

ISSUE 5, 2023

# aari news

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**Binjai (*Mangifera caesia*) Diversity in Terengganu: Cultural Significance and Rare Varieties Unveiled**

**Golden opportunity and experience in Kagoshima University, Japan and National Chiayi University Taiwan: The Postgraduate Programme on Tropical Fisheries with International Linkage (ILP)**

**'Harmoni Nusantara' Deepens University-Community Relations**

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# agri news Issue 5, 2023

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## A Note from the Editor

December 31, 2023

Dear AgriNews readers,

As we step into a new year filled with possibilities and fresh opportunities, I want to extend my warmest wishes to each and every member of our esteemed faculty. May this year bring you joy, success, and fulfillment in all your endeavors.

Our AgriNews family has always thrived on the collective wisdom and diverse experiences of our faculty members. As we embrace the new year, I encourage all of you to consider sharing your insights, research findings, and stories with the AgriNews community. Your contributions not only enrich our newsletter but also foster a sense of collaboration and shared knowledge among us.

A heartfelt thank you to the dedicated members of our editorial board who work tirelessly to curate and present valuable content to our readers. Your commitment is the backbone of AgriNews, and we are truly grateful for your hard work and passion.

Let's make 2024 a year of growth, learning, and meaningful connections. Here's to a prosperous year ahead for each of you, both personally and professionally.

Best wishes,

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

# Propagating Gac plant (*Momordica cochinchinensis*)

By Dr. Ramisah Mohd Shah

*Momordica cochinchinensis*, commonly known as the gac plant, is a fruit-bearing perennial vine native to Southeast Asia. It belongs to the family Cucurbitaceae, which also includes cucumbers, pumpkins, and melons. The most closely related species to gac is *Momordica charantia*, also known as bitter melon. Gac is particularly renowned for its bright orange to red, spiky fruit, primarily cultivated for its nutritional and potential medicinal properties. Gac fruit is rich in carotenoids, particularly beta-carotene, lycopene, and zeaxanthin, which are antioxidants contributing to the fruit's vibrant color. These compounds also offer potential health benefits.

Did you know that gac is a dioecious plant? Dioecious means that the female and male reproductive parts are located on different plants. If you happen to cultivate the male plants, you will only get male flowers, and no females will be produced. The female gac flowers need to be pollinated with pollen from the stamen of male flowers. The pollen of the male flowers is located under the three sides of the anther. After plucking the male flower and removing the sepal, the pollen is rubbed onto the stigma of the female flower structure. A successful fruit set can be observed within a week, and the fruit can be harvested approximately eight weeks after pollination.

Once the fruit has matured, we can harvest it and extract the seeds. Gac seeds are relatively large compared to many other crop seeds. They are typically flat and have

an elliptical or ovate shape, with slight variations in size and shape among individual seeds. The outer layer of the gac seed is covered by a hard and protective seed coat, often dark brown or black in color.

Can a gac plant be grown from the seed? Yes, it is possible to grow a gac plant from the seed. However, there is one drawback to using seeds as propagation material: we cannot determine which one of the seeds will grow into a male or female plant. The gender of the seed cannot be determined based on its outer characteristics. Thus, to overcome the limitation of dioecy, the best way to propagate gac plants is through vegetative propagation methods. Unlike seed propagation, where the gender of the resulting plant cannot be predetermined, vegetative propagation allows for the replication of a specific plant with known characteristics. One common method is using vine cuttings. By selecting a healthy and productive gac plant, taking cuttings from its vines, and inducing the development of roots using root hormones, it is possible to reproduce a genetically identical plant.

Utilizing this method allows for the easy propagation of both male and female gac plants, making them suitable as planting materials. For optimal cultivation, it is recommended to cultivate two male plants for every ten female gac plants, ensuring a balanced ratio of 1:5. The male plants are needed to supply pollen for a successful pollination process.



Figure 1.0: A bright red color of gac fruit, suitable for harvesting

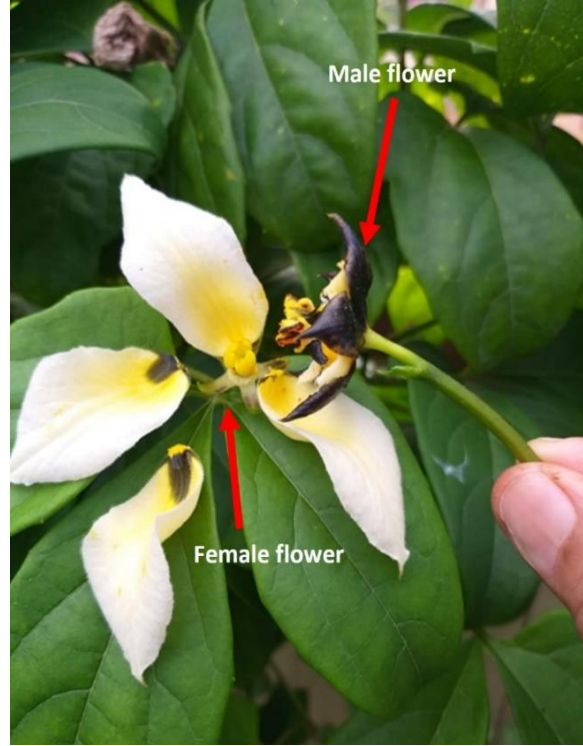


Figure 2.0: Pollination process of male pollen to female flower

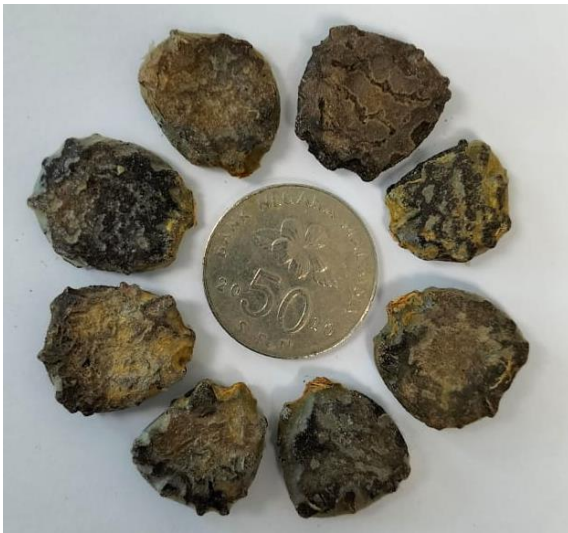


Figure 3.0: Gac seed



Figure 4.0: Gac cutting with new shoot development

# ***Bran Dazzle Ice Cream: Unlocking the Hidden Potential of Neglected Rice Bran***

*By Dr. Nor Akma Ismail*

In the world of frozen delights, ice cream has long reigned as the undisputed champion of sweet, indulgent treats. But what if we told you that ice cream could be more than just a guilty pleasure? Imagine savouring a scoop of your favourite flavour while also reaping the health benefits of a dietary powerhouse. This is where rice bran-incorporated ice cream enters the scene, offering a delightful and nutritious twist to your dessert experience. Given that ice cream is a dessert adored by people of all ages, it presents the ideal chance to introduce rice bran into ice cream recipes. This means that everyone can relish these delectable treats without concerns about their health, guilt-free.



Figure 1. Rice Bran

Rice bran constitutes a significant by-product resulting from the rice milling and polishing procedures. As consumer health awareness continues to rise, cereal brans, recognized for their abundant dietary fiber content, are becoming more prevalent in food products to boost both their fiber content and nutritional value. Currently,

wheat and oat brans dominate as the primary cereal brans incorporated into food products, whereas rice bran remains underutilized and seldom tapped into as a dietary fiber source. Rice bran stands as a promising alternative because of its comparable high fiber content, aligning with other cereal brans. Due to these encouraging health advantages, a group of students (Minhaj, Samanta, Shoumen, Farzana, Javed, Naiemur, and Taniina) from the Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh supervised by Dr. Nor Akma Ismail (FPSM, UMT) has developed rice bran ice cream named 'Bran Dazzle Ice Cream'.



Figure 2. Bran Dazzle Ice Cream Team with the Supervisor, Dr. Nor Akma Ismail during Product Launching Day



Figure 3. Bran Dazzle Ice Cream

Bran Dazzle Ice cream is made of a combination of milk, sugar, skimmed milk powder, whipped cream, rice bran, egg yolk, raisins, dates, and vanilla extract. The sweetness of Bran Dazzle Ice Cream is regulated using dates and raisins instead of

sugar. The raisins and dates were also used to give a balanced taste of sweet and sour that excites the sensory experience. During the research and development (R&D) stage of this product, three formulations were created and tested based on physical, chemical, and sensory properties, and the most acceptable formulation was chosen and presented during the Product Launching Day. Bran Dazzle Ice Cream has won 2nd Place during the Product Launching Day. Bran Dazzle Ice Cream offers a low sugar content, a potential source of dietary fiber, and gratifies sweet cravings in a health-conscious manner.

# ***Binjai (Mangifera caesia) Diversity in Terengganu: Cultural Significance and Rare Varieties Unveiled***

By Norhafiza Ramly

Terengganu is one of the states in Malaysia rich in varieties of Binjai (*Mangifera caesia*). Some of them grow naturally in the forest, while others are planted by the villagers. Due to the various species of Binjai in Terengganu, some places or villages in Terengganu are specifically named in conjunction with the Binjai fruit. For example, Kampung Binjai Rendah, Kampung Binjai Bongkok, Kampung Banggol Binjai, Kampung Binjai Berambu, Kampung Gong Binjai, Kampung Binjai Manis, and Mukim Binjai in Kemaman; all these villages are named after the type or historical significance of Binjai growing on their land.

As one of the exotic fruits, the uniqueness of Binjai lies not only in its taste and fragrance but also in its beautiful flower blooms in every season. Pink-pale purple flowers appear at the end of all tree branches. Consequently, the Binjai flower becomes a natural landscape decorator that blooms abundantly amidst the greenery of the forest when its season arrives. We can identify the location of the tree in the forest or villages simply by observing from afar.

In the year 2023, the author had the chance to taste several varieties of Binjai in Terengganu. This opportunity arose because almost all Binjai varieties produced fruit this year, causing their prices in markets to become cheaper compared to previous years. Terengganu people usually enjoy eating Binjai by mixing sliced Binjai with salt,

sugar, and hot chilies. Additionally, some of them ferment slices of Binjai with sugar or make "sambal" to eat with warm rice.

According to interviews with a few owners of Binjai trees in Terengganu, around Marang, Kuala Terengganu, Batu Rakit, Dungun, and Manir, a Binjai tree can produce an average of 2000-5000 fruits, depending on the tree's size. Usually, Binjai fruits can be harvested and fully matured in early August, coinciding with the end of another exotic fruit called Kuini (*Mangifera odorata*), which typically ends in early October.

Although Binjai can be found every year, there are also Binjai varieties that only produce fruit once every 3 or 4 years. The special characteristic of this species is that its fruits fall into the sweet category and are rarely found in marketplaces during their seasons.

Through the author's observations, each variety of Binjai can be identified by differences in size, physical characteristics, skin texture, smell intensity, pulp thickness, and texture.

The author can conclude that after trying various Binjai varieties, the skin color, sizes, and physical characteristics cannot determine the taste—whether sweet or sour—although they are distinguished by variety. This is because there are instances where fruits share the same skin color, sizes,



and physical characteristics, but their tastes differ in terms of sweetness or sourness. However, the author found that Binjai varieties with a strong fragrance and pungent smell fall into the sour category, while Binjai fruits with a sweet and soft scent fall into the sweet category.

Despite no research having been conducted on the varieties of Binjai in Terengganu, the author's experience in comparing Binjai collections in Terengganu by identifying skin color, size, fruit shape, aroma, and taste of the pulp suggests the presence of 6 varieties found in Terengganu, excluding those from other places in Malaysia. There might be other species that the author did not encounter during the last harvest season.



Figure 1: Right - Binjai with yellow colour and brown spots on its outer skin; it has a sweet-sour taste but emits a very sweet aroma. Middle - A fruit dark brown in appearance offers a very sweet taste but with slight hints of chelated taste similar to "Tapai Pulut". Its fragrance is sweet but less robust compared to the common Binjai. Left - This variety boasts a larger size compared to other species, featuring rougher skin and thicker, softer, juicier pulp with a sour taste. Its scent is very strong and pungent.

Hopefully, a botanist will conduct further research on the varieties of Binjai as these exotic fruits are a treasure in Malaysia that needs protection to prevent their extinction in the future.



Figure 2: A Binjai variety that is slightly rounded, with a skin resembling mahogany wood, offers a very sweet taste with lower fibre content and a solid, fragrant texture. This variety is considered the best for direct consumption and is well-suited for making juice.

# Preserving Binjai Trees: Nurturing a Unique Fruit Legacy at the UMT Bukit Kor Campus

By Assoc. Prof. Dr. Nur Aida Hashim, Mohd Shahrul Zanudin, Siti Nor Shamimi Mat Nasir and Siti Aisyah Mohammad Taupik

The binjai fruit, scientifically known as *Mangifera caesia* (Photo A), is a distinctive seasonal fruit. Two binjai trees thrive at UMT Bukit Kor Campus, Marang (Photo B), reportedly planted by the local community a decade ago. These trees serve as a potential source of income for the community, with the fruits being sold in Kuala Terengganu at an affordable price of approximately RM5 per fruit. During the fruiting season, individuals from areas beyond Bukit Kor visit specifically to capitalize on this fruit to generate income.

On September 4th, 2023, a concerted effort to clean the surroundings of the binjai trees took place. The staff at the Agrotechnology Complex, Faculty of Fisheries and Food Science (Photo C), spearheaded this initiative. The endeavour aimed to streamline fruit picking and to fortify the bond between the staff and the Bukit Kor community to facilitate revenue collection. The initiative was led by the staff at the Agrotechnology Complex, Faculty of Fisheries and Food Science (Photo C).

Various activities were carried out, including tree marking and measurement of the tree trunk diameter, averaging around 4 meters (Photo D). Notably, one binjai fruit tree, situated by the river, stands out for harbouring two species of stingless bees at its base (Photo E). Remarkably, these

stingless bee colonies endure even when seasonal floods submerge their nests during the monsoons. To safeguard the fruit from dropping directly onto the ground, a net was installed beneath the binjai tree after clearing the surrounding bushes. The pungent odor of fallen binjai fruits tends to attract animals or insects to consume them.

Staff members have ventured into diversifying binjai fruit products beyond fresh consumption. They have concocted binjai fruit-based ice cream (Photo F), juice (Photo G), and pickles (Photo H). The ice cream recipe involves blending binjai flesh with an ovalette, liquid or evaporated milk, sweetened condensed milk, and sugar. Similarly, for the binjai juice, fresh binjai flesh, sweetened condensed milk, and boiled water are blended. The pickle recipe entails long-cut binjai flesh placed in a container and seasoned with salt, sugar, and chopped chili.

Preserving these binjai trees at Bukit Kor becomes imperative, ensuring they are spared from future land-clearing activities. The hope is for these trees to flourish, allowing future generations to relish the unique binjai fruit. Furthermore, inviting visitors from other regions to explore and learn about these binjai trees can provide educational opportunities.



Photo A: Binjai fruits (*Mangifera caesia*)



Photo B: One of Bukit Kor's binjai trees



Photo C: Agrotechnology Complex Bukit Kor staff, involved with an activity to clean the surroundings of binjai tree.



Photo D: Measuring the approximate diameter of the tree trunk which was around 4 meters



Photo E: There are two species of stingless bee nesting at the base of the tree



Photo F: *Binjai pickles*



Photo G: *Binjai juice frappe*



Photo H: *Binjai ice cream*

# ***LED Innovations: Preserving Postharvest Quality in Fresh Lettuce (*Lactuca sativa* var. *crispa*)***

By Ts. Dr. Wan Zawiah Wan Abdullah and Ts. Dr. Aidilla Mubarak

Fresh lettuce (*Lactuca sativa* var. *crispa*) is a highly commercial green leafy vegetables and contain rich source of natural antioxidants and vitamins. However, lettuce has a short storage life and is susceptible to physiological deterioration process and decay triggered by inappropriate storage conditions, mechanical injuries, environmental stresses and pathogenic attacks. The use of chemical treatment for preserving fresh produce is not well accepted by consumers due to health consciousness, however finding a healthier solution to preserve fresh produce become very important to guarantee the demand of food security and safety.

Light Emitting Diodes (LED) light is a safe technology, uses minimal heat and has been shown to preserve, inactivate pathogens as well as to enhance the nutritional value of fresh produce in the post-harvest stage. Therefore, the investigation on the potential of LED treatment in preserving the fresh lettuce quality is deemed valuable. In this study, the different colour and wavelength of LED light treatment effects on postharvest quality of lettuce have been evaluated.

LED Irradiation Treatment showed the ability to preserve post-harvest quality as well as nutritional quality of fresh lettuce in postharvest phase. Red LED and blue LED light were significantly effective in

maintaining the flavonoid and phenolic content in lettuce during storage period. In addition, the LED treatments were also effective in reducing weight loss, reducing chlorophyll degradation and increasing the total soluble solid content in lettuce compared to untreated samples. Indeed, the treatment of LED has successfully prolonged the shelf-life of lettuce. This method of LED light illumination on fresh lettuce shows a promising application in retail as a simple, non- chemical postharvest preservation method which can be useful innovation for extending the shelf-life of green vegetables.



**Fresh lettuce purchased from wet market in Kuala Terengganu, was used in this study**



The setup of LED treatments, installed in the 5°C walk-in chiller



Red light illumination, wavelength 630nm



Blue light illumination, wavelength 470nm



Green light illumination, wavelength 530nm

# **Collaboration with Corteva Agriscience™: Cultivating Excellence in Data-Driven Agriculture**

*By Assoc. Prof. Dr. Siti Nordahliawate M. Sidique and Assoc. Prof. Dr. Nur Aida Hashim*

The RIG Biointeractions and Crop Health, emphasized the importance of field data in comprehending the challenges faced by local growers. This group acts as a link connecting the research and development community with the industry. By obtaining field data, the researchers aim to design and implement effective pest and disease management strategies. This proactive approach also provides valuable insights for farmers and agronomists, enabling the adoption of best practices.

Through collaborative efforts with researchers from Universiti Malaysia Terengganu (UMT), Corteva Agriscience™ not only helping farmers increase crop yields but also empowering them with valuable data-driven decision-making capabilities. The synergy between Corteva Agriscience™ and UMT researchers transforms fields into data mines, enabling farmers to comprehend, predict, compare, and gain insights about their farms that might remain invisible to the naked eye.

Born from the merger of DuPont Pioneer, DuPont Crop Protection, and Dow AgroSciences, Corteva Agriscience™ brings together scientific achievement and the brightest minds in agriculture. "We grow by working together," highlighting the company's belief in the collective effort to advance agricultural practices. Through initiatives like the Corteva AgriScience™ grant, researchers are empowered to

contribute to building a sustainable agricultural future.

Corteva Agriscience™ goes beyond conventional research grants, actively investing in the next generation of agricultural leaders through the Educational Farm (Edu-Farm). This innovative platform provides graduates with hands-on experience, nurturing problem-solving skills within a natural living environment alongside farmers. This educational emphasis not only enhances the productivity of farmers but also contributes significantly to the sustainability of their livelihoods. Through shared values and collective efforts, Corteva Agriscience™ is indeed cultivating excellence in agriculture.

Rice crop management, a complex task involving various factors, a meticulous approach address challenges ranging from planting methods to the constant threat of weeds, insect pests, and diseases. The researchers advocate for a checklist approach to guide farmers in deciding when to apply chemical controls. This checklist involves considerations like identifying the prevalent disease, assessing favourable conditions, and ensuring the correct timing for control applications.

In the ongoing battle against pests, diseases, and the looming climate crisis, farmers and researchers stand on the frontline. The impact of climate change on agriculture



emphasizes the urgency for collaborative efforts to develop sustainable practices.

The key components of data-driven agriculture that allow precision agriculture or smart farming through the collaboration:

1. **Data Collection:** gathering information such as disease assessments, insect pest invasion, data on soil conditions, weather patterns and other relevant factors.
2. **Data Analysis:** utilizing advanced analytics and algorithms to process the collected data and extract meaningful insights.
3. **Decision Support Systems:** implementing tools and technologies that assist farmers in making real-time decisions based on the analysed data. This include recommendations for optimal planting times, precise fertilizer application, irrigation scheduling, and pest control strategies.
4. **Automation and Robotics:** incorporating technologies like drones to perform specific task.
5. **Variable Rate Technology (VRT):** adapting input application rates (e.g., fertilizers, herbicides, insecticides and fungicides) based on specific conditions across different areas of the field. This ensures resources are used efficiently, reducing waste and environmental impact.

Data-driven agriculture aims to optimize resource use, increase productivity, reduce environmental impact, and enhance overall sustainability in farming practices, consequently, improve overall crop yield and quality.

As the agriculture evolves, researchers

recognize the need for knowledge exchange—a dynamic force propelling the industry towards innovation and resilience. The traditional approach of achieving specific results and targets in farmer support is gradually shifting towards knowledge exchange. This collaborative approach actively engages farmers in the scientific process, fostering an environment where information is shared, and collective learning becomes the norm.

Knowledge exchange does not stop at researchers sharing insights with farmers; it extends to fostering communication among farmers themselves. This exchange of knowledge and improvement travels swiftly through neighbouring farming communities, creating a network of shared experiences and expertise.

Data is not merely information; it is the key to cultivating connected, agile, and smarter farms. Through this collaborative effort, farmers are equipped not only to address current challenges in crop management but also to navigate the evolving landscape of agriculture. As technology and research continue to converge, the partnership between Corteva Agriscience™ and UMT researchers serves as a beacon for the future of data-driven, sustainable farming practices. This transformative journey indicates a new era where the combination of agriculture and technology creates a resilient and successful agricultural land.



**The presence of a researcher is essential to offer guidance to the research assistant in the meticulous preparation of the land and the precise labelling of the experimental plots.**



**Occasionally, extensive data assessments require the commitment of the entire team until the evening**



**Dr. Asamoah Osei gained valuable experience in cultivating paddy and conducted thorough assessments, intending to transfer this knowledge to Ghana.**



**Conducting thorough evaluations of paddy diseases involves carefully monitoring disease incidence across the entire three-month growing season. This inclusive approach commences at the early stages, identifying sheath blight, progressing through various leaf spots, and finally with panicle blast just prior to the harvest.**



**The research on weed, insect pests, and diseases in the experimental plots of a 20-acre paddy field in Kelantan started in February and paddy had been harvested by mid-May 2023.**



**“Rice is life” highlights the role of rice in sustaining livelihoods, providing nutrition, and supporting the overall well-being of those who depend on it as a primary dietary staple.**



**For the past decade, Dr. Aida has been collaborating with Corteva Agriscience™, making substantial contributions to data that enhance agricultural practices.**

# ***Maximizing Crop Protection and Yield: The Role of Companion Plants and Trap Crops in Organic Gardening***

*By Assoc. Prof. Dr. Nur Aida Hashim, Siti Aisyah Mohammad Taupik, Siti Nor Shamimi Mat Nasir and Prof. Dr. Shamsul Bahri Abdul Razak*

Vegetables, a basis of a balanced diet, have gained popularity as a hobby among many households' post-pandemic. However, challenges such as the escalating costs of planting materials, fertilizers, and pesticides often hinder the pursuit of this rewarding hobby.

In organic farming and permaculture, the implementation of companion plants and trap crops has emerged as an effective strategy for insect control, reducing reliance on chemical treatments. Companion plants serve dual purposes, acting as repellents to pests or attractants to beneficial insects like bees and wasps. Marigolds, Lantana camara, basil, oregano, chives, garlic, mint, and coriander are excellent examples of repellent companion plants. Alternatively, bright colour flowering plants such as *Tunera sp.*, sunflowers, *chrysanthemum*, *chamomile*, *Bidens pilosa*, cosmos, *zinnia* and plumed cockscomb entice beneficial insects.

Strategically planting these companion species amidst vegetable crops not only fortifies pest control but also diminishes the need for purchasing insecticides, thus trimming expenses significantly. On the other hand, trap crops are instrumental in shielding the primary cash crop from pests. These crops, distinct in species, variety, or growth stage from the main crop, lure pests away from the essential harvest. Unlike

companion plants, trap crops are more attractive to pests. Once pests concentrate on these decoy plants, targeted use of chemical pesticides eliminates them, eradicating the need for widespread insecticide spraying on the main crops.

Incorporating trap plants strategically within garden can effectively manage pests without relying heavily on chemical pesticides. For example, radishes, pumpkins, and nasturtiums serve as effective trap plants for flea beetles, while sunflowers act as deterrents against thrips. Additionally, beets act as natural repellents for aphids and spider mites when planted near eggplants. Introducing globe amaranth alongside cucurbits helps deter cucumber beetles. Collard greens act as an excellent barrier to safeguard cabbage plants from cabbage worms. Similarly, cultivating dill around tomato plants effectively shields them from tomato hornworms. Encircling brassicas like broccoli, kale, and collards with radishes and nasturtiums captures flea beetles effectively. These trap plants serve as a natural defence mechanism against invasive pests, significantly reducing the need for chemical interventions and ensuring a healthier yield."

By integrating companion plants and trap crops, gardeners can effectively manage pests, reduce dependence on chemicals, and nurture thriving vegetable gardens without

incurring excessive cost.



*Tunera subulata* attract beneficial insects such as pollinators and parasitoid wasps.



Globe amaranth helps deter cucumber beetles.



Planting chives as repellent companion plant among vegetables is an excellent strategy for pest control.



Bushes of water celery (selom) deterrent for leaf eating and sap sucking insects together with Angelonia (purple flowers) that can attract pollinators.





Marigolds, the repellent companion plants that can easily be cultivated.



Pumpkins and corns serve as effective trap plants for flea beetles and armyworms respectively.

# Feeding Young Minds: 'Eat Right Every Bite' Comic for Safe and Healthy Eating

By Ts. Dr Aidilla Mubarak, Ts. Dr Wan Zawiah Wan Abdullah and Assoc. Prof. Ts. Dr Nur Aidya Hanum Aizam



Consuming nutritious foods is crucial for acquiring essential nutrients, as well as sustaining and enhancing overall well-being. Ensuring the safety of our food is equally vital in shielding us from potential risks like harmful bacteria and toxins. In an effort to enhance awareness about obtaining healthy and safe food, a comic book titled “Eat Right Every Bite” was produced. Ts. Dr. Aidilla Mubarak and Ts. Dr. Wan Zawiah Wan Abdullah provided the factual input for the development of this comic. The storyline for each topic covered in this comic was built by Ts. Dr. Aidilla Mubarak together with Assoc. Prof. Ts. Dr. Nur Aidya Hanum Aizam. The illustrations in this comic were done by a 16-year-old student, Ms Ezria Zulfaizal. Illustrations with anime-inspired drawings which are known for its vibrant colours and expressive characters create a visual appeal that can keep readers immersed and eager to follow the story.

The comic features 8 stories which aim to captivate young readers to receive significant messages concerning the importance of healthy and safe food. It is intended to raise awareness and instill positive eating habits in young readers.

**To get your copy, contact Ts. Dr. Aidilla Mubarak/ Ts. Dr. Wan Zawiah Wan Abdullah or purchase from Penerbit UMT.**

# ***Eksplorasi Alam Bukit Kor: Crop Science – UNAIR Program***

*By Siti Aisyah Mohammad Taupik and Dr. Suhaizan Lob*



On August 8th, 2023, an exciting event of Eksplorasi Alam Bukit Kor took place at the Kompleks Agroteknologi Bukit Kor, UMT in Marang, Terengganu. The event aimed to foster a spirit of shared learning within the community, focusing on agricultural knowledge. Attendees included lecturers, staff from the Crop Science program, and students from Airlangga University (UNAIR) in Indonesia (Photo 1).

The event commenced with a heartfelt reception and acknowledgment extended to the UNAIR students by Associate Prof. Dr. Nur Aida Hashim, overseeing the Kompleks Agroteknologi Bukit Kor. She then provided valuable insights into the evolution of UMT's presence in Bukit Kor. Subsequently, Mr. Mohd Shahrul Bin Zanudin, an agriculture officer, elaborated further on the instructional amenities, encompassing

greenhouses, student accommodations, and cultivation areas dedicated to coconuts, passion fruit, and pineapples.

Before diving into activities, the students enjoyed a delightful breakfast featuring a variety of fruits and traditional Malaysian dishes. They also had the chance to savour refreshing drinks prepared by the staff, including Asam Renda (*Carissa carandas*) (Photo 2) juice and passion fruit (*Passiflora edulis*) (Photo 3) juice, both rich in vitamin C. These juices were made from freshly picked fruits cultivated on-site.

The students embarked on a journey to a coconut plot, where they gained valuable insights into coconut cultivation management. Following a demonstration on fertilization by the staff, the students even had the chance to fertilize coconut plants

themselves (Photo 4). To add to the experience, they enjoyed the pure and refreshing pandan-infused coconut water from the same plot (Photo 5).

Next stop was the mushroom farm, where the students participated in an activity aimed at enhancing the farm's conditions. They worked together to set up black nets in controlling the temperature and humidity for optimal mushroom growth. Additionally, they learned the art of planting and maintaining greenhouses, as they collaborated to tackle algae growth that was hindering crop growth within the structures.

The program's overarching goal was to introduce the fascinating world of agriculture and contribute to the maintenance efforts at Bukit Kor. The event fostered indirect interactions between students and staff, while also promoting the Bachelor of Science in Agrotechnology (Crop Science) with Honours program to international students. The hope was to offer fresh insights and experiences about UMT Bukit Kor's agricultural practices, nurturing strong relationships between staff and students in the process.



Photo 1: The UMT lecturers and staff of the Crop Science Program with the students of Airlangga University (UNAIR), Indonesia.



Photo 2: The Asam Renda fruit (*Carissa carandas*) made refreshing drinks.



Photo 3: The Passion fruit (*Passiflora edulis*) made refreshing drinks.



Photo 4: The students even had the chance to fertilize coconut plants.



Photo 5: The students enjoyed the pure and refreshing pandan-infused coconut water.

# ***‘Harmoni Nusantara’ Deepens University-Community Relations***

*By Dr. Nabilah Abdul Hadi*



On August 8th, 2023, the Universiti Malaysia Terengganu (UMT) organized a community service program titled ‘Harmoni Nusantara’ to strengthen the relationship between Malaysia and Indonesia through meaningful activities. The program was conducted by the Bachelor of Food Science (Food Service and Nutrition) program under the Faculty of Fisheries and Food Science (FPSM).

The ‘Harmoni Nusantara’ program is spearheaded as a proactive step to bring the two countries closer together through cultural understanding and interactions among FPSM academicians, FPSM support staff, Kuala Nerus communities, and international students from Airlangga University (UNAIR), Indonesia. Furthermore, this initiative serves as a means to promote the Bachelor of Food Science (Food Service and Nutrition) to local communities and

international students. In a warm and enthusiastic atmosphere, various activities were designed to achieve this goal, with 42 participants participating in this program enthusiastically.

In pursuit of these objectives, Prof. Madya Ts. Dr. Zamzahaila Binti Mohd Zin, the Head of the Bachelor of Food Science (Food Service and Nutrition) program, emphasized that “this community service provides a platform for the local community, UNAIR students, FPSM academic staff and support staff to interact, dialogue, and exchange knowledge, experiences, or views in the field of food science, academics and culture”.

The event commenced with knowledge-sharing sessions led by FPSM academic staff, Mr. Rahijan Abdul Wahab and Mr. Aziz Yusof, who discussed topics on ‘Ways of Handling Raw Materials’ and ‘Managing My Diabetic

Through Diet: My Personal Experience'. The program also featured a vegetable carving demonstration by FPSM support staff member Mr. Zamani Bin Mohamed. A central objective of the program was to enhance participants' cultural awareness. The cooking competition served as the centrepiece, allowing participants from the Kuala Nerus community and UNAIR students to immerse themselves in and appreciate the unique cultures of each respective country. This activity provided an ideal platform for cultivating mutual understanding and appreciation of cultural diversity. The prize distribution session recognized the efforts and collaboration demonstrated by the participants. Mrs Radziah Binti Jusoh and Miss Melissa Izzati secured the grand prize for the cooking competition with their fried rice creation named 'Sepakat Membawa Berkat'. UNAIR students enthusiastically provided feedback on the event, expressing their appreciation for the program as a valuable opportunity to connect with the community and engage in meaningful discussions.

'Harmoni Nusantara' has successfully achieved its intended goals, representing a positive step towards promoting diversity and fostering inclusive and harmonious relationships between UMT staff, the Kuala Nerus community, and UNAIR students. The program is viewed as a positive effort to build integrated relationships between Malaysia and Indonesia. The exchange of knowledge, experiences, and culture, can strengthen the bonds that are becoming stronger and lasting between the two countries. The 'Harmoni Nusantara' program succeeded thanks to the hard work of the Bachelor of Food Science (Food Service and Nutrition) academicians and support staff who were determined to make it happen.



**FPSM staff, Mr. Zamani Bin Mohamed, showcased his skill in vegetable carving during the 'Harmoni Nusantara' program**



**A UNAIR student and local community member showcasing their homemade fried rice during the 'Harmoni Nusantara' program.**

# ***Hazard Analysis Critical Control Point (HACCP) Training for Polytechnic Educators***

*By Ts. Dr Aidilla Mubarak and Ts. Dr Wan Zawiah Wan Abdullah*



Hazard Analysis Critical Control Point (HACCP) is an internationally recognized system which identifies and manages food safety risks. A training related to the HACCP system was carried out as part of the Upskilling and Reskilling Program required by the Polytechnic as training related to the main core areas of teaching and learning for the Higher Education Officers. Ts. Dr Aidilla Mubarak and Ts. Dr Wan Zawiah Wan Abdullah were invited to give training on the development and implementation of HACCP for selected educators from Polytechnic colleges in Malaysia.

The training was carried out on the 13th to 16th August 2023 at Port Dickson, Negeri Sembilan. The program was participated by 11 educators from Politeknik Tun Syed Nasir Syed Ismail, Johor; Politeknik Merlimau, Melaka; Politeknik Sultan Haji Ahmad Shah, Pahang; and Politeknik Sultan Idris Shah,

Selangor.

Participants were given the exposure to the pre-requisite program, hazard analysis, development and implementation of the HACCP plan as well as maintenance of the HACCP plan. Participants were given tasks in relation to these sections, and were requested to make presentations in regards to specific choice of food product in food industry. This approach helps the participants to have enhanced understanding of the covered topics.





Talk given by Ts. Dr Aidilla Mubarak



Talk given by Ts. Dr Wan Zawiah Wan Abdullah



P Participants carrying out task related to developing HACCP plan



Presentations by the participants



Photo commemorating the completion of the training

# ***Empowering Agriculture Students: Exploring IoT and Microsoft Azure for Precision Farming in Agriculture 4.0***

*By Assoc. Prof. Ts. Dr. Fauziah Tufail Ahmad*



Modern agriculture is evolving into a more professional and technology-driven industry. Agriculture students who can learn, not just in the fields with dirty hands, but also through a computer system while comfortably seated in their office, monitoring the quality of their yields. Can you imagine a future where a farmer manages their farm while wearing a suit? It's a concept that might surprise you, but it's where agriculture is headed. We need to convey this message to the younger generation to change their perception of agriculture. It's not just for village or country folks; it has the potential to reach a global scale. In reality, whether it's modern or traditional, agriculture remains one of the most critical aspects of our lives, ensuring a continuous food supply throughout the century.

Our country's goal is clear: to secure our food supply through agriculture embedded with the latest technology, including the Internet of Things (IoT) and Industry Revolution 5.0 (IR5.0). But the path to execution is still long. That's where we, the staff of the Crop Science Program in the Faculty of Fisheries and Food Science, step in. Our mission is to prepare our students to be the 'superheroes' who will save our country's food supply. Part of this plan involves equipping our Crop Science students with both the theory and hands-on experience in systems that support IoT in agriculture. To achieve this, we organized a

workshop on "Microsoft Azure Fundamentals, Precision, and Digital Farming for Agriculture 4.0 and ESP 3.0 Agriculture." This workshop took place in three phases from May 12th to May 27th, 2023, and was approved by the Ministry of Higher Education under the KPT-PACE program. It was jointly organized by the Microsoft team and NQC Technology, with the official support of the Dean of the Faculty of Fisheries and Food Science. The Head of Program, Dr. Suhaizan Lob, and the Crop Science academic staff played a vital role in ensuring the success of this workshop.

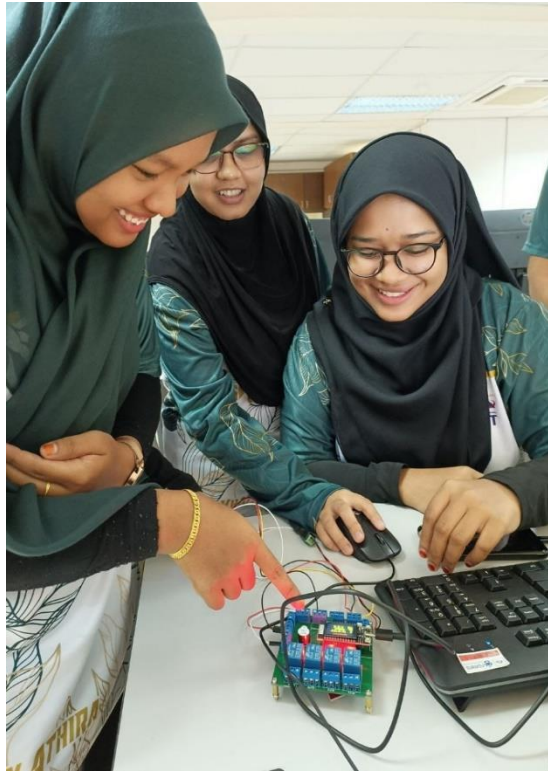
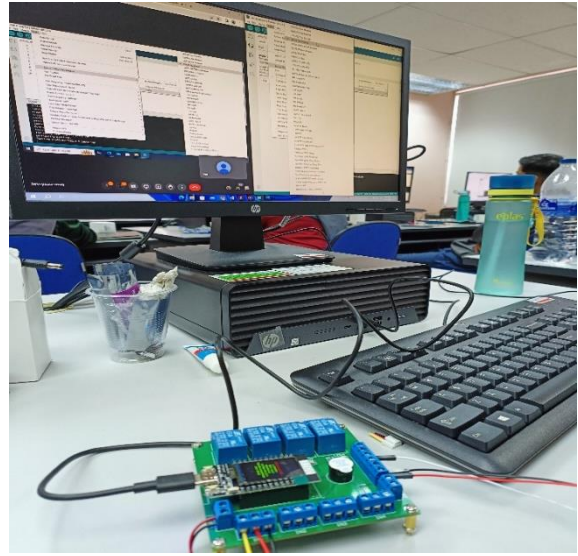
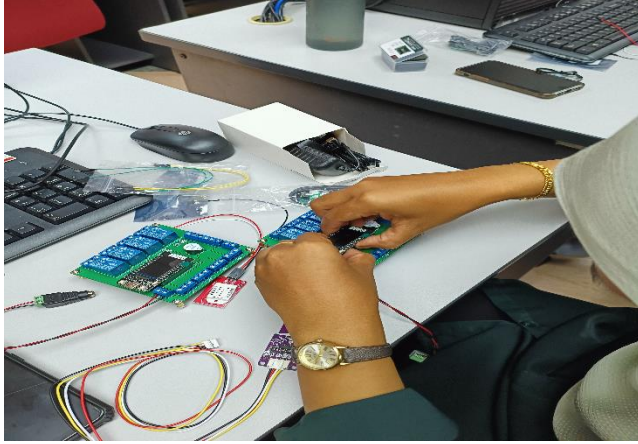


The workshop consisted of 12 modules focused on preparing students to become IoT developers. Students learned essential skills and knowledge required to create and maintain IoT systems, including IoT Hubs, Device Provisioning Services, Azure Stream Analysis, Azure PaaS Service, smart device management, sensor applications, monitoring and troubleshooting, data security systems, Azure Digital Twins, and more. These skills and knowledge are fundamental for students to design IoT solutions for agriculture. Furthermore, this knowledge helps students select the best IoT systems and sensors for agricultural

applications. Students were also taught how to analyze and interpret the data obtained from these systems. Successful students who attended the workshop and passed the examination received professional certification: Microsoft Certified: Azure Fundamentals. Out of the 50 Crop Science students who participated, an impressive 44 passed the exam with flying colors and received the certification.

Programs like this are essential to prepare our students for digital farming and enhance their employability upon graduation. While Microsoft Azure is well-known in the IT field, its practical application in the real world is limited. We are proud that our students not only have a solid understanding of Microsoft Azure but also know how to optimize its use in the real world. This not only helps safeguard our food supply but also equips them with valuable skills to face the challenges of a rapidly changing world.





**KPT PACE:**  
**MICROSOFT AZURE FUNDAMENTAL  
 CERTIFICATION, PRECISION DIGITAL  
 FARMING TOWARD AGRICULTURE 4.0  
 & ESP32 IOT AGRICULTURE**

<b>12 &amp; 13 MAY 2023</b> MICROSOFT FUNDAMENTALS & CERTIFICATION	<b>19 &amp; 20 MAY 2023</b> PRECISION AND DIGITAL FARMING TOWARD AGRICULTURE 4.0	<b>26 &amp; 27 MAY 2023</b> ESP32 AGRICULTURE
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**EN. SHEIKH  
NASIR  
KAMARUDIN**  
Microsoft Certified  
Trainer



**IR. TS. DR ANUAR  
BIN MOHAMED  
KASSIM**  
Senior Lecturer and  
Researcher



**EN. SHAHRULNIZAM  
BIN MAT REJAB**  
Trainer Cum Project  
Developer



**UMT** **FPSM** **N&E**  
UNIVERSITI MALAYSIA TERENGANU  
FACULTY OF FOOD, NUTRITION & LAND MANAGEMENT



# ***Golden opportunity and experience in Kagoshima University, Japan and National Chiayi University Taiwan: The Postgraduate Programme on Tropical Fisheries with International Linkage (ILP)***

*By Dr. Sharifah Rahmah Syed Muhammad*



Master of Science in Tropical Fisheries is a 1.5-year coursework program under the Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu. The program allies with fishery-related postgraduate schools from various parts of ASEAN countries namely the Sam Ratulangi University (Indonesia), Kagoshima University (Japan), University of the Philippines Visayas (Philippines), Kasetsart University (Thailand), Nha Trang University (Vietnam), IPB University (Indonesia) and National Chiayi University (Taiwan) under The Postgraduate Programme on Tropical Fisheries with International Linkage. Students registered under this program are entitled to take elective courses from any of these

universities within the linkage and stand a chance to receive financial support.



This year, one of our students, Nur Athirah Binti Mohammad Aris received a scholarship

from the Japan Student Services Organization (JASSO) of ¥160,000 (RM5,259) to take her elective courses at Kagoshima University, Japan for about 40 days starting from the 18th of August to the 28th of September 2023. Two other students; Hesti Pratiwi and Sari Hidayati were awarded NT\$18,000 (RM2,710) from National Chiayi University, Taiwan each to participate in the program for approximately 29 days from the

1st to the 30th of August 2023. Nur Athirah also received an additional RM2,000 while Sari and Hesti received RM1,500 each from the International Office, Universiti Malaysia Terengganu to support their flight tickets.

At Kagoshima University, Nur Athirah had the opportunity to engage in academic activities with local and international students while exchanging information regarding current issues in respective origin nations about fisheries and aquaculture-related problems and efforts to find solutions. She had hands-on practical skills and was assigned an individual mini project investigating the toxicity of polycyclic aromatic hydrocarbons (PAHs) on Javanese medaka. She was exposed to firsthand experience of utilizing different techniques and advanced technology available in Japan. Nur Athirah also had the chance to visit Kagoshima-maru research vessel for aquaculture, fishery and marine-related activities. During the 40 days in Kagoshima, Nur Athirah was exposed to the Japanese culture and lifestyle. She learned to accept and adapt to the cultural differences between Malaysia and Japan as well as understanding the cultures of other six ASEAN nation students of the ILP Programme during the stay together in Shimoarata Campus. According to Nur Athirah, her journey at Kagoshima University was an extensive experience for involvement

in fisheries studies and a wide exposure to cultural differences among the multinational participants.



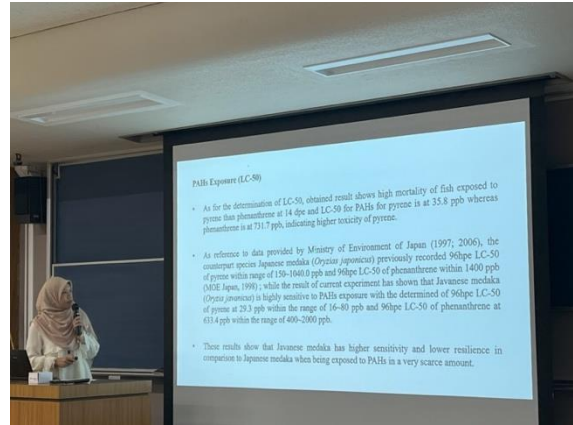
Nur Athirah was exposed to various up-to-date academic and laboratory activities with local and international students at Kagoshima University.



National Chiayi University has been an incredible journey for Hesti and Sari in academic growth, especially in fisheries and aquaculture with access to a modern and dynamic academic system that has broadened student horizons. The professors at National Chiayi University are not only knowledgeable but also incredibly passionate about their field of expertise, making learning a truly enriching experience. The International sessions and collaborative study involving students from several universities in Asia have been a valuable



aspect of our education, allowing them to gain insights into different educational systems and worldviews. Besides exposing themselves to various advanced laboratory techniques and intensive lectures related to aquaculture nutrition, aquatic animal physiology, environment, food processing and safety, biotechnology and high-tech aquaculture, Hesti and Sari had an opportunity to visit oyster, shrimp and tilapia farms around the area. The cultural experience at National Chiayi University has been eye-opening, with opportunities to taste local cuisine and explore the rich history of Chiayi City. Their experience at National Chiayi University has not only widened their views on commercial aquaculture but has also made them more culturally aware and globally connected individuals, ready to face the challenges of an interconnected world.



# ***FPSM Welcomed Food Technology Students from CVASU for a Thrilling Internship Adventure!***

*By Dr. Nur suaidah Mohd Isa, Dr. Nor Akma Ismail and Dr. Nurmahani Mohd Maidin*



On the 18th October 2023, The Faculty of Fisheries and Food Science (FPSM) was visited by a total of 59 Food Science and Technology students from Chattogram Veterinary and Animal Science University (CVASU), Bangladesh, to participate in a one-month internship program. This program is an annual collaboration between the Universiti Malaysia Terengganu, particularly the Faculty of Fisheries and Food Science and the Chattogram Veterinary and Animal Science University (CVASU), Bangladesh. The delegate from CVASU was accompanied by Prof. Dr. Ferdusee Akter. Throughout the course of this program, these students have undertaken a short course on Sensory evaluation and Food Product Development, which was conducted by the lecturers of the Bachelor of Food Science (Food Technology) program, Dr. Nur Suaidah Mohd Isa and Dr. Elham Taghavi assisted by Mrs. Faridah, Mrs. Dayang Normiah, Mr. Zamani and Mr. Ikhwan for the laboratory sessions.



During the course, the students were exposed to the theory behind sensory evaluation for food products as well as a hands-on lab session for acceptance tests that includes from sample preparation up to statistical analysis of data. The course is then followed by an intensive 3 days course on food product development whereby students have been exposed to the important aspects of food product development such as idea generation, product concept, product characteristics and product packaging development.



The students were also given the opportunity to develop innovative food products. A total of 8 groups were formed whereby each group was supervised by lecturers who were also part of the Bachelor of Food Science (Food Technology) program at FPSM.



Some of the exciting products developed by the students and lecturers were MyPop (crispy spring rolls made with coconut dregs) led by Dr. Tuan Zainazor, Brandazzle (Rice bran ice cream) led by Dr. Nor Akma, Pinut Bun (Pineapple based bun) led by Ts. Dr. Faisal Ahmad, Trykies (Peanut skin cookies) led by Dr. Nur Mahani, Pierex (Pie made with jackfruit) led by Dr. Wan Aizuddin, Pineapple delight (Pineapple based cupcakes) led by Dr Mannur Ismail Shaik, Fishtastic (Fish sausage incorporated with seaweed) led by Ts. Dr. Nizaha Juhaida and finally Drango leather (Fruit leather made with dragon fruit peel) led by Ts. Dr. Azizah Mahmood. This project

provides the students an overview of the challenging task of developing a new food product in the food industry.



The developed products were then presented during the most awaited event - Product launch where audiences were given the opportunity to sample these innovative food products. 3 lecturers were invited as judges for the event - Prof Madya Ts. Dr. Norizah, Chm Dr. Azlin Shafrina, Dr. Yusnita and Dr. Nabilah. At the end of the session, Group 3 with their product, Mypop which is an innovative snack consisting of crispy mini rolls made with coconut dregs led by Dr. Tuan Zainazor was awarded the Gold award of the student's product innovation competition. Brandazzle ice cream made with rice bran by Group 6, led by Dr. Nor Akma was announced for the silver award while Pinut bun from Group 8 led by Ts. Dr. Faisal Ahmad was announced for the bronze award. Certificates of achievement and medals were awarded to the winners during the prize giving ceremony by Prof Madya Ts. Dr. Norizah Mhd. Sarbon.



A period of 4 weeks passed quickly, all of the students managed to complete the course within the time period and it was time to say goodbye. Congratulations to all students for the successful completion of the course and not to forget, earnest gratitude to the dedicated lecturers and staff of the Food Technology Programme, Faculty of Fisheries and Food Science for their hard work in ensuring the internship runs smoothly. Special thanks to Prof. Dr. Ferdusee Akter for

her kind assistance throughout the internship programme and thank you to the Chattogram Veterinary and Animal Science University (CVASU), Bangladesh for their willingness to visit us here at the Faculty of Fisheries and Food Science, Universiti Malaysia Terengganu. Hopefully, the internship provides a valuable experience for everyone and opens up doors for future collaborations between CVASU and UMT. Till we meet again next time!.

# Announcement (seminar, talk, conference etc)

## 1. Karnival Inovasi @ UMT 2023 Achievement

### Best Presenter



### Gold Medal



Silver Medal

**Karnival INOVASI @ UMT 2023**  
MEMACU GENERASI KE ARAH PEMBUDAYAAN INOVASI

**TAHNIAH PERAK**

**AIPP-D24**

TAJUK INOVASI :  
SHOP'N'SCORE: CLASS  
GAMIFICATION USING ONLINE  
SHOPPING APP

**Karnival INOVASI @ UMT 2023**  
MEMACU GENERASI KE ARAH PEMBUDAYAAN INOVASI

**TAHNIAH PERAK**

**AIPP-D19**

TAJUK INOVASI :  
ParaSIGHT: AQUATIC PARASITES  
CARD GAME

**Karnival INOVASI @ UMT 2023**  
MEMACU GENERASI KE ARAH PEMBUDAYAAN INOVASI

**TAHNIAH PERAK**

**AIPN-61**

TAJUK INOVASI :  
Waste or taste?

**Karnival INOVASI @ UMT 2023**  
MEMACU GENERASI KE ARAH PEMBUDAYAAN INOVASI

**TAHNIAH PERAK**

**AIPY-04**

TAJUK INOVASI :  
DeepFisher: Innovative Deep Learning Technology For  
Fish Species Classification

## 2. Awards and Event



# agri news