum syrup, a naturally occurring elixir brimming with a richness akin to molasses, is produced from these specialised varieties. This incredibly versatile liquid gold is essential to the culinary arts. It improves food by bringing out the complex layers of flavour in everything from morning pancakes and waffles to the seductive smoke of barbecue sauces and the cosy embrace of baked goods.

Delving further, sorghum's influence touches the realm of tradition and heritage. Across cultures, this grain takes center stage in crafting traditional fermented beverages, including the art of brewing alcoholic drinks like beer. These libations open a window into the tapestry of history, offering a taste of the profound cultural significance of sorghum across different corners of the globe. In this voyage through the unexpected and the delectable, sorghum emerges as a true luminary – not just nourishing our bodies, but leaving an indelible mark on industries, cuisines, and the stories of human connection.

Sorghum's Boundless Influence: Cultivating a Sustainable Tomorrow

The significance of sorghum is etched into the mosaic of human heritage by spanning not only geographical boundaries but also those of time and culture. This unassuming grain plays a significant role in reshaping agriculture in the modern era, sustaining food networks, and addressing urgent global challenges like food scarcity and the ever-present threat of climate change.

Sorghum emerges as a ray of hope as our planet struggles with rapid population growth, the effects of climate change, and the shadows of food insecurity. It is a priceless asset for areas affected by arid conditions due to its drought resistance, ability to thrive in hot climates, and sparing use of water. Sorghum stands tall in the face of other crops that fail, providing sustenance, wealth, and a lifeline to farmers in harsh environments.

The impact of sorghum, however, goes far beyond the boundaries of the dining room. Sorghum is positioned as a pioneer of sustainability and serves many purposes, each of which advances the cause of a greener future. It is a leader on our path to lower carbon emissions and renewable energy because of its wise use of water resources and potential as a biofuel source. The effects of sorghum, however, go beyond energy. Its function in creating industrial materials paves the way for environmentally friendly manufacturing techniques, illustrating a more peaceful coexistence of industry and nature.

Figure 3: Various commercial products from sorghum

Conclusion

An intriguing story is developing in the sorghum saga's various chapters. We are at the start of a new era for food products, one that is anchored in the adaptability, nutritivity, and sustainability that sorghum embodies, thanks to the combined efforts of those who see its potential. As we finish writing, we catch a glimpse of a future filled with optimism, where the pages of development are glowed with the golden hue left by sorghum's legacy.

Malaysian Slipper Lobster

By Assoc. Prof. Dr. Mohd Hanafi Idris, Khairul Azmi Muhamad Amin and Ihsan Hani Radzi

The slipper lobster belongs to the family Scyllaridae under the order Decapoda. Within this family, there are four subfamilies: Artidinae, Ibacinae, Scyllarinae, and Theninae (Holthuis, 1985). According to WoRMS (2021), there are 28 species across 4 genera.In Malaysia, there are 5 species of slipper lobster belonging to the genus Thenus (Burton & Davie, 2007). Slipper lobsters inhabit depths of up to 500m and distributed worldwide (Holthuis, 1991), except in the Arctic Sea, Northwest Atlantic, Atlantic-Antarctic, Antarctic-Southern Indian Ocean, Northeast Pacific, and Pacific-Antarctic (FAO Major Fishing Areas). In Malaysia, as recorded by the Department of Fisheries (2019), these species can be found along the East Coast (Kelantan, Terengganu, and Pahang), East Malaysia (Sabah and Sarawak), and in East Johor (Siow & Asgnari, 2018).

Slipper lobsters have not been subjected to the same level of intensive fishing as spiny lobsters or true lobsters (Spanier & Lavalli, 2007), despite being harvested wherever they are found. Different methods of capturing slipper lobsters are used depending on the species' ecology. Scuba divers capture species such as Scyllarides, Arctides, and Parribacus that prefer crevices, caverns, and reefs. Trawling is used to capture species such as Thenus and Ibacus that prefer soft substrates. Both species of slipper lobsters are edible, and some are commercially valuable, including the Balmain bug (Ibacus peronii) and, Moreton Bay bug. Slipper lobsters were caught worldwide in 1991 at a total of 2,100 tonnes according to Holthuis (1991). Annual output has remained about 5,000 tonnes in recent years, with Thenus orientalis accounting for the majority of the total (FAO, 2002).

In contrast, the slipper lobster that inhabits mainly plain substrates has a more dorsoventrally flattened body and triangular form (Spanier & Weihs, 1992). Thenus spp. inhabit soft-bottom substrates, such as sand or mud(Burton & Davie, 2007; Radhakrishnan et al., 2007). This explains a triangular-shaped and thin body as an adaptation for living and burying in soft habitats (Radhakrishnan et al., 2007; Haddy et al., 2003), where less effort is required for burial compared to a thick body with a highly vaulted carapace. According to the latest report by Radzi (2023), out of five species reported in Malaysia waters, only three species have been recorded, namely Thenus indicus (Leach, 1816), Thenus orientalis (Lund, 1793) and Thenus unimaculatus (Burton and Davie, 2007).

Thenus indicus (Leach, 1816)

Description: The total length of Thenus indicus (Leach, 1816) ranges from 114 to 217 mm (mean 164.85 ± 27.10 SD), and their weight ranges from 35.30 to 249.2 g (mean 111.30 ± 48.93 SD). They lack spotting or pigmented patches on their pereiopods, as depicted in Figure 1A and 1B. The body color is mainly brown, and both the telson and pleopods are yellow. There is distinct setation of varying intensity on the upper longitudinal groove of the second pereiopod. The pereiopods are slender in shape, and spots or patches are absent on all the segments, which are used for species identification. There is a distinct small spine located on the inner side of the merus of the third maxillipeds. They mostly have a prominent denticulate structure on the inner surface of the ischium. Thenus indicus (Leach. 1816) notably lacks a little spine on the inner ventral margin. Additionally, the dentations are not prominently visible, perhaps due to their small size. The inner margin of the ischium is practically smooth, leading to the possibility that they may be identified as T. parindicus. The dorsal profile is slightly concave and slender. The rostral processes are directed anteriorly, sharp, and pointed upward, and there are rostral, pregastric, gastric, and cardiac teeth. The antennal segments have several sharp anteromarginal teeth, with the most prominent ones pointed forward and outward on the anterolateral border.

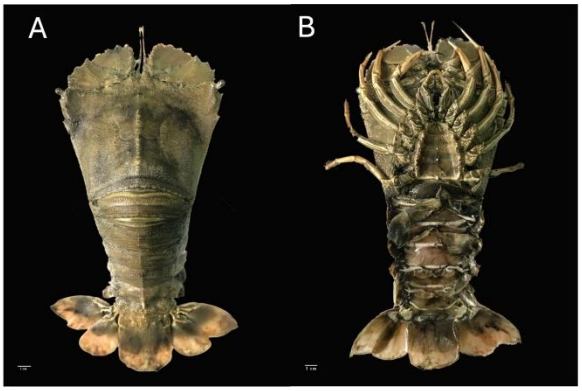

Figure 1. Slipper lobster Thenus indicus (Leach, 1815). (A) The dorsal part and (B) the ventral part of Thenus indicus. (Photo courtesy of: Ihsan Hani Radzi)

Thenus orientalis (Lund, 1793)

Description: The total length of Thenus orientalis (Lund, 1793) ranges from 104 to 220 mm (mean 171.50 ± 32.93 SD), and their weight ranges from 23.10 to 213.20 g (mean 133.39 ± 57.19 SD). The body color is mainly light red for both sexes. The telson and pleopods are pink or red. These characteristics can be seen in Figure 2A and 2B. The pereiopods are robust, with obvious spots or patches on some or all segments, which are used for species identification. The dorsal profile is slightly convex and robust. The rostral processes are blunt, more robust, and elevated. They possess a rostral tooth, pregastric tooth, and gastric tooth, but lack a cardiac tooth. The Antennal segments' anteromarginal teeth are wider and broader, while the anterolateral teeth are less prominent and curved slightly backward. Obvious spots or large patches are present on some or all segments of legs.

Figure 2. Slipper lobster Thenus orientalis (Lund, 1793). (A) Dorsal part and (B) ventral part of Thenus orientalis. (Photo courtesy of: Ihsan Hani Radzi)

Thenus unimaculatus (Burton and Davie, 2007)

Description: The total length of Thenus unimaculatus (Burton and Davie, 2007) ranges from 198.3 to 220 mm (mean 165.50 ± 38.33 SD), and their weight ranges from 165.9 to 244.4 g (mean 145.39 ± 58.19 SD). Purple to black pigmentation blotches appear on the inner face of the merus of the second and sometimes the third legs. These blotches are usually large but can vary in extent, and sometimes being reduced to a narrow streak. These characteristics can be seen in Figure 3A and 3B. Purple pigmentation occasionally surrounds the eye sockets on the carapace. The outer face of propodus, with the upper-most longitudinal groove, bears obvious setae over at least the proximal half. Alternatively, there may be less pigmented purple or grey patches located on the inner edge of the first and second appendages, which progressively darken towards the inner margin. Merus of third maxilliped has a small spine proximally on inner ventral margin. The inner margin of the ischium is prominently dentate along entire length. There are discernible setae of varying intensity within the upper longitudinal groove of the second pereiopod. There is a clearly identifiable tiny spine located on the inner side of the base of the third maxilliped, along with a noticeably dentate ischium on the same appendage. Due to its lack of regular spotting on the pereiopods this species appears similar to T. indicus. It differs most obviously by possessing a distinctive blotch of color on the inner face of the merus of the second and sometime third legs. The color of this blotch is variable from light to dark purple or indigo.

Figure 3. Slipper lobster Thenus unimaculatus species (Burton and Davie, 2007). (A) Dorsal part and (B) ventral part of Thenus unimaculatus. (Photo courtesy of: Ihsan Hani Radzi)

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Planktons: Small in Stature, Paramount in Importance

By Assoc. Prof. Ts. Dr. Wan Nurul Nadiah Binti Wan Rasdi

Plankton is one of planet Earth's most important building blocks of flora and fauna. We learned in primary school about the food chain, stemming from the primary producers to the consumers up to apex predators that sit on top of the chain. The humble plankton, although small in stature, is vital to ecology.

Plankton is defined as a collection of microorganisms so small that the naked eye cannot see them. Planktons have two distinct types: phytoplankton and zooplankton. Phytoplankton are microorganisms that can generate energy through photosynthesis from sunlight, and zooplankton is the organism that consumes phytoplankton or other zooplankton to survive. Essentially, phytoplanktons are the flora (plants) of zooplankton's fauna (animals).

These microorganisms' importance can not be understated. It serves as a food source for many creatures, from small fishes to massive, majestic creatures such as the blue whale, which eats zooplankton through its filter. The sustainability of current biodiversity relies heavily upon the availability of plankton. Without them, the delicate food web would collapse, causing significant ramifications throughout the chain.

Planktons and all of the worlds' biodiversity are now under duress. As the world is expanding economically, the negative environmental impacts are also put into overdrive. Climate change, pollution, increase in acidity, and many other factors affect the delicate balance of the biosphere. These factors need to be aptly addressed by all parties involved in ensuring the survival of humanity.

Of all the natural resources that humans consume, fisheries are one of the most important. After all, fish are the primary source of protein and micronutrients in many countries, particularly those with

limited capability to grow its food. In many species of fish life cycle, the early stages of growth are where the importance of plankton, primarily zooplankton, is at the highest. This is because the abundance of plankton helps immensely in making sure that fish grow to be adults and can reproduce. Taking away zooplankton from this equation cuts off the cycle, rendering the life cycle null. Therefore, it is imperative to start thinking about food security regarding the availability of plankton.

In Malaysia, marine, inland fisheries as well as aquaculture plays an important role in general consumption, as well as export goods. Our fishermen plays a vital role in making sure this sector continues supporting the Malaysian economy, hence raising the need to navigate this industry towards sustainability as well as ensuring food security for years to come, as fish as a food source is known to be one of the most nutrient-dense option high in protein, lipid and micronutrients. Compared to its terrestrial counterpart, marine livestock remains one of the most efficient food sources as it has higher fertility rates and low conversion ratios, making it a more biologically efficient food source.

The United Nations Sustainable Development Goals (UN SDGs) stipulated Life Below Water is its 14th out of 17 Goals. The Goals aim to conserve and sustainably use the oceans, seas and marine resources for sustainable development. At the core of it all, one would look into these planktons, this small yet important piece that string together the rich biodiversity, to be of paramount focus.

To achieve the stipulated goal, a country must approach the policy, regulation and management of fisheries, aquaculture and biodiversity with sustainability as its primary objective. These three are linked together, where one cannot exist without the other. This is key towards planning and executing food security, as a growing population cannot simply brush sustainability aside as we are dealing with finite resources that will someday deplete faster than we thought if left unchecked. Therefore, we must understand the role planktons play in biodiversity and ecology to plan for sustainable practice regarding harvesting marine resources.

In addressing the issue of aquatic food security, the food supply must be sufficient and safe, with sustainability in mind. This can be achieved by not overfishing and letting nature go through its course to replenish whenever we harvest. And through further understanding and sensitivity towards plankton growth, this aim can manifest itself and ensure that food through marine resources can be relied upon in years to come.

Other than fishing, aquafarming can also help establish options that increase food security chances. This is particularly important in developing countries as it presents an option to introduce a whole new sector that can grow into a fully-fledged industry. For example, Japan is particularly popular with the development of eel farming, a staple food in Japanese culture. Without aquafarming, these eels,considered a delicacy, might not be here anymore. However, Japan has proven that this is not the case, and through the development of aquafarming, it managed to keep the delicacy alive and become a thriving global market. This case is where the importance of plankton comes into the picture. For

example, research has shown that lobster farmers benefit immensely a healthy dose of planktons at a healthy dose of plankton at the larval stage of lobsters.

Planktons can also be useful for other applications, presenting an economic potential due to their rich biochemical profile full of lipids, proteins, pigments, and other biochemical compounds. This is particularly useful for other areas such as cosmetics, wastewater management, renewable energy, and many other fields should enough research and investment be done to cultivate further and study the extensive use of planktons.

Planktons is not just a building block that determines the future of marine biodiversity, it is also one of the things that keeps the Earth habitable. These microscopic creatures need the attention they deserves, as through further research, investment and increased understanding of plankton achieve food security, economic progress and survival.

Through a scientific approach and modern technology, planktons can be further understood, and their advantages in particular its ecological and economical standpoint, can be applied in many fields and industries to ensure that it is in line with UN SDGs and the preservation of the environment towards a more sustainable future.

Figure 1 & 2: Planktons are important microscopic creatures

Mushroom Magic: Turning Harvests into Value-added Noodles

By Dr. Yusnita Hamzah and Assoc. Prof. Ts Dr. Wan Zaliha Wan Sembok

Our recent initiative focused on transferring knowledge on mushroom noodle production to the community has been met with enthusiasm and success. Our latest endeavour, which aimed to educate the community about the making of mushroom noodles, has been well-received and productive. Two primary groups participated in this initiative, which was funded by the Centre for Knowledge Transfer, Industry and Community Linkages (PPIJIM UMT) under the Knowledge and Technology Assimilation Grant Scheme (KTAGS) 2023-2024: the students of SMK Sultan Mansor,the staff and parents of Program Pemulihan Dalam Komuniti (PPDK) Riyadhul Jannah, Marang Terengganu. The activities were held on the 17th and 24th April 2024, respectively. These groups had already begun cultivating their oyster mushrooms, and we aimed to enhance their skills by teaching them how to produce mushroom noodles.

As co-researcher, Dr. Yusnita Hamzah focused on product development, while Associate Professor Ts Dr. Wan Zaliha led and oversaw the project and addressed the plantation element. Additionally, two final-year students from the Bachelor of Food Science (Food Service & Nutrition) program were also involved to facilitate this program. This experience provided the students with valuable opportunities to polish their communication skills and engage with the community.

Before the hands-on session, participants were explained about oyster mushrooms, their benefits, and the different types of noodles along with their nutritional compositions. This foundation helped participants understand the value of integrating oyster mushrooms into potential products.

Figure 1: Fresh oyster mushrooms that are ready to be harvested

The noodle-making process is straightforward, requiring minimal technology and low costs, making it accessible to everyone. This simplicity allows community members to easily integrate mushroom noodle production into their daily routines. One of the significant advantages of mushroom noodles is their enhanced nutritional value. The inclusion of oyster mushrooms in the noodles increases their fibre, protein and mineral content, making them a healthier option compared to regular noodles. This added nutritional value not only benefits the consumers but also makes the product more appealing in the market.

By learning to produce and sell mushroom noodles, the participants can generate additional income. This economic benefit is crucial for the sustainability of the project and encourages continuous engagement from the community. At the end of the activity, the participants enjoyed preparing their main dish of aglio olio using the produced noodles. This practical application of their new skills was both enjoyable and rewarding.

Overall, the primary benefit of this project is the transfer of knowledge to the community. Empowering individuals with the skills to produce a nutritious and marketable product fosters self-sufficiency and promotes economic development within the community. We hope that these activities will be beneficial to them and that they can use the skills and knowledge to generate a valuable side income in the future.

Figure 2&3: Oyster mushroom noodles production.
Figure 4: Aglio olio from oyster mushroom noodless

Figure 5 & 6: Group photograph of participants from SMK Sultan Mansor and Riyadhul Jannah, Marang

Figure 7: Certificates and souvenirs hand over at the end of the program

Citrus Green Soap: FPSM Lab Staff's Innovation Utilizing Used Cooking Oil and Kaffir Lime

By Fadlina Yusof

Cooking oil used in practical cooking classes in the food preparation and processing laboratories at the Faculty of Fisheries and Food Science (FPSM) can amount to nearly 100 kilograms annually. Instead of discarding this waste oil, laboratory staff collect it to sell it to used oil buyers or turn it into dishwashing soap.

Since 2022, a laboratory staff has been developing dishwashing soap from this waste oil. The simplicity of the production process, the readily available ingredients, and the meager cost are the main driving factors behind this soap development. The original formula for the soap, named "Sabun Minyak Masak Terpakai" (SMMT), required only three ingredients: used cooking oil, sodium hydroxide (alkali) powder, and distilled water. The neutralization reaction between the alkali solution and the fatty acids in the cooking oil produces soap. The resulting soap must dry for up to two weeks before it can be used for dishwashing. While SMMT is very effective at removing dirt and grease from food laboratory dishes, its color and scent need improvement to enhance user acceptance.

Several attempts were made to improve the quality and user acceptance of this soap, including adding natural ingredients such as pandan leaf extract, lime, and kaffir lime. In 2024, the latest soap version was produced and named "Citrus Green Soap" (CGS) (Figure 1.0). The production process of CGS is shown in Figure 2.0. Adding green mica colorant and kaffir lime leaf and fruit extract increased user acceptance by 73%, based on a sensory evaluation test involving 30 respondents (Figure 3.0). User acceptance of the color and scent of CGS also showed improvement.

To identify CGS's characteristics, physicochemical analyses such as pH, foaming ability, and solubility were conducted and compared with several commercial soap brands. Observations showed no significant differences in terms of pH and foaming ability. However, CGS took longer to dissolve than commercial soaps. This characteristic makes the soap more long-lasting than other soaps.

CGS is also more economical than the existing commercial detergents used in the laboratory. Laboratory washing tests showed that CGS could clean nearly 11 times the number of dirty plates compared to commercial detergents (215 plates versus 20 plates). In addition to being cost-effective, CGS is environmentally friendly as it does not contain harmful chemicals.

Further research can be conducted to produce the soap in liquid form and to further improve user acceptance of its scent and fragrance.

Figure 1 Solidified Citrus Green Soap

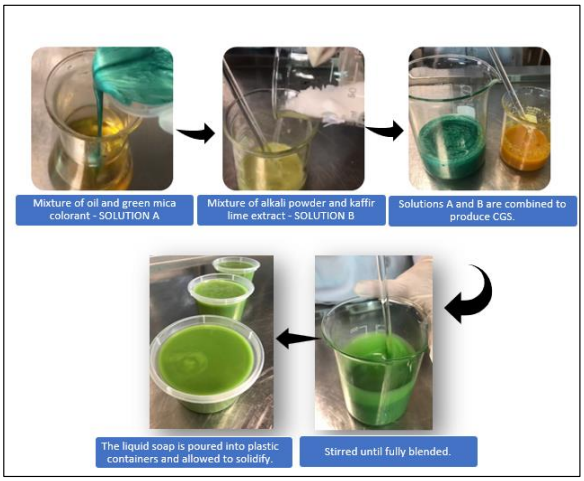


Figure 2.0 The Process of Producing CGS

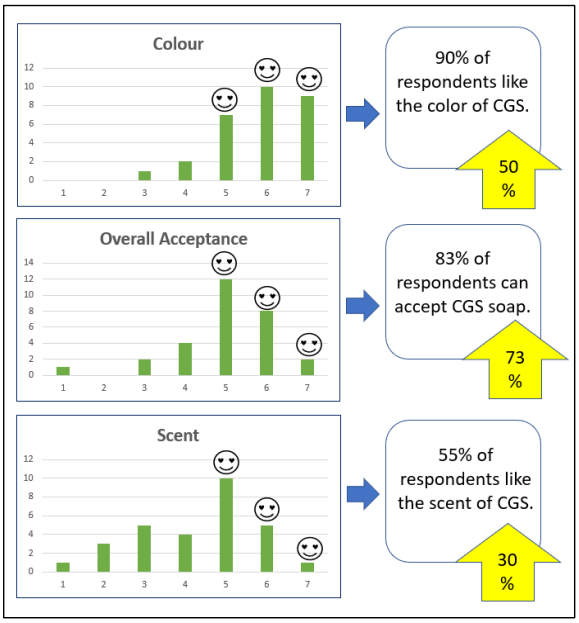


Figure 1 CGS Sensory Evaluation Findings

Understanding Taste Perception Across Life Stages: Aging, Pregnancy, and Childhood

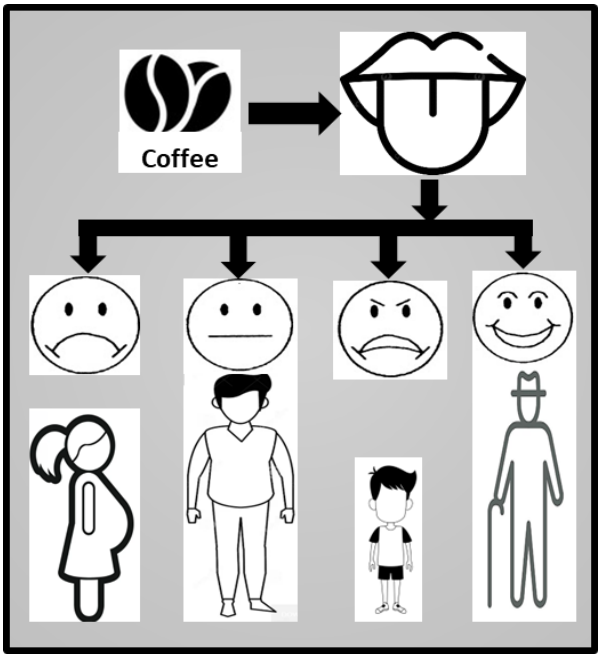
By Dr. Elham Taghavi and Dr. Faridah Yahya

The effects of physiological aging on the perception of taste are represented by the alterations of taste cells, the reduction of salivary production, and inability to fully chew food. Taste changes can be categorized into two types: qualitative and quantitative. Qualitative changes include dysgeusia, where foods you once liked now to taste bad. Quantitative changes involve ageusia (complete loss of taste), hypogeusia (reduced taste sensitivity), and hypergeusia (increased taste sensitivity). Several health issues in older adults can cause changes in taste, like dysgeusia (altered taste) or ageusia (loss of taste). Common causes of taste loss in the elderly include changes in taste receptor cells, poor oral health, and a decline in the sense of smell. Additionally, it gets worse due to aging-related issues like poor health, taking many medications, and chronic diseases. The existence of taste disorders is commonly observed in elderly hospitalized patients for acute conditions, and it is often associated with poor oral hygiene and infections.

Furthermore, it's common for women to notice changes in taste during pregnancy, like foods tasting more bitter or less sweet, but the exact details of these changes are still unclear. Most studies show either no change or a reduced ability to taste, especially in early pregnancy, suggesting that taste sensitivity may decrease during pregnancy. The results show that taste buds have receptors for hormones and other substances that change during pregnancy. Circulating gonadal hormones or other contributions from the endocrine system, as well as physiological changes in weight and immune response could all bear some responsibility for such a modulation of taste during pregnancy. As our knowledge of taste expands, we propose that alterations in taste perception during pregnancy may not be exclusively influenced by fluctuations in hormones such as progesterone and estrogen, as commonly believed.

Moreover, children naturally prefer sweeter and saltier foods and dislike bitter ones more than adults do. This makes it harder for them to enjoy low-sugar, low-sodium, vegetable-rich diets, making them particularly susceptible to the modern food environment filled with salty and sugary foods. Sensory experiences early in life shape preferences. Mothers who eat healthy foods help their children start well, as flavours from their diet pass to amniotic fluid and breast milk, making breastfed infants more accepting of these flavours. Infants fed formula get used to its taste and may initially struggle with new flavours like fruits and vegetables. However, no matter how they are fed early on, infants can learn to like different foods through repeated exposure and a varied diet. Caregivers should focus on the child's willingness to eat rather than their facial reactions. In addition, providing complementary foods low in salt and sugars may help protect the developing child from excess intake later in life. Early exposure to healthy tastes can promote good eating habits, which can reduce the risk of chronic illnesses linked to poor diet.

In summary, taste perception is influenced by a combination of physiological changes, health conditions, and early sensory experiences. Aging can diminish taste sensitivity, while pregnancy and early childhood bring their own unique changes to taste preferences and perceptions. Understanding these factors can help in promoting healthier eating habits across different stages of life



Different taste perception at different life stages

Empowering the Telaga Batin Community through Social Entrepreneurship: The Aquaponics Innovation Program

By Ts. Dr. Rasina Rasid, Dr. Mohd Fazrul Hisam Abd Aziz, Dr. Roseliza Mat Alipiah, Dr. Siti Aisyah Saat, Assoc. Prof. Dr. Nadirah Musa, Assoc. Prof. Ts. Dr. Amir Izzwan Zamri, Ts. Dr. Nik Aziz Nik Ali, Dr. Nurul Aqilah Iberahim, Amira Liyana Mohd Tajuddin, Nasorriah Nasir, Muhammad Nur Shazwan Jamzuri, Mariam Marip, Mei Rifqi Mursyidah, Dr. Ahasan Habib, Dr. Hassan Ibrahim Sheikh Mohamed, Dr. Lee Kok Leong and Prof. Dr. Najiah Musa

"Entrepreneurship through Aquaponics Innovation with the Telaga Batin Community" is one of the community projects recently approved by the Ministry of Finance Malaysia, funded under The Ministry of Finance-Public University Community Empowerment Program, also known as Community@UniMADANI. Managed by the UMT Center for Knowledge Transfer, Industry and Community Network (Pusat Pemindahan Ilmu, Jaringan Industri dan Masyarakat UMT, PPIJIM), this initiative focuses on creating positive social, economic and environmental impacts within the community.

The project aims to increase the income of Telaga Batin Community through innovations in aquaponics and downstream products. It is a continuation of UMT's aquaponics project with the neighborhood community since 2008. The strategic partners involved include the Department of Fisheries Malaysia (DOF), the National Unity and Integration Department (NUID), the Malaysia Cooperative Societies Commission (MCSC) and the Co-operative Institute of Malaysia (CIM). Among the activities to be carried out are knowledge transfer and sharing sessions with the community through workshops and hands-on trainings on tilapia and freshwater crayfish farming, vegetable cultivation, as well as new recipes and methods for marketing downstream products. This project involves members from the Faculty of Fisheries and Food Science, the Faculty of Business, Economics, and Social Development, the Terengganu State Fisheries Office (Terengganu State Office of DOF), the Telaga Batin Community, and private researcher.

The project aligns with UN SDGs 1 (No Poverty) and 2 (Zero Hunger) by promoting income generation and food production through farming and downstream products, contributing to significant social and economic benefits for the community. It also promotes SDG 14 (Life Below Water) by fostering sustainable aquaculture practices that reduce reliance on marine fisheries resources. Additionally, this project supports the National Food Security Policy Action Plan (DSMN) 2021-2025 by enhancing the sustainability of food supply chain.

Aquaponic system at KRT Kg Telaga Batin

Lecturers, students and members of the Telaga Batin Community involved in the previous cycle of project. 2nd row: Ts. Dr. Rasina (5th from the right), Emeritus Prof. Faizah (4th from the right), Dr. Siti Aisyah (far left), Ms. Yusliza from the CIM (3rd from the right)

Recent visit to the site by NUID Director, Dato Haji Che Roslan Che Daud (wearing purple batik shirt)

Some of the vegetable plants in the previous cycle of aquaponic project

Demonstration of pekasam tilapia preparation by Assoc. Prof. Amir and Mr. Shazwan for the community members during the previous cycle

Growing Green: The Benefits and Applications of Organic Fertilizers

By Dr. Elham Taghavi and Dr. Faridah Yahya

In the rapidly advancing field of agriculture, organic fertilizers are gaining popularity for their sustainability and long-term benefits. Derived from natural sources, these fertilizers improve soil health and gradually release essential nutrients. Organic fertilizers are natural compounds made from waste materials or by-products, processed minimally with human intervention. Common examples include manure, compost from animals and agricultural waste, and by-products from food processing. These fertilizers are not only environmentally friendly but also enhance soil health and fertility over time.

Common Types of Organic Fertilizers

Bone meal is a rich source of calcium and phosphorus, crucial for strong root development and disease resistance. Made from steamed and finely ground animal bones, it also contains micronutrients like magnesium, zinc, and iron, which support plant health and soil microbial growth. Available in powder or granular form, bone meal is safe for regular use without risking plant damage.

Blood meal, a slaughterhouse by-product, is essentially dried animal blood. It's an excellent nitrogen source, vital for fruiting, flowering, and lush foliage. This water-soluble fertilizer can be applied as a liquid, efficiently boosting nitrogen levels in the soil.

Seaweed fertilizer is a renewable resource packed with micronutrients that benefit soil health and fertility. It supports beneficial microbial activity in the soil, ensuring a healthy growing environment.

Fish fertilizer from fish waste is a nutrient-rich organic option that enhances soil health and fertility. It provides a balanced mix of macronutrients (nitrogen, phosphorus, and potassium) and micronutrients (calcium, magnesium, chlorine, sulfur, and sodium). Fish fertilizer can be used as a soil additive, foliar spray, or compost pile ingredient.

Manure from farm animals like chickens, goats, or cows is an excellent organic fertilizer. It enriches the soil with nutrients, promoting healthy plant growth.

Vermicompost is produced from worm waste. This fertilizer is rich in water-soluble nutrients immediately available to plants. It can be directly applied to crops, enhancing soil fertility and plant health.

Compost tea, or liquid extract from solid compost, boosts plant growth and yield. It encourages robust root development and serves as a natural pest deterrent, as microorganisms in the tea can produce disease-inhibiting byproducts.

Liquid fertilizer from local microorganisms (MOL) is an innovative organic solution that utilizes naturally occurring beneficial microbes to enhance soil fertility and plant growth. MOL is produced by fermenting organic materials such as fruit waste, fish waste, or plant residues with locally sourced microorganisms. This process results in a nutrient-rich liquid that can be easily

absorbed by plants, promoting robust growth and improved yields. MOL not only supplies essential nutrients like nitrogen, phosphorus, and potassium but also introduces beneficial microbes that enhance soil health by decomposing organic matter and suppressing soil-borne diseases. Its use is particularly advantageous in sustainable agriculture, as it supports eco-friendly farming practices and reduces dependency on synthetic chemical fertilizers.

Organic Fertilizer vs. Chemical (Synthetic) Fertilizer

While synthetic fertilizers offer immediate nutrient delivery to plants, they do not sustain soil health. Continuous use can lead to soil infertility, as chemical fertilizers do not support the beneficial organisms crucial for soil vitality. This results in a dependency on regular fertilization to achieve desired results. In contrast, organic fertilizers are easy to use and available in both liquid and slow-dissolving granular forms. They release nutrients slowly, improving soil health over time by enriching it with essential nutrients and fostering beneficial soil microbes and mycorrhizae.

Knowledge Transfer for Community Benefits

On January 30, 2024, Faculty of Fisheries and Food Science (FPSM), Universiti Malaysia Terengganu held a workshop on "Penghasilan Baja Organik Untuk Pertanian Lestari" at the Kompleks Agroteknologi Bukit Kor. A total of 40 participants from the districts of Kuala Nerus, Marang, and Dungun, gathered at Bukit Kor to gain valuable insights in organic fertilizer preparation.

This event was in collaboration with the Jabatan Perpaduan Negaradan Integrasi Nasional and fully funded by Pusat Pemindahan Ilmu dan Jaringan Industri (PPIJI), UMT under Knowledge and Technology Assimilation Grant Scheme (KTAGS 2023). Participants were exposed to the theory of organic fertilizers given by lecturers from the Crop Science program. An Agricultural Officer and staff of FPSM at Bukit Kor had conducted practical sessions on fertilizer preparation.

FPSM is dedicated to share knowledge about organic agriculture with the community. This initiative highlights FPSM's commitment and expertise in promoting sustainable agricultural practices and benefiting the wider community through knowledge transfer.

Conclusion

Choosing the right fertilizer is vital for sustainable agriculture. Organic fertilizers offer a holistic approach, nurturing not just the plants but also the soil. By integrating organic fertilizers into farming practices, the community indirectly invests in long-term soil health and environmental sustainability. This approach ensures that crops are nourished naturally and sustainably, paving the way for a healthier future in agriculture.

En. Mohd. Shahrul Zanudin, Agriculture officer gave explanation about organic fertilizer products to interested participant during workshop.

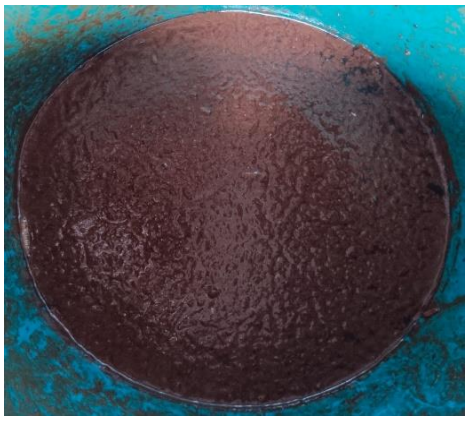
Participants deeply engrossed with talk given by Assoc. Prof. Dr. Ng Lee Chuen about soil health and soil nutrient.

Incorporating jokes amidst serious agricultural information made the participants smile and relax, fostering greater engagement during the workshop.

Fruits are the primary ingredients in organic fertilizer formulas. Fruits that are rich in potassium (K) are essential for plants to produce flowers and fruits.

Participant for “Bengkel Penghasilan Baja Organik untuk Pertanian Lestari”.

Each participant was given souvenir DIY Organic Fertilizer Kit and certificate of attendance at the end of workshop.



Products from the workshop after 3 weeks include: a) Fruit fertilizer b) Fish fertilizer both fertilizers are now ready for use.

AFIMA International Mobility Programme: A student exchange programme that offers practical and intercultural experiences.

By Dr. Shumpei Iehata and Dr. Yeny Nadira Kamaruzzaman

The Asia Fisheries and Marine Environment Leaders Programme (AFIMA) stands at the forefront of East Asian environmental stewardship and intercultural cooperation. AFIMA brings together students from Korea, China, Japan, and Malaysia and promotes a climate of understanding and shared responsibility for the sustainability of the marine environment and effective fisheries management. At its core, AFIMA is dedicated to promoting cooperation between East Asian countries and seeking to address the interconnected environmental issues in their waters. This exchange program aims to train tomorrow's leaders in navigating complex environmental policies and international relations in the 21st century.

AFIMA's impact extends beyond borders, equipping its members with the skills needed for strategic negotiations that shape global environmental policies. The program actively supports sustainable fisheries and marine conservation, empowering students to take charge of summit negotiations on critical issues such as WTO fisheries subsidies, catch allocation by regional fisheries organizations, carbon offsets, and climate change. This initiative is poised to garner international recognition, fostering cooperation among the future leaders of these nations. AFIMA asserts that through collaboration, dialogue, and mutual understanding, it can contribute to the preservation of our marine environments and the well-being of the global community as a whole.

The Faculty of Fisheries and Food Sciences (FPSM) at Universiti Malaysia Terengganu (UMT) has been tirelessly committed to implementing the CAMPUS Asia Plus project (AFIMA Leaders Program) in collaboration with the Graduate School of Fisheries and Environmental Sciences at Nagasaki University since 2022. This ongoing partnership underscores both institutions' commitment to promoting international collaboration and academic exchange. As part of the global mobility component of the project until 2024, a total of nine (9) UMT students participated as outbound students at Nagasaki University, immersing themselves in the enriching academic and cultural environment of our partner institution. Conversely, three (3) Nagasaki University students had the valuable opportunity to experience academic life at Universiti Malaysia Terengganu as inbound students.

This exchange initiative not only strengthens academic ties between Universiti Malaysia Terengganu and Nagasaki University but also provides students with a unique platform for intercultural learning and developing a global perspective in the fields of fisheries and environmental sciences. The continued success of this collaboration underscores the mutual commitment to improving educational opportunities and promoting international understanding.

In terms of academic development, students participating in the program were offered a unique opportunity to enrol in postgraduate courses that will enable them to broaden their perspectives and gain additional insights beyond the scope of their major field of study at their home university. In particular, these courses have been deliberately selected to provide a diverse and complementary academic experience. In addition, students were encouraged to share their newfound knowledge and discoveries with their fellow students through presentations, creating a collaborative environment in which various topics and concepts were exchanged. This dynamic exchange of ideas enriched the scientific discourse and contributed to a more comprehensive understanding of the respective topics.

In the cultural area, the AFIMA program offered UMT students a comprehensive experience in the living traditions of Japan. Students had the opportunity to experience traditional kimonos, a cultural dress unique to Japan, which added a layer of cultural understanding to their overall experience. They were also able to enjoy regional delicacies such as takoyaki, udon, sushi, and bento and immerse themselves even deeper in the culture. As part of their cultural exploration, students ventured beyond the academic setting and attended the annual university festival. This cultural extravaganza offered a glimpse into the diverse talents of fellow students and provided a unique and enriching cultural perspective. The combination of academic and cultural experiences demonstrates the holistic nature of the program and promotes both the intellectual and cultural development of the participating students.

Meanwhile, Nagasaki students will have a unique opportunity to immerse themselves in the warm embrace of Malaysian hospitality. During their time at UMT, these students have the opportunity to engage with a rich spectrum of cultures, diverse religious practices, and a variety of regional cuisines. The multicultural environment at UMT offers Japanese students the opportunity to experience Malaysia's cultural mosaic first-hand. Through interaction with fellow students, teachers and the local community, they will become familiar with the cultural diversity that defines Malaysia. This insight goes beyond the academic realm and offers Japanese students the opportunity to appreciate and understand the cultural nuances that contribute to the vibrant Malaysian tapestry.

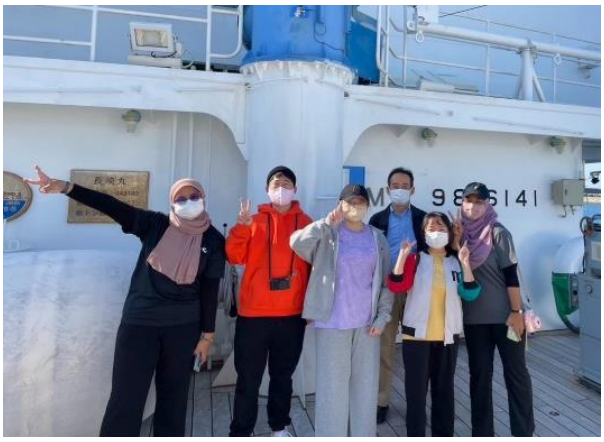
In addition to cultural immersion, Japanese students have the opportunity to explore the variety of regional cuisines Malaysia has to offer. From traditional dishes to local delicacies, the culinary journey adds another layer to your cultural experience. This not only expands their gastronomic horizons, but also ensures a shared experience that promotes intercultural understanding and appreciation. Essentially, for Japanese students, attending UMT goes beyond mere academic pursuits; It becomes a holistic cultural experience that enriches their worldview and fosters a deep appreciation for the diversity that defines both Malaysia and the global community.

In conclusion, participation in this program has proven to be crucial in improving students' understanding and expertise in fisheries and the marine environment. Beyond academic activities, the program provides them with a platform to network and network with fellow students who share the same passion for water research, fostering a community of like-minded people. Additionally, the experience was invaluable in expanding their knowledge

base and gaining insights into different cultures, facilitated by meaningful interactions with individuals who are experts in their respective fields.

The exchange of cultural perspectives was a two-way street that allowed them to not only learn about other cultures but also share their own, creating rich and mutually beneficial cultural exchanges. Studying abroad in Japan or Malaysia as part of this AFIMA program not only exposed them to a comprehensive education system, but also immersed students in a fascinating new culture. The global perspective cultivated through this international experience is invaluable and contributes to their personal and academic development. As beneficiaries of this enriching opportunity, we encourage our students to take advantage of the opportunity to participate in this program. It is not just an academic endeavor; It is a transformative experience that shapes well-rounded people, fosters a deeper understanding of our areas of interest, and promotes cultural exchange on a global scale.

2022 UMT student at Nagasaki University (Outbound), 8th September



Babul Atiqah Binti Othman (Bachelor of Applied Science (Fisheries)) & Faten Nuraisyah Binti Zainuddin (Bachelor of Science (Aquaculture))

2022 Nagasaki University student at UMT (Inbound), 15th August – 26th October

Yoshiki Sugiyama (Bachelor of Environmental conservation and planning) from Nagasaki University

2023 UMT student at Nagasaki University (Outbound), 6th April – 27th June

Muhammad Danial Bin Noor Iskandar & Raja Muhamad Mukmin Bin Raja Kamaruzaman
(Bachelor of Applied Science (Fisheries))

2023 Nagasaki University student at UMT (Inbound), 12th August – 25th October

Shunya Kiyabu & Ryo Okamoto (Bachelor of Marine Environmental Science)

FAO Global Sustainable Aquaculture Advancement Partnership (GSAAP) Annual Meeting and Thematic Workshop 2023 in Shanghai, China

By Namira Lee Tzu, Dr. Nurul Aqilah Iberahim, Assoc. Prof. Dr. Nadirah Musa, Dr. Lee Kok Leong and Prof. Dr. Najiah Musa

Group photograph of delegates at the 2023 FAO GSAAP Annual Meeting and Thematic Workshop of Ecological Aquaculture in Shanghai. UMT's delegates are in the 2nd row as follows: Prof. Najiah, 9th from the right; Dr. Aqilah, 10th from the right; Assoc. Prof. Nadirah, 11th from the right. Independent youth observer, Ms Namira Lee Tzu, is also in the 2nd row, 8th from the right.

The Global Sustainable Aquaculture Advancement Partnership (GSAAP) Annual Meeting and Thematic Workshop of Ecological Aquaculture were jointly organized by the Food and Agriculture Organization (FAO) of the United Nations (FAO) and Center for Ecological Aquaculture (CEA) of Shanghai Ocean University (SHOU). The events were held from December 4-5, 2023 in Shanghai, China.

The GSAAP is a voluntary collaborative mechanism for aquaculture stakeholders including universities, scientific research agencies, and other academic institutions. Co-initiated in 2022 by the FAO and the Chinese Academy of Fishery Sciences (CAFS) with a group of founding members including Universiti Malaysia Terengganu (UMT), the GSAAP aims to deepen scientific understanding of aquaculture, and promote continuous innovation of sustainable technologies. Prior to partnering with the FAO and CAFS to establish the GSAAP, UMT demonstrated its commitment to sustainable aquaculture by pledging support for the Shanghai Declaration: Aquaculture for Food and Sustainable Development in 2021. The declaration serves as a roadmap for optimizing aquaculture's role in achieving the 2030 Agenda for Sustainable Development.

The annual meeting addressed the development and future plan for achieving the GSAAP's goals, while the ecological aquaculture workshop focused on harmonizing aquaculture with the natural environment, and enhancing ecosystem

services. In her role as a GSAAP steering committee member, Prof. Najiah led a team to the annual meeting and thematic workshop. The team included two GSAAP scientific committee members, Assoc. Prof. Nadirah and Dr. Aqilah, and independent youth observer Ms. Namira Lee Tzu. During the meeting, Prof. Najiah highlighted UMT's contributions in promoting sustainable aquaculture and maintaining ecological balance. It was agreed in the meeting that ecological aquaculture can be implemented at different scales, from farm to landscape, and can involve various practices such as integrated multi-trophic aquaculture, polyculture, organic aquaculture, and ecosystem-based management. On the other hand, various environmentally friendly aquaculture approaches from different countries were presented and discussed in the thematic workshop.

Prof. Najiah (on the right), presented the book "Current Development and Technologies in Aquaculture (Vol 1 and 2) to the President of SHOU, Prof. Wan Rong accompanied by Dr. Aqilah (second-to-left) and Assoc. Prof. Nadirah (on the left).

Dr. Aqilah (second from the right) presented a token from the Faculty of Fisheries and Food Science to Dr. Mattias Halwart, FAO Team Leader of the Aquaculture Branch in the Fisheries and Aquaculture Policy and Resources Division, accompanied by Prof. Najiah (on the right) and Assoc Prof. Nadirah (on the left)

Prof. Najiah (on the left) presented a token from the Faculty of Fisheries and Food Science to Prof. Kang Li, Secretary General of the Center for Ecological Aquaculture (CEA) of Shanghai Ocean University, while Dr. Aqilah (on the right) accompanied them

Dr.Aqilah (on the left) presented a token to Prof. Libin Zhang from the Key Laboratory of Marine Ecology and Environmental Sciences, Institute of Oceanology, Chinese Academy of Sciences (IOCAS), China

Sultan Mizan Professorial Chair, Emeritus Prof. Patrick Sorgeloos, who was also present at the meeting

Assoc. Prof. Dr. Nadirah (on the left) presented a token to Prof. Weiqun Lu, who serves as the Director of Aquatic Animal Physiology Department at the College of Fisheries and Life Science, SHOU, as well as the Deputy Director of Laboratory of the Ministry of Education, and the Deputy Director of International Research Center of the Ministry of Science and Technology, China

Independent Youth Observer, Ms Namira Lee Tzu (on the left) and Dr. Aqilah at the Puye Town Digital Ecological Breeding Center

Ecological Aquaculture Genetics and Breeding Research Building at the Puye Town Digital Ecological Breeding Center

The rooftop solar energy system fully generates the energy needed for the farm and center's operations

Delegation from Chinese Academy of Fishery Sciences Visits Universiti Malaysia Terengganu to Promote and Strengthen Collaborations in Sustainable Aquaculture

By Dr. Nurul Aqilah Iberahim, Assoc. Prof. Dr. Nadirah Musa, Mariam Marip, Dr. Lee Kok Leong, Prof. Dr. Najiah Musa

In an effort to foster and boost international collaborations in sustainable aquaculture, Universiti Malaysia Terengganu (UMT) recently hosted a delegation from the Chinese Academy of Fishery Sciences (CAFS). The visit, which took place from December 18th to 21st, 2023, marked a significant milestone in the ongoing partnership between the two institutions under the FAO Global Sustainable Aquaculture Advancement Partnership (GSAAP).

The delegation, led by Prof. Chen Jinfa, Vice President of CAFS, included prominent researchers and professors from various CAFS subsidiary institutions including Yellow Sea Fisheries Research Institute (YSFRI), Pearl River Fisheries Research Institute (PRFRI) and Fisheries Machinery and Instrument Research Institute (FMIRI). The delegates were accompanied by Dr. Lee Kok Leong, who served as the translator. Key delegate members included Assoc. Prof. Dr. Song Jinlong from CAFS, Prof. Dr. Cui Zhengguo from YSFRI, Prof. Pan Houjun from PRFRI, and Assoc. Prof. Dr. Che Xuan from FMIRI.

The program began with a visit to Tanjung Demong Fisheries Research Institute on December 19th, 2023, where the delegation was welcomed by Senior Research Officer Mr. Nik Daud Nik Sin. He briefed the delegation about the facilities and ongoing research at the institute, followed by a tour of the premises. The delegation later visited the aquaculture sites in the Besut area, accompanied by Ms. Nik Rohiman, the District Head of Fisheries for Besut, and Ms. Mariam Marip, the Head of the Fisheries Biosecurity of the Terengganu State Fisheries Office. The visit aimed to facilitate the exchange of knowledge and experiences in sustainable aquaculture technologies, as well as to discuss the implementation, impact, and benefits of MyGAP.

The following day, December 20th, 2023, was filled with academic and professional engagements. It began with a courtesy call to the Deputy Vice-Chancellor (Research and Innovation) of UMT, Prof. ChM. Dr. Marinah Mohd Ariffin, accompanied by Prof. Ts. Dr. Effendy Abdul Wahid, the Dean of the Faculty of Fisheries and Food Science, and Prof. Dr. Najiah Musa, the FAO GSAAP Steering Committee Member and Chairman of the CAFS visitation program, Mr. Mohammad Zaidi Haji Mahadi, Deputy Registrar of the faculty, Muhammad Syahrunizan Abdul Rashid, Assistant Registrar of the faculty, as well as members of the FAO GSAAP Scientific Committee, Assoc. Prof. Dr. Nadirah Musa and Dr. Nurul Aqilah Iberahim.

This was followed by a joint seminar and bilateral discussions held at the faculty. The seminar featured several impactful presentations, beginning with Assoc. Prof. Dr. Song Jinlong, who shared insights into CAFS in his speech entitled 'A Journey to CAFS'. Prof. Dr. Najiah Musa then discussed advancements in recirculating aquaculture systems (RAS) and antimicrobial resistance (AMR), followed by Prof. Dr. Cui Zhengguo, who presented on RAS developments at YSFRI. Prof. Dato' Dr. Nor Aieni Mokhtar from INOS highlighted innovations in coastal fisheries through the design and development of a prototype catamaran and innovative fishing devices. Assoc. Prof. Dr. Che Xuan provided insights into aquaculture facility engineering at FMIRI. The seminar continued with Prof. Pan Houjun discussing antimicrobial resistance and biosecurity in aquaculture at PRFRI, followed by Ms. Mariam Marip, the Head of Biosecurity of Terengganu State Fisheries Office, presenting on MyGAP. Further contributions were made by Assoc. Prof. Ts. Dr. Wan Nurul Nadiah Wan Rasdi, who spoke on sustainable zooplankton production using RAS, while Ts. Dr. Rasina Abdul Rasid highlighted aquaponics as a tool for sustainable food production, community livelihood enhancement, and diversification. Dr. Emienour Muzalina Mustafa presented on the research and industrial application of RAS in Malaysia, while Ts. Dr. Lokman Nor Hakim Norazmi ended the session with a presentation on balancing aquaculture potential and invasion risk for Cherax quadricarinatus in Malaysia. The seminar not only provided opportunities for the exchange of knowledge, but also for potential collaboration.

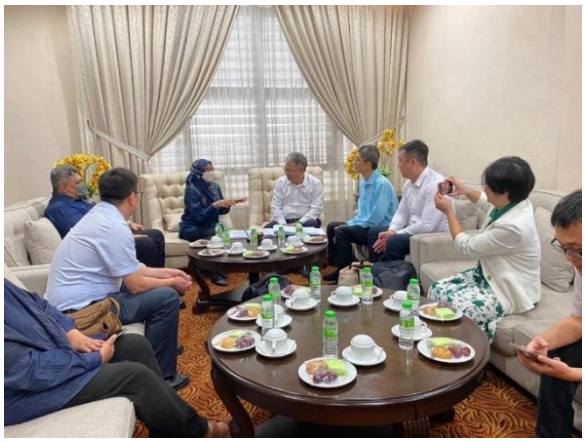
In the afternoon, the delegation paid a courtesy visit to the Terengganu State Fisheries Office (Terengganu State Office of Department of Fisheries) and was welcomed by the Director, Mr. Ruzaidi Mamat. The delegation was briefed on the role of the Terengganu State Fisheries Office concerning aquaculture, capture fisheries (fish landings), conservation and fisheries enforcement as well as inland fisheries. The delegation also engaged in exchanging knowledge and experiences on best practices in fisheries management. These interactions signified the importance of international collaboration in addressing global challenges in the fisheries sector.

Overall, the visit was a great success, not only fostering the academic ties between UMT and CAFS and its subsidiaries, but also underscoring UMT's role in advancing sustainable aquaculture at the global level.


Senior Research Officer, Mr. Nik Daud provided a briefing about Tanjung Demong FRI (left). Prof. Chen Jinfa presented a token of appreciation to Tanjung Demong FRI, accompanied by Prof. Dr. Najiah (right)


The CAFS delegation touring the facilities at Tanjung Demong FRI, guided by Mr. Nik Daud and his team


The delegation's visit to the marine fish nurseries in Besut, led by Ms. Mariam Marip, the Senior Fisheries Officer of the Terengganu State Fisheries Office, accompanied by the members of the Faculty of Fisheries and Food Science and GSAAP Committees. (Left) Business owner of Pertamuda (M) Sdn Bhd, Mr. Zulkifli explained about the grouper and sea bream nursing at his nursery; (Right) Mr. Zulhimi of TRMZCA Enterprise briefed about the facilities and operations of his nursery.



The delegation's courtesy call to the Deputy Vice-Chancellor (Research and Innovation), Prof. ChM. Dr. Marinah Mohd Ariffin, accompanied by the Dean, and the members of the FAO GSAAP Steering and Scientific Committees

Delegates from CAFS and UMT researchers engaging in discussions during the seminar

A group photograph of the CAFS delegation, faculty members and seminar participants captures a moment of international collaboration

The CAFS delegation's courtesy visit to the Terengganu State Fisheries Office

Presentation of token of appreciation to the Director of the Terengganu State Fisheries Office, Mr. Ruzaidi Mamat (on the left) by Prof. Chen Jinfa, the CAFS Vice President.

Buzzing Towards Sustainability; First International Workshop on Stingless Bee Cultivation Conducted at SPMVV

By Dr. Mannur Ismail Shaik and Prof. Dr. Shamsul Bahri Abd Razak

The International Workshop on Stingless Bee Cultivation and Conservation took place on the 20th and 21st of December, 2023, at Sri Padmavathi Mahila Visvavidyalayam (SPMVV) in Tirupati, India. Organized by the university's Department of Biotechnology in collaboration with the Women and ICT Frontier Initiative (WIFI) program, the event focused on the crucial role of stingless bees in biodiversity, sustainable agriculture, and food production. Esteemed experts Prof. Dr. Shamsul Bahri Bin Abd Razak and Dr. Mannur Ismail Shaik from the Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu, Malaysia, led the workshop, sharing their extensive knowledge and practical experience with academicians and community members.

The workshop aimed to enhance income through stingless bee rearing, improve breeding and rearing methods, develop better honey harvesting techniques, and elevate standards in the quality and management of stingless bee products. It attracted a diverse group of participants, including researchers, enthusiasts, community members, and students, united by a shared interest in stingless bee conservation and cultivation. Practical demonstrations allowed attendees to engage hands-on with breeding, rearing, and bee trapping technology. Interactive discussions facilitated knowledge exchange and collaboration among participants, addressing both challenges and opportunities in the field.

The event also highlighted the ongoing collaboration with the WIFI program, introduced by the United Nations Asian Pacific Training Center for ICT for Development (UNAPCICT). The event was graced by the presence of SPMVV's Vice-Chancellor, Prof. D. Bharathi, Registrar, Prof. N. Rajani, Dean, Prof. P. Sujathamma, Workshop Convener, Prof. R. Usha, Co-convener, Prof. N. John Sushma, and Prof. P. Josthna.


Dr. M. Ismail Shaik
Prof. P. Josthna


SRI PADMAVATI MAHILA VISVAVIDYALAYAM
(WOMEN'S UNIVERSITY) TIRUPATI

Fostering China-ASEAN Sustainable Offshore Aquaculture Cooperation

By Assoc. Prof. Dr. Wan Nurul Nadiah Wan Rasdi, Dr. Lee Kok Leong and Prof. Dr. Najiah Musa

Visit to Demonstration Base for Fish Broodstock Technology Innovation of the Guangxi Academy of Sciences and Guangxi Academy of Marine Sciences. From left to right: Prof. Li from Nanning Normal University, Prof. Najiah and Assoc. Prof. Wan Nurul Nadiah

Universiti Malaysia Terengganu (UMT) was honoured to be invited by the Guangxi Academy of Sciences (GXAS) to the 2023 Annual Summary Meeting to evaluate and consult on the implementation of the project 'Intelligent Land-Sea Relay Aquaculture Equipment and New Model in Beibu Gulf' under the China National Key R&D Program: Technological Innovation in Marine Agriculture and Freshwater Fisheries, as well as to deliver keynote reports at the China-ASEAN Science and Technology Innovation Cooperation Technical Conference. The events took place from January 12th to 14th, 2024, at the China-ASEAN Geospatial Information Industry Park in Nanning, Guangxi Zhuang Autonomous Region, China. The conference spotlighted the theme "Promoting Sustainable Offshore Aquaculture Cooperation in ASEAN to Facilitate Green and Carbon-Neutral Development in the Marine Economy".

The conference convened prominent Chinese and ASEAN academics and scientists to deliver keynote addresses on cutting-edge research and share insights that aligned with the conference theme. Malaysia was represented by Prof. Dr. Najiah Musa and Assoc. Prof. Dr. Wan Nurul Nadiah Wan Rasdi from UMT. Prof. Dr. Najiah Musa delivered a compelling keynote titled "The Way Forward Towards a Fruitful China-ASEAN Deep-Sea Aquaculture Collaboration: Malaysia's Perspective." Her talk focused on the latest advancements in deep-sea aquaculture, and outlined the collaborative strategies necessary for successful deep-sea aquaculture cooperation between China and ASEAN countries, emphasizing Malaysia's unique contributions and perspectives in this sector. On the other hand, Assoc. Prof. Dr. Wan Nurul Nadiah Wan Rasdi presented an insightful talk on sustainable plankton production, where she elaborated on

innovative techniques and ecological strategies for plankton cultivation. She highlighted the crucial role of sustainable plankton production in supporting the marine food web and ensuring the viability of offshore aquaculture practices.

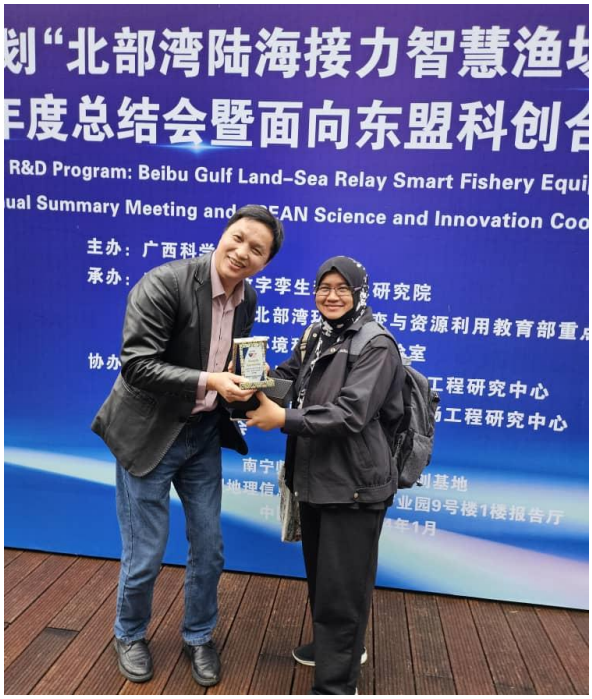
Being in the far south of China, and geographically adjacent to the ASEAN region, Guangxi is well-positioned to benefit from the China-ASEAN strategic partnership, as well as thriving on marine economy in the gulf coast. In this regard, GXAS stands at the forefront in establishing scientific cooperation with the ASEAN counterparts. As a beacon of scientific excellence, GXAS fosters a diverse array of research areas including agriculture, environmental science, and industrial technology, for knowledge advancement and technological innovation. GXAS, equipped with state-of-the-art laboratories and facilities, conducts pioneering research to address both regional and global challenges, aligning with its commitment to sustainable development.

The annual meeting and conference provided a platform for fruitful exchanges of ideas and best practices between the Chinese and ASEAN scientific communities, thus reinforcing the role of science and innovation in promoting sustainable aquaculture and marine economy. Driven by a shared vision for sustainable development and collaborative spirit among participants, the conference successfully advanced the region's agenda for sustainable development and carbon-neutrality.

In conclusion, the 2023 Annual Summary Meeting of "Intelligent Land-Sea Relay Aquaculture Equipment and New Model in Beibu Gulf" project, and the China-ASEAN Science and Technology Innovation Cooperation Technical Conference hosted by GXAS, were both impactful landmark events. These events fostered the China-ASEAN cooperation partnership, and highlighted the critical role of scientific cooperation in achieving sustainable and green development in the marine economy. The involvement and contributions of Prof. Dr. Najiah Musa and Assoc. Prof. Dr. Wan Nurul Nadiah Wan Rasdi exemplified UMT's commitments to promoting sustainable aquaculture development and addressing the challenges and opportunities in the region.

Prof. Najiah delivering her keynote presentation titled "The Way Forward Towards A Fruitful China-ASEAN Deep-Sea Aquaculture Collaboration: Malaysia's Perspective"

Assoc. Prof. Wan Nurul Nadiah presenting her keynote report titled "Sustainability Management of Live Feed Culture for Marine Fish Larviculture"



Prof. Najiah presenting a token of appreciation to Prof. Xu Guilin, Executive President of GXAS. Prof. Xu is also a Senior Engineer (professor level) at the Institute of Geography and Oceanography, Nanning Normal University, and the Key Laboratory of Beibu Gulf Environmental Change and Resources Utilization, Ministry of Education

A photo session after the conference. In the front row, from left to right: Prof Xu Guilin, Assoc. Prof. Wan Nurul Nadiah. The second-row features Dr. Kelly, Prof. Najiah. In the back row are Prof. Zhang Libin from the Key Laboratory of Marine Ecology and Environmental Sciences, Institute of Oceanography Chinsese Academy of Sciences (IOCAS) and Prof. Yang Hongsheng

A photo session with Prof. Zhang Libin at the China-ASEAN Satellite Data Service Center

A reception dinner for prominent scientists from China and ASEAN. Seated from left to right are Assoc. Prof. Wan Nurul Nadiah, Prof. Najiah, Prof. Li Deren (Honorary Director and Academic Committee of the State Key Laboratory of Surveying, Mapping and Remote Sensing Information Technology at Wuhan University), and Prof. Yuan Changan, President of GXAS.

Calligraphy token given by the farm management during the visit to the oyster farming demonstration base. From left to right: Prof. Zhang Libin, Prof. Najiah, Assoc. Prof. Wan Nurul Nadiah, the business owner, Ms. Huang and Prof. Xu Guilin. In the background is a giant dashboard live-streaming water quality parameters of the oyster farm

A boat ride to the oyster farm. From left to right: Prof. Winda Mercedes Mingkid, Mr. Yu HengXing (PhD scholar and key researcher), Prof. Xu Guilin, oyster farm owner, Ms. Huang, Prof. Zhang Libin, Prof. Najiah, Assoc. Prof. Wan Nurul Nadiah

Cherishing time together during the farewell dinner. From left to right (back row): Dr. Indra Raymond Nicolas Salindeho (Crustacean Culture) and Prof. Winda Mercedes Mingkid (Genetics of Reproduction in Aquaculture) from Sam Ratulangi University. Front row, from left to right: Dr. Kelly, Assoc. Prof. Wan Nurul Nadiah and Prof. Najiah

FPSM Laboratory Management Staff Technical Visit To Universiti Putra Malaysia (UPM), Malaysian Agricultural Research and Development Institute (MARDI), and National Institute of Occupational Safety and Health (NIOSH) Bangi.

By Nasrenim Suhaimin

This technical visit took place from February 19th to 22nd 2024. A total of 22 FPSM scheme C members were involved in this visit. The visit was conducted at the following Faculty of Food Science and Technology (FSTM), UPM, Biotechnology & Nanotechnology Centre, MARDI, National Institute of Occupational Safety and Health (NIOSH), Bangi, Beryls Chocolate Factory & Museum, Serdang and Farm Fresh Farm, Serdang.

On February 20, 2024, the first place we visited was Faculty of Food Science and Technology (FSTM) at UPM. The participants were welcomed by Deputy Dean of Academic and Student Affairs, Associate Professor Dr. Radhiah binti Shukri. This was followed by a friendly meeting with the Faculty Occupational Safety and Health Committee (JKKP) of FSTM, UPM.

Participants were then taken to the Pioneer Juice and Puree Processing Plant. Here, participants have the opportunity to visit FSTM's newly built pilot plant. This facility features High Pressure Processing (HPP) technology. HPP offers services to the public at a fair fee.

Next, participants were led to the Food Service Complex in Food 6 building. Here, participants visited the Food Demonstration Laboratory, Fruit and Vegetable Preparation Laboratory, Hot Food Preparation Laboratory, and Cold Food Preparation Laboratory. Participants will also be taken to L'apprenti Deli Laboratory and L'apprenti Café Laboratory, which offer commercial sales services to visitors.

The next destination was the Biotechnology & Nanotechnology Centre, MARDI. Dr. Khairun Hisam Nasir gave a briefing about MARDI and the Center for Molecular Diagnostics and Validation (CMDV) to the participants.

Participants were then taken to the Tissue Culture Laboratory. Here they were briefed by Dr. Zuraida Ab Rahman about the research activities. The participants were then transported to the Transgenic Laboratory under the direction of Dr. Rogayah Sekeli

The next day, February 21, 2024, we visited Beryls Chocolate Factory & Museum, Serdang. At the Beryls Chocolate Museum, participants received an explanation about developments in the chocolate industry. Attendees were offered the opportunity to read and explore the interesting information on display. They also got to observe the workers's chocolate-making process from distance. Before the visit concluded, a video presentation was presented to participants in the gallery hall.

Our visit activities continued in the afternoon with a visit to the National Institute of Occupational Safety and Health (NIOSH) in Bangi. During the visit to NIOSH, participants had the opportunity to attend a briefing on occupational safety and health by Mr. Sharizat, an officer from the Education and Learning Department at NIOSH. Participants were then taken to the Dust Mask Laboratory. Here, we received explanations about face masks and the methods to verify the effectiveness of face masks.

On the last day, February 22nd, we visited Farm Fresh Farm in Serdang. At Farm Fresh Farm, participants are taken on a tour around the farm using a tractor provided. This farm is an Agro Tourism Centre resulting from a collaboration between UPM-Farm Fresh. The farm has produced some dairy products such as cow's milk and ice cream using more sustainable agricultural management methods. Here participants can view and purchase fresh farm products. The farm has implemented hydroponic and aquaponic vegetable cultivation methods to produce a significant portion of the vegetables here.

FOSTUC 2024: Strengthening Research Synergy for Food Sustainability

By Dr. Nor Akma Ismail

On 27th-28th February 2024, the Faculty of Fisheries and Food Science (FPSM), University Malaysia Terengganu (UMT) collaborated with the Faculty of Food Science and Technology, University Putra Malaysia (UPM) and the Faculty of Food Science and Nutrition, University Malaysia Sabah (UMS) has successfully organized the 2nd Food Science and Technology Undergraduate Colloquium (FOSTUC) 2024. The FOSTUC 2024 is an initiative by the Faculty of Food Science and Technology, UPM to emphasize the Experiential Learning and Competency-Based Education Landscape (EXCEL) framework which focuses on Research Infused Experiential Learning (REAL) in Food Science and Technology outcomes.

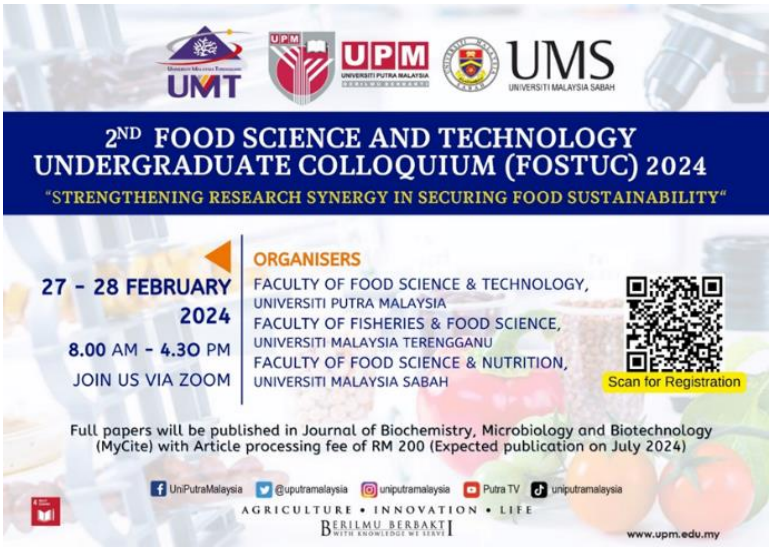
This year, with the theme “Strengthening Research Synergy in Securing Food Sustainability”, this colloquium was held virtually through the Zoom App. This two-day event gathers 60 final year students of Bachelor of Food Science and Technology (BSTM), UPM; Bachelor of Food Science (Food Technology), FPSM, UMT, and Bachelor of Food Science and Nutrition; Bachelor of Technology and Bioprocessing, Faculty of Food Science and Nutrition, UMS. The colloquium provided an opportunity for the students to share their thought-provoking and hypothesis-proving outputs from their research projects.

FOSTUC 2024 also invited three distinguished keynote speakers to share their expert views on food security. Prof. Farooq Anwar from UPM presented "Functional Foods: Current Developments and Future Perspectives." Assoc. Prof. Ts. Dr. Amir Izzwan Zamri from UMT spoke on "Empowering Communities through Functional Foods: Bridging the Gap for Future Growth." Prof. Chye Fook Yee from UMS discussed "AI for Food Security and Safety."

From the 60 participants, the best 3 presenters were chosen from each

university as the winners of Bronze (RM 100), Silver (RM 200) and Gold Awards (RM 300) and a presenter was chosen as the Grand Award (RM 450) winner. For UPM, the winners are; Nur Aisyah Syahirah Ahmad Fauzi (Bronze), Nur Aisyah Syahirah Ahmad Fauzi (Silver) and Afiah Mohamed Ghazali (Gold). For UMT, the winners are; Nurul Aina Azhar (Bronze), Cheok Hui Yun (Silver) and Lau Cai Ling (Gold). For UMS, the winners are; Yeap Ching Yee (Bronze), Lim Cheak Ting (Silver) and Low Bei Xuan (Gold). The Grand Award has been awarded to Siti Norsyahirah Rosli from UPM.

In conclusion, the event was a tremendous success, strengthening the academic relationships between faculties and universities to produce holistic, competitive, and resilient graduates. This colloquium hopes have inspired all students to explore a wide spectrum of topics and research in the future.



UMT FOSTUC Committee Members

2024 Hong Kong-Zhuhai-Macau Marine Industry Development Forum & 2024 China-ASEAN Mariculture Industry Development Forum – Invited Speech and International Collaboration

By Assoc. Prof. Dr. Sandra Catherine Zainathan, Assoc. Prof. Dr. Nor Azman Kasan, Assoc. Prof. Dr. Nurul Ulfah Karim, Dr. Emienour Muzalina Mustafa, Ts. Dr. Rasina Abdul Rasid, Mariam Marip, Dr. Lee Kok Leong, Prof. Dr. Najiah Musa

Group photograph of participants at the 2024 Hong Kong-Zhuhai-Macau Marine Industry Development Forum, and China-ASEAN Mariculture Industry Development Forum in Zhuhai, Guangdong, China

The 2024 Hong Kong-Zhuhai-Macau Marine Industry Development Forum and the China-ASEAN Mariculture Industry Development Forum were organized by the China-ASEAN Belt and Road Joint Laboratory on Mariculture Technology, and the State Key Laboratory of Biocontrol, in collaboration with Xiamen University, the Yellow Sea Fisheries Research Institute of the Chinese Academy of Fishery Sciences, Shanghai Ocean University, the Sun Yat-sen University Zhuhai Alumni Association, the Guangdong Ocean Association, and the Zhuhai Youth Association of Marine Industry Advancement.

The forums were held at the Convention Center of the Southern Marine Science and Engineering Guangdong Laboratory (Zhuhai) on the Zhuhai Campus of Sun Yat-sen University in Zhuhai, Guangdong, China, from March 5th to 7th, 2024. Universiti Malaysia Terengganu was honored to receive sponsorship from the Chinese organizers for six lecturers to attend the forums and share their insights and expertise in their respective field. These lecturers

include Prof. Dr. Najiah Musa, Assoc. Prof. Dr. Sandra Catherine Zainathan, Dr. Emienour Muzalina Mustafa and Ts. Dr. Rasina Abdul Rasid from the Faculty of Fisheries and Food Science, as well as Assoc. Prof. Dr. Nor Azman Kasan, Assoc. Prof. Dr. Nurul Ulfah Karim from the Institute of Tropical Aquaculture and Fisheries (Akuatrop). Also invited to the forum was a special guest, Ms Mariam Marip from the Terengganu State Fisheries Office. More than 600 participants from China and ASEAN countries joined the forums to speak and foster international collaborations.

The first day of the forum was filled with engaging sessions, including a featured talk by a member of the Chinese Academy of Sciences who also serves as the Director of the Southern Marine Science and Technology Guangdong Laboratory (Zhuhai), introducing various research institutions in China. Additionally, there were special ceremonies for the launching of China-ASEAN Aquaculture Technology Cooperation Network, and the appointment of International Cooperation Science and Technology Envoy by the China-ASEAN Belt and Road Joint Laboratory on Mariculture Technology.

On the second day, the China-ASEAN Mariculture Industry Development Forum featured breakout sessions on shrimp aquaculture, seaweed aquaculture, marine fish aquaculture, facility aquaculture and green products, and marine biomedicine and finance, where participants delivered expert presentations and shared their insights and experiences. The sub-forums continued in the second half of the day focusing on international cooperation discussions regarding significant issues in each field. This resulted in proposals for international joint research grant, future collaborations including student/research exchanges, and the shared use of the research facilities under the China-ASEAN Belt and Road Joint Laboratory. The international cooperation signing ceremony for each session was held on the last day of the forum, which was then followed by post-forum visits to the healthy and efficient aquaculture demonstration bases (shrimp and seabass) of the Southern Marine Science and Technology Guangdong Laboratory (Zhuhai).

The China-ASEAN Aquaculture Technology Cooperation Network was launched by the participating institutions. Prof. Dr. Najiah (second from the left) represented UMT in the launch ceremony

Signing ceremony for the China-ASEAN International Cooperation Project on Pathological and Epidemiological Investigation of Major and Emerging Diseases of Fishes, as well as Green Prevention and Control Technologies. Assoc. Prof. Dr. Sandra (third from the left) represented UMT in the ceremony

Photography session with the representatives of UMT's long-term collaboration partners, Yellow Sea Fisheries Research Institute (YSFRI) and Pearl River Fisheries Research Institute (PRFRI). First row, from left to right: Dr Emienour, Assoc. Prof. Dr. Nurul Ulfah, Prof. Dr. Najiah, Prof. Yang Bing (YSFRI), Prof. Wang Qing (PRFRI). Second row, from left to right: Mr. Musa Lee Zheng, Assoc. Prof. Dr. Sandra Catherine, Ts. Dr. Rasina

Prof. Dr. Najiah (on the left), received a souvenir on behalf of UMT from Prof. Tianxin Lin, the Assistant President of Sun Yat-sen University

From the left: Ts. Dr. Rasina, Prof. Dr. Najiah, Prof. Tianxin Lin, Ms. Vicky and Prof. Jianguo He sharing thoughts on future collaborations

Prof. Dr. Najiah (standing) delivering her insights into empowering small-scale aquaculture in developing countries through integration of Industry 4.0 smart technologies during the sub-forum on facility aquaculture and green products

Dr. Emienour (left) and Assoc. Prof. Dr. Azman (right) delivering their expert presentations during the sub-forum on algae aquaculture

Assoc. Prof. Dr. Sandra delivering her expert presentation on aquatic viruses during the sub-forum on fish aquaculture

Ts. Dr. Rasina delivering her expert presentation during the sub-forum on shrimp aquaculture

From left to right: Ms. May Myat Noe Lwin (Manager of a Mynmar fish pellet manufacturing company), Prof. Kay Lwin Tun (University of Yangon), Dr. Dongdong (Hainan University), special guest Ms. Mariam Marip (Terengganu State Fisheries Office) and Prof. Dr. Najiah in a group discussion

Assoc. Prof. Dr. Ulfah and Prof. Hanmei Xu of China Pharmaceutical University, who is also the co-founder of Nanjing Anji Biotechnology Co. Ltd.

Anti-clockwise: Prof. Dr. Yeong (ASEAN-FEN representative), Ts. Dr. Rasina, Dr. Emienour, Assoc. Prof. Dr. Nor Azman, Assoc. Prof. Dr. Nurul Ulfah, Assoc. Prof. Dr. Sandra Catherine, Mr. Musa Lee Zheng, and Prof. Dr. Najiah

FPSM Shares Iftar Meals for Madrasah Ar-Rasyidin

By Nor Azni Mohd Yunos

The glorious month of Ramadan opens up various opportunities for us to do good deeds. A group of Faculty of Fisheries and Food Science laboratory staff also did not miss the chance to participate by agreeing to contribute iftar meals on March 27th, 2024 for Madrasah Ar-Rasyidin as a part of Universiti Malaysia Terengganu (UMT) community service program. Madrasah Ar-Rasyidin is located in Wakaf Tengah, Kuala Nerus, and accommodates 25 students and staff during Ramadan. This program aims to alleviate their financial burden by providing iftar meals for their students and staffs to celebrate the holy month of giving, Ramadan.

All the ingredient were sponsored by the staff involved, and the meals were freshly prepared at Basic Food Preparation Laboratory. Among the dishes provided were Nasi Hujan Panas with chicken in spicy tomato gravy, Terengganu style braised beef served with achar, bread and butter pudding with custard sauce, fresh watermelon as dessert, and basil seed rose drink. All the food was delivered to the madrasah at 5.00pm, along with a small donation from our staff.

All the laboratory staff involved in food preparation.

All the dishes and donation were delivered by En. Nik Aqil to Ustaz Marzuki from Madrasah Ar-Rasyidin.

Celebrating Eid with Sweet Perfection: The Story of a Team and Their Cake

By Dr. Siti Nur'afifah Jaafar, Nor Azni Mohd Yunos and Faridah Mohd Isa

In celebrating the beauty and joy of Eid al-Fitr, the Eid Mubarak cake often becomes a focal point on the festive table in the grand UMT Eid Mubarak Feast. This year, it was held on the 25th April 2024. To us, the cake is not just a dessert but a symbol of hard work and dedication from 10 committed team members. This exceptional team members are the Faculty of Fisheries and Food Science staffs including Fadlina Yusof, Faridah Mohd Isa, Nor Azni Mohd Yunos, Suhana Muhamad Hanidun, Suzana Mat Saad, Aniza Draman, Nasrenim Suhainim, Mohd Ikhwan Faizuddin Azman, Nik Mohd Aqil Nik Pa' and Nur Harmiera Abdul Rahman.

In this article, we will delve into the diligent efforts they put into creating this magnificent cake while ensuring the best hygiene practices throughout the process. Everything started with meticulous planning. They have decided to bake Pandan Gula Melaka cake with fondant decoration. Then, tasks have been divided efficiently. Some were responsible for preparing the ingredients, some for mixing and baking, and others specialized in cake decorating. Each member played a crucial role in ensuring everything ran smoothly.

Main ingredients like all-purpose flour, sugar, butter, eggs, milk, and flavouring agents were prepared with care. Faridah, as the ingredient managers, ensured all ingredients were of high quality and sufficient in quantity. They also made sure all tools and equipment were clean and ready for use. All ingredients were thoroughly cleaned before use, and expiration dates were checked. She was also taking charge of mixing the ingredients, with the help of other team members. They worked efficiently, ensuring the batter was well-mixed and consistent. The batter was then baked to perfection ensuring the correct temperature and baking time was applied, so the cake was evenly cooked and soft. Work surfaces and equipment were cleaned before and after each use.

The most challenging and creative part was decorating the cake. Suzana worked hard during this phase. The cake is covered with buttercream and colourful fondant to create captivating designs based on the theme proposed by organizer of UMT Eid Mubarak Feast. The "Majlis Sambutan Aidilfitri UMT 2024" lettering was neatly cut and placed, and the finishing touches with cake topper, stone chocolates, beads, and sprinkles added elegance. Each decorating tool was thoroughly cleaned before use, and they made sure not to touch the cake directly with bare hands.

Throughout the process, the best hygiene practices were consistently applied. Among the hygiene measures practiced includes:

1. Continuous Cleaning: All work surfaces and equipment were cleaned regularly to prevent contamination.
2. Personal Hygiene: Team members ensured their hands were washed with soap and water before starting

work and after any breaks or using the restroom.

3. Hairnets and Protective Clothing: Each member wore hairnets and protective clothing to ensure no hair or dirt fell into the batter or cake.
4. Proper Ingredient Storage: Ingredients were stored correctly in sealed containers to ensure cleanliness before use.

What makes this cake truly special is the spirit of collaboration among team members. Every step, from preparation to decoration, was carried out with full cooperation and good communication. They supported each other and provided feedback to ensure the final product met the desired standards.

After hours of hard work, the beautiful and delicious UMT Eid Mubarak Feast cake was finally ready to be presented. It weighed 14kg at 20 x 30 inches in size. It is not just a cake but a symbol of hard work and team spirit. May this cake bring happiness and strengthen the bonds among all who enjoy it. Thank you to all team members for their dedication and hard work, as well as their commitment to ensuring food hygiene and safety. With their hard work and the best hygiene practices applied, this celebration was undoubtedly more joyous and meaningful.

Figure 1: Faridah and Azni filling the mould with cake batter
Figure 2: Suzana colouring the fondant.

Process of covering the cake the night before the event, involving several team members

The team

Some of team members taking a memorable photo with the cake before the event begins

Two Gold Medals for FPSM at 2nd International Laboratory Innovation Seminar, NaLIS 2024

By: Suhana Muhamad Hanidun

The second International Laboratory Innovation Seminar (NaLIS) organized by the Centre of Research and Field Service (CRAFS), Universiti Malaysia Terengganu was held on the 6-7th of May 2024 at Universiti Malaysia Terengganu Convention Centre, UMTCC. The two-days seminar started with a Plenary Speech entitled 'Bridging Innovation to Life' by Nur Fadzlina Binti Mahamad Razi, the Deputy Chairman of Malaysian Innovation Foundation.

The main focus in NaLIS 2024 includes Laboratory Quality, Laboratory Analysis Technique and Technology, Laboratory Management and Operation and Laboratory Safety Health and Environment. Thirty-one innovation projects were presented throughout the two-days seminar. The participants consisted of university and college staff from Malaysia and Indonesia. The innovations created and shared can be implemented and applied in the workplace to ensure the laboratory operation is more effective, money-saving, green technology application, time-saving and other benefits.

Besides the innovation presentation and vendor exhibition, seven interesting and informative speeches were given by experienced speakers in their respective fields. The topics are;

1. Innovation in Propolis Production and Honey Dehydration by MARDI.
2. Good Lab Practise in GMP Environment by Imedikel Sdn. Bhd.
3. Microplastic in Marine Life & Human Health by MRIG, UMT
4. Technology and Innovation in Marine Life Conservation (sea turtle) by Fisheries Research Institute, FRI
5. Revolution in Microscopy by Matrix Optics (M) Sdn. Bhd.

FPSM was so proud to have two teams present their projects at NaLIS 2024. Mrs. Aniza Draman presented Citrus Green Soap, CGS and Mrs. Faridah Mohd Isa presented Tepung Pra Campuran Bit Lobak Merah. Both projects were innovated using laboratory waste as the main ingredient.

Citrus green Soap was innovated from used oil collected from cooking laboratories at FPSM with an additional citrus aroma from kaffir lime peel and leaves. It is comparable to commercial products in the effectiveness of removing oil residues and dirt that stick to dishes and cooking equipment in the laboratory. On the other hand, Tepung Pra Campuran Bit Lobak Merah was produced from dried carrot pieces, waste from the basic cutting practical class to reduce laboratory waste. This premix makes baking carrot cake easier and has the potential to be marketed.

Figure 1 and 2: The Gold Medal Award to both FPSM teams.

Figure 3 and 4: Citrus Greean Soap and Tepung Pra Campuran Bit Lobak Merah

Figure 5 and 6: Mrs. Aniza and Mrs. Faridah receiving Gold Medal award on the closing ceremony

In-depth Experience for Food Science Students, UMT on Industry Visit to Selangor and Negeri Sembilan

By Dr. Yusnita Hamzah

On May 9th and 10th 2024, third-year Food Science students from Bachelor of Food Science (Food Service and Nutrition) had the invaluable opportunity to embark on an educational industry visit to key locations in Selangor and Negeri Sembilan. This activity was part of the out-of-class learning experience for the Food Processing and Preservation subject (STM3123). The main objective of the visit was to expose students to the real-world situations and practices of the food processing industry, as well as to prepare them with the practical experiences necessary for industrial training and future employment.

Cutting-Edge Technology Demonstration at UPM

The first stop on the tour was the Juice and Puree Processing Pilot Plant Learning Centre at the Faculty of Food Science and Technology, Universiti Putra Malaysia (UPM). Here, students witnessed a demonstration of High-Pressure Processing (HPP) technology, an innovation in juice preservation that ensures product quality and freshness. They were able to see the teaching factory in action, understand the entire process from start to finish, and appreciate the importance of HPP technology in modern food processing.

Chocolate Production Insight at Beryl's

The tour continued to Beryl's Chocolate and Confectionery Sdn. Bhd., a well-known name in the local chocolate industry. Students had the chance to visit the exhibition gallery, which showcases the history and development of Beryl's, and observe the chocolate-making process from the viewing corridor. This experience provided students with a comprehensive understanding of the complexities and creativity involved in chocolate production, from selecting high-quality raw materials to innovating in product design and packaging.

Holistic Approach at Ajinomoto

Ajinomoto (Malaysia) Bhd. offered a comprehensive session that included a visit to the Visitor Gallery & Production Corridor, a Q&A session, a cooking demonstration, and light refreshments using the company's products as the cooking ingredients. Students gained an in-depth understanding of the company's daily operations, the application of its products in food preparation, and the importance of quality and safety in food production. The interactive Q&A session and cooking demonstration allowed students to delve deeper into the knowledge and practical skills necessary for the industry.

Complete Process at Yakult

The final stop was Yakult Sdn. Bhd., where students observed the entire production process of Yakult products, from bottle manufacturing to various types of packaging levels. This visit provided a clear view of how Yakult maintains the quality and safety of its products through stringent production

processes and advanced technology. Students were able to see first-hand how the theories of food fermentation they learned in class are applied in the real world.

Exposure and Preparation for the Future

Overall, this industry visits not only provided practical exposure to the food processing industry but also fostered motivation and inspiration among students to excel in the field of food science. The experience helped students understand the application of theoretical knowledge in practical settings, thereby enhancing their readiness for industrial training and future careers.

This industry visits opened opportunities for students to see how technology and innovation play crucial roles in ensuring food quality and safety, inspiring them to apply their knowledge and skills in advancing the food industry in Malaysia.

Some photos during the visit;


PUSAT PEMBELAJARAN
LOJI PERINTIS MEMPROSES JUS DAN PURI


Beryl's

Bridging Borders: FTIP, Universitas Padjadjaran and FPSM, UMT Continue to Strengthen Academic Ties

By: Assoc. Prof. Dr. Mohd Nizam Lani

Lecturers from Food Science attended the meeting with FTIP, UNPAD delegates

In an exciting development for international academic cooperation, the Faculty of Fisheries and Food Science (FPSM) at Universiti Malaysia Terengganu (UMT) recently played host to a delegation from Universitas Padjadjaran (UNPAD), Indonesia. The four-day visit, which took place from March 8 to March 11, 2024, marked the beginning of what promises to be a fruitful partnership between these two esteemed institutions. The visiting team, comprising representatives from UNPAD's Faculty of Industrial Technology, led by Dr. Robi Andoyo, Deputy Dean (Academic and Research), was warmly welcomed to the picturesque coastal campus of UMT. Their mission for visiting UMT was to explore potential collaborations that could reshape the landscape of fisheries and food science education in Southeast Asia.

Diving Deep into Collaboration

As the delegates from UNPAD set foot on UMT's campus, the air was charged with anticipation. The first two days were a whirlwind of introductions, campus tours, and presentations that showcased the best of what FPSM has to offer. "We were immediately impressed by the state-of-the-art facilities at UMT," remarked one of the UNPAD delegates. "It's clear that this institution is at the forefront of fisheries and food science research." As UNPAD is aiming to be the Top 500 QS World Ranking, there are initiatives between UMT-UNPAD that will foster greater academic and cultural exchange, benefiting our institutions and the broader academic community. The proposed collaborations are as follows:

1. **Dual-Degree Programs**: Focusing on the Degrees of Food Technology, Master's, and PhD levels.

2. **Cross Academic Supervision**: Involving final year students, Master's, and PhD candidates from both UNPAD and UMT.
3. **Staff Mobility Program**: Facilitating academic and cultural exchange among our faculty members.
4. **Student Mobility Program**: Offering students the opportunity to experience academic life at our respective institutions.
5. **International Community Project (Komuniti Cakna Antarabangsa)**: Engaging in community-oriented projects with an international perspective.
6. **Establishing a Halal Consortium**: Focusing on collaborative research and development between Malaysia and Indonesia in the field of Halal studies.

The UMT team, equally enthusiastic, pulled out all the stops to demonstrate their commitment to excellence in both teaching and research. From high-tech laboratories to innovative community outreach programs, every aspect of FPSM's work was put on display. In bustling roundtable sessions, academics from both institutions shared their visions for the future. Ideas flowed freely, from short-term staff exchanges to ambitious joint research projects in sustainable aquaculture and marine conservation. "The energy in these discussions was palpable," said a senior FPSM professor. "It was clear that both sides were not just willing, but eager to work together."

The exchange present from the Dean of FPSM, UMT and Deputy Dean, FTIP, UNPAD

Heavy discussion by UNPAD delegates

Charting the Course Ahead

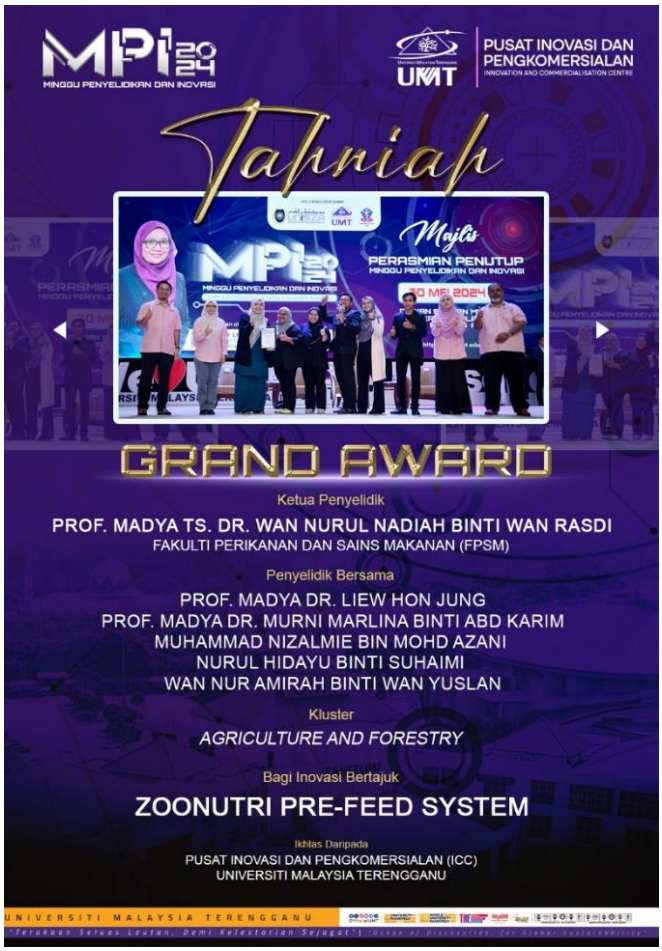
As the visit drew to a close, both teams came together to crystallize their plans for the future. Key outcomes included agreements on student and staff exchanges, a framework for co-supervision of postgraduate students, and the identification for joint research: food technology innovation in fisheries products and halal research. These areas are aligned with the expertise by both universities.

A New Chapter Begins

As the UNPAD delegates boarded their flight home, both sides agreed that this was just the beginning of a long and productive partnership. "We came here with high hopes, but the reality has exceeded our expectations," said the leader of the UNPAD delegation. "We're leaving not just with plans, but with a genuine sense of partnership and shared purpose." With a reciprocal visit to UNPAD already in the planning stages, it's clear that this new international academic alliance is off to a flying start. As these two institutions join forces, the future of fisheries and food science in Southeast Asia looks brighter than ever.

Announcement (seminar, talk, conference etc)

1. MPI 2024 Grand Award




Media UMT

Kosmo | Sinar H... | Bernama | Utusan | Metro | New Str... | The Star | Berita H... | Teganuki...

SUARA KONTEMPORARI

Kosmo!

4 Jun 2024

Penyelidik UMT raih anugerah keseluruhan MPI 2024

2. Come and join us!

3. Biodiversity Day 2024 Logo In Malay

Convention on Biological Diversity (CBD) an associated organization of the United Nations invites to design the logo in different languages on the occasion of International Day for Biological Diversity with suitable themes/slogans. Dr. Mannur Ismail Shaik from Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu has published CBD LOGO in Malay language for the year 2024.