University of Peradeniya
Sri Lanka

HANTHANA BLOSSOMS

Best Research Briefs of Faculty of Agriculture undergraduate Research Symposium (FAuRS)

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Faculty of Agriculture Undergraduate Research Symposium

Message from the Vice Chancellor



As the Vice Chancellor of the University of Peradeniya, Sri Lanka, it is with immense pleasure that I write this message for the 8th volume of the 'Hanthana Blossoms' magazine launched on 10th April 2025, at the Faculty of Agriculture Undergraduate Research Symposium (FAURS 2024). The Faculty of Agriculture of the University of Peradeniya is tasked with conducting basic research in the fields to strengthen the knowledge and skills of young undergraduates in finding solutions to pressing national and global problems in agriculture and related fields. FAURS 2024, provides a forum for final year undergraduates and the academic staff of the Faculty of Agriculture, for fruitful dialogues and dissemination of research findings to a wider audience. Accordingly, this symposium presents a valuable opportunity for young researchers to present, discuss and obtain feedback from experts in the field of agriculture. The magazine 'Hanthana Blossoms' launched at FAURS 2024 is a platform to disseminate research findings of the Faculty of Agriculture final year students to a general audience in a simple easy-to understand language. This is a vital component of research dissemination to develop strong linkages between researchers and ground-level stakeholders for fruitful collaborations and to further enrich research culture. 'Hanthana Blossoms' is expected to motivate undergraduates to enhance their research capacity and research communicating skills and I strongly believe that this will be contributed to enhance the quality of research and collaborations in the future. I take this opportunity to appreciate and thank the Dean of the Faculty of Agriculture, the Coordinator, and the Organizing Committee of FAURS 2024 for their tireless efforts to make this event a success. I congratulate the organizing committee for the successful launch of the 8th issue of 'Hanthana Blossoms' magazine.

Professor W.M.T. Madhujith
Vice Chancellor
University of Peradeniya
10th April 2025

Message from the Dean

I am immensely pleased to write this message for the latest edition of the 'Hanthana Blossoms' magazine, which highlights FauRS 2024. The Faculty of Agriculture at the University of Peradeniya has consistently been a pillar of excellence in scientific exploration. Throughout the years, there has been nurturing and guiding scientists who are not only skilled in research but also deeply committed to making significant contributions to society. In a landmark move, the faculty introduced a mandatory research project to the undergraduate curriculum in 1975. This initiative was designed to equip undergraduates with the necessary research skills, laying a strong foundation for their future endeavors as emerging scientists. Since its inception in 2014, the Faculty of Agriculture Undergraduate Research Symposium (FauRS) has become a pivotal event in our academic calendar. It offers a valuable platform for final-year undergraduate students to present their research findings to their esteemed stakeholders, fostering their confidence through participation in various competitions. The 'Hanthana Blossoms' magazine, a trilingual publication, plays a crucial role in our outreach and dissemination efforts. By featuring select content from the Research Briefs Competition of the FauRS, it serves as a conduit between academic research and the wider community. Through this medium, the aim is to highlight the outstanding achievements of our students and raise awareness among the general public about their remarkable accomplishments. As the Dean of the Faculty, I would



like to extend heartfelt congratulations to the coordinator and the dedicated organizing committee of FauRS 2024. Despite facing numerous challenges, unwavering commitment and resilience have ensured the success of this year's symposium. Additionally, the successful launch of the 8th volume of 'Hanthana Blossoms' magazine is a testament to your hard work and dedication. I encourage everyone to explore the pages of 'Hanthana Blossoms' and appreciate our students' inspiring journey of discovery and innovation. Let us continue to support and celebrate their achievements as they progress in their respective fields.

Prof. B.C.Jaywardana
Dean, Faculty of Agriculture
University of Peradeniya

Message from the Coordinator of FAuRs - 2024



It is with immense pleasure that this message is written for the 8th volume of Hanthana Blossoms as the Coordinator of the Faculty of Agriculture Undergraduate Research Symposium (FAURS 2024). FAuRs is intended for unravelling, recognizing and rewarding the multitude of talents students possess and accordingly both technical and non-technical competitions are organized among final year undergraduates based on their research project. Research Brief is one such open non-technical competition in which students get a valuable opportunity to disseminate their research findings to a general audience in all three languages; English, Sinhala and Tamil. Articles submitted to the Research Brief Competition are evaluated by an eminent panel of judges and the selected articles are published in the Hanthana Blossoms magazine. The expectation is that the participants of this competition obtained practical experience on addressing a non-scientific audience on research in written media in native languages. Gratitude is expressed to Prof. B.C.Jaywaradana, the Dean, Faculty of Agriculture for guidance, Dr. Geeshani Somaratne, the Coordinator of Research Brief Competition, the panel of judges and the editors of Hanthana Blossom. Congratulations are extended to the winners of the competition and all the contributors.

Dr. M Ariyaratne
Coordinator
FAuRS 2024

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98. සල්ලි වෙනුවට පුංචි මිත්‍රයෙක්

TAMIL

99. மண்ணின் ஈரப்பதன் மற்றும் சைற்ரோகைனினின் இலைவழி விசிறல், பாசிப்பயறு தாவர வர்க்கமான ஹர்சாவின் வித்துக்களின், வித்துக்கடினத்தன்மை உருவாவதில் செல்வாக்கு செலுத்துமா?

100. செயற்கைக் கோள்கள் மூலம் விவசாயம் சாத்தியமானதா?

101. வீழ்ச்சியடைந்து வரும் கிராமப்புறங்களை நகர்ப்புற குடியேறிகளால் மீண்டும் மீளுருவாக்கம் செய்ய முடியுமா? : ஐப்பானின் சிக்கி ஒகோசி கியோர்யொகுதாய் (Chiiki Okoshi Kyouryokutai) ஷாகா(saga) மாகாணத்தை அடிப்படையாகக் கொண்ட ஓர் ஆய்வு

102. கடல் கோழி மீனில் இருந்து புரத சத்து மற்றும் ஒமேகா 3 கொழுப்பமிலம் நிறைந்த சுவையூட்டித்தூள்.



The Potential of Using Azolla as a Bioremediation Agent to Alleviate Soil Salinity Stress of Rice Crop

M.D.A.M. Perera

Rice cultivation and soil salinity

As humans, we are concerned about yield from both the consumer's and the farmer's perspectives. The agriculture sector is severely affected by the adverse climate, which reduces the yield. We should conserve arable lands and increase productivity to feed the growing population day by day. One of the approaches is to mitigate the adverse impact of climate change and conserve and increase agricultural production. Soil salinity is one of the global issues that arise as a result of climate change, as well as due to anthropogenic activities. In tropical regions, rice is cultivated as one of the staple crops, where soil salinity has become a severe issue. Salinity is developed in the paddy field mainly with poor-quality of irrigational water.

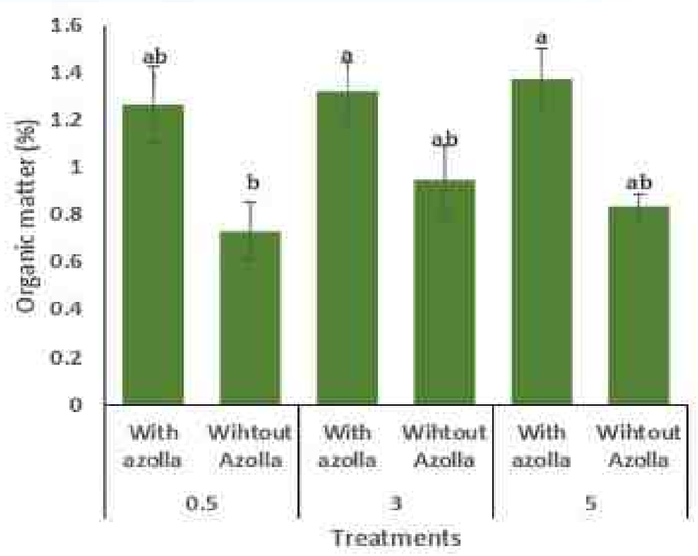
How to overcome soil salinity by using azolla?

Purification of irrigational water and removal of accumulated salt ions from soil can be used to control the salinity development. One of the approaches to purifying the water is by using the bioremediation properties of plants. Azolla, as an aquatic fern, can be used as an effective management strategy to mitigate the salinity development and overcome the negative impact of salinity. As a bioremediation agent, Azolla absorbs excess salt ions, and gradual removal of salt ions from the field leads to lower salinity, that ensured by the increased salt ion concentration of azolla tissue. Salt ions uptake efficiency is enhanced by the dense fine root system of azolla due to a higher specific surface area, as shown in the figure below.

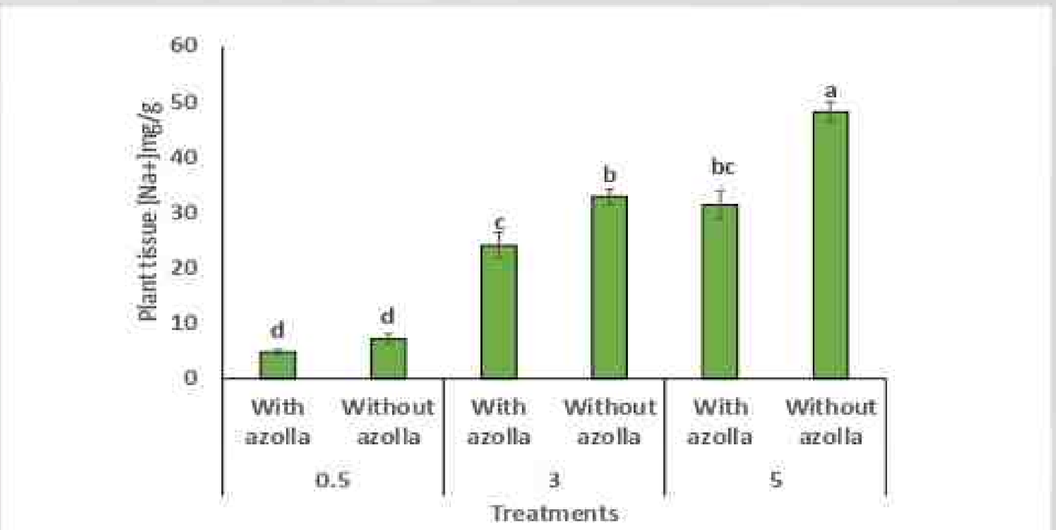
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Azolla helps to increase the organic matter content of soil by incorporating dead azolla and releasing root exudates into the soil, as shown in the figure below.



Improvement of organic matter content contributes to the increase in cation exchange capacity of soil, which enhances the binding of salt cations with soil particles. Azolla contributes to the nitrogen cycle by fixing atmospheric nitrogen in the soil with the help of *Anabaena azollae*. The effectiveness of applied azolla could be seen as a reduction in Na^+ ion concentration of rice plant tissue, as shown below in the figure.



Azolla treated plant had higher root dry weight and total root length, even though the shoot dry weight did not show a significant difference under salinity. Results of the study reveal that the presence of azolla without salinity is a disadvantage for the crop due to competition between azolla and the crop for the same resources. However, under salinity application of azolla is an effective strategy to mitigate the soil salinity. There are some limitations, such as the effectiveness of the strategy relies on the level of salinity, and this practice can be done with only irrigated low-country rice cultivation, with continuous maintenance of standing water.

This is a non-technical summary of the project report titled "The potential of using Azolla as a bioremediation agent to alleviate soil salinity stress and enhance the morphological and physiological characteristics of rice plant," supervised by Prof. L.D.B. Suriyagoda, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. lalith.suriyagoda@agri.pdn.ac.lk.



Tackling Household Food Waste for a Better Tomorrow!

Hansika Rekhani

Imagine this: You buy fresh fruits and vegetables, but they remain in your fridge for days. Eventually, they rot, and you throw them away. Does that sound familiar? You are not alone! From 17% available food for consumption, 60% of food waste at the household level. It is a considerable proportion with comparing wholesale and retail levels. It silently contributes to hunger, harms environmental and encourages careless consumption. But if I told you that even small actions can have a massive impact? In order to determine how food waste patterns in 1010 households spread across 25 districts in Sri Lanka to measure how food waste affects key Sustainable Development Goals (SDGs): SDG 2 (Zero-Hunger), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action).

Fighting Hunger (SDG 2)

The districts of Hambanthota, Kegalle, Matale, Nuwara Eliya and Polonnaruwa have become food waste warriors in a country where hunger remains a challenge. These districts prioritize leftover preservation and leftover usage to reduce household food waste contributing achieving SDG 2. However, higher household size and higher number of kids in districts like Jaffna, Mannar Batticaloa contribute to household food waste, making it harder to eliminate hunger.

Changing Consumption Habits (SDG 12)

Have you ever wondered how small changes in your shopping and cooking habits can lead to a sustainable lifestyle? Monaragala, Rathnapura and Trincomalee districts practice meal planning, writing shopping list and concerning on expiration dates to avoid over purchasing and premature disposal. Conversely, areas that demonstrate hospitality to their guests, prepare higher number of meals and confusion about food labels experienced higher food waste, undermining responsible consumption patterns.

Taking Climate Action (SDG 13)

Do you aware that natural resources are wasted when food is wasted? It is emissions of methane, a greenhouse gas 25 times more powerful than CO_2, are even worse! Gampaha, Galle, Hambanthota, Nuwara Eliya and Rathnapura districts make significant progress toward SDG 13 by composing food waste and having solid awareness about climate changes due to household food waste. The most interesting finding was households who have proper awareness do not have proper waste disposal method. Therefore, they tend to burn, burry and landfills like unfavorable disposal methods.



Ensuring Food for Everyone

To alleviate hunger, household can contribute indirectly by reducing food waste, which keeps more food in circulation. It improves access to food for vulnerable people.

Saving Money and Resources

Food waste is equivalent to wasting money. Household can minimize it by making more informed purchases, writing shopping list and planning meals. Efficient resource utilization ensures the responsible consumption.

Protecting the Environment

Households can practice composting to reduce methane emission produced by food waste that ends up in landfills. By reducing food waste, households can help to slow down global warming.

'Because every small action in your kitchen can create a big difference for our nation, our planet, and future generations'

Waste less today — nourish tomorrow.

This is a non-technical summary of the project report titled "Assessing Socio- Economic and Environmental Implications of Household Food waste in Sri Lanka Using and Index Based Approach" supervised by Dr. Senal A. Weerasooriya*, Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya. *senalw@agri.pdn.ac.lk



Are Welfare Programs Really Feeding the Hungry? A Look at Aswesuma and Other Beneficiary Programmes in Rathnapura

K. Himashi Kovindya

Imagine a kitchen, once smelling of spices and family chatter and laughter, now silent and dark. It is the year 2022, and Sri Lanka is gradually recovering from a brutal economic storm. Rice and lentils are costly, and the market stalls, which were once full, are bare. This is not fiction; it was the daily reality for many households in towns like Rathnapura.

We set out with a question. **Are the promises of help, the social welfare measures like Aswesuma, funding for the elderly and the disabled, really filling those empty plates? Are they effective?** We were not concerned with statistics on paper alone. We wanted to see the concern in a mother's eyes, sense the weariness in an old man's voice.

So, we went deeper than the reports. We spoke to individuals, listened to their struggles, their small victories, their quiet desperation. We used a tool known as CARI, a way of measuring not what individuals consumed, but how they thought about food – the anxiety, the concessions, the lingering uncertainty.

What we found was a patchwork of hope and hardship. To some, the aid was a lifeline, a tattered lifeline keeping them afloat. But for others, especially those with disabilities, the plates remained empty. The Aswesuma program, intended as a safety net, may be partially successful. But further improvements could be beneficial for the poor people.

We witnessed how decisions were made, not just on food, but on survival. Education, a far-off hope for some children, was a luxury. The roof above their heads, leaky and brittle, determined what they could indulge in eating. And in those homes where mouths of female were shut, where decisions were made only by male, the pantry shelves seemed barer.

We learned from their experiences that hunger is not just an empty stomach. It's an issue of losing face, being anxious. We understood that government aid, like Aswesuma, does not adequately see its way to those most in need, because of complicated forms and lack of funds. We also saw how strong people are, they share what they have and they try to help each other. But hoping for the best is not enough.



This is not a story of numbers, it is a story of life, blood and resilience, where families cling onto hope with seemingly impossible odds stacked against them. It is the story of a system that attempted to help, but failed to do so. It is an appeal to everyone to remember behind every number there is a person, a family, and a story waiting to be heard and told. Until every kitchen overflows with a shared meal's warmth, our story is still not over.

This is a non-technical summary of the project report titled "Effectiveness of the Targeting Approach in Addressing Food-Insecurity: A study of the Aswesuma and other Beneficiary Programmes in the Rathnapura District." supervised by Prof. Shamala Kumar*, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya. *skumar@agri.pdn.ac.lk



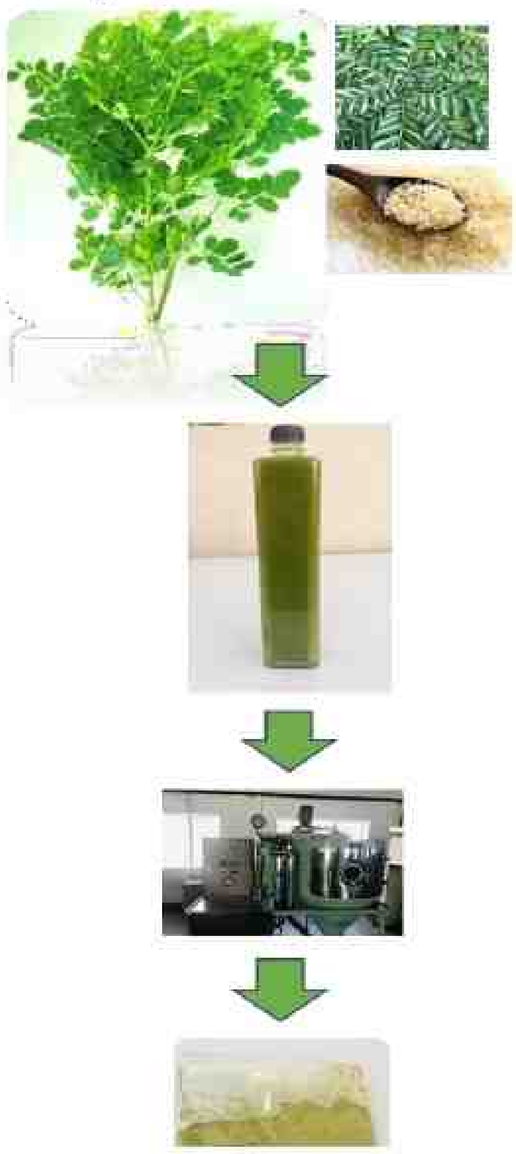
Instant Herbal Porridge with Moringa: A Nutritious Solution for Modern Life Style

S.S. Ranatunga

Introduction

Sri Lankan traditional herbal porridge, **Kolakenda**, is very important for its health benefits and curative properties. However, since it has a limited shelf life and takes a long time to prepare, it is hard to fit into our busy lives today. As a solution for this, my research aims to develop an **instant herbal porridge powder with Moringa leaves**, which is a protein, vitamin, and antioxidant-rich product. It uses **spray-drying technology** that guarantees longer shelf life without compromising the essential nutrients and therapeutic value of the original herbal porridge. It provides a **convenient-to-drink alternative** that connects traditional Kolakenda and contemporary eating lifestyles, preserving health and wellness with every serving.

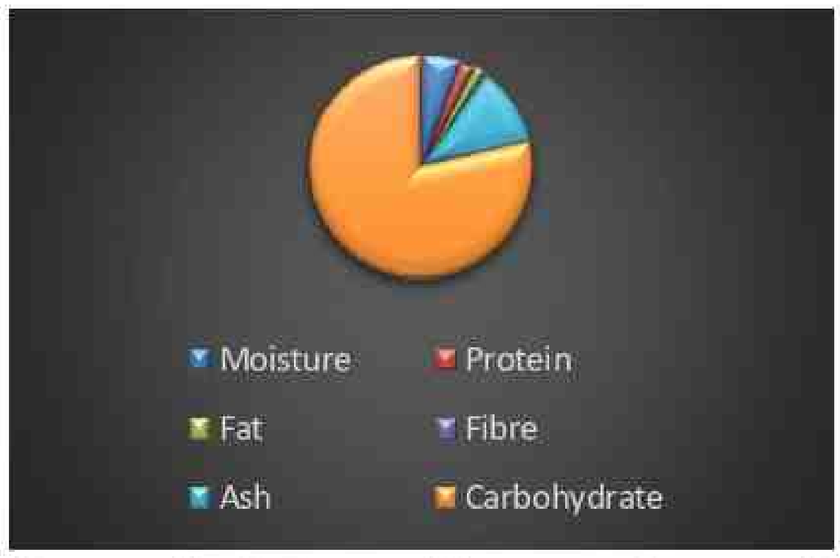
Story of Instant Powder Preparation



Preparation of instant herbal porridge powder commenced with the preparation of rice milk from parboiled white rice (Nadu variety) and the extraction of juice from fresh Moringa and Karapincha leaves. By trial and error, various combinations were utilized in order to get the desired taste without the bitterness being caused by Moringa.

A panel of 35 testers tested and refined the most preferred recipe to meet consumers' preferences. The selected liquid porridge was spray-dried to convert it into a fine powder. The powder was carefully gathered, packaged in durable aluminum bags, and stored for further tests.

Nutritional Composition of Instant Powder



This instant herbal porridge powder provides a convenient and simple method of supplementing the goodness of traditional herbal porridge in an instant. It is rich in energy value with 356.7 kcal/100g and a source of energy-rich antioxidants to enhance immunity and well-being. It is easily soluble in hot water to produce a smooth and delicious meal in minutes. It is not laborious to finish and simple to prepare. It is also a great choice for individuals who want a healthy, wholesome meal without the hassle of cooking up the usual.



Overall, the Moringa instant herbal porridge is a healthy, convenient answer to the lifestyle of the modern world. With its simple reconstitution ratio of 3g in 25-30 mL of hot water, it makes for a quick, healthy meal that sustains the subject for long hours of time. The porridge is stored in triple-laminated aluminum bags, which protect its color, solubility, and safety for up to 28 days. New technologies like freeze-drying, natural preservatives, and vacuum sealing will further improve product quality and shelf life. Not only does it address the growing demand for health-conscious convenience but also the demand for sustainable, environmentally friendly products.

This is a non-technical summary of the project report titled "Development of an Instant Herbal Porridge Incorporating Moringa Leaves (*Moringa oleifera*) and Assessment of its Physicochemical and Nutritional Properties" supervised by Dr. D.M.M.S.Daundasekara, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *saumalid@agri.pdn.ac.lk



Unlocking Global Markets: The Impact of Non-Tariff Measures (NTMs) on Sri Lanka's High-End Value-Added Coconut Exports

J.A.P. Apsara

Sri Lanka's coconut industry has long been a vital contributor to the national economy, supporting livelihoods and driving exports. However, as global trade becomes increasingly regulated, Non-Tariff Measures (NTMs) have emerged as significant barriers to the expansion of high-end value-added coconut products in international markets. This research explores the intricate relationship between NTMs and Sri Lanka's coconut exports through a Gravity Model approach, shedding light on the challenges and opportunities in this crucial sector. Additionally, the study evaluates Sri Lanka's export performance through Trend analysis, offering a data-driven perspective on the nation's competitive standing.

Why does this matter?

Coconut-based products such as virgin coconut oil, coconut milk, and coconut flour are gaining popularity worldwide due to their health benefits and versatility. Despite this growing demand, Sri Lanka's exporters face stringent NTMs, including food safety standards, labelling requirements, and certification processes, which can either hinder or enhance trade competitiveness. Understanding how these regulations impact market access is essential for policymakers, exporters, and industry stakeholders looking to strengthen Sri Lanka's global trade position. This study employs a Gravity Model analysis using PPML estimation to quantify the impact of NTMs on Sri Lanka's high-end coconut product exports. Additionally, a Descriptive Analysis compares Sri Lanka's export competitiveness with global leaders, offering insights into strategic improvements.

Key Insights from the Study

Impact of NTMs (Trade Barriers vs. Trade Facilitators), Export Performance Analysis, and Descriptive Analysis are the key insights of this study. The Gravity Model results indicate that while NTMs impose compliance challenges, they can also serve as quality assurance tools to ensure product quality and safety, creating opportunities for Sri Lankan products to gain a premium market position. The trend analysis confirms fluctuations in Sri Lanka's export growth, largely influenced by shifts in global demand, trade policies, and regulatory standards. The descriptive analysis highlights Sri Lanka's strengths and weaknesses in high-end coconut product exports. It assesses Sri Lanka's competitive position against other coconut-exporting nations, highlighting areas for improvement and strategic positioning. While the country maintains a competitive edge in certain products, gaps exist compared to leading exporters such as the Philippines and Indonesia.

Moving forward to thrive in the global marketplace, Sri Lanka must adopt targeted strategies such as investing in certification programs, improving supply chain efficiency, and enhancing diplomatic trade negotiations. The research findings suggest that easing trade restrictions, enhancing product branding, and aligning with international standards will be crucial in overcoming NTMs.

By proactively addressing these challenges relevant to NTMs, Sri Lanka can unlock greater export potential, strengthen its position as a leading supplier of high-end coconut products, and drive sustainable economic growth. This research provides essential guidance for policymakers and industry stakeholders, ensuring that Sri Lanka's coconut sector not only navigates trade barriers but also capitalizes on emerging opportunities in the international arena.



This is a non-technical summary of the project report titled "The effect of Non-Tariff Measures (NTMs) on High-end Value-added Coconut Exports from Sri Lanka: A gravity Model Analysis" supervised by Dr. Senal A. Weerasooriya*, Department of Agricultural Economics & Business Management, Faculty of Agriculture, University of Peradeniya. *senalw@agri.pdn.ac.lk.



Optimizing Seed Priming Strategies to Enhance Salinity Resilience in Rice (*Oryza sativa* L.)

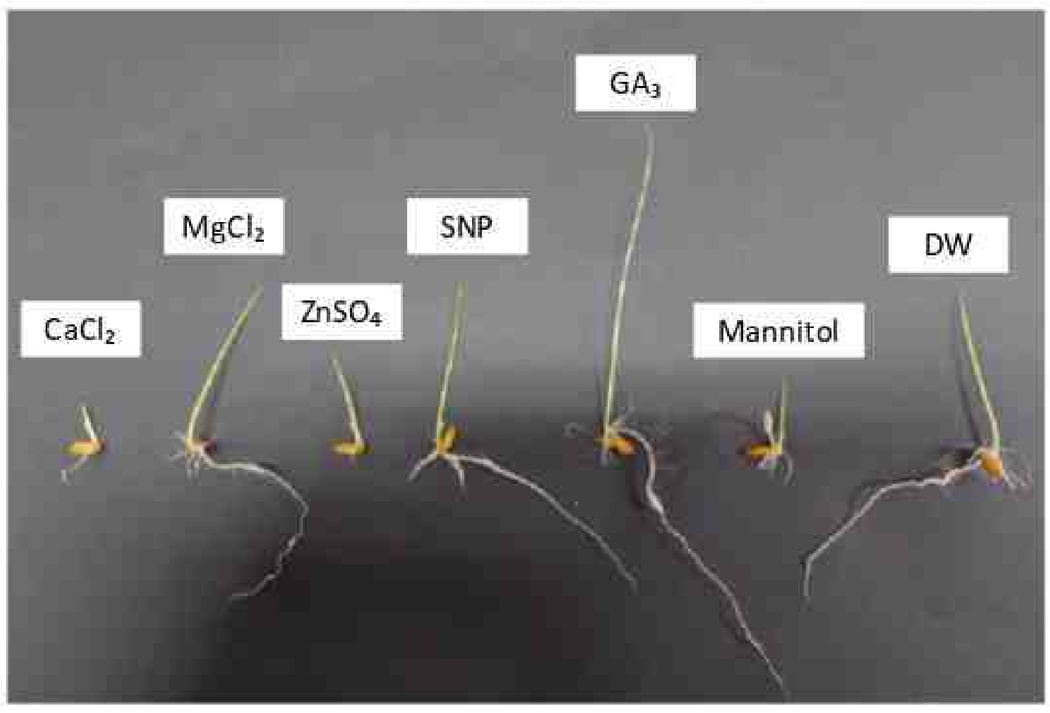
A.R.S.A. Athauda

The Challenge of Salinity in Rice Cultivation…

Soil salinization, aggravated by climate change, is a growing concern, particularly for rice production, which is essential for global food security. Salt stress disrupts water uptake, nutrient absorption, and overall plant growth. This research explores seed priming as a potential solution to mitigate salinity stress in rice, offering an affordable and practical approach for farmers in affected areas.

Priming Agents and Their Impact on Rice Growth…

The study tested several priming agents; Calcium Chloride ($CaCl_2$), Magnesium Chloride ($MgCl_2$), Mannitol, Zinc Sulfate ($ZnSO_4$), and Sodium Nitroprusside (SNP), Gibberellic Acid (GA_3) and distilled water under three salinity levels: very low (1 dSm^{-1}), low (2.5 dSm^{-1}), and moderate (6 dSm^{-1}). The aim was to evaluate how these agents influenced various growth parameters as shoot height, fresh and dry weight, root length, and ionic balance of Bg300 (salinity susceptible) rice variety.



How Seed Priming Mitigates Salinity Stress???

Dry Weight: Salinity reduced the dry weights. However, with $ZnSO_4$ significantly enhanced the dry weight, possibly due to its role in ion regulation and stress mitigation.

Ionic Balance (Na^+ and K^+): Priming with $CaCl_2$ and Mannitol reduced sodium uptake, improving the Na:K ratio, which is critical for stress resilience. SNP and $ZnSO_4$ also contributed to better potassium retention, helping maintain ionic balance under stress.

Seed priming did not alleviate the adverse effects of moderate salinity on Bg300 rice growth.

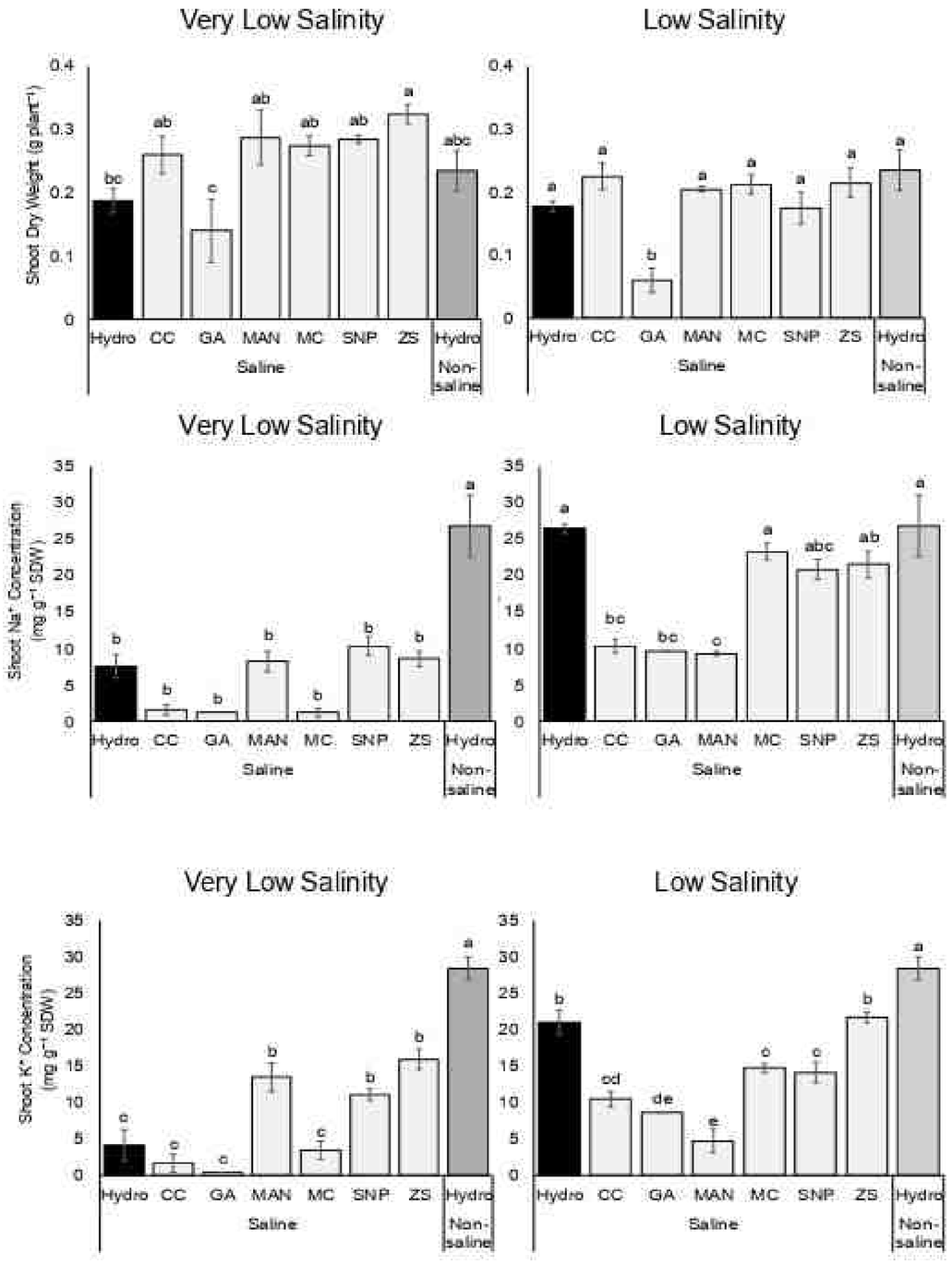


Figure 1. Abbreviations: Hydo-H20, CC-$CaCl_2$, GA-GA3, MAN-Mannitol, MC- $MgCl_2$, ZS-$ZnSO_4$

A Path to Resilient Rice…

$CaCl_2$, $ZnSO_4$, SNP and mannitol showed consistent benefits across salinity levels between 1 - 2.5 dSm^{-1}, making them highly promising, cost-effective solutions for farmers dealing with low saline soils. As climate change and soil degradation continue to threaten global food security, adopting simple yet effective techniques like seed priming could play a crucial role in sustaining rice production in challenging environments. The potential for large-scale application of these treatments could contribute significantly to improving global rice production.

This is a non-technical summary of the project report titled "Optimizing Seed Priming Strategies to Enhance Salinity Resilience in Rice (*Oryza sativa* L.)" supervised by Prof. L.D.B. Suriyagoda*, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *lalith.suriyagoda@agri.pdn.ac.lk



The Safest Way to Wash Leafy Greens for a Healthier Meal

A.P.V.R. Gnanadarshana

Fresh leafy greens are a key part of a healthy diet, but they can also carry harmful bacteria from soil, water, and handling. Simply rinsing them under tap water might not be enough to remove these invisible risks. This is especially true for lettuce, cabbage, and gotukola, which are commonly consumed raw in salads and other dishes. Contaminated vegetables can lead to foodborne illnesses, making proper disinfection an essential step in food preparation. But what is the best method to clean leafy greens without compromising their taste and texture?

A Scientific Approach to a Common Problem

Many households rely on traditional methods like rinsing with saltwater or vinegar, while others trust store-bought vegetable washes. However, not all cleaning methods are equally effective at eliminating harmful microbes. To determine the most reliable and practical solution, my research tested four widely used disinfectants:

☑ Citric acid (a natural compound found in citrus fruits like lemons)
☑ Vinegar (acetic acid, commonly used in pickling and food preservation)
☑ Saltwater (a traditional soaking method believed to remove dirt and bacteria)
☑ Chlorinated water (widely used in commercial food processing)

Each vegetable was soaked in these solutions and then analyzed for bacterial reduction and sensory changes (taste, smell, and texture). The goal was to find the most efficient method that balances safety and consumer preference.



The Best Disinfectant for Fresh Vegetables

The results were clear and compelling.

🥇 0.1% Citric acid solution emerged as the best choice, eliminating 99.9% of bacteria while maintaining the natural taste and texture of the vegetables.
🥈 Chlorinated water was nearly as effective (99.8%), but it left an undesirable chemical aftertaste that many testers disliked.
🥉 Vinegar removed 96% of bacteria but was criticized for its strong smell and altered taste.
❌ Saltwater was the least effective, reducing bacteria by only 33–57%, making it an unreliable choice for proper disinfection.

Sensory evaluations revealed that citric acid-treated vegetables were preferred for their freshness and mild flavor, making it a safe, natural, and highly effective alternative to chemical disinfectants.

A Simple and Effective Solution in the Kitchen

The best part? This method can be easily applied at home by simply following these steps:

1. Dissolve 1 gram of citric acid in 1 liter of water.
2. Soak leafy greens for six minutes to allow the solution to break down harmful bacteria.
3. Rinse thoroughly with clean tap water before consuming or cooking.



If citric acid powder isn't available, fresh lemon juice can be used as a natural substitute

By adopting this simple science-backed technique, the risk of foodborne illnesses can be significantly reduced while keeping the vegetables fresh and delicious. Making small, informed choices in the kitchen can lead to healthier meals and a safer diet for all the family members.

💡 Quick Tip: Next time when washing leafy greens, add a squeeze of lemon for an all-natural, food-safe disinfectant! 🍋

This is a non-technical summary of the project report titled "The Assessment of Microbiological and Sensory Quality of Lettuce, Cabbage and Gotukola Subjected to Different Disinfection Treatments" supervised by Prof. B.E.P. Mendis, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. ereshamendis@agri.pdn.ac.lk



Why do Temporary Agency Workers Quit Jobs in Factories?

J.G.R.N Jayarathne

The hiring of Temporary Agency Workers (TAW) is gaining popularity as a cost effective way to address labor requirement of companies which is also evident in the food and agricultural sector while circumventing contractual obligations associated with more traditional staffing options. Both public and private organizations in Sri Lanka follow this method, although it remains a controversial practice.

Who are Temporary Agency Workers?

Workers who are not directly hired by the organization they work for, but are hired by third party agents or sub-contractors are referred to as TAWs. In common usage, TAWs are referred as "Manpower workers" and the companies which supply these workers to the organizations are known as "Manpower agencies".

The Problem

Manufacturing sector is the largest sub sector in the industrial sector in Sri Lanka and since it is a labor intensive industry; many companies in the manufacturing sector rely heavily on TAWs. However these TAWs leave their jobs in factories frequently, leading to high churn rates. Employee churn refers to the number of workers who leave an organization during a specified period and are replaced by new hires.

Why does this matter?

High churn rate among TAWs disrupts the workflow of the company leading to inefficiencies and increase workload for remaining workers. Also it reduces the quality of product and services, lowering the overall output level of the company. The company has an additional cost in hiring new workers and frequent churn disturb the workforce stability of the company which negatively affects to the profitability of the company.

Study focus…..

Therefore through this study we addressed the root causes for employee churn among TAWs, which is important for the reduction of churn rate and implementation of effective worker retention strategies.

This study was conducted in a food processing company which was experiencing high churn rate among TAWs, with the participation of former TAWs who left the company recently.

Why do Temporary Agency Workers leave?

Based on the study findings, we identified several key reasons for their decision to quit.

Work related issues were the major reason for quitting. Difficult work conditions such as heavy work load and the unfavorable work environment (e.g. odor of gherkins and brine solutions) act as key issues. Miscommunication between workers and the agency worsened this issue further.

"The agency told us we would be sorting fruits like grapes and apples, but when we arrived, we had to work with gherkins." (24 years old female worker)

Most of the young male workers had left due to lack of financial growth & peer influence. Also they were motivated to seek for foreign jobs by seeing their friends leaving for higher paying jobs in abroad.

"Most of my friends went for foreign jobs, and now they earn in one day what I make in a month." (22 years old male worker)

Considerable number of workers had left the workplace due to non-work related personal issues such as family issues, medical issues, marriage and relocation. Most of these workers left as their pre-planned action on how to face these events.

Identifying trends in these reasons for leaving,
Younger workers (20-30 years old) with lower education levels (up to O/L) are more likely to leave due to unfavorable working conditions and they left within very short period of time than workers who left due to non-work related personal issues and lack of financial growth.

What can be done?

Since the organization has not much control over the non-work related personal issues, organization can focus on eliminating work related issues by improving working conditions, offering better financial benefits & providing skill development programs.

Additionally, creating personalized retention plans by using artificial intelligence will be effective in retaining young TAWs & transitioning temporary workers in to permanent roles will be effective in reducing impulsive leaving of TAWs.

This is a non-technical summary of the project report titled "Employee churn among temporary agency workers: The case of a food processing factory in Biyagama" supervised by Prof. Shamala Kumar*, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya. *skumar@agri.pdn.ac.lk.



Food Compatible Solvents for More Antioxidants

A.P.N.E. Jayabhanu

Background

Antioxidants are one of key compounds within foods that provide many health promoting roles in our body. Foods like pomegranate, cinnamon and tea are generally recognized as foods that rich in antioxidants. The main basis for these considerations is the experiments done in laboratories. In laboratories, methanol, ethanol like strong solvents is used to extract antioxidants before doing the analysis, since most of antioxidants are dissolved in these solvents. However, water is used generally during actual food preparations at home and food industry. Water is not very effective at extracting antioxidants. Therefore, this leads to misinterpretations of antioxidant availability in consumable products when evaluating the antioxidant content of foods.

Challenge

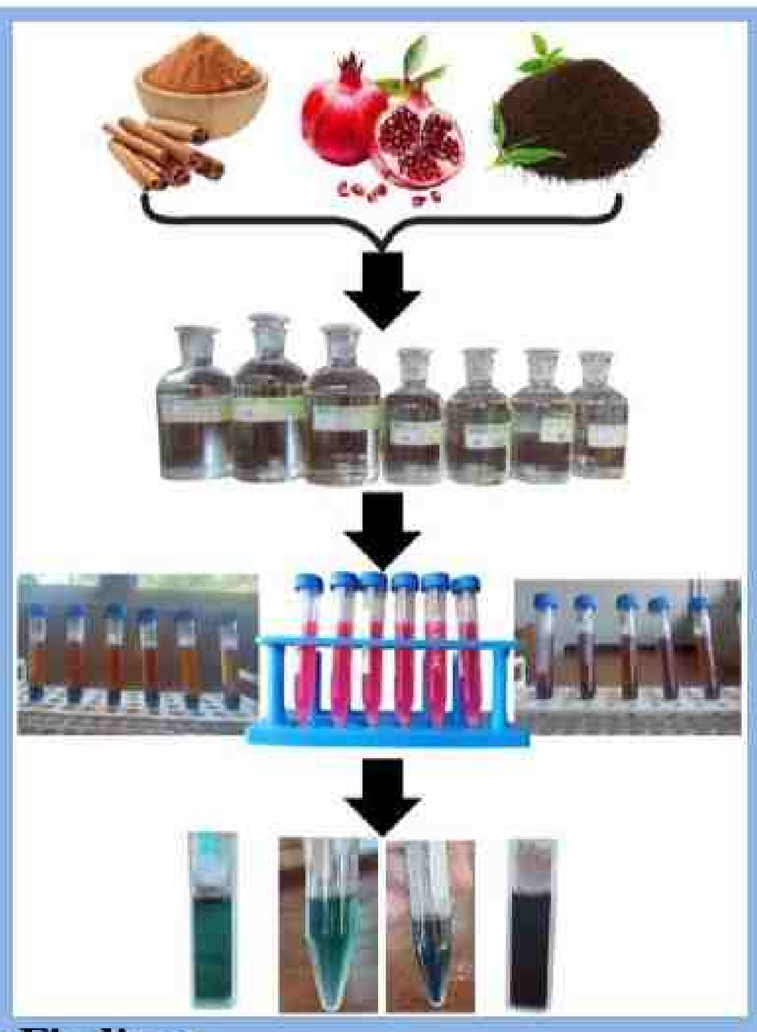
The challenge is to develop a food-compatible and safe solvents to extract more antioxidants while keeping the process suitable for food products.

Method

To address this challenge, different food-compatible solvents were developed by combining common food ingredients like sugars, organic acids. Seven different solvent combinations could be formulated using those ingredients.

After that, antioxidants of pomegranate, tea and cinnamon were extracted into those solvents as well as water, ethanol, and methanol too.

Then, the amount of extracted antioxidant level of those solvents was measured by doing several laboratory tests and with results of those tests, most effective solvent for extracting antioxidants was identified.



Key Findings

- Improved antioxidant extraction with food-compatible solvents over conventional solvents.

Among all the tested solvents, a sugar-based formulation (sucrose and glucose) showed superior efficiency in extracting antioxidants compared to water, which is commonly used in food preparation. That solvent showed better extraction efficiency of antioxidants as same as methanol.

- More accurate representation of antioxidant content in food systems using a sustainable solution.

With the results of the study, it is pleasured to say that, these food-compatible solvent systems can replace the conventional solvents used in laboratories as a sustainable alternative.

Conclusion

This study successfully addressed the challenge in developing a **food-compatible extraction method that can replace conventional solvents** with better represents real food applications. This study showed that antioxidants could be extracted more effectively than water using a developed sugar-based solvent solution which is safe for use in food applications.

This is a non-technical summary of the project report titled "Food compatible extraction of antioxidants from selected food commodities" supervised by Mr. N.Y. Jayanath*, Faculty of Agriculture, University of Peradeniya. * jayanathny@agri.pdn.ac.lk.



Smart Irrigation for a Thirsty Future: How Advanced Soil Sensors Can Help to Grow Chili with Less Water?

A.M.N. Rangana

Water scarcity! is a major challenge for agriculture today and climate change is making it even worse. In Sri Lanka, 87 % of the country's freshwater is used for farming, a huge challenge in dry seasons. To tackle this, scientists are testing smarter ways to water crops. One promising approach is sensor-based deficit irrigation (DI), which helps plants get the right amount of water while reducing waste.

The **TEROS 21** is a special sensor that measures how dry the soil is (similar to checking if a sponge is damp or parched). To use it effectively for irrigation, it is important to understand the relationship between this measurement and how much water is actually available in the soil. This relationship is shown in a soil water retention curve (SWRC) (Figure 1).

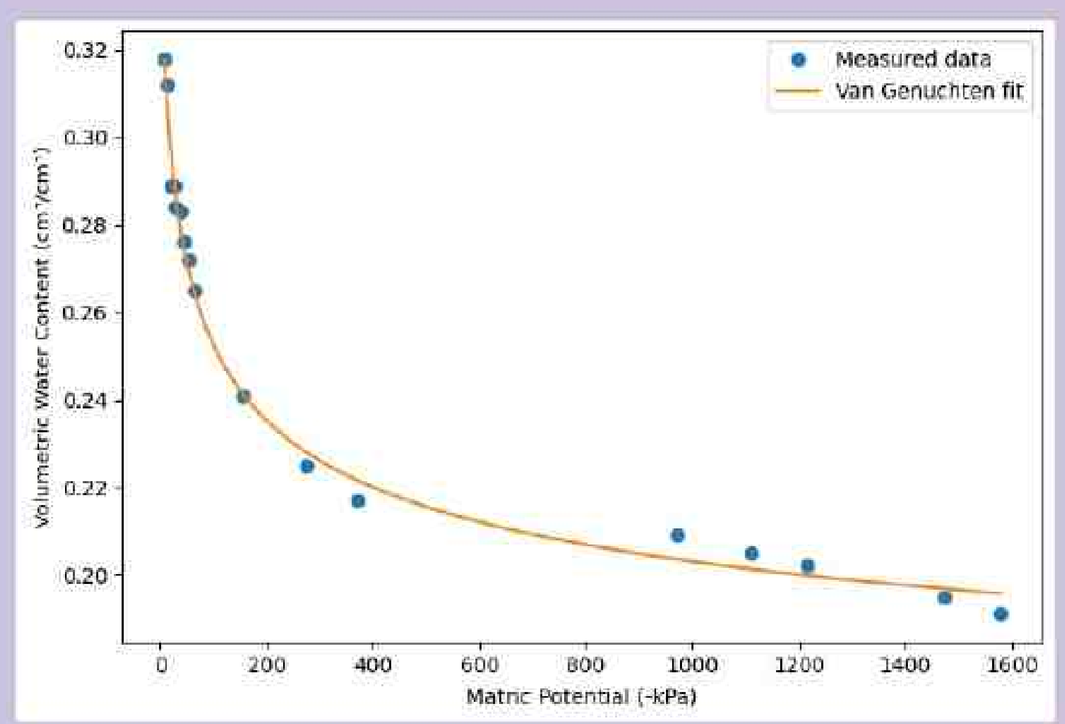


Figure 1. SWRC developed using TEROS 21 Gen 2 sensor ($R^2 = 0.993$)

Using this information, different watering schedules were designed (Table 1) based on how much water the soil lost over time. Then, soil water content was always topped up to its field capacity. Simply, the drier the soil got; the more water stress the chili plants experienced. Does stress impact plant growth? To answer this, several growth parameters of the chili plants were measured.

Table 1.

T1	Irrigate every day (-11 to -20 kPa)
T2	Irrigate once in every two days (-21 to -30 kPa)
T3	Irrigate once in every three days (-31 to -40 kPa)
T4	Irrigate once in every four days (-41 to -50 kPa)

The results showed that plants exposed to higher water stress (T3 and T4) had lower growth, both in terms of size and health.

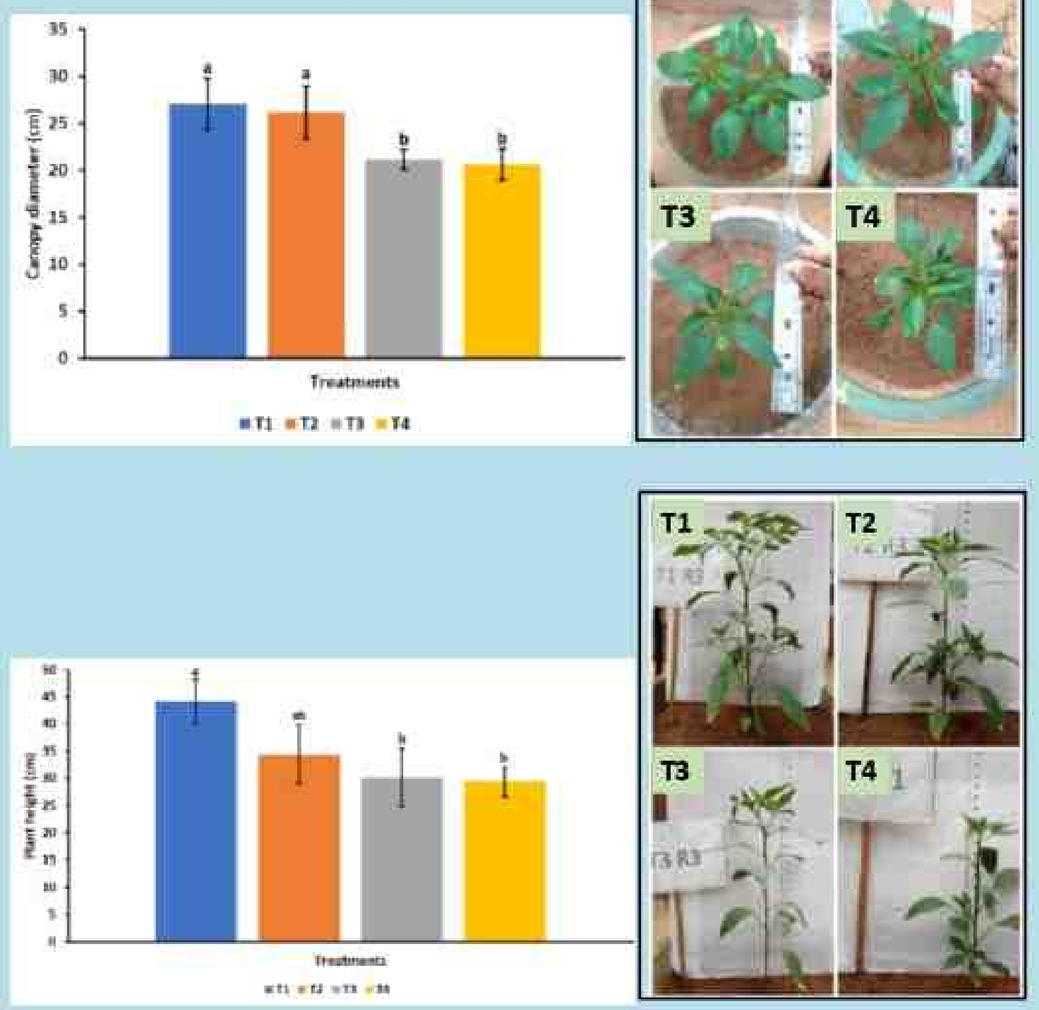


Figure 3. Comparison of changes in growth parameters across the treatments



Figure 3. Downloading the soil matric potential data from the data logger.

Key Takeaways:

The TEROS 21 sensor is an effective tool for quickly monitoring soil water depletion and developing soil water retention curves, offering a faster alternative to traditional, time-consuming laboratory methods.

The tested deficit irrigation strategies should now be evaluated under real field conditions to assess their practicality and effectiveness.

This is a non-technical summary of the project report titled "Impacts of various deficit irrigation strategies on the growth of Chili (*Capsicum annum* L.) cultivated in Reddish Brown Earth soil in Sri Lanka" supervised by Dr. Duminda N. Vidana Gamage*, Department of Soil Science, Faculty of Agriculture, University of Peradeniya. *dumindavidana@agri.pdn.ac.lk



Can Nutri-Priming with Albert's Solution Revolutionize the Growth and Nutritional Quality of Radish and Mung Bean Microgreens

J.D. Prathibhavi

Tiny Greens, Mighty Nutrition: Unveiling the Superfood Potential of Microgreens

Microgreens are young, tender greens harvested at an early stage of growth, packing a concentrated punch of flavor and nutrients. Despite their small size, these vibrant greens contain significantly higher levels of vitamins, minerals, and antioxidants compared to their mature counterparts. Their rapid growth cycle and minimal space requirements make them a sustainable and accessible superfood, gaining popularity among health-conscious consumers and urban farmers alike.



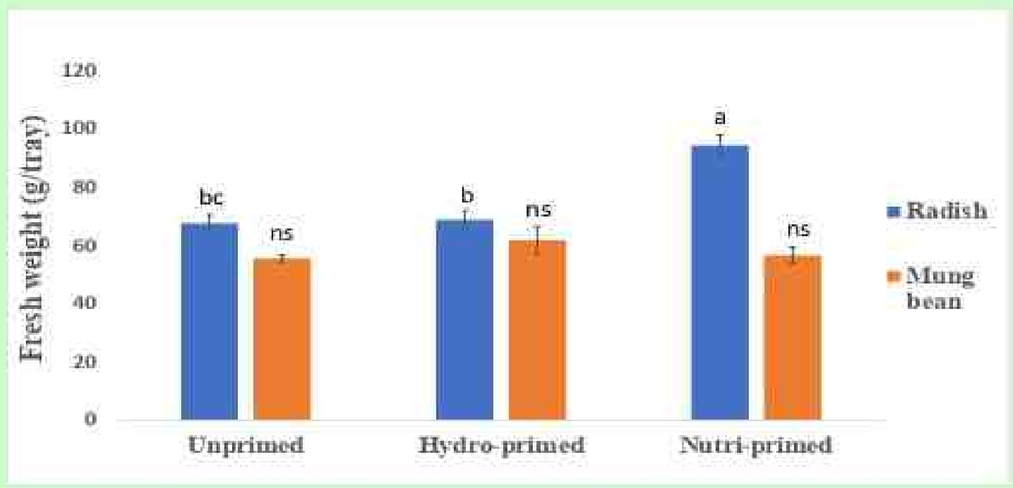
Nutri-Priming with Albert's Solution

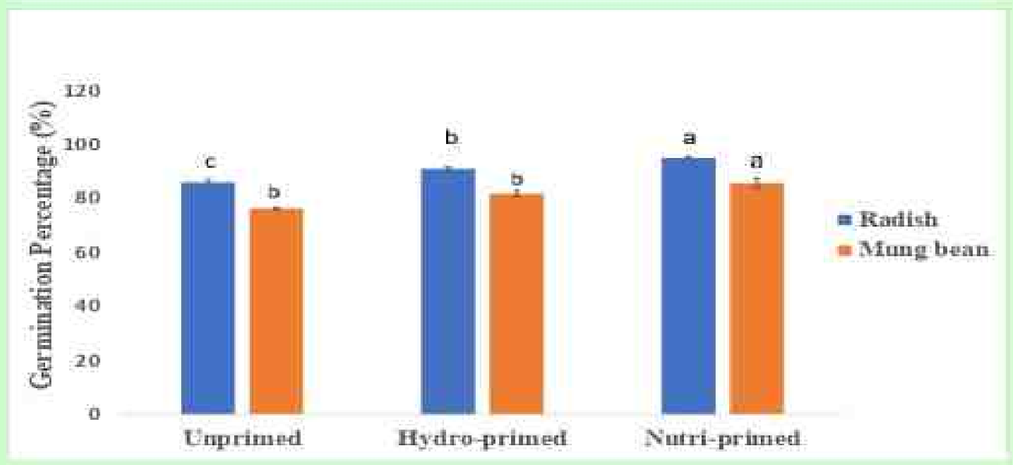
Nutri-priming is an innovative seed treatment that enhances germination, growth, and nutrient uptake by soaking seeds in a nutrient-rich solution before planting. Albert's Solution, a well-balanced fertilizer, provides essential macro- and micronutrients that support early seedling development.

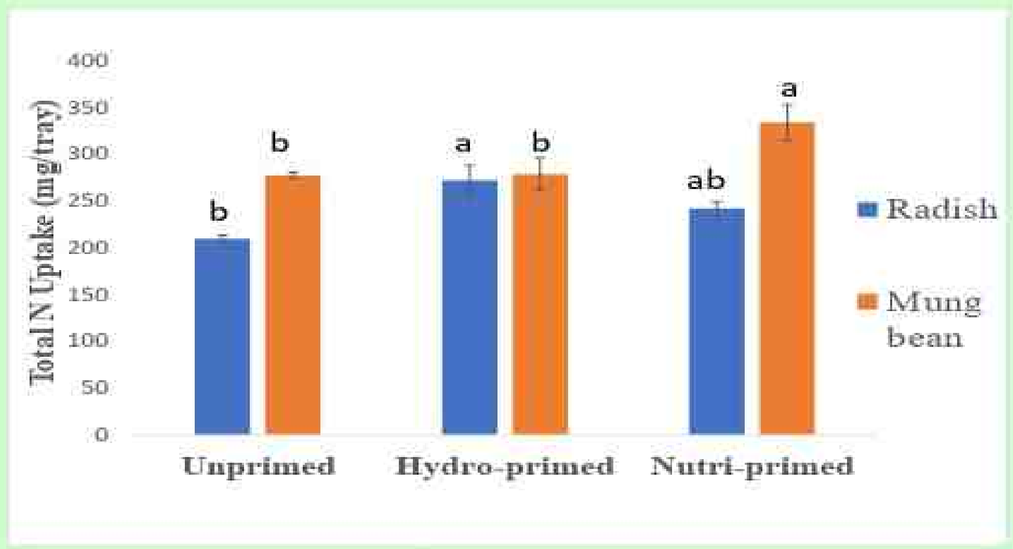
'Let's explore how nutri-priming by Albert's Solution influences the germination, growth, biomass yield, and nutrient quality of radish and mung bean microgreens'

Unveiling the Benefits: How Nutri-Priming Enhances Radish and Mung Bean Microgreen Growth and Nutritional Quality

The findings of this study highlight the potential of nutri-priming to enhance microgreen production. Soaking radish and mung bean seeds in Albert's Solution (8g/L) for 12 hours significantly improved germination percentage in both species.







In radish, fresh weight gain suggests higher microgreen yield. Meanwhile, in mung bean microgreens, nutri-priming significantly ($P<0.05$) improved nitrogen(N) and potassium(K) accumulation compared to both unprimed and hydro-primed treatments. Overall, these results indicate that while nutri-priming enhances biomass yield in radish and promotes N and K assimilation in mung bean microgreens, it does not contribute significantly to the nutritional biofortification of radish.

This is a non-technical summary of the project report titled "Exploring the potential of seed nutri-priming on yield and nutritional quality of radish and mung bean microgreens" supervised by Dr. Samantha Dissanayaka, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *samanthad@agri.pdn.ac.lk



Factors Affecting Undergraduate Business Operators' Intention to Continue their Businesses: Study Conducted at the University of Peradeniya

E.M. Dilshi Kavindi Ekanayaka

Entrepreneurship and new business creation are recognized as key drivers of economic growth in a country. Entrepreneurial intention serves as a fundamental antecedent of entrepreneurial behavior. While some undergraduates operate different types of businesses during their studies. The role of undergraduate business operators in contributing to economic growth and progression as well as fostering innovation, has become increasingly significant in recent years. Undergraduate business operators are defined as students who balance their academic studies with running their own businesses. The businesses that are carried out by undergraduates, typically small-scale but serve as a foundation for entrepreneurial growth and skill development.



After they complete their studies, their decisions vary from continuing their businesses or transitioning to paid employment. This study examines the factors influencing undergraduate business operators' intentions to continue their entrepreneurial ventures after graduation at the University of Peradeniya.

Entrepreneurship can be defined as an intentional activity. Intention is defined as an aim that an individual has in mind to carry out or achieve. Building on the Theory of Planned Behavior framework and incorporating additional variables. Attitude towards continuing businesses is one's established mindset or attitude for continuing their businesses. It is the belief and emotional state towards continuing to function, resisting hardship, and prospering in the long term. Subjective Norms can be identified as perceived social pressures to engage in or avoid certain behaviors. Perceived behavioral control is the belief of someone's ability to perform a behaviour successfully. Perceived entrepreneurial skills refer to an individual's belief in their own abilities to successfully perform tasks related to starting and running a business with skills like problem-solving, decision-making, and managing time and resources.

Motivation is an internal state that drives individuals to achieve a goal. Risk-taking propensity is an individual's willingness to take risks. It includes readiness to invest time, money, and effort into a new venture despite the possibility of failure in the entrepreneurial context.

This research addresses a notable gap in the entrepreneurship literature that is exclusively focused on initial business formation rather than the intention to continue businesses.

Data were collected through a primary survey administered to 80 undergraduate business operators identified through snowball sampling. Using Structural Equation Modeling (SEM), the study analyzed the relationships between intention to continue business and several potential determinants.

The results indicate that students' intention to continue with their businesses after graduation is significantly affected by attitude towards continuing business, perceived behavioural control, motivation and gender.

Notably, continuation intentions were not significantly influenced by subjective norms, perceived entrepreneurial skills, and risk-taking propensity.

One of the main findings from this research is that students who already run businesses may have paid less attention to what others think, and they have been less influenced by others' opinions. Also, some students have received mixed signals from different social groups (such as family and close friends).

"These results provide valuable insights for higher education institutions and policymakers seeking to foster sustainable business operators among university students, suggesting that targeted interventions focusing on attitude development and enhancing self-efficacy could effectively encourage graduates to be successful business operators".

This is a non-technical summary of the project report titled "A study of factors affecting undergraduate business operators' intention to continue their businesses" supervised by Proof. K.A.S.S. Kodithuwakku*, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya. *sarathsk@agri.pdn.ac.lk



Comparative Analysis of Bioactive Compounds, Antioxidant Potential, and Development of a Decision-Supportive Mobile Application Using Machine Learning Based Image Processing for Quality Assessment of Three Watermelon Varieties

A. S. Polwattage

Watermelon (*Citrullus lanatus*) is a widely enjoyed fruit, cherished for its high water content and refreshing taste. However, determining its internal quality without cutting it open can be challenging, as external indicators like rind color or tapping may not always provide reliable insights. As a result, consumers often struggle to select high-quality watermelons, leading to dissatisfaction with the options available in the market.

To address this issue, **a mobile application was developed to assess the internal quality attributes of three watermelon varieties: Sweet Baby, Rocky 475, and Kinaree 457.** To gauge the need for such a prediction tool, a consumer survey was conducted to evaluate satisfaction levels with market-available watermelons. Additionally, the study aimed to **perform a comparative analysis of the bioactive compounds and antioxidant potential of the selected varieties.** This was achieved by measuring the Total Phenolic Content (TPC) and assessing antioxidant activity through 2,2-Diphenyl-1-Picrylhydrazyl (DPPH) free radical scavenging and Ferric Reducing Antioxidant Power (FRAP) assays.

For the mobile application development, a model was created using image processing techniques. Watermelon images were captured, and features such as pixel area, color metrics (mean red, green, and blue values of the rind), and shape metrics (aspect ratio, roundness, and eccentricity) were extracted using Python. Additionally, the weight of the watermelons was included as an input predictor. The model aimed to predict internal quality attributes, including sweetness level (measured by Brix value), flesh color (evaluated by the a* value for redness), and flesh firmness (measured by the force required to penetrate 2 cm of flesh). Each attribute was categorized into three classes: sweetness (less sweet, moderately sweet, high sweet), flesh color (pale red, red, deep red), and flesh firmness (soft, moderately firm, hard). These predicted attributes were provided as the outputs of the mobile application.

The results of the consumer survey revealed that more than 50% of the respondents were unsatisfied with the sweetness and flesh colour of watermelons available in the market. Also, the biochemical analysis revealed significant ($p < 0.05$) variations among the varieties, with Kinaree 457 exhibiting the highest TPC (5.07 mg GAE/100g FW) and antioxidant activity with DPPH (7.47 mg TE/100g FW), while Sweet Baby exhibited the highest FRAP activity (5.96 mg Fe^{2+} Eq/100g FW). Correlation analysis demonstrated strong relationships ($r > 0.8$) between watermelon sweetness, flesh color, and flesh firmness with both watermelon weight and extracted image features, including pixel area and entropy. Also, the Random Forest model integrated into the mobile application achieved an overall accuracy of 95.98%, precision of 96.86%, recall of 93.97%, and an F1 Score of 95.22%.

This study demonstrates the feasibility of integrating image processing and machine learning into a decision-supportive tool for predicting the internal quality of the three selected watermelon varieties. To enhance prediction robustness, future work could incorporate a larger dataset encompassing diverse environmental conditions.

Investigating the impact of post-harvest storage duration on watermelon quality and integrating time-dependent quality predictions are recommended. Adding nutritional information to the mobile app would provide users with health benefits alongside quality assessments. Expanding language support and incorporating feedback mechanisms can improve app usability for a broader audience.

Lastly, extending this methodology to assess the internal quality of other fruits using similar image processing and machine learning techniques holds promise.

This is a non-technical summary of the project report titled "Comparative Analysis of Bioactive Compounds, Antioxidant Potential, and Development of a Decision-Supportive Mobile Application Using Machine Learning Based Image Processing for Quality Assessment of Three Watermelon Varieties" supervised by B.E.P. Mendis*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *ereshamendis@agri.pdn.ac.lk



Evaluating Sri Lankan Avocado Accessions Using Modern Biotechnological Applications

V. G. Wijesundara

Avocado is one of the world's most popular fruits which is also known as Alligator Pear or Butter fruit. The name "Butter Fruit" itself, paints a picture of the creamy, nutty and buttery textured flesh of its famous green colored fruit. Avocado is believed to have been originated in Southern Mexico and has taken over the world with its popularity since then. The first official records mentioning avocado in Sri Lanka is found in the year 1927 during the British era. However, avocado is assumed to have been in the picture long before that, presumably since the Dutch era.



Avocado is well-known for its health benefits as it is packed with vitamins and has good fats in its flesh that helps reduce bad cholesterol levels in blood. Avocado leaves are also used in some cuisines as a spice because of its anise-like flavor and it is also believed to be a good fiber source. In addition, avocado oil is one of the popular beauty secrets of the cosmetic industry, and is used in skin care, hair care and lip care products because of its deep hydrating and anti-aging properties.

Avocado is mainly grown in Kandy, Matale, Nuwara-Eliya, badulla and Kegalle and the yearly production is around 15,000 metric tons according to the Department of Agriculture. The main exporters of avocado in the world are America, Israel, and South America, and Sri Lanka is yet to take an important part in this competition. In order to develop Sri Lankan avocado varieties that can compete with the rest of the world, proper assessment of the qualities of Sri Lankan avocado accessions needed to be done. When identifying the qualities of these accessions, it is important to consider not only the physical features that can be visually observed, but also their genetic potential.



Observation of the color of mature avocado leaves

Therefore, for this study, we selected all the 15 Sri Lankan avocado accessions maintained at the Fruit Research and Development Institute at Kananwila, Horana to be tested. The physical features of the selected Sri Lankan accessions were evaluated according to the Descriptors for Avocado published by the IPGR Institute.

Then, the information related to the genetic potential of the selected accessions was assessed. For that, we used modern biotechnological applications including PCR amplifications. These modern applications helped unveil the details written in their DNA that helped us to identify the relationships among these accessions. By using these details, a tree diagram was developed showing close relatives and distant relatives among the 15 accessions.

Now, to achieve our ultimate objective of developing improved varieties, we can select Sri Lankan avocado accessions that are distantly related and which have commercially important physical qualities, as the parents. Equipped with the new-found knowledge from this study, we can now hope to design breeding programs to develop Sri Lankan avocado varieties with superior qualities.



This is a non-technical summary of the project report titled "Morphological characterization and Molecular Markers-Based Genetic Diversity Analysis of Avocado accessions in Sri Lanka" supervised by Dr. L. H. M. Y. K. Somaratne*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. * yamunas@agri.pdn.ac.lk



Molecular Diversity of *flightin* in Insecta and Designing of small interfering RNA

M. P. Dissanayake

Introduction

Myzus persicae, commonly known as the Green Peach Aphid, is a significant agricultural pest that affects various crops worldwide. It damages plants not only by direct feeding but also by transmitting over 100 plant viruses. The most commonly using pesticides have led to resistance development in M. persicae, making traditional control methods less effective. Therefore, there is an urgent need for alternative and sustainable pest control strategies.

One of the most promising approaches is **RNA interference (RNAi)**, that uses double-stranded RNA (dsRNA) to suppress essential genes in pests. This method is eco-friendly, highly specific, and minimizes harm to non-target organisms. My research focuses on using RNAi to silence the ***flightin* gene** in *M. persicae*, which encodes a structural protein for *flightin* muscle elasticity and overall wing function. The goal is to produce deformed wings in aphids, ultimately preventing their movement and reducing onward virus transmission between plants.

Molecular Diversity Analysis of Flightin

To understand the evolutionary variations of the flightin gene in aphids and other hemipteran insects, I conducted **molecular diversity analysis** using bioinformatics tools:

Results showed that there are **44 orthologs of *flightin*** across hemipteran insects

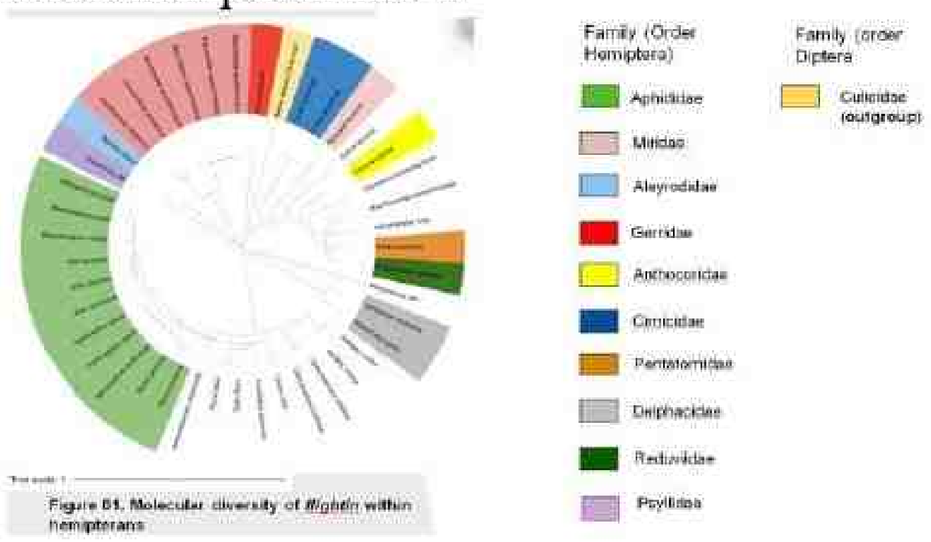


Figure 01. Molecular diversity of *flightin* within hemipterans

Design of dsRNA to Target *flightin* Gene

The two **mRNA transcripts** of flightin in *M. persicae* were identified, and **two dsRNAs** were designed with 100 base pairs accordingly using siDirect **too.**

dsRNA target the X1 transcript variant

ATTAAAGACCGATTGCATGCTCAAAATATCTAA
ATTTATAATTTTCAATGCTACAGATAAATTAGAC
TTACAGCAAACTCTGCTGTACAATATACTAATA

dsRNA relevant to X2 transcript variant

ATAATTTTCAATGCTACAGATAAATTAGACTTAC
AGCAAACTCTGCTGTACAATATACTAATACTAA
TATACTATGTATTATAGAACCATCAACCAATAA

The dsRNAs were tested for **on-target efficiency** and **off-target effects** within the siDirect platform.

- To confirm specificity, **BLAST analysis** was performed against other insects. The results showed:
  - **100% specificity** for *M. persicae*.
  - **Over 90% specificity** for other aphid pests (***Rhopalosiphum maidis, R. padi, Acyrthosiphon pisum, Metopolophium dirhodum***).
  - **No significant similarity** with key pollinators (***Apis cerana, A. dorsata, A. florea***), ensuring minimal risk to bees.

This confirms that the designed dsRNA can **effectively control *M. persicae* and other aphid species** while maintaining environmental safety

To proceed with laboratory experiments, I designed specific **primers** to amplify and sequence the *flightin* gene of **Sri Lankan *M. persicae***

- **Two amplification primers**
- **Four sequencing primers**

I taxonomically identified suspected aphids under a **microscope** by mounting on slides, observing



morphological characteristics such as:

Oval body shape

- Indentation between the antennae
- Sharp cauda (tail-like structure)
- These features confirmed the species as ***M. persicae***. The aphids were then cultured and maintained under controlled conditions

This is a non-technical summary of the project report titled "Molecular Diversity of flightin in Insecta and Designing of small interfering RNA" supervised by Prof. Venura Herath*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. * venura@agri.pdn.ac.lk



Hidden Diversity of Sri Lankan Honeybee (*Apis Cerana*) and the Struggles of Beekeeping in Sri Lanka

R.L. Pipuni Madhusala

Enhancing our native honey bee for sustainable honey production

Sri Lanka's bee honey production is at primary level and fails to meet national demand. *Apis cerana*, the native honey bee, has not been selectively bred like European honey bee (*Apis mellifera.* Understanding its variation across Sri Lanka is the first step to breeding them for better productivity. However, the diversity of *A. cerana* in Sri Lanka is poorly understood and open a door for new research. Let's find out variation of Sri Lankan honey bee through this study with asking about challengers and bee keeping practices from bee keepers.

How was the study conducted?

A total of 720 pollen carrying foraging worker bees were captured from 72 maintained beehives across 24 agroecological regions, including WU1, WU2b, WU3, WM1a, WM2b, WM3b, WL1a, WL2b, WL3, IU1, IU2, IU3b, IM1a, IM2a, IM3b, IL1b, IL2, IL3, DL1b, DL2a, DL2b, DL3, DL4, and DL5, covering all seven agroclimatic zones of Sri Lanka.

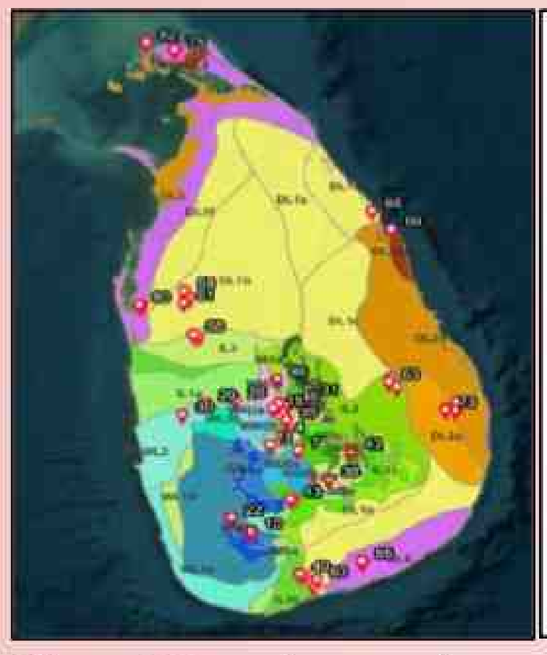


Figure 1 Honey bee sample collected places



Figure 2 Survey details collected districts

One single honey bee was dissected to take 35 characters. Statistical methods such as ANOVA and Kruskal-Wallis tests, along with mean separation tests like Tukey's, helped to identify variation among bees living in different agroecological zones for each character. To see the connectivity among each zone, these tests were not enough. Therefore, calculating the average value of each character Principal Component Analysis and a dendrogram had to be created. Sixty beekeepers representing 14 districts helped to gather information on beekeeping practices and the challenges they faced.

What did the study find? Are there any differences among our honey bee (*A. cerana*)?

The analysis revealed significant differences ($p < 0.05$) in all morphological traits across agroecological zones. Further principal component analysis (PCA) highlighted three distinct clusters, as DL4 and DL5 forming separate groups within the 95% confidence region.

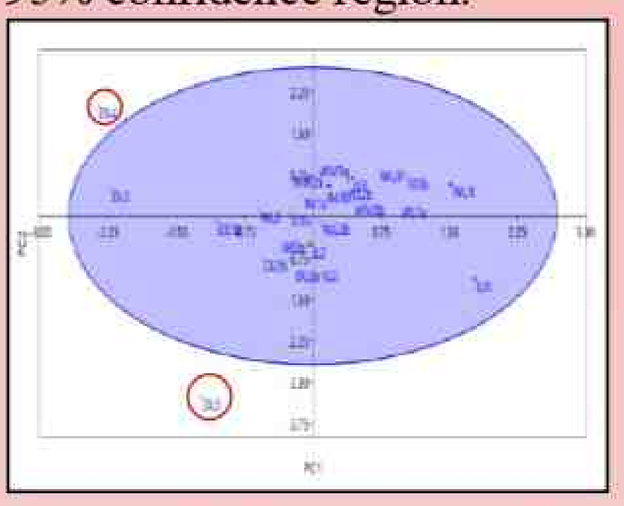


Figure 3- PCA analysis results showing DL4 and DL5 as separate clusters away from 95% confidence region

The dendrogram revealed four main clusters at 96% similarity level based on the branching pattern. These clusters were identified as the IU1 cluster, DL3-DL4 cluster, DL5 cluster, and a separate cluster consisting of the remaining zones.

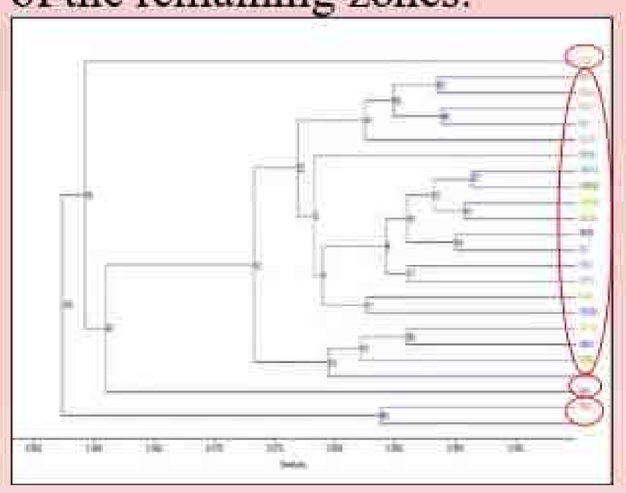


Figure 4- Dendrogram with 4 main clusters AT 96% similarity level

According to the responses from beekeepers, ants, geckos, and wax moths were identified as common pests affecting bee colonies. Additionally, climate change and pest and disease attacks were cited as the main threats leading to colony loss. Most farmers prefer to use bee hives recommended by the Department of Agriculture, particularly the 8-frame style, and rely on sugar syrup as their primary form of supplementary feeding. This practice helps ensure the colonies thrive, especially during periods when natural forage is limited.

What are the future directions?

The study reveals distinct morphological variations across agroecological zones, highlighting the need for further molecular-level analysis. This will help to better understand the underlying genetic factors driving these variations and provide insights into the reasons behind the observed clustering patterns.

This is a non-technical summary of the project report titled "Morphological Variations of *Apis cerana* Across Different Ecological Regions and Survey of Bee Keeping Practices in Sri Lanka." supervised by Dr.Wikum H.Jayasinghe, Department of Agricultural Biology Faculty of Agriculture, University of Peradeniya. *whj@agri.pdn.ac.lk



Development Of Flavored Air-Frying Oil Sprays Infused with Spice Oleoresins: Formulation, Physiochemical Characterization, and Sensory Evaluation

Hasuru Dissanayake

What are oleoresins?

Oleoresins are highly concentrated natural extracts derived from plants, usually through solvent extraction or distillation. They contain both essential oils and resinous compounds, contributing to the color, aroma, and texture of various products.

Air frying over deep frying

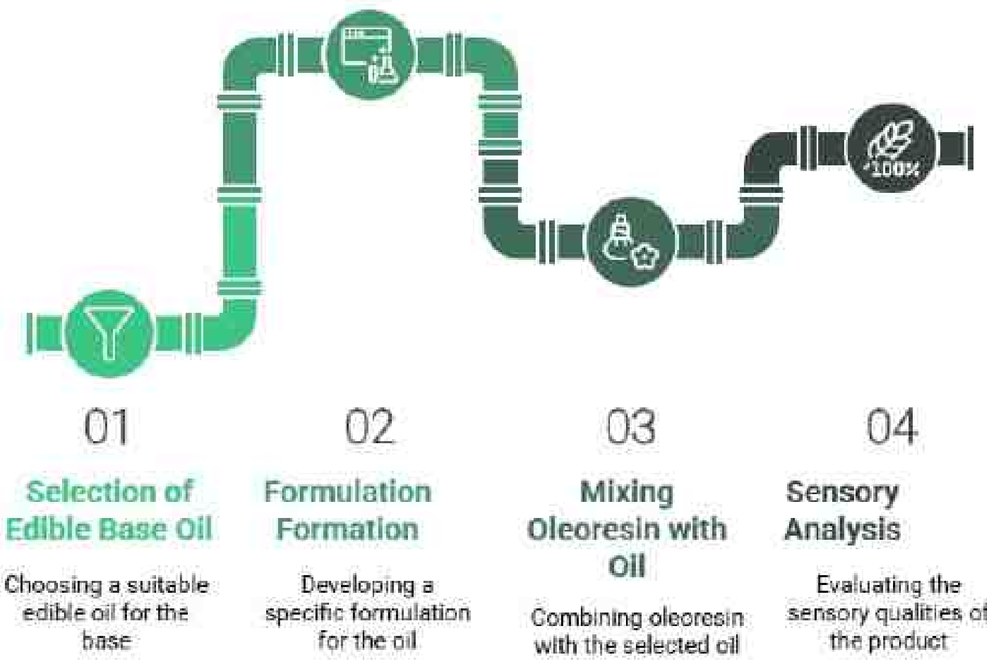
Air frying is a healthier cooking method that requires less oil, leading to lower oil consumption for consumers. It delivers a crispy texture to snack-like foods while using minimal oil. Additionally, the controlled temperature in air frying helps to reduce the formation of harmful acrylamide compounds, which are typically produced during high-temperature cooking with oil.

One-step addition of spicy flavor to air fried products

Oleoresins are thick, viscous liquids and cannot be directly used in frying food products. To make them suitable, they can be blended with edible base oil in varying ratios to create an oleoresin-infused flavored air frying spray oil. In this process, oleoresins are vortexed with a selected edible base oil, allowing the mixture to be sprayed onto food products intended for air frying.

Selection of an edible base oil

When selecting an edible base oil for frying, several physicochemical properties must be considered. Key factors include smoke point, oxidative stability, volatility, viscosity, spray ability, surface tension, and density. A higher smoke point, spray ability, and density positively influence frying performance, while lower surface tension, viscosity, oxidative stability, and volatility contribute to a more favorable frying oil for infusing spice oleoresins. Stability under high temperatures is essential to prevent the breakdown of flavor compounds during frying. The choice of oil also affects the final texture and crispiness of the fried product. Furthermore, the oil's compatibility with oleoresins plays a crucial role in achieving a uniform & well-balanced flavor infusion.



Formulation of infused air frying oils

A spice oleoresin-infused flavored air frying spray oil was developed for both frozen potato chips and fish fillets of the great barracuda (Sphyraena barracuda) species. Virgin coconut oil was selected as the edible base oil, and formulations for frozen potato chips included oleoresins of garlic, onion, and red chili. For frying fish fillets, the formulations incorporated oleoresins of garlic, red chili, rosemary, and black pepper. The oleoresins were extracted from spices using the Soxhlet extraction method.

The first sensory analysis (ranking test) was conducted with 30 untrained panelists to determine the optimal amount of spraying oil for air-frying potato chips and fish fillets. The ideal oil amount was identified as 0.65 g per 100 g of potato chips and 3.0 g per 100 g of fish fillets. Subsequently, the second and third sensory analyses were performed to identify the preferred formulations for both potato chips and fish fillets, which were air-fried using the previously formulated oil blends.

Conclusion

The two oleoresin-infused air-frying oil formulations; one for potato chips at 1.5% (v/v) with a ratio of 3:3:4 (onion: garlic: red-chili), and one for fish fillets at 4.0% (v/v) with a ratio of 4:2:2:1 (garlic: rosemary: chili: black pepper) received the highest acceptance for flavor, color, texture, and overall mouthfeel, demonstrating their potential as marketable products.

This is a non-technical summary of the project report titled "Development of Flavored Air-frying Oil Sprays Infused with Spice Oleoresins: Formulation, Physiochemical Characterization, & Sensory Evaluation" supervised by Prof. R.P.N.P. Rajapakse* and Prof. B.E.P. Mendis**, of the Dept. of Food Science & Technology, Faculty of Agriculture, Uni. of Peradeniya. *niranjanp@agri.pdn.ac.lk., **ereshamendis@agri.pdn.ac.lk



Scotch Bonnet Fusion: A Spicy-Tropical Burst of Energy!

Dinusha Rasanjalee

Ever imagined a drink that excites your taste buds, energizes your body, and keeps you refreshed, **without all the extra sugar?** Meet our revolutionary Scotch Bonnet fusion, a one-of-a-kind beverage that blends fiery spice with tropical sweetness for the ultimate refreshment!

Why Scotch bonnet?

You might associate scotch bonnet with spice, but did you know it's packed with antioxidants and metabolism-boosting compounds? This exciting drink blends the unexpected kick of scotch bonnet with the tropical sweetness of pineapple and the hydrating benefits of king coconut. The result? A unique, refreshing, and functional beverage that energizes without artificial stimulants.

A Flavor Adventure Like No Other

🌶️ **Spicy Kick** – A subtle heat that lingers, keeping you alert and refreshed.
🍍 **Tropical Sweetness** – Pineapple's natural sugars balance the spice for a smooth, delicious taste.
🥥 **Hydrating Goodness** – King coconut water replenishes and refreshes.
💪 **Packed with Benefits** – Rich in antioxidants and vitamins for a natural energy lift.

Crafted to Perfection

After months of trials and taste tests, we discovered the perfect balance with optimum scotch bonnet 3 g per litter, enough heat to awaken your senses, just the right amount of sweetness, and a refreshing aftertaste that makes you crave another sip. Consumer panels loved the unique combination, praising its unexpected yet delightful flavor profile!



Why You'll Love It

✅ **No Artificial Additives** – 100% natural ingredients.
✅ **A Unique Drinking Experience** – Unlike anything you've tasted before.
✅ **Supports Local Farmers** – Made from fresh Sri Lankan produce.
✅ **Guilt-Free Indulgence** – Low in sugar, high in refreshment!

This Ready-To-Serve drink contain,

Total sugar: **55.5** g/100ml | pH: **4.5** | Shelf life: **21 days (stored at 4°C)**, Naturally energizing, with functional benefits and no excessive sugars.

Natural Boost for Health-Conscious Consumers

Today's consumers are increasingly mindful of what they consume, prioritizing clean labels and natural ingredients. This Scotch Bonnet-infused beverage is **specifically designed for those who want an energizing drink without the artificial sweeteners, preservatives, or synthetic additives** found in conventional beverages. By using only fresh, locally sourced ingredients, we ensure that every sip delivers **pure, wholesome goodness** without compromise. Whether you're an athlete, a busy professional, or someone looking for a refreshing change for a lazy day, this drink is the perfect natural alternative to conventional energy drinks.



What's Next?

With the right marketing push, this beverage has the potential to shake up the functional drink market! Future research will focus on improving shelf life and expanding commercial production. Soon, you might see this fiery yet refreshing drink on store shelves, offering a healthier alternative to traditional energy drinks.

This is a non-technical summary of the project report titled "Development and Evaluation of Physicochemical and Functional Characteristics of Sri Lankan Scotch Bonnet (Capsicum chinense) Based Ready To Serve (RTS) Beverage" supervised by Dr. Sajeevika Saumali Daundasekara*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. * saumalid@agri.pdn.ac.lk



Elevating Yogurt: Where Rice Milk Meets Dairy

S. K. N. Sathsarani

"Yogurt" is a daily nutrient dose for many, loved for its instantly refreshing nature and known for gut-friendly benefits. What if we could add your daily staple, rice to make yogurt even more inclusive and nutritious? This research explored the idea of replacing a part of cow milk in yogurt with rice milk, using two rice varieties: CIC - Savandara having low amylose content and CIC - Red fragrant rice with high amylose content.

Why rice milk?

Rice milk is a liquid extracted from rice, having starch as the key component, that closely resembles a milk-like texture and functionality. Rice milk is widely regarded as the best hypoallergenic milk alternatives available with a range of vitamins and minerals, a variety of bioactive phytochemicals, and dietary fibers. Moreover, it can provide resistant starch, known for providing health benefits, such as improved digestion and better blood sugar control.

What we did……..

Six different types of yogurts were formulated by replacing 20%, 30%, and 40% of cow milk with rice milk of above mentioned two rice varieties and 100% cow milk yogurt (Control) were also produced. The yogurts were stored under refrigerated conditions, and tests were conducted on both fresh samples and those stored for up to four weeks to assess changes in physicochemical, microbial, and sensory properties over time.

a. Rice milk incorporated yogurts
b. CIC- Red fragrant rice
c. CIC- Savandara rice
d. Red fragrant rice milk
e. Savandara rice milk

What we found……

A fascinating interplay of factors was noted, as pH, titratable acidity, total soluble solid levels, and syneresis rates shifted dynamically over four weeks of shelf-life analysis. The changes in these properties which involved in determining the quality of yogurt varied based on the rice variety used, the rice milk to cow milk ratio of the yogurt and also the day of the shelf-life study.

According to the results of the study, there are notable advantages over cow milk yogurt.

- Rice milk incorporated yogurts, contain resistant starch (0.08% - 0.9%) which was absent in cow milk yogurt.
- The pH of rice milk yogurts declined more slowly over time, maintaining a mildly sour flavor.
- The survival rate of *Lactobacillus* spp. (good bacteria) was higher, indicating potential probiotic benefits.
- Although the fat content of rice milk incorporated yogurt was relatively lower, yogurt made with red fragrant rice milk showed no noticeable difference in protein content compared to cow milk yogurt.
- Another interesting finding was that the syneresis rate (whey separation) under room temperature was lower in rice milk incorporated yogurt, maintaining its consistency for longer time compared to cow milk yogurt.

To conclude, the developed rice milk incorporated yogurts proved to be a viable alternative with desirable quality characteristics.

The future of rice milk incorporated yogurt ….

To move from a novel concept to a widely accepted functional food item, further evaluation of the nutritional aspect, including the probiotic effect and assessing the viability of large-scale production, and exploring the cost-effectiveness and feasibility of producing rice milk yogurt at a commercial level will be important steps.

This is a non-technical summary of the project report titled "Evaluating the Potential of Incorporating the Rice Milk of High and Low Amylose Rice Varieties into Yogurt" supervised by Mr. N.Y. Jayanath*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. * jayanathny@agri.pdn.ac.lk



Pro-Pasta: How Do Sensory and Physicochemical Properties Change in Fish Protein-Fortified Pasta?

W.M.S.S. Kumarasingha

Introduction

Fish is one of the most widely consumed protein sources globally, while pasta is a popular, convenient, and affordable food. But has anyone considered incorporating fish protein into pasta? It is indeed possible and applicable in new product development. This is accomplished through the enzymatic digestion of fish muscle protein under specific time-temperature conditions. Fish Protein Hydrolysates (FPH) are gaining recognition as valuable products derived from the enzymatic hydrolysis of fish or fish by-products.

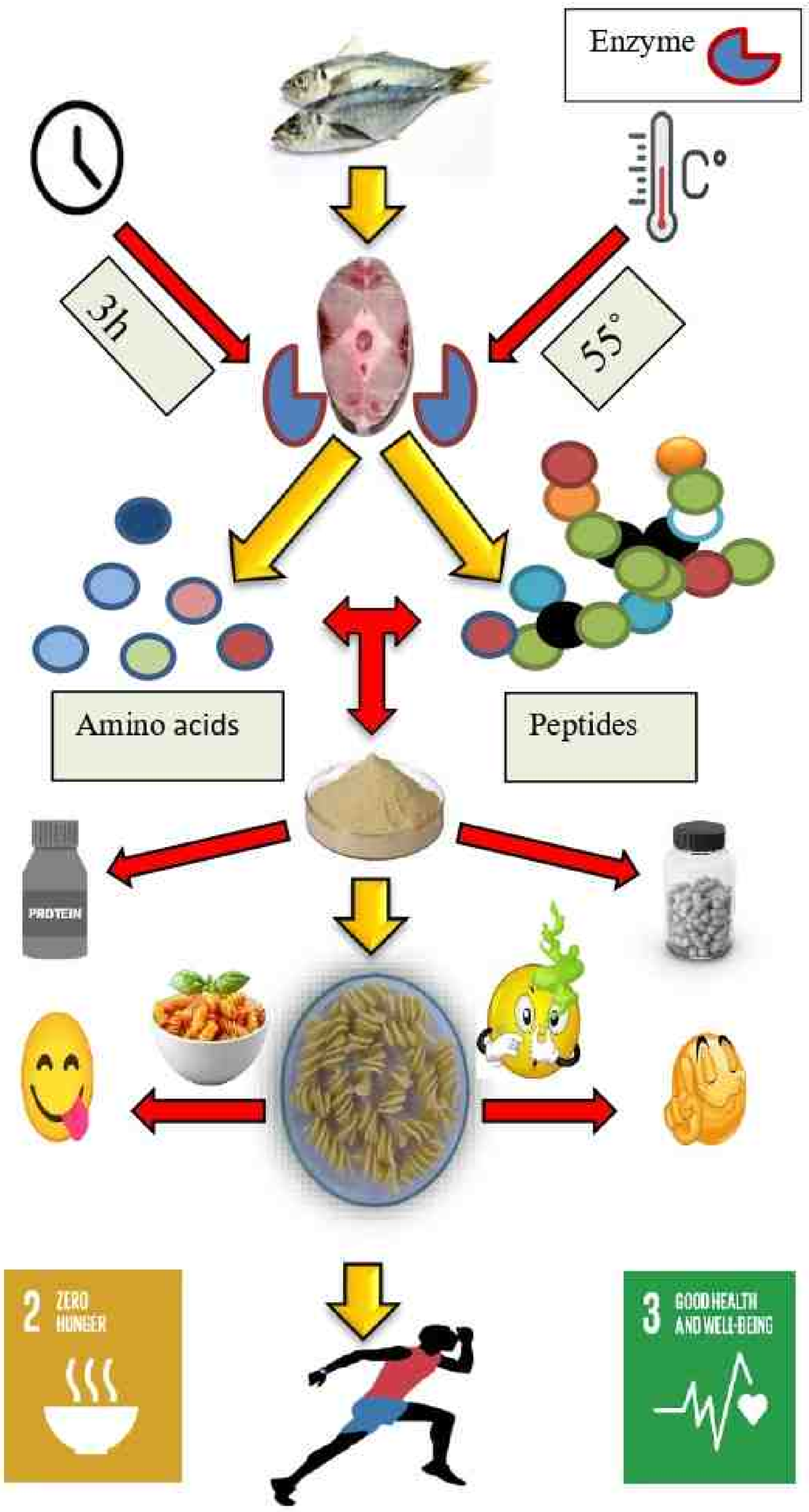


Figure 1: Graphical illustration of production of FPH powder and fortification into pasta in value addition.

Do you know Linna fish?

In this study, one of the most popular fish species in Sri Lanka, "Linna", was used to produce fish protein hydrolysate.

How is pasta made?

Wheat flour semolina, egg, water, and hydrolyzed fish protein powder were combined, and a pasta machine was used to extrude protein-fortified pasta.

How do we manage fishy odor?

A 95% ethanol wash was applied to the wet fish protein hydrolysate to reduce the fishy odor. Corolase 7000 and Corolase 8000 commercial enzymes were employed under various time-temperature combinations to obtain FPH.

What happened during the sensory test?

Color, odor, taste, appearance, and mouthfeel were evaluated and 10% fish protein-fortified pasta was accepted by the sensory panelists ($p<0.05$).

What physicochemical properties are evaluated?

Several properties of pasta were evaluated, including optimal cooking time, water absorption, swelling during cooking, and cooking loss.

Appearance of raw and cooked pasta



Figure 2: FPH incorporated pasta physical appearance.

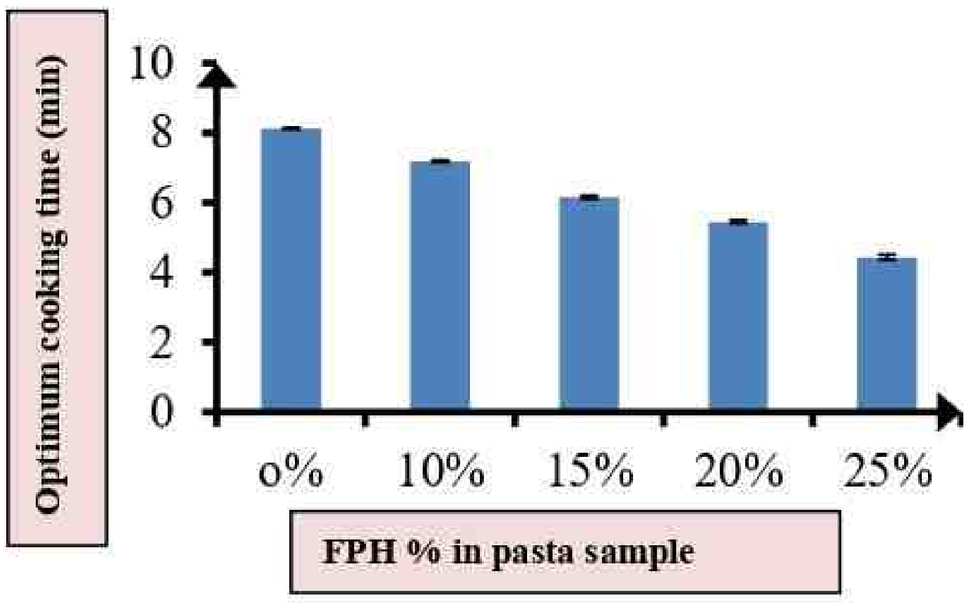


Figure 3: Optimum cooking time with FPH

This Is a Non-Technical Summary of The Project Report Titled "Enzymatic Hydrolysis of Shortfin Scad Fish (*Decapterus Russelli*) Muscle Protein to Develop a Protein Fortified Pasta and Evaluation of Its Sensory and Physicochemical Properties" Supervised by Prof. R.P.N.P. Rajapakse. Department Of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. Niranjanp@Agri.Pdn.Ac.Lk



Unmasking Fake Turmeric, Choose Pure Turmeric for a Healthy Curry

P.P.G Manhari

Golden yellow turmeric powder



This gold-colored seasoning is one of the most demanding spices all over the world. Turmeric can be abundantly seen in some seasons and sometime of the year it is rare as a drop of sunlight in a moonlit night.

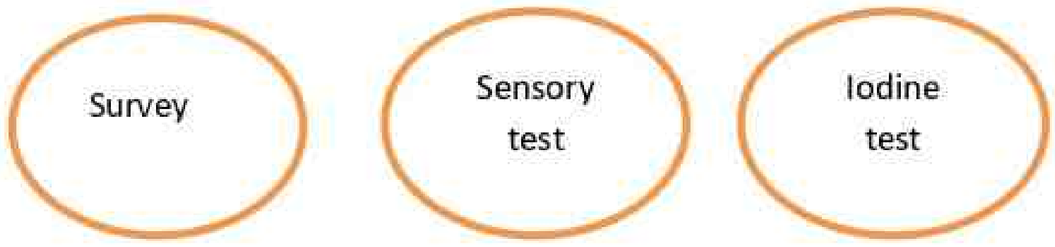
Turmeric is not only adding a color to our dishes but also the distinct flavor it gives is very significant in our south Asian cuisines. Turmeric contains an antioxidant, anti-inflammatory agent which is known as curcumin. Curcumin is the main reason for the beautiful golden color turmeric dominates.

Since the ancient time turmeric has been used for medicinal and culinary purposes. Turmeric is a rhizome and ginger is one of close relatives. So, there can be turmeric substitutions from same family which turmeric and ginger belong.

In some scenarios turmeric is mixed with cheap ingredients and added with harmful yellow colorants such as lead chromate and metanil yellow. In our culinary purposes only a pinch of turmeric powder is added. But consuming these hazardous colorants over the time make people unhealthy leading to terminal illnesses.

This research gives insight in to consumer awareness of adulteration in turmeric powder, laboratory tests, sensory perception in recognizing color difference in adulterated turmeric powder with rice flour against pure turmeric and Artificial Intelligence (AI) in detecting rice flour as the adulterant in turmeric powder

Summary of the study





Survey – survey was conducted via face-to-face interviews and circulating google form in social media. Fifteen questions were asked about awareness of adulteration in turmeric powder.

Sensory test – sensory tests were done in order to asses color differences against pure turmeric. Thirty untrained panel participated in sensory evaluation.

Iodine test- starch iodine complex formation was employed by iodine test.

Microscopic images -rice flour adulterated turmeric sample series were observed under light microscope

AI tool- colorimetric values were taken from rice flour adulterated turmeric sample series to integrate as inputs to develop AI tool

Results

According to survey majority of people were aware of turmeric adulteration. Sensory results showed that above 5% and 10% rice flour adulterated turmeric powder can be identified by human eye in terms of color. Iodine tests can be employed as laboratory scale tests to quantify turmeric powder adulteration by rice flour. Not only that light microscope images clearly showed rice flour granules in these sample series. The developed AI tool can be used as quick and reliable method to detect rice flour adulteration in turmeric powder.

Conclusion

There are limitations for these conducted studies. Such as the followed iodine test is not suitable for minor adulteration of rice flour in turmeric powder. The developed AI tool is limited only for the selected turmeric variety grown in selected area. But as an initiative this AI tool can be further developed considering these limitations with the hope of unmasking fake turmeric powder and you and me can choose pure turmeric powder to have a delicious and healthy curry.

This is a non-technical summary of the project report titled "Detection of Rice Flour Adulteration in Turmeric Powder using Laboratory Methods and Development of an AI based tool" supervised by Dr. E.R.J Samarakoon*, Food Science and Technology, Faculty of Agriculture, University of Peradeniya. rasanjalis@agri.pdn.ac.lk



What Drives Farmers into Diversification of Income Sources?

S. Kariyawasam

Rural farmers often face challenges like limited resources, unpredictable weather, and seasonal income fluctuations. Despite these challenges, some farmers continue farming as their only income source, while some others have diversified into other gainful activities besides farming, leading to multiple business ownerships. Therefore, a question arises about what motivates certain farmers to start additional business activities besides farming.

What motivates farmers to diversify income sources?

Some Farmers may face financial difficulties due to inadequate farming income, or risks crop damaged associated with unfavorable weather conditions.



To deal with such situations, they may start additional businesses as a survival strategy to supplement their primary income. Such survival needs often push farmers to diversify into additional income generating activities such as selling value-added products or providing services. These arise from necessity-driven motivations.



There is another set of farmers who may want to improve their social status, accumulate wealth while fully utilizing their family labour and physical resources.

Diversification into additional income generating activities by such farmers are driven by the need to capitalize available opportunities.

There can also be some farmers who initially start businesses out of necessity and subsequently to capitalize perceived opportunities.

Hence, conducting multiple businesses can be practiced as a survival strategy and/or capital accumulation strategy. However, framers who are motivated to capitalize opportunities (rather than as a survival strategy) show a higher tendency to increase the number of additional business activities they carry out.

In such a context, multiple business ownership of farmers enables policymakers to shift their focus of attention from increasing farm income to increasing household income. Such a focus will facilitate fully utilization of farmers' household resources, including idling family labour to increase income, while reducing the vulnerability to unfavorable climatic conditions. The study revealed that husbands showed a higher involvement in income diversification whereas wives exhibited a moderate involvement and unmarried children above 18 years showed the least involvement.

Farmers in the study location showed a higher tendency to start retail shops, selling food and beverages, hiring vehicle and machinery, tailoring, repairing vehicles and machines, lending money, supplying labour, and tourism related activities as their additional business activities.



Identifying motivations for diversifying businesses would help for rural employment enhancement and poverty reduction initiatives. Policymakers and development agencies could design targeted support programmes for promoting rural entrepreneurship to facilitate business expansion in rural farming areas.

This is a non-technical summary of the project report titled "A Study of Motivations for Starting Additional Businesses Among Pluriactive Farmers In Imaduwa, Galle." supervised by Prof. K.A.S.S.Kodithuwakku, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya. *sarathsk@agri.pdn.ac.lk



Say Goodbye to Smelly Seaweed! A New Way to Make it Fresh and Delicious

B.A. Tharushika Thathsarani

Have you ever picked up seaweed at the beach or in a meal and noticed that strong, fishy smell? What if I told you that scientists are working on methods to make those seaweed fresh and odor-free for your plate? The main character that I am talking about in this article is a marine edible alga called *Kappaphycus alvarezii*, which called as "Doty Doty" by the sea weed farmers.



Kappaphycus alvarezii (Doty Doty) Brown algae

This seaweed is packed with nutrients, but its strong fishy odor often stops people from enjoying its benefits. That's where our research comes in! Using a combination of natural and food-grade chemicals we found ways to disinfect and deodorize seaweeds making it is pleasant to eat. This will be good news for the Sri Lankan consumers who are willing to try different food sources in their food basket. Since these seaweeds are harvested from the ocean, there can be a possible risk of consumption without proper disinfection treatments. Therefore, in our research work we thought of carrying out disinfection and deodorizing treatment combinations to make this seaweed pleasant in smell while maintaining the microbial quality of the food. Blanching, chlorine, salt & vinegar, and lime juice were selected as the physical and chemical treatments for disinfection of the seaweed. By applying these treatments, we successfully reduced the microbial load to minute level which is very favorable for fresh consumption.



Very few bacterial colonies after disinfection

Tea is renowned for absorbing the odor compounds from the foreign materials. By considering this property, green tea was used as a deodorizing treatment for the seaweed. By making our hope success, green tea had reduced the strong fishy odor of *K. alvarezi* making it more palatable for the consumers. Similarly, 20% ethanol was used as another deodorizing treatment. The effect of the deodorizing treatments was evaluated using sensory evaluations using consumer panelists. In that, the consumers had identified a significant reduction of fishy odor in treated seaweed samples. The results were further confirmed using different sensory tests such as triangle tests, preference ranking tests, 9-point hedonic tests, and free choice profiling tests.

As a beautiful island surrounded by sea, these marine edible algae are a great solution for the food insecurity and malnutrition of Sri Lanka. Therefore, this deodorizing and disinfection treatment combination will play a major role in Sri Lankan food industry. With improved taste and safety, seaweed can be incorporated into everyday meals such as salads, snacks, and even plant-based seafood alternatives. This could also boost the seaweed industry, making it more appealing for commercial food production. Moreover, since seaweed is a highly potential food source, improving its sensory appeal could contribute to eco-friendly food choices in Sri Lankan cuisines. With these innovations, seaweed could soon become a mainstream superfood in Sri Lanka. As the next step these improved processing methods should be introduced to the food industries and the consumers should be educated about the benefits of consumption of fresh marine algae. With these innovations, seaweed could soon be a staple on your plate. As an intelligent consumer, are you ready to give this ocean superfood a try?



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This is a non-technical summary of the project report titled "Promoting the Utilization of *Kappaphycus alvarezii* (Doty Doty) Brown Algae: Disinfection, Deodorisation, and Quality Evaluation Through Chemical and Physical Treatments" supervised by Prof. B.E.P. Mendis*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *ereshamendis@agri.pdn.ac.lk



Increasing Yield and Drought Tolerance of Rice by Silicon Fertilization

T.M.R. Rusarani

Boosting Rice Growth and Resilience with Silicon (Si) Fertilization

Rice farming faces many challenges, including poor soil conditions, water stress, and weak plant growth. However, research shows that adding Si fertilizer can significantly improve rice health, making plants stronger, more productive, and better able to withstand tough conditions.

How Does Silicon Help Rice Plants?

Si is not often considered an essential nutrient, but it plays a big role in plant growth. When rice plants absorb Si, it strengthens their leaves, stems, and roots, making them more resistant to diseases, pests, and harsh weather.

Our study looked at how Si fertilization affects rice plants grown under different water conditions, flooded fields and alternative wetting and drying (AWD) to see how it improves growth.

Key Findings of the Research

The results showed that Si significantly improved root development, increasing both root length and thickness. This allowed plants to absorb water and nutrients more efficiently, leading to better anchorage and stronger growth.

Even under AWD conditions, where water availability varied, Si-treated plants maintained healthy root systems, ensuring better nutrient uptake.

Along with stronger roots, Si fertilization also enhanced shoot growth, leading more leaves. With a well-grown shoots in silicon-treated plants, contribute to higher yields. Another important benefit of Si fertilization was improved water use efficiency.

In AWD conditions, Si-treated plants were able to manage water stress better by maintaining healthy leaves and sustaining photosynthesis. Even with less water, these plants showed steady growth, making Si a useful solution for farmers in regions facing water shortages.

Additionally, Si enhanced the plant's ability to capture and use sunlight efficiently, ensuring steady energy production for growth and grain filling. This led to healthier plants that could produce higher yields with better grain quality. Overall, Si fertilization not only improved plant structure but also helped rice plants use resources more efficiently, leading to more sustainable farming practices.



+Si **−Si**

Why Should Farmers Use Silicon Fertilization?

Using Si fertilizer is an easy and cost-effective way to improve rice production. It makes plants stronger, helps them use water more efficiently, and increases yield even in challenging conditions. By adopting Si fertilization, farmers can get healthier crops, better harvests, and more profits while protecting their fields from environmental stress.

Would you like to learn how to apply Si fertilizer to your fields? Let's work together to improve rice farming for a better future!



This is a non-technical summary of the project report titled "Effects of soil silicon enrichment on growth and physiology of rice under alternative wetting and drying practices" supervised by Prof. L.D.B. Suriyagoda*, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. lalith.suriyagoda@agri.pdn.ac.lk.

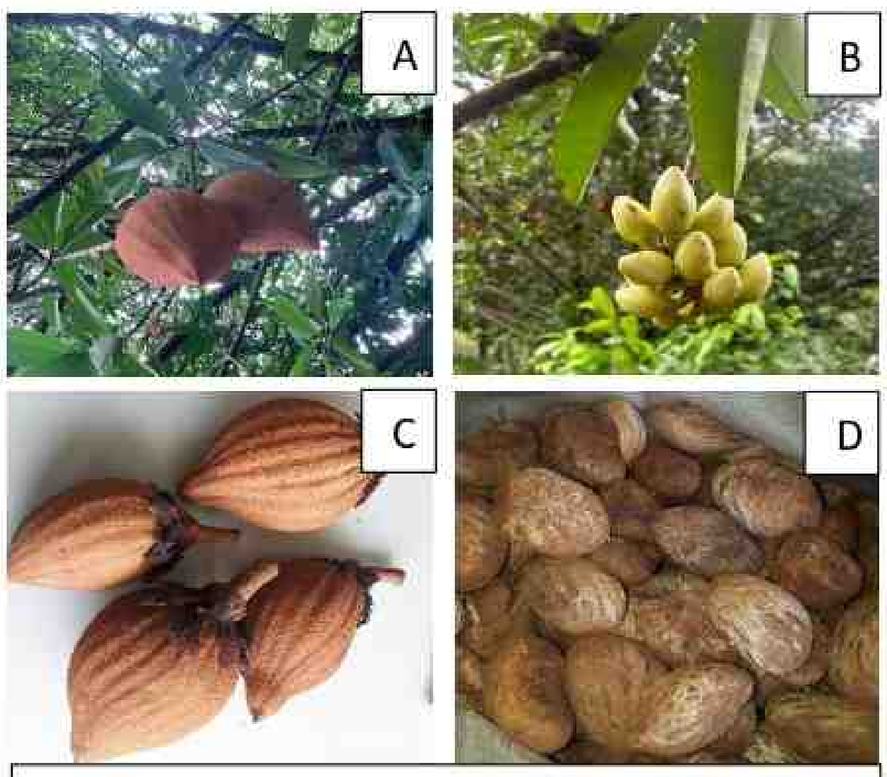


Spreading Health: A New Take on Natural Fat Alternatives

W. M. M. Chamathka

Some of the world's wealthiest treasures aren't locked in vaults or buried underground. They are hidden in plain sight. This study is focused on uncovering the potential of one such hidden treasure growing quietly in forests and fields, waiting to be discovered. It is called African butter fruit.

This remarkable tree is native to West Africa and it produces seeds that yield a natural, nutritious fat that local communities have used as food for generations. Now, these trees growing successfully in the wet zone, in Sri Lanka. This natural fat is introduced for local palates by blending it with commonly used natural flavourings.



African butter tree baring fruits (A), The flower buds (B), The fruits (C), The Seed kernels (D)

There are two developed distinct formulations to appeal to different taste preferences. The first is a savory blend where butter tree fat is enriched with garlic powder, black pepper, and dried oregano leaves. The second is a sweet-spicy fusion combining butter tree fat with roasted chili powder and sugar.

The study revealed some exciting findings that would interest everyday consumers. Both formulations stayed fresh in the refrigerator for at least two months. Unlike many natural fats that can quickly go bad, these spreads maintained their quality with barely noticeable changes.

The spreads were tested for harmful microorganisms that can spoil food. The results showed virtually no harmful microbes even after two months of storage.

It was confirmed that both two formulations are free from heavy metals which can raise health concerns. This ensures a clean and safe choice for your kitchen. Beyond purity, these blends also contain natural compounds that may help combat harmful free radicals in the body.

Different intensity levels of different attributes including Appearance, Flavour, texture and, odour were evaluated using trained people. There were no detectable changes of different levels of attributes over time.

These findings show that butter tree fat can be turned into delicious spreads that stay fresh and safe in the refrigerator. These formulations do not need any artificial processing or chemical additives as for commercially existing fat based spreads. They are simply nature's butter enhanced with natural flavors.



Formulation G (A), Formulation C (B)

"By encouraging local farmers to grow African butter tree, it can be potentially introduced a new sustainable crop to Sri Lanka while giving consumers a more natural alternative to processed spreads in the local market"

This is a non-technical summary of the project report titled "Evaluation of physicochemical & Functional Properties of Value-added *Pentadesma butyracea* Fat Spreads and, Shelf-life Assessment" supervised by Mr. N. Y. Jayanath, Department of food science and technology, Faculty of Agriculture, University of Peradeniya. jayanathny@agri.pdn.ac.lk. (Acknowledgment: Dr. S. Kathirgamanathar, industrial Technology Institute, Malabe, selvaluxmy@iti.lk)



Tiny Magical Fungi, Big Impact: Mycorrhizae Can Cut Down Phosphorus Fertilizer Inputs

K.A.A.I. Amarasinghe

Maize Cultivation in Sri Lanka

Maize (*Zea mays* L.) is the second most important crop in Sri Lanka. Maize is primarily used for animal feed, human consumption, and industry for oil production. It is mainly cultivated in dry and intermediate zones under irrigated or rainfed conditions with added high doses of chemical fertilizer.

Why are high doses of P a concern?

Phosphorus is an essential nutrient that helps maize plants to carry on their photosynthesis, respiration, root development, energy transfer, etc.

Rock phosphate is a diminishing resource. The application of high doses leads to a rapid reduction in rock phosphate. P availability is very low in soil solution because it is a highly immobile nutrient.

There should be solutions to this problem. One of the best solutions is to use arbuscular mycorrhizal fungi.

Who is arbuscular mycorrhizal (AM) Fungi?

AM can create symbiotic interaction with plant roots. Plants provide carbon in the form of sucrose to AM fungi that live in the roots. In return, AM fungi provide P and micro-nutrients directly to plants from the soil.

How overcome this problem?

AM fungi have external hyphae so they can create a hyphal network with root plants. Because of that, the absorptive area of the root is increased. Plants can reach more places in the soil to get nutrients.

AM fungi release organic acids and enzymes to dissolve insoluble P complexes by improving solubility.

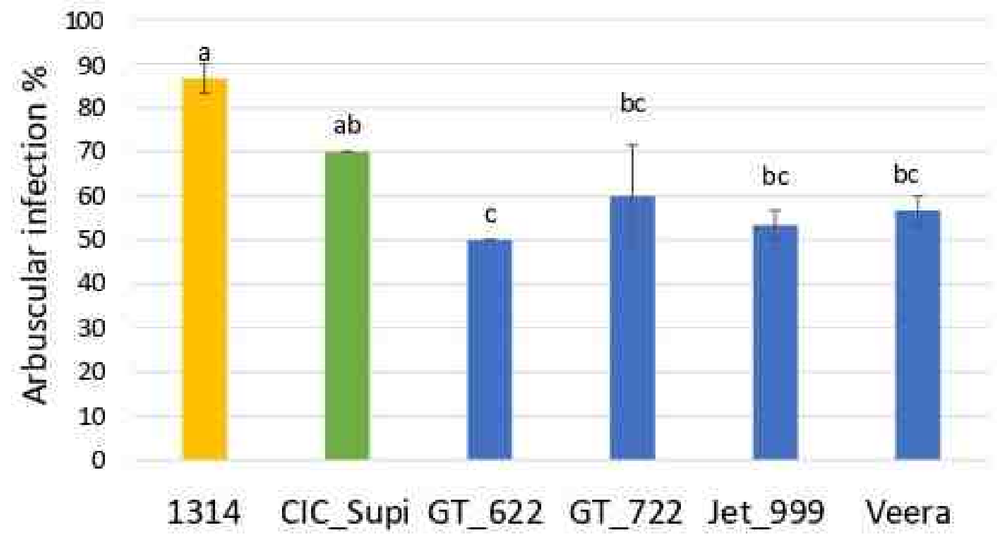
Can it happen naturally?

Yes, it happens. The infection rate of arbuscular mycorrhizal fungi varied according to their species and variety. CIC supiri and 1314 variety had higher infection rates of AM fungi.

Can it be further enhanced by using inoculant?

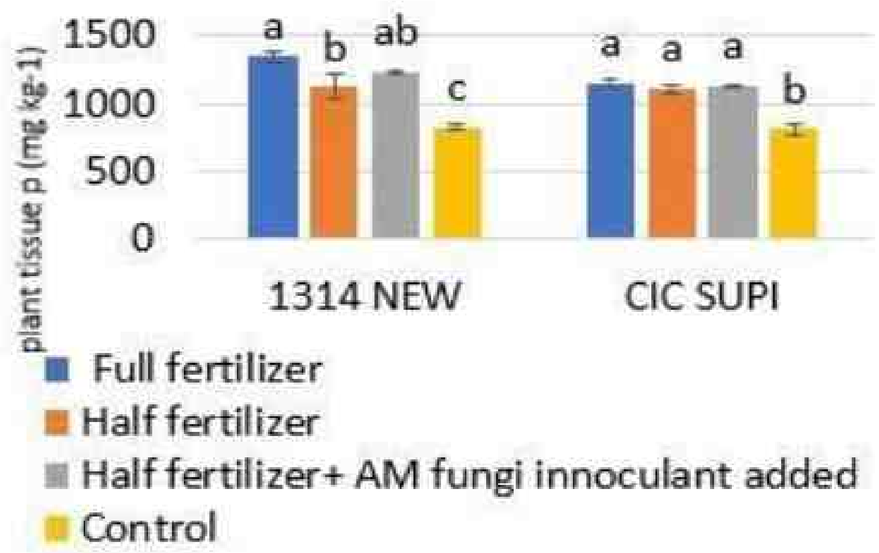
Two varieties, 'CIC Supiri' and '1314', were grown in pots with four treatments.

Infection rate of AM fungi varies with varieties



Infection rate of AM fungi varies with inoculant

Results of the pot experiment reported comparable tissue P contents for the treatments with recommended fertilizer and inoculant-added treatment.



Inoculation of AM fungi resulted in the highest AM infection percentage of arbuscules for both varieties.



What is the conclusion?

AM fungi can enhance phosphorus uptake and growth in maize under phosphorus-deficient conditions.

The good news for farmers...

Farmers can reduce their fertilizer cost by using AM fungi inoculant for their maize cultivations.

Although AM fungi are very small in size, they have magical impacts for future agriculture….

This is a non-technical summary of the project report titled "Mycorrhizae fungi associated with selected maize (*Zea mays* L.) varieties under different soil phosphorus levels" supervised by Prof. R.M.C.P. Rajapaksha *, Department of Soil Science, Faculty of Agriculture, University of Peradeniya.
* chandir@agri.pdn.ac.lk



Lobster Mysteries of Sri Lanka: A Deep Dive into DNA and Morphology

Narmada Dasmi Jayakody

Have you ever wondered if all lobsters are the same? At first glance, they might seem similar, but deep beneath their hard shells lies a hidden world of diversity. In Sri Lanka's southern waters, lobsters play a crucial role in both marine ecosystems and the fishing industry. But how do we know which species we are catching? That's where science steps in!

Why correct identification is important?

Knowing which lobsters live in our waters isn't just interesting, it's crucial for sustainability. Proper species identification ensures we manage fisheries wisely, preventing overfishing and helping local fishing communities thrive for generations to come. Fishermen traditionally identify lobsters by their color, size, and patterns. However, some species look almost identical, making it difficult to tell them apart. This can lead to confusion in markets and even affect conservation efforts.

New era of species identification

Lobster identification has taken a leap forward with the help of two powerful scientific tools: morphology and DNA analysis. By carefully studying physical features such as shells, antennae, and spines, researchers can make initial distinctions between species. However, for precise confirmation, DNA barcoding is used, an advanced technique that works like a fingerprint test, uniquely identifying each species based on its genetic code. This combination of traditional observation and cutting-edge genetics is revolutionizing the way marine species are classified, ensuring accuracy in research and conservation efforts.

Morphological Identification of Lobsters

Researchers carefully observed important physical features of lobsters. These included the arrangement of spines on the shell (carapace spination), color patterns and bands on the legs, the shape and size of antennae, and the structure of walking legs and the tail.

Calipers are used to measure specific body parts, such as carapace length, rostral spines, and leg proportions. These measurements helped in identifying and differentiating between different species.



Molecular identification (DNA Barcoding) of lobsters

Tissue samples, usually taken from the antennae flagellum of each lobster, are collected for genetic analysis. Using a standardized extraction method, high-quality DNA is isolated from these samples.

A process called PCR (Polymerase Chain Reaction) is used to amplify a specific gene known as COI (Cytochrome Oxidase I). This gene serves as a genetic marker to help distinguish between different lobster species.

Once sequencing is completed, the DNA is read like a code to determine the species. The sequences are then compared with global databases, such as GenBank, to confirm the species identity.

A Breakthrough Discovery

By combining physical observation and DNA analysis, the study successfully identified all five lobster species found in the southern waters of Sri Lanka. This method provides a more reliable understanding of lobster diversity.

Why it matters?

The goal of using both techniques is to achieve clear and accurate species identification. This knowledge helps scientists and fishermen understand which species are present, manage lobster populations more effectively, and protect them from overfishing. Ensuring the long-term health of lobsters also supports the sustainability of the fishing industry.

This is a non-technical summary of the project report titled "Morphological and Molecular Identification of Lobster Species Caught in Southern Province of Sri Lanka" supervised by Prof. A.R.S.B. Athauda*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya.
*sbathauda@agri.pdn.ac.lk



Development of a Fermented Nut Spread from Peanut, Soybean, and Velvet Bean

H.K Batugedara

Peanut butter was not just a tasty spread, it was a solution created by a doctor who cannot chew meat. It became a protein-packed lifesaver. What if we can take this idea even further? What if the peanut butter could be more than just a protein, but more digestible, more flavorful and even better?

Therefore, I have conducted research on developing a fermented nut spread using peanuts, soybeans, and velvet beans. The primary goal was to enhance its nutritional profile while addressing key challenges, such as the **strong green or beany flavor** and the presence of anti-nutritional factors in velvet beans. Velvet beans are rich in protein and other beneficial nutrients but contain high levels of **L-DOPA**, a compound that can have adverse effects when consumed in large quantities. Fermentation was selected as the main processing technique because it is known to improve the nutritional value, digestibility, and sensory properties of food by breaking down undesirable compounds and enhancing beneficial ones. To evaluate the effects of fermentation, several laboratory tests were conducted. **Proximate analysis** was performed to determine the macronutrient composition, including protein, fat, and moisture content. The results showed that fermentation led to an increase in **protein content**, making the spread nutritionally superior to regular peanut butter, while the fat content remained similar to commercial products. This means the spread offers a **protein-rich alternative** without altering its fat composition, making it suitable for consumers looking for enhanced nutrition.

Another key improvement observed was in the **antioxidant content**, which was measured using DPPH radical scavenging activity and total phenolic content analysis. The results indicated a significant increase in antioxidant levels, which suggests that the fermented nut spread could offer potential health benefits, such as reducing oxidative stress and inflammation in the body. This enhancement is likely due to the breakdown of complex compounds during fermentation, making antioxidants more bioavailable.

One of the most important aspects of this research was addressing the high L-DOPA content in velvet beans, as excessive consumption can lead to negative health effects. CHemical content analysis confirmed that fermentation successfully **reduced L-DOPA levels**, making the spread safer for regular consumption.

In addition to laboratory analysis, a sensory evaluation was conducted to assess consumer acceptance of the product. The results indicated positive feedback, with participants showing a good level of acceptance for the fermented spread. Although some variations in texture and flavor were noted compared to non-fermented, the product was generally well-received, suggesting its potential as a marketable alternative.



This is a non-technical summary of the project report titled "Development of a Fermented Nut Spread from Peanut, Soybean and Velvet Bean" supervised by Mr. N.Y. Jayanath*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *jayanathny@agri.pdn.ac.lk



A Colorful Guide to Track the Freshness of Buffalo Curd

K. Punsara Nirmal

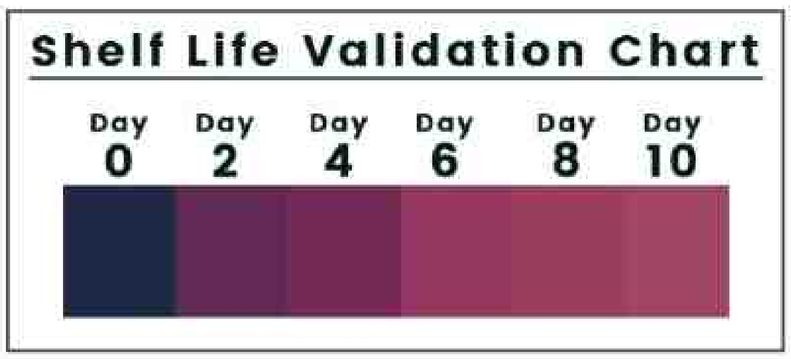
Imagine you're about to enjoy a creamy, tangy spoonful of buffalo curd, but suddenly, you wonder is it still fresh? You glance at the expiration date, but that's not always a reliable guide. What if your curd could simply signal when it's no longer fresh? That's exactly the idea behind this research; a color-changing freshness indicator that transforms freshness detection into a visual experience, making it easier than ever to know when your curd is at its peak.

The Magic of Color

At the heart of this revolutionary innovation lies nature's very own pH-sensitive artist, anthocyanins. These vibrant, plant-based pigments are found in foods like red cabbage, butterfly pea flower, and beetroot, and they have an incredible ability to change color depending on the acidity of their surroundings. Imagine using this natural ability to create a smart, visual signal for buffalo curd's freshness. No more guesswork, no more sniffing, no more relying on the expiration date. Just a simple color shift that tells you exactly when your curd has reached its prime or gone beyond it.

The Freshness Indicator

This research takes the concept of anthocyanins and transforms it into a practical, everyday solution. By embedding these pigments into small gel discs made from natural gelling agents like carrageenan and agarose, the freshness indicator is born. These tiny discs are placed on the surface of the buffalo curd and act as a visual display of its freshness. As the curd's pH changes over time, the color of the gel disc shifts, providing an immediate, visual clue to whether the curd is still safe to eat. The color change is small but clear, giving consumers a simple and easy way to tell how long the curd has been stored.



Why it's a Game Changer

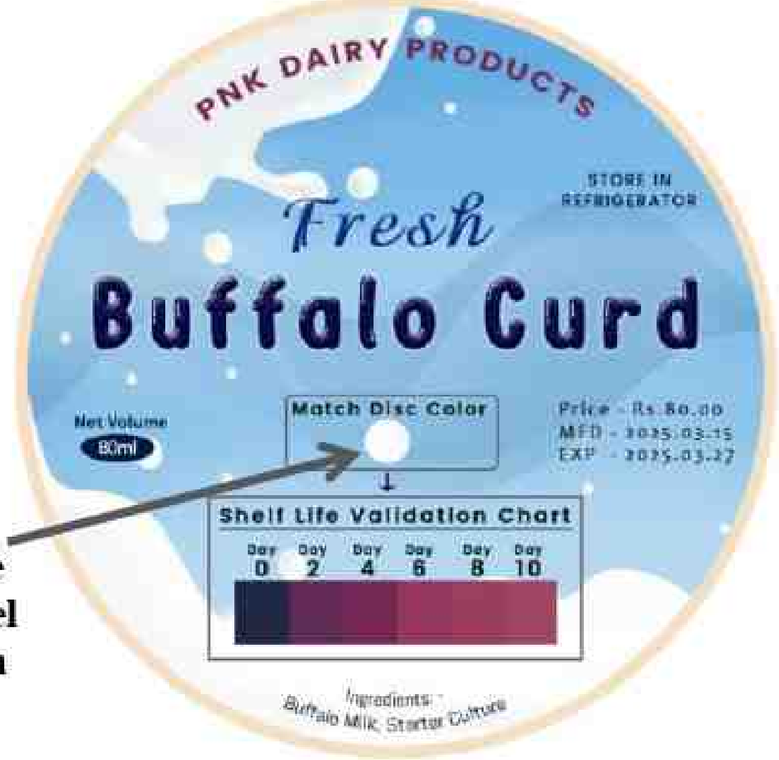
This innovative freshness indicator is a true game changer. It offers instant clarity and allows consumers to determine the freshness of their curd with a simple glance. No more uncertainty or wasting perfectly good food because you weren't sure whether it was still fresh. Thanks to its reliance on food-grade, plant-based ingredients, it's natural and safe for use, aligning perfectly with the growing demand for eco-friendly and sustainable food products. Additionally, this approach reduces reliance on lab-based spoilage tests, offering a consumer-friendly and biodegradable solution that makes freshness detection accessible to everyone.

Looking Ahead

But this is just the beginning. The potential for this color-changing gel extends far beyond buffalo curd. In the future, we could see this technology applied to a wide range of dairy products and perishable foods, creating smarter, more sustainable packaging systems that help consumers avoid food waste while ensuring food safety. This innovation represents a leap toward intelligent packaging.

Next time you reach for buffalo curd, imagine if it could tell you instantly whether it's still fresh. Thanks to this research, that future is closer than you think. The color changing gel could soon be the new standard in freshness monitoring, and with it, the future of smarter food storage is unfolding right before our eyes.

A label to cover the lid of the curd tub, enabling to see the color changing smart gel disc



Transparent window to see the colored gel disc placed on curd

This is the non-technical summary of the project titled "Development of Anthocyanin-based Colorimetric Freshness Indicator to Validate the Shelf Life of Buffalo Curd under Refrigerated Storage", supervised by Prof. R.P.N.P. Rajapakse, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. niranjanp@agri.pdn.ac.lk



Science Vs. Perception - Are Mite-Resistant Coconut Hybrids Truly Lower in Quality?

H.D.S. Himasha

Background

Coconut plays a crucial role in Sri Lanka's economy and daily life. The Coconut Development Authority (CDA) reports that 56% of the annual coconut production is consumed domestically, while Sri Lanka was the world's fourth-largest coconut exporter in 2022. However, a drastic decline in coconut production has led to soaring prices, with fresh nut prices fluctuating up to Rs. 250 in recent months. This decline threatens local consumption, the coconut industry, and export earnings, making the Rs. 1.5 billion target for 2023 increasingly difficult to achieve.

This production decline is attributed to multiple factors, including:

- Fertilizer shortages
- Pest infestations
- Climate variability

Among these, coconut mite infestations have emerged as a major contributor to reduced yields, significantly impacting the overall production. In response, the Coconut Research Institute (CRI) has introduced five new hybrid coconut crosses specifically bred for mite resistance and high productivity:

- SR × BGD
- DY × SR
- GT × BGD
- T × BGD
- DY × T

These hybrids exhibited strong resistance to mite infestations and promising yield levels, making them a viable solution to declining coconut production.

What is this perception?

While these hybrids exhibit lower susceptibility to mite infestations, public perception has posed a new challenge. These varieties produce yellow or orange-colored nuts, leading to concerns that they resemble king coconut, which is primarily used for beverages rather than kernel production.

As a result, there is a widespread misconception that these hybrids may have inferior kernel and milk quality, making them unsuitable replacements for traditional coconut varieties. Thus, this research aimed to scientifically evaluate the kernel and fruit quality of these new hybrid varieties compared to selected well-established traditional coconut varieties.

Methodology

The study was conducted at the CRI, Lunuwila, using coconut samples collected from Wanathawilluwa, where these newly developed hybrids are cultivated. The study statistically analyzed multiple kernel and fruit quality parameters.

Key Findings – Are they really inferior in quality?

1. The new hybrid varieties performed equally well in kernel thickness, coconut milk yield, and other fruit parameters, proving they are not inferior to traditional coconut varieties.

2. SR × BGD Outperforms the rest among the five hybrids; SR × BGD demonstrated the best overall performance, excelling in both yield potential and kernel quality, making it a particularly promising variety for large-scale cultivation.

3. The assumption that yellow-colored coconuts are unsuitable for kernel production was contradicted by evidence, confirming that these hybrids can effectively replace traditional varieties in both domestic and commercial applications.





This is a non-technical summary of the project report titled "**Assessment of fruit quality characteristics in newly developed coconut hybrids resistant to *Aceria* mite**" supervised by **Prof. L.K. Weerasinghe** Department of Crop Science, Faculty of Agriculture, University of Peradeniya. lasanthaw@agri.pdn.ac.lk and **Dr. H.D.M.A.C. Dissanayaka,** Genetic and Plant Breeding Division, Coconut Research Institute Lunuwila.



Tea For Tomorrow: Finding the Best Brews for Mid-Country Farms

Chamalka Kaushini Rajamantri

Tea (*Camellia sinensis* L.) cultivation is a vital component of Sri Lanka's economy and cultural identity. This sector provides livelihoods for numerous rural households while preserving the nation's agricultural heritage. However, tea cultivars exhibit distinct agroclimatic adaptations, with varying performance across different growing regions. In Sri Lanka's mid-country zone, specific cultivars demonstrate superior productivity and quality characteristics compared to others. Current research at the Hanthana Tea Research Institute (TRI) focuses on identifying most suitable cultivars for mid-country cultivation conditions through systematic evaluation of their performances.

The primary objective of this study was to facilitate cultivar selection optimization for mid-country tea cultivation, enabling farmers to make informed agronomic decisions. By identifying climate-adapted cultivars, this research aimed to enhance productivity while minimizing yield losses associated with suboptimal variety selection. A comprehensive understanding of cultivar-specific growth patterns will empower growers to maximize production efficiency.

A key research outcome involves the development of cultivar-specific harvesting protocols. Our findings demonstrate significant variation in shoot replacement cycles among cultivars, with faster-growing accessions/varieties requiring more frequent harvesting intervals compared to slower growing accessions/cultivars.

Farmers will be able to prevent the over-plucking effects of damage to the plants in the long term with proper timing. Farmers will also know when to harvest the tea leaves to achieve the best quality with this research, which implies consumers will receive quality tea and farmers will receive more profits.



The second critical part of the study involves the best time for pruning and fertilizing the tea plants. Pruning can promote bush health through removal of the old or dead leaves and stems, helping the plant direct its energy into forming new leaves. Fertilizing gives the plants the nutrient that enables them to grow healthy and productive. This research helps to determine the best times to fertilize and prune. Knowing when to fertilize and prune allows farmers to improve the health and growth of their plants, leading to more productive tea bushes in the long term. This also helps to ensure that the plants keep producing quality leaves, season after season.

The research conducted at the Hanthana Tea Research Institute is valuable information that can be utilized to inform farmers to make better decisions on what tea cultivars to plant, when to harvest, and how to handle their crops. Through designing better harvesting schedules, improving labor planning, and determining the best times for pruning and fertilization, the research can help farmers increase both their yield and quality of tea. Notably, the identification of new suitable tea accessions, such as Accession 15 and Accession 139, for mid-country conditions adds further value to this study. These accessions could offer farmers additional options that are better adapted to the region, potentially enhancing productivity and resilience to environmental conditions. Ultimately, it is not about completely changing how tea farming is done but finding pragmatic solutions to improve the existing system. What this research comes up with will help the future of tea farming in Sri Lanka by allowing farmers to make better decisions and ensuring the sustainability of the business.

This is a non-technical summary of the project report titled Assessing the Shoot Replacement Cycle of Selected Tea Accessions Under Mid Country Conditions Supervised by Prof L.K. Weerasinghe, Department of Crop Science, Faculty of Agriculture, University of Peradeniya.
*lasanthaw@agri.pdn.ac.lk



Hybrid Sorghum: The Secret to Sri Lanka's Forage Revolution?

D.G.I. Sewwandi

Transforming Livestock Farming with High Yield Hybrid Sorghum

As Sri Lanka's dairy and livestock industries strive for self-sufficiency, one challenge remains at the forefront ensuring a reliable, nutrient-rich forage supply year-round. Traditional pasture crops often struggle to withstand the country's prolonged dry periods. However, hybrid fodder sorghum has emerged as a game-changer, offering superior drought tolerance, higher biomass yield, and exceptional forage quality.

The Experiment: Identifying the Best Hybrid Variety

A recent study at Dimo Agri Techno Park, Lenadora, evaluated the performance of three hybrid fodder sorghum cultivars - Sugargraze, Fat Boy and Honey Pot under Sri Lankan conditions. The goal? To determine the best-performing variety and assess how plant spacing impacts growth and yield.

The study featured four treatments:

- **T1:** Sugargraze at 45×15 cm spacing
- **T2:** Sugargraze at 30×15 cm spacing
- **T3:** Fat Boy at 30×15 cm spacing
- **T4:** Honey Pot at 30×15 cm spacing



The Results: Fat Boy Takes the Lead

The findings were remarkable. Fat Boy recorded the tallest plants (265.55 cm), the highest dry matter yield (10.36 MT/ha), and superior nutrient composition. In comparison, Sugargraze at 30×15 cm spacing outperformed its standard counterpart (45×15 cm) in terms of fresh matter yield (62.45 MT/ha), proving that modified spacing can significantly boost forage productivity. Additionally, Honey Pot exhibited the highest leaf-to-stem ratio, an indicator of better digestibility for livestock. However, its lower dry matter content (14.4%) suggested that it may be less efficient for silage production compared to Fat Boy.



The Way Forward: A New Era for Forage Cultivation

Given its outstanding performance, Fat Boy is recommended for import and large-scale cultivation in Sri Lanka. Meanwhile, for farmers cultivating Sugargraze, adopting a 30×15 cm spacing strategy will help maximize yield and enhance forage quality. Hybrid sorghum has the potential to revolutionize Sri Lanka's livestock feed industry, reducing reliance on expensive imports and fostering a sustainable, locally-driven dairy sector. By incorporating advanced agronomic practices and promoting these superior hybrids, Sri Lanka can take a significant step towards ensuring food security, farmer prosperity, and a resilient livestock

This is a non-technical summary of the project report titled "Assessment of the forage value of hybrid fodder sorghum cultivars intended for import and marketing in Sri Lanka" supervised by Dr. M.B.P..Kumara Mahipala*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *pmahi@agri.pdn.ac.lk



Investigation the Performance of Paddy Husk Derived Biochar as a Reactive Materials to Reduce the Environmental Impact from Hair Dye Mixed Wastewater

Isurika Madushani

Introduction

The demand for personal care products, including skincare, hair care, oral care, and cosmetics, is increasing. However, their contribution to wastewater generation is often overlooked. Wastewater from salons, particularly from hair dyeing processes, is frequently discharged into nearby water bodies, leading to potential environmental contamination.

How was the study conducted?

This study focused on the objective of evaluate the effectiveness of a column-based wastewater treatment plant constructed using a combination of paddy husk derived biochar and bricks as reactive materials for treating water contaminated with hair dye.

The study looked at different hair dye brands and how they affect water quality. It measured things like how acidic or salty the water became after mixing with the dyes. The tests checked pH, the amounts of dissolved particles, and the presence of certain chemicals. Special tools were used to understand how these dyes change the water. The goal was to see how much pollution they cause and how difficult they might be to clean from wastewater. To find a good way to clean this wastewater, materials like burnt paddy husks, and crushed roof tile bricks were used. Different mixes of these materials (different % of bricks & biochar) were tested to see which one worked best at removing harmful substances. Wastewater was passed through columns filled with these mixtures, and the removal efficiency of nitrate of the wastewater was checked before and after the process. The time water spent in the columns was also measured. This helped identify the best material mix for cleaning wastewater from hair dye.



Figure 1- Column based water treatment plant

Results and Discussion

The results of pH, EC, TDS variation with time show that using paddy husk biochar and bricks helped remove the pollutants effectively. The water's acidity levels stayed balanced, and the amounts of dissolved substances (TDS) and salts (EC) was reduced. This means the materials effectively removing unwanted particles, making the water much cleaner. This method could be a useful and natural way to treat wastewater from hair dye use.

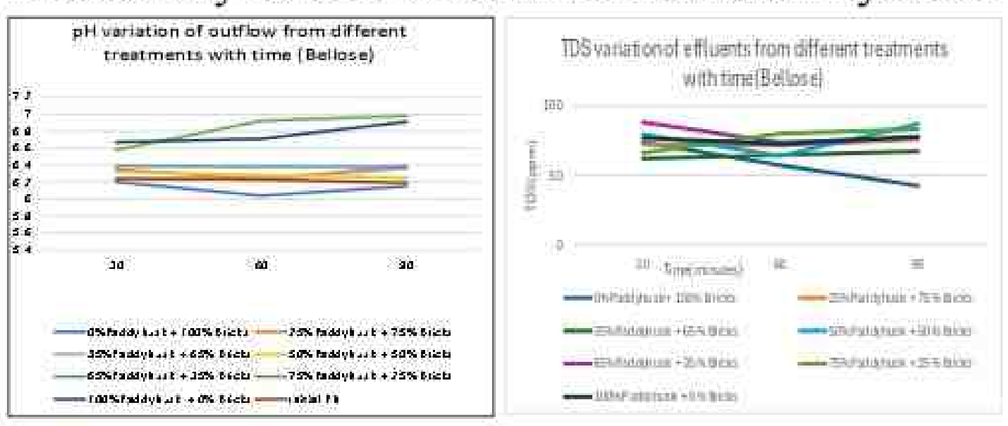


Figure 2-pH, TDS variation with the time after treatment

The results of adsorption test for find the adsorption capacity of bricks and biochar separately, bricks were better at holding onto the unwanted substances compared to paddy husk. This means bricks did a stronger job in removing the Nitrate from hair dye mixed wastewater.

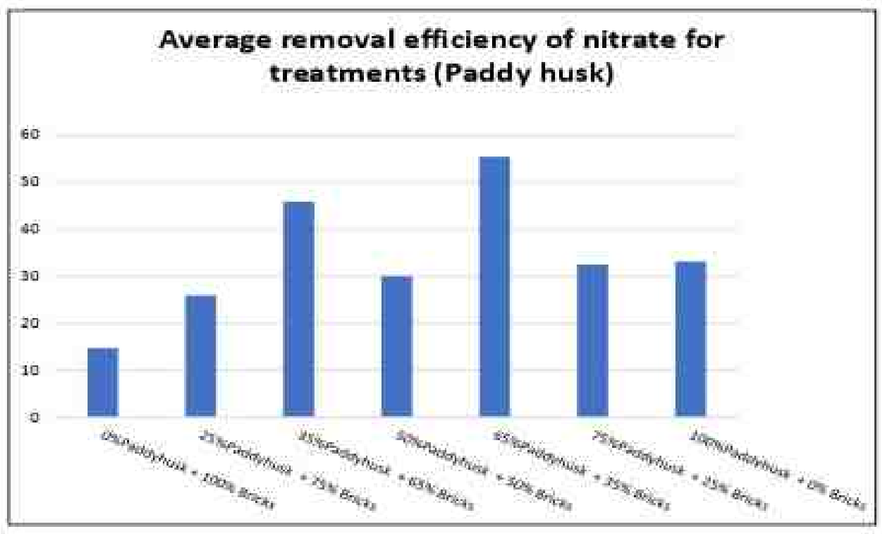
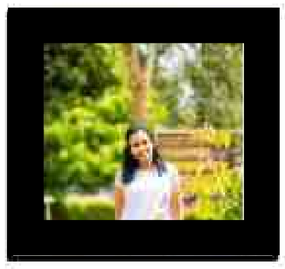


Figure 3- Removal Efficiency variation of different combinations of paddy husk and bricks

The results show that the best nitrate removal happened when the mix had 65% paddy husk and 50% bricks. This combination performed better than others, reaching the highest efficiency. Lower and higher amounts of paddy husk did not work as well, meaning that balance between the two materials is important. The findings suggest that using the right mix of paddy husk and bricks can make wastewater treatment more effective.

This is a non-technical summary of the project report titled "Investigation the performance of paddy husk derived biochar as a reactive material to reduce the environmental impact from hair dye mixed wastewater" supervised by Dr. S.S.K Chandrasekara, Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya. * sewwandhich@agri.pdn.ac.lk



Investigating Agronomic Behaviour, Model Validation and Climate Adaptation of Organic Maize-Groundnut Intercropping

J.Y.A Sudusingha

Introduction

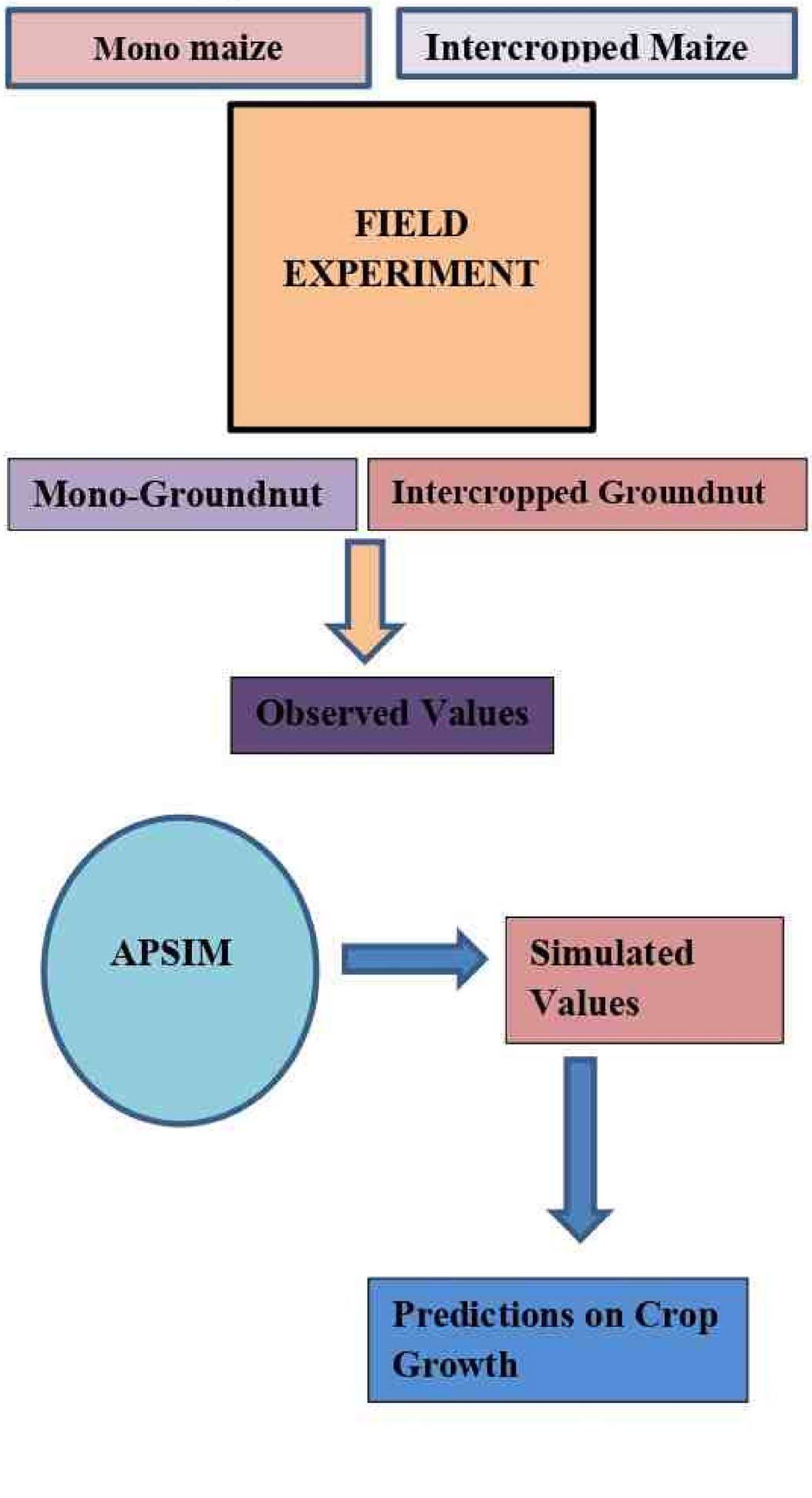
Instead of growing just one crop in the field, what would happen if two crops are grown that help each other? This is called as "intercropping"

What is the important?

This can help farmers to get more yield, from same land and use resources like water and nutrients better.

What is APSIM?

APSIM is computer-based tool, used to simulate the growth of crops. It helps and researchers and agricultural professionals to understand how various factors such as weather and management practices, influence crop production.



Why Organic Farming?

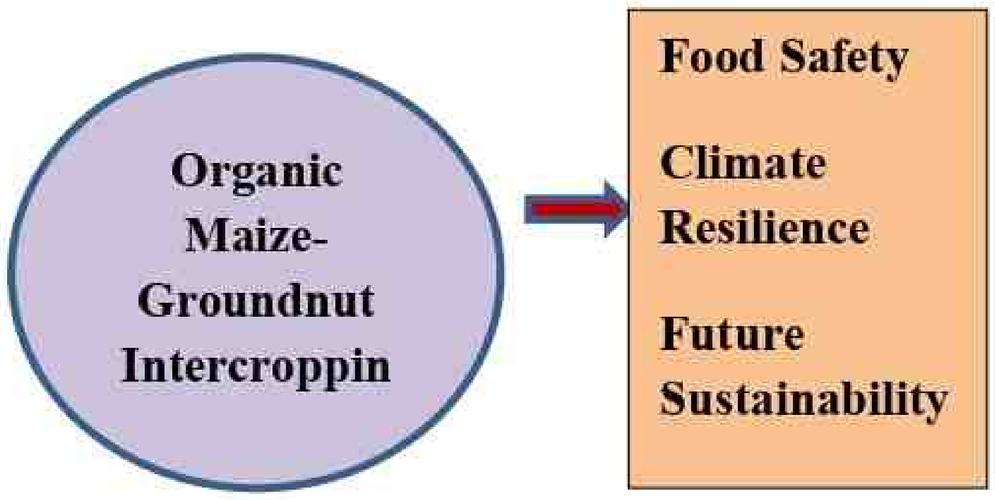
Organic farming is a way of growing crops that works *with* nature, not against it. Instead of using artificial chemicals to fertilize the soil or kill pests, organic farmers use natural materials and methods. This can include things like compost to feed the soil and natural sprays made from plants like neem to keep pests away. Organic farming helps to protect the environment and can produce healthier food.

Why the attention towards "Climate Resilience" vital?

Climate change is causing more unpredictable weather, like stronger rains and hotter temperatures. This can make it hard for farmers to grow crops reliably. Our research looks at whether organic intercropping can help. We want to know if this method can still produce good harvests even when the weather gets tougher. This is what we mean by 'climate resilience' the ability of a farming system to withstand and recover from climate change impacts.

What are the findings of the Research Project?

Our study clearly demonstrates that growing maize and groundnuts together using organic methods offers several advantages. It allows for increased food production compared to growing the crops separately, highlighting the efficiency of intercropping. Furthermore, the organic system shows **promise for maintaining yields even under changing climate conditions**, indicating its resilience. These findings suggest that organic intercropping is a viable and sustainable alternative for farmers seeking to improve their productivity while minimizing their environmental impact.



This is a non-technical summary of the project report titled "Evaluation of Agronomic Performance, APSIM validation and Climate Resilience of Maize-Groundnut Intercropping Under Organic Cultivation" supervised by Dr. S.H.N.P. De Silva*, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *sssnuwanp@agri.pdn.ac.lk.



The Mystery of Agarwood!

P.Y. Piyumika

Imagine walking into a forest where ordinary-looking trees hold a priceless secret. A secret so rare that it can transform simple wood into a luxury product worth thousands of dollars. This is the magic of agarwood, a fragrant, resin- filled wood that has been treasured for years. But here's the catch not every tree produces it, and even when it does, it can take years.

What if we could unlock this hidden treasure faster? What if we could create agarwood in a way that doesn't harm nature! Science has found a way and that's where our story begins.

The Secret of Agarwood Production

Agarwood comes from like *Gyrinops walla,* which grows in Sri Lanka. When these trees are wounded or infected, they produce a dark, aromatic resin as a defence mechanism. This resin is what makes agarwood so valuable, used in perfume, incense and traditional medicine. However, naturally occurring agarwood is extremely rare, making it one of the most expensive woods in the world.

Can We Create Agarwood Without Destroying Trees?

Scientists are now exploring ways to produce agarwood without waiting for nature to take its course. One of the most promising methods is **tissue culture technology** - a process where shoots of a plant are grown in a controlled environment to create agarwood. This allows scientists to study and enhance agarwood formation without harming natural forests. A key discovery in this field is the use of Methyl Jasmonate, a natural chemical that trick the tree into thinking it is under attack. This triggers the tree's defence mechanism. Secondary metabolite are produced as a result of defence mechanism. Secondary metabolite are the main reasons for unique fragrance of agarwood. we can grow agarwood in laboratories, reducing the need to cut down wild trees.



But here's an important question: **How long should the shoot be exposed to this chemical for the best agarwood production?**

This is where our study come in! We tested different weeks to see how long *Gyrinops walla* shoots should be exposed to 1 µM Methyl Jasmonate for the best results. Over 10 weeks, we monitored secondary metabolites production using Thin Layer Chromatograpy to analyze the chemical change in the shoots.

The highest amount of agarwood formation was observed around week 6 to 7, meaning this was the best incubation period for maximum secondary metabolites production. After 10th week, there was no significant improvement- proving that longer exposure doesn't necessarily lead to more secondary metabolite.



This is a non-technical summary of the project report titled "The optimum incubation period for maximum production of secondary metabolites in *Gyrinops walla* shoot culture with elicited 1 µM Methyl Jasmonate" supervised by Prof. J.P. Eeswara*, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *jpeeswara@agri.pdn.ac.lk.



Can We Overcome the Subjectivity and Complexity of Current Tea Quality Evaluation Methods, Through an AI Model?

Ushenya Peiris

The 158-year-old Ceylon Tea Industry.

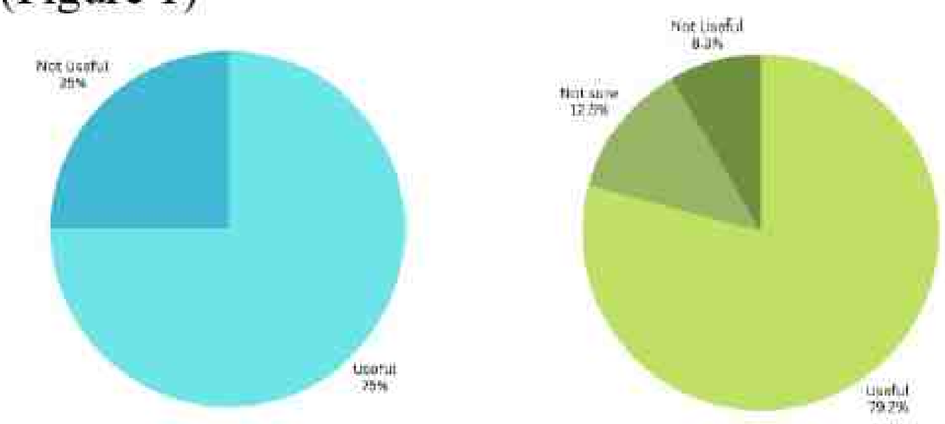
Tea, is Sri Lanka's highest export revenue-generating crop, contributing 4.1% to the country's GDP (2022). In year 2024, the production of Ceylon tea surpassed 260 million kilograms with an export revenue exceeding $1.4 Billion. Ceylon tea solidifies Sri Lanka's position as the 4th largest tea producer of the world while, it is globally renowned, for its distinctive flavor profile and the exceptional quality.

Current tea quality evaluation methods

Ceylon black tea is evaluated primarily by the Sri Lanka Tea Board and secondarily by tea buyers, exporters and brokers. The two key methods are organoleptic evaluation (Tea Tasting) and laboratory analysis. Laboratory analysis demands more skill, time, cost and also, tea tasting, despite its industrial heritage, is inherently subjective, costly and requires experience.

Do the tea manufacturers and the tea buyers like to use an AI model to validate and predict the tea quality?

24 tea manufacturers representing the three tea growing elevations of the country, were surveyed for their opinion on an AI model to predict and validate the tea tasting result given by the tea tasters. Additionally, 8 large tea buyers of the country representing local and export tea buyers and tea brokers were also surveyed. 79.12% of the tea manufacturers and 75% of the tea buyers found such an AI model to be rather quick, efficient and accurate and considered the model to be useful. (Figure 1)



Tea buyers Tea manufacturers

Figure 1: Opinion of Tea buyers and Manufacturers for a tea quality assessing AI tool

How the 'Tea Quality Validatory and Predictive AI tool' is built?

276 black tea samples from 74 tea estates were acquired representing the 3 tea growing elevations. These samples were analyzed, for total polyphenol content, total nitrogen content, moisture level, crude fiber content, caffeine content, bulk density, liquor pH, leaf color, infusion color and liquor color. These parameters were analyzed and the same samples were tea tasted by a panel of expert tea tasters. The tea tasting results and the analyzed data, were checked for correlation and a baseline regression analysis was conducted, resulting a R^2 value of 0.9186 with all the parameters.

By using, neural networks with 'resilient back propagation' method with weight backtracking, a Decision Support System (DSS) was built, with the 15 analyzed parameters as input nodes, 10 neurons and 1 hidden layer providing a model accuracy of 92%. Additionally, by just using easily detectable, liquor pH, leaf bulk density, leaf and infusion color as the inputs, another DSS was built which has 8 nodes, 1 hidden layer and 20 neurons giving an accuracy of 70% (Figure 2). The output of these two AI models is a "Tea Quality Score (TQS)" in a scale of 1 to 5, which can be used in validating and predicting the tea quality assessment methods, and are rather objective, efficient, quick and accurate than the traditional tea quality assessments.

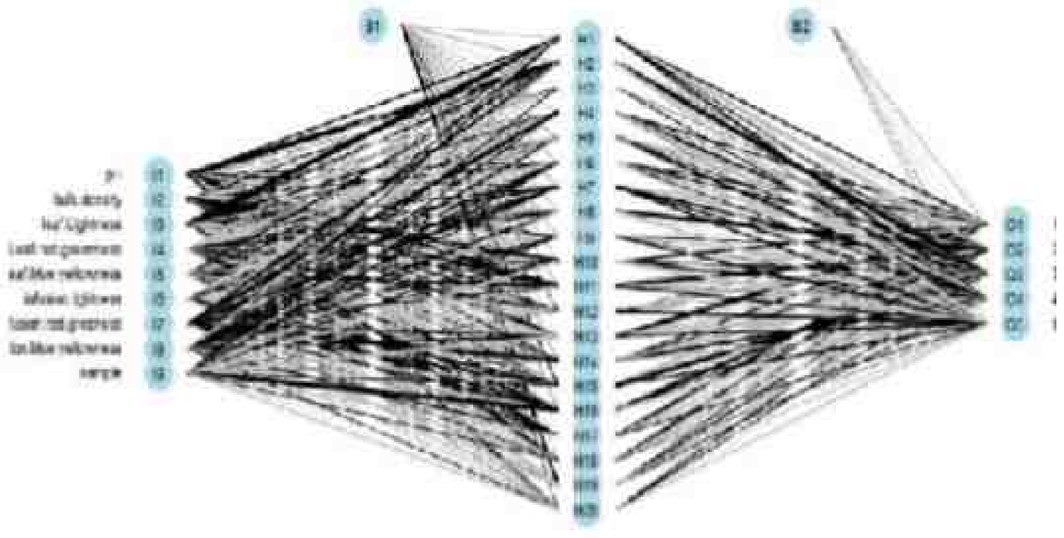


Figure 2: The Neural Networks based DSS

Future with AI in tea quality assessment…

A web application or a stand-alone application can be developed based on the AI model, which can be used by the tea buyers, tea manufacturers and the tea quality assessors for tea quality evaluation, prediction and validation.

This is a non-technical summary of the project report titled "Development of an AI-Driven Decision Support System based on Physicochemical properties of Ceylon black tea, to validate and predict tea tasting assessments conducted by the Tea tasters" supervised by Prof. B.E.P.Mendis*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *ereshamendis@agri.pdn.ac.lk



Unlocking Mango Freshness: An AI-Powered Approach to Optimal Storage

W.S. Thathsarani

Why do we need an AI model?

Mangoes are a beloved and economically important tropical fruit worldwide. A key challenge in the food industry is determining the optimal storage time for mangoes to achieve the best quality for processing. Currently, ripeness is often assessed visually, which can be subjective and lead to inconsistencies and waste. This research investigates how Artificial Intelligence (AI) can offer a more accurate and efficient solution by predicting the optimal storage period.

Why is it Important?

This research is important because it addresses key challenges in the mango industry. Accurately predicting the optimal storage period for mangoes can significantly minimize fruit spoilage, promoting greater sustainability by reducing waste in the mango processing industry. Furthermore, ensuring consistent fruit quality through optimized storage leads to higher-quality processed mango products, ultimately benefiting consumers. Finally, AI-driven solutions offer the potential to streamline the handling and storage of mangoes, enhancing operational efficiency and reducing costs throughout the supply chain.



How was it done?

The research methodology was designed to monitor mango ripening under controlled conditions carefully. First grade 'TomEJC' mangoes from CIC Holdings PLC were used. The experimental setup involved storing batches of mangoes at specific temperature and humidity levels for eight days. Daily measurements and image capture were conducted. For image capture, 5760 images were taken and organized into training and testing datasets. To quantify ripening, physicochemical properties, including weight, color, firmness, pH, and TSS, were measured. The resulting data was statistically analyzed. Finally, a Convolutional Neural Network (CNN) AI model was created and trained using the collected data to predict the optimal storage period of the mangoes.

What are the Key Research findings?

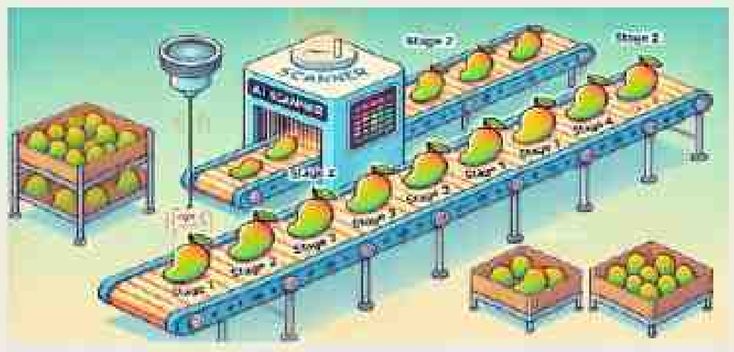
This study revealed some interesting changes as the mangoes ripened. Observed a clear rise in the amount of sugar (TSS) within the fruit, indicating it got sweeter over time. The pH, which tells us how acidic they were, also increased gradually during storage. On the other hand, the mangoes became softer, with their firmness decreasing noticeably. And visually, the mangoes change color, shifting towards more yellow shades, which is a typical sign of ripening. When analyzing all the measurements, some significant connections were found. For instance, the amount of sugar was strongly related to both the pH and the firmness of the mangoes. We also saw a link between the color changes and the sugar content. Overall, the AI model we used showed it could predict these ripening stages and the physiochemical parameters of the mangoes to a certain extent.

Limitations…

It's important to acknowledge this research has a few key limitations. First, we focused exclusively on the 'TomEJC' mango variety; results might differ for other types of mangoes, which ripen differently. Our storage conditions (temperature, humidity) were carefully controlled, unlike the variability of real-world settings. The model also didn't account for how climate change can affect ripening. Finally, AI models generally improve with more data, and using a larger, more diverse dataset could further enhance the model's accuracy and applicability.

Towards Smarter Mango Management

This research provides a strong foundation for using AI to optimize mango storage. By accurately predicting the optimal storage period, we can minimize waste, ensure consistent product quality, and improve efficiency in the mango industry.



This is a non-technical summary of the project report titled "Identifying the optimal storage period for TEJC mangoes before processing: an AI-based approach" supervised by Type your Internal Main Supervisor Name*, Department of Food Science & Technology, Faculty of Agriculture, University of Peradeniya. *rasanjalis@agri.pdn.ac.lk



A Novel Boric Acid -Based Gel for Sustainable Control of Domestic Ants in Sri Lanka

K. H. Geethmee Tayonika Dilshani

Problem?

Ant infestations are common in domestic and commercial areas, resulting in hygiene problems and damage to structures. Traditional ant control has been with chemical insecticides, but their environmental and health concerns necessitate environmentally friendly options. Boric acid gel baits offer a compelling option considering their low toxicities to humans and pets but high effectiveness against ants. However, despite its potential, there is a global shortage of research into boric acid gel baits and no published studies from Sri Lanka. This research aimed to evaluate the effectiveness of a boric acid gel bait product against common domestic ant species using laboratory and field trials.

Why Does Boric Acid Affect Ants but Not Humans and Pets?

Boric acid is so successful against ants due to their small body size, unique digestive system, and the way they share food within the colony. Boric acid works as a slow-acting stomach poison in ants, it disrupts their metabolism when ingested, leading to dehydration and, eventually, death. In animals and humans, however, boric acid is much less toxic because their larger body size dilutes the dose to such an extent that a much larger amount would be required to cause harm. In addition, mammals have more efficient detoxification pathways that can metabolize and eliminate small amounts of boric acid without toxicity. This makes ant baits based on boric acid a safer choice for household pest management, with fewer risks to non-target organisms and successful elimination of ant infestations.



Conducting field tests in the KIOSK

Conducting laboratory tests

Did you know?

Material cost of Producing 10ml of this gel is only 5 Rupees

How?

To develop the most attractive and effective gel, I conducted a step-by-step evaluation process:

- Step 1: Finding the Perfect Recipe

Before finalizing the gel, tested four different ingredient ratios to see which one attracted the highest number of ants. This ensured that ants would readily consume the bait. So, finally sugar powder: fish meal powder ratio is 3:1 selected as a perfect formulation.

- Step 2: Testing in the Laboratory

conducted controlled experiments on three common ant species:

Tapinoma melanocephalum (Ghost ants)
Monomorium pharaonis (Pharaoh ants)
Anoplolepis gracilipes (Yellow crazy ants)

Using six treatments (Control, 0.25%, 0.5%, 1%, 2% boric acid, and a commercial bait), I recorded the mortality rate over five days to determine which concentration worked best.

- Step 3: Field Testing – Real-World Battle!

took my best-performing bait (2% boric acid) and tested it in three locations:

🏠 A hostel room
🍽️ A restaurant
🍳 A kitchen

counted the number of ants before and after applying the bait to assess its effectiveness in a real-world setting.

Victory Over the Tiny Invaders

This study proved the effectiveness of boric acid-based gel bait in controlling household ants. In lab tests, the 2% boric acid formulation caused the highest mortality in ghost ants, Pharaoh ants, and yellow crazy ants, significantly outperforming lower concentrations and commercial bait ($p < 0.05$).

Field trials showed a drastic drop in ant populations within a day—533.3 to 1.3 in a hostel room, 146 to 15.3 in a restaurant, and 295 to 87.6 in a kitchen. A slight resurgence over time **suggested the need for repeated applications.**

These findings highlight boric acid gel bait as an eco-friendly, cost-effective solution for long-term ant control, paving the way for improved pest management in Sri Lanka.



Final outlook of the product

This is a non-technical summary of the project report titled "Laboratory and field evaluations of boric acid-based gel against common domestic Ants in Sri Lanka" supervised by Dr. W. H. Jayasinghe*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. *whj@agri.pdn.ac.lk



The Future Is Green: How Bioplastics Are Revolutionizing the Packaging Industry

R.D.I.S. Jayathissa

Imagine a world where plastic packaging does not choke our oceans or clutter our landfills. What if the materials that keep our food fresh could simply return to nature? This vision is not a far-off dream but a growing reality, thanks to the innovative field of bioplastics.

The Plastic Problem

We all know the story: plastic pollution is a massive problem. Conventional plastics, made from fossil fuels, take hundreds of years to break down. They harm wildlife, pollute ecosystems, and contribute to climate change. Finding eco-friendly replacements is no longer a choice, it is a necessity.

Nature's Building Blocks

This research delves into creating these sustainable alternatives using some surprising ingredients such as seaweed, crustacean shells, and starch.

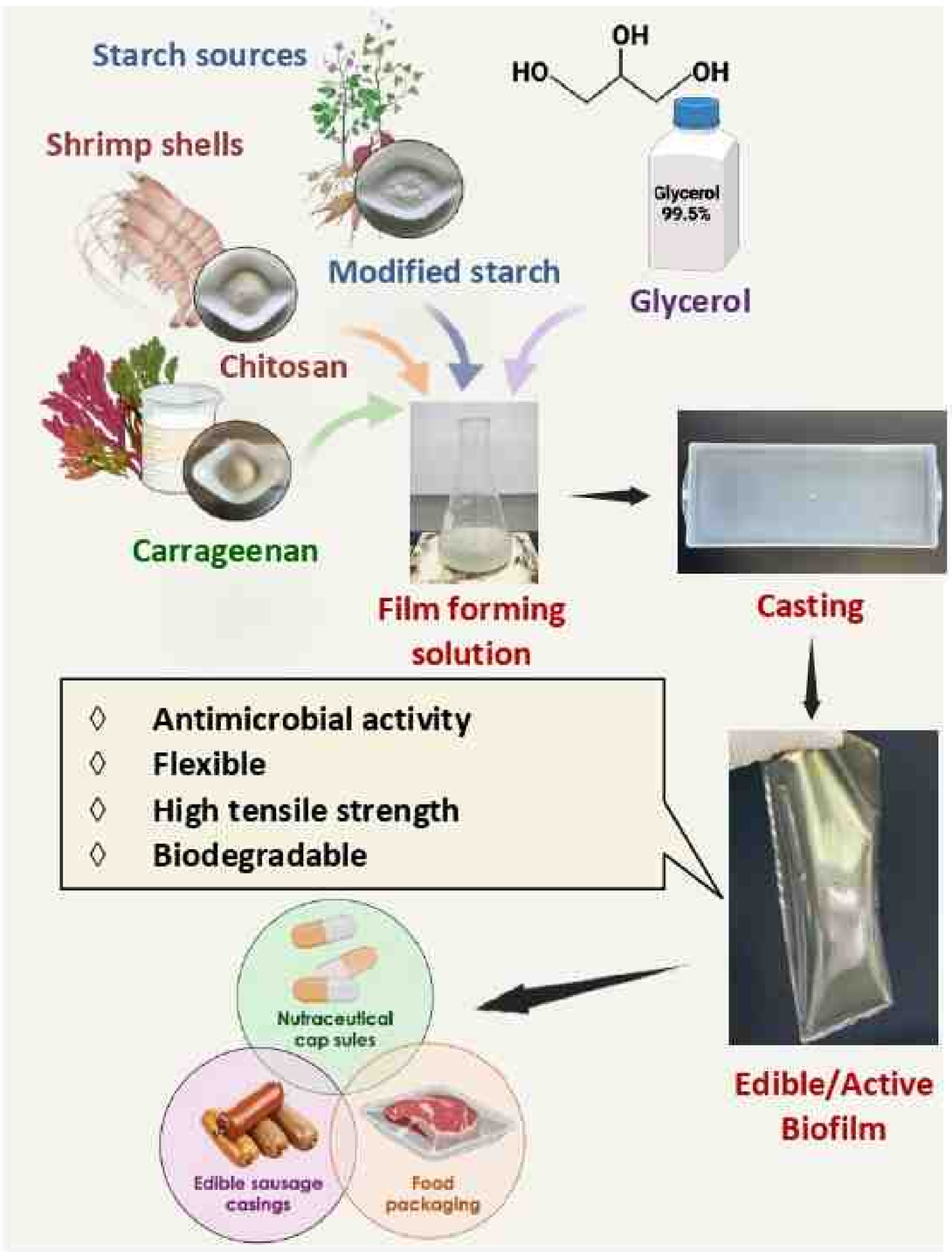


Figure 1: Bioplastic film fabricating procedure and potential applications

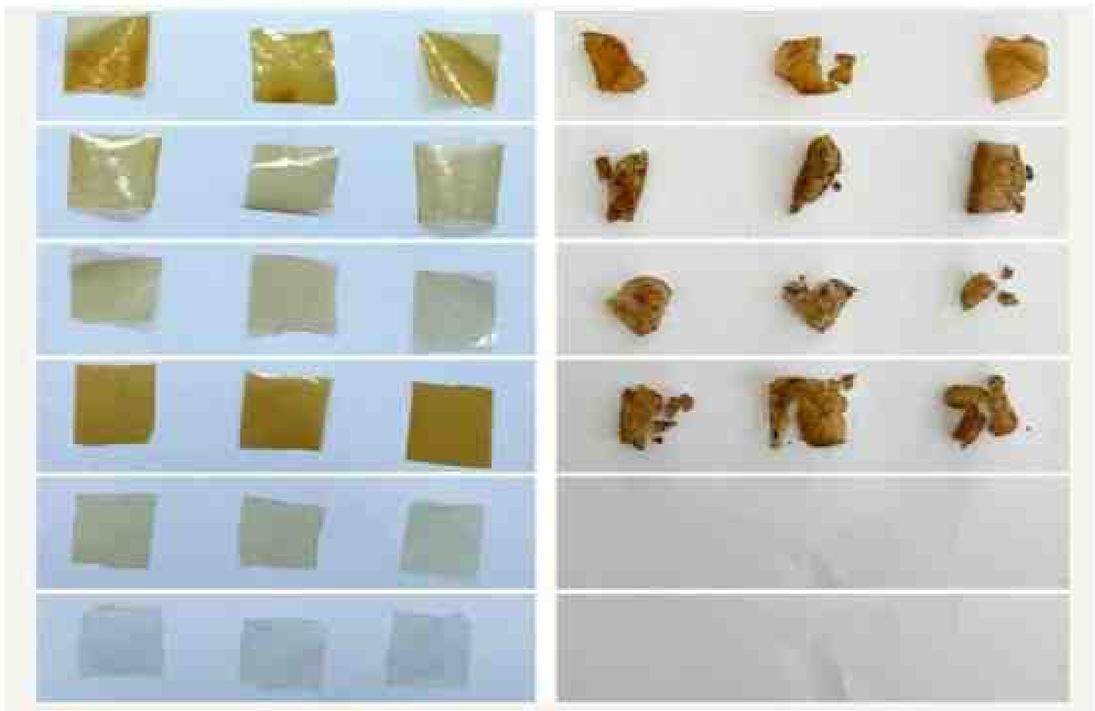


Figure 2: Biodegradability after 7 days of composting

Exciting Applications

Bioplastic films with antimicrobial chitosan enhance food shelf life by preventing microbial growth, ensuring fresher products and reducing waste. Their biodegradability makes them ideal for eco-friendly packaging, while their flexibility allows them to replace gelatin/cellulose-based sausage casings with a sustainable, edible alternative.

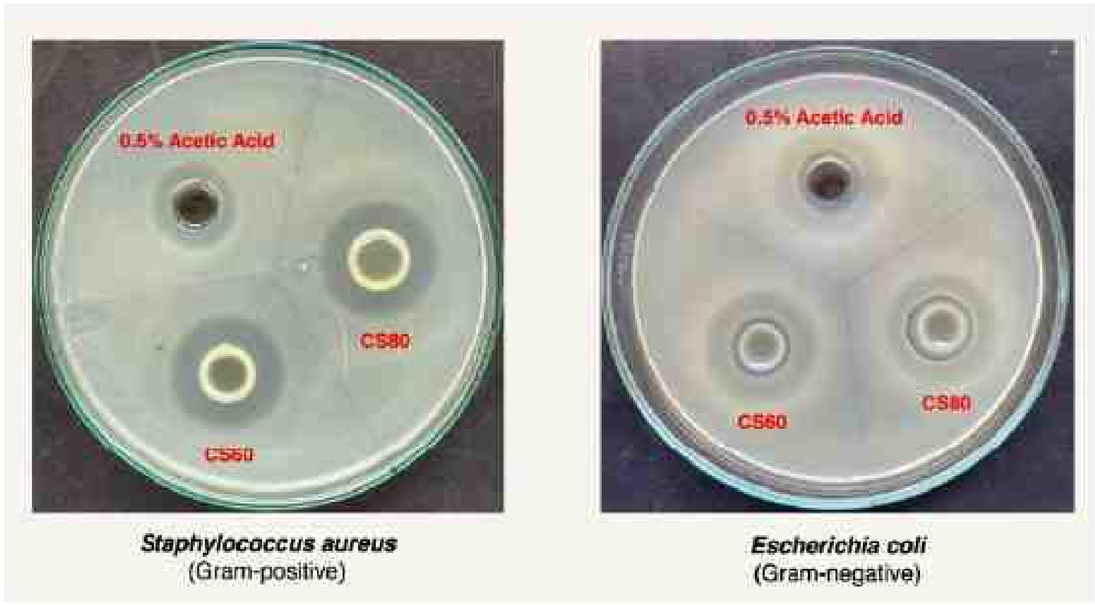


Figure 3: Antibacterial activity of the bioplastic film forming solution

A Greener Tomorrow

Bioplastics represent a significant step towards a more sustainable future. By harnessing the power of nature, we can create packaging materials that protect our planet while meeting our everyday needs.

It is time to embrace these innovative solutions and pave the way for a cleaner, greener tomorrow.

This is a non-technical summary of the project report titled "Development and Characterization of Active Bioplastic Film from Carrageenan, Chitosan, and Modified Starch: A Sustainable Alternative for Petroleum-based Plastics Packaging" supervised by Prof. J.K. Vidanarachchi*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *janakvid@agri.pdn.ac.lk and Prof. Pradeepa C.G. Bandaranayake*, Agricultural Biotechnology Centre, Faculty of Agriculture, University of Peradeniya. *pradeepag@agri.pdn.ac.lk



WORLD BEYOND THE ESTATE: How Off-Estate Employment of the Household Members of Tea Harvesters has Shaped Their Quality of Life (QOL)

W.P.T.S. Thilakarathna

> Despite the significant contributions to Sri Lanka's national output, net foreign exchange, and employment, the tea estate industry is facing challenges due to workforce shrinkage from the outmigration of labor to other sectors of employment. The tendency of estate residents to seek for more attractive off-estate employment opportunities has increased due to the poor living conditions in estates that affect the physical, social, environmental and psychological aspects of their quality of life **(QOL)**

According to the Department of Census and Statistics (DCS), an estate is a geographical area greater than 20 acres in extent and has more than 10 residential laborers and therefore, "off-estate" employment can be identified as the work performed by estate residents outside an estate's physical and operational boundaries, often involving different employers and sectors. It is worthwhile to investigate in which ways the off-estate jobs undertaken by estate residents have changed the conditions of their quality of life, since the estate sector has a historical legacy of poor living conditions.

The study was targeted at both male and female tea harvesters in a Regional Plantation Company (RPC) tea estate based in Hatton, with at-least one household member working an off-estate job. The key objectives of the study were to identify the types of off-estate jobs of the household members of tea harvesters, to evaluate the impact of the nature of off-estate job the household member and the demographic factors of the tea harvester on the overall QOL of the tea harvester and to elaborate on how the off-estate job has affected the physical, social relationships, environmental and psychological aspects of the tea harvesters' QOL



Key Findings of the study reveal that the off-estate jobs of the estate residents (household members of the tea harvesters) range from **off-estate wage** to **off-estate professional**, and most of them engage in off-estate manual labor jobs such as daily paid laborers, hotel/restaurant workers, factory workers, retail workers, domestic workers/housemaids (local and Middle-East), drivers, few of them are self-employed (vegetable growing, tailoring) and a small number of them work professional jobs such as teaching and police service.



The QOL of tea harvesters, which was assessed based on WHOQOL-BREF method, shows a marginal association with the nature of the household member's off-estate job in terms of their presence at home, i.e., if they work within the district and present at home or if they work outside the district and away from home and it indicates a significant association with the tea harvester's gender. Male workers show better QOL than females.

Further, the study reveals that, despite some off-estate job such as migrant jobs in Middle east which earn more than or around LKR 100,000 has led to notable improvements in household conditions of the tea harvesters, family members being away from home for most of the year has caused increased emotional loneliness among them. This highlights the need for more diversification of the jobs within the estate to retain the residents and their labor within the estate sector.

This is a non-technical summary of the project report titled "Off-estate Employment of the Household Members of the Tea Harvesters and Its Impact on Tea Harvester's Quality of Life (QOL)" supervised by Prof. Shamala Kumar*, Department of Agricultural Economics & Business Management, Faculty of Agriculture, University of Peradeniya. *skumar@agri.pdn.ac.lk.



Assessing the Nutritional Knowledge among Pregnant Women in Sri Lanka

S. M. Wanigabadu

Importance of maternal nutrition education

Maternal malnutrition is a critical issue in Sri Lanka, contributing to high rates of low birth weight (15.7%), stunting (17%), underweight (21%), and wasting (15%) among children under five. While nutrition education is essential, gaps in knowledge persist among pregnant women, particularly in different socio-demographic groups. This study investigates socio-demographic factors associated with nutritional knowledge among pregnant women to inform better-targeted educational interventions.

Study groups

A cross-sectional study was conducted among pregnant women from Peradeniya, Tissamaharama, and Kotmale area representing diverse socio-demographic backgrounds, with variations in age and education levels.

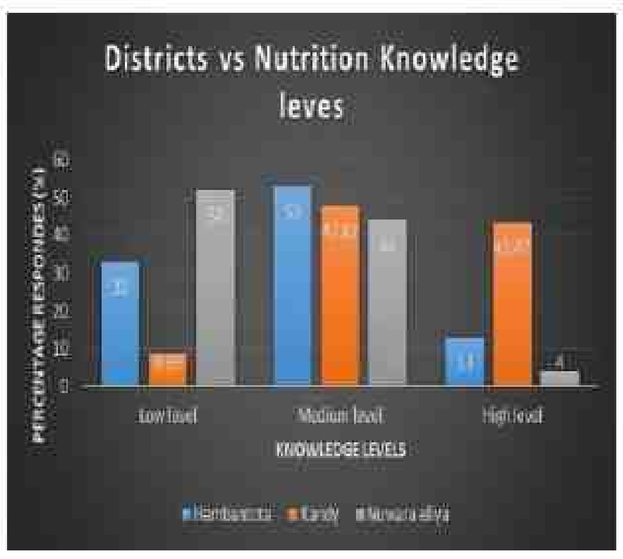
Study Measures

The participants' socio-demographic data such as age, education level, parity, ethnicity (Sinhala, Tamil, Muslim), district of residence, and monthly family incomes were collected through a pre-tested questionnaire survey. Additionally, the questionnaire also assessed their knowledge about general nutrition recommendations and the importance of proper dietary intake during pregnancy.

Results & Discussion

The study sample consisted of 78 pregnant women with a mean age of 28.91. The majority of the participants were 28-33 age groups. The results showed that the higher maternal age was associated with better nutrition knowledge levels ($r=0.274$, $p<0.05$). These results may be due to increased life experience and most older women have prior pregnancy experience.

Education levels were also significantly associated with nutrition knowledge ($p<0.05$). Individuals with higher education levels (tertiary education) show greater nutrition knowledge. Possible reasons for these results may be a higher ability to understand and apply nutrition guidelines. Further, it was identified that the levels of knowledge significantly vary by location. The highest nutrition knowledge was observed among women from Peradeniya and the lowest nutrition knowledge was observed in women from Kothmale. This could be due to the differences in education levels among populations and the gap between the availability and accessibility to health care facilities and sources of information. These findings emphasize the need for improved and location-specific nutrition education to address disparities in maternal nutrition awareness.



Recommendations

Community- based workshops and training should be conducted and develop a customized nutrition education programs for pregnant women, especially in rural and estate areas like Nuwara Eliya where nutrition knowledge lowest (52%). Mobile-based interventions (e.g., **nutrition apps, SMS reminders**) can bridge knowledge gaps in underserved areas. With 100% of pregnant women in the study sample using mobile phones and 89.9% owning smartphones, there is a strong opportunity to implement mobile-based health (mHealth) interventions

This is a non-technical summary of the project report titled "Assessing nutrition knowledge gaps and developing nutrition education mobile platform for pregnant women in Sri Lanka" supervised by Dr. S. S. Daundasekara*, Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *saumalid@agri.pdn.ac.lk.



Golden Brew: Enhancing Mead with Iramusu Magic

K. D. U. M. Medagama

What is Mead?

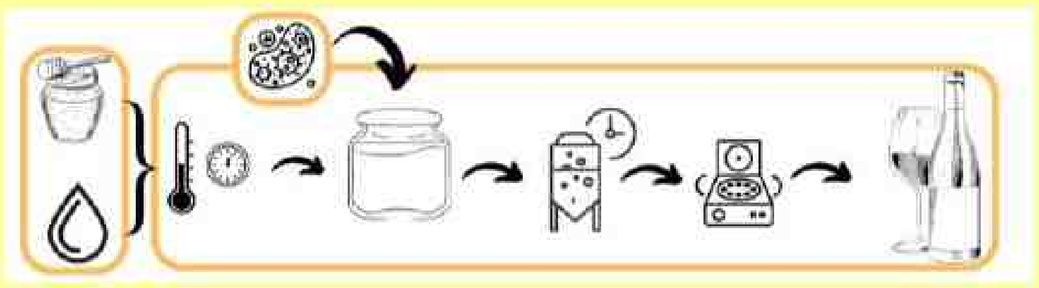
Long before wine filled chalice and beer aged in vats, there was **mead**, the golden nectar of warriors. Crafted from honey, water, and yeast, this ancient, fermented drink has been enjoyed for thousands of years, from Viking feasts to medieval banquets. Mead one of the oldest fermented beverages cherished by diverse cultures. Mead is prepared by fermenting a blend of honey and water in the presence of *Saccharomyces cerevisiae* and allowing maturation over time.

Why Mead?

Sri Lankan beekeepers face challenges due to limited honey product diversity. Unrecognized potential of mead as a marketable alternative honey-based product, providing bee farmers with yet another way of expanding their businesses. This diversification of honey use can help the honey industry cope with production exceeded and explore new local and international market opportunities.

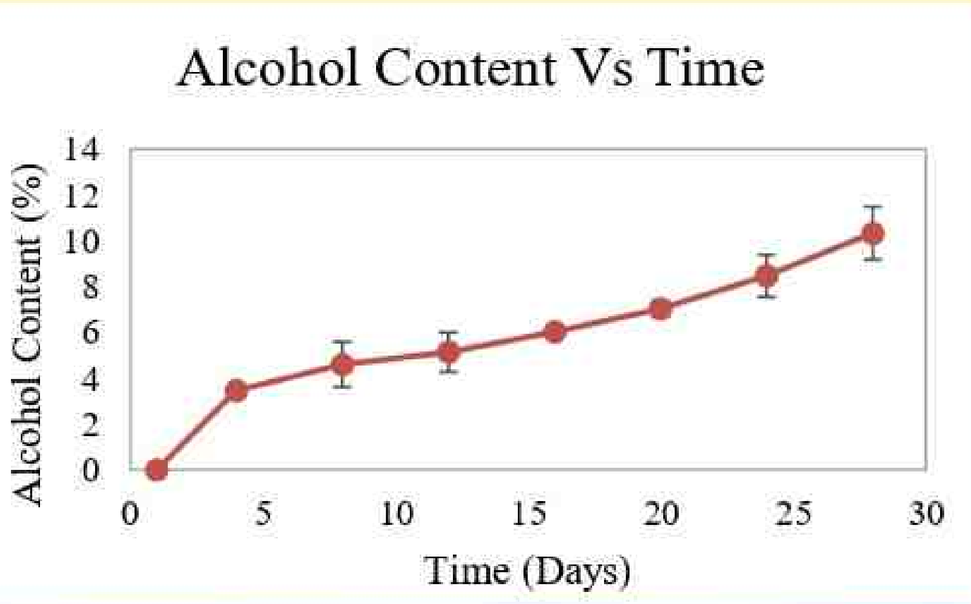
How is Mead Prepared?

Traditional mead is prepared by mix honey and warm water to form a fermentable must, adding the yeast, cover with an airlock, and let it ferment in a dark location at room temperature for 2 to 6 weeks. Mead can be sweet or dry, and age adds complexity. Here honey to water ration differs 1:1, 1:2 and 1:3 according to the desired alcohol content. 1:1 ratio gives the highest alcohol content. Moreover, to enhance the flavour and medicinal properties, several herbs, fruits are incorporated to mead.



What's special in this study?

In this study *Hemidesmus* indicus which is commonly known as "Iramusu", known for its antioxidant and anti-inflammatory properties, is incorporated to the mead to influence fermentation, dynamics and improve the mead's chemical and sensory profile. The research focuses on optimizing the extraction process using response surface methodology (RSM) and determining the best infusion concentration. The fermentation kinetics, titratable acidity, total soluble solids (TSS), yeast growth during fermentation. Optimum conditions for extraction ensure high antioxidant capacity in mead infused with iramusu. Fermentation kinetics confirms 11% alcohol content, high yeast growth, high titratable acidity, low TSS and optimal pH in iramusu incorporated mead.



Therefore,

Introducing iramusu into mead fermentation increases phenolic and flavonoid content, improves fermentation efficiency, enriches flavour, and has potential health advantages.



This is a non-technical summary of the project report titled "Optimization of Mead Fermentation Incorporating *Hemidesmus indicus: Exploring* Fermentation Dynamics, Sensory Attributes, and Health Benefits" supervised by Type your N. Y. Jayanath*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *jayanathny@agri.pdn.ac.lk.



Transforming Agricultural Waste into Sustainable Packaging: A Solution to Synthetic Plastic Pollution

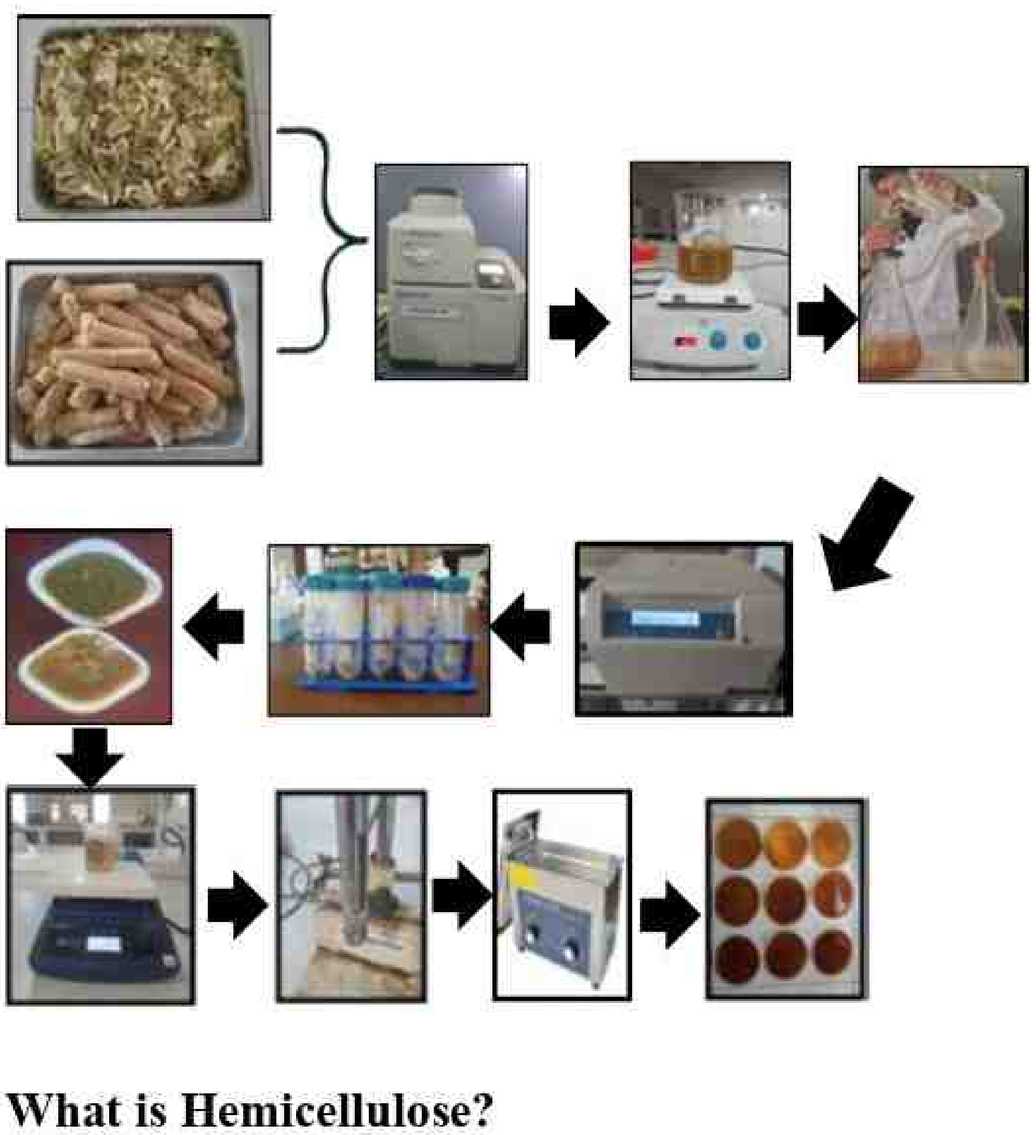
R.M.U.G.N.M. Rajanayaka

Growing Threat of Synthetic Plastic Pollution…

Synthetic plastics pose a critical global crisis with an increasing trend that adds thousands of metric tons to the environment annually. Therefore, the search for the sustainable alternative is more critical than ever since it contributes to the pollution, harming the ecosystem and persisting in the environment for thousands of years. In the context of Sri Lanka, it produces 250, 000 metric tons of plastic annually, with 69% being mismanaged.

Harnessing Agricultural Waste for a Greener Future…

Corn (*Zea mays*) husks and corn cobs, as agricultural residues, produce around 400, 000 of agricultural waste annually. Instead of being burned or discarded these residues can be repurposed into valuable materials. This research is focused on mitigating issues generated from synthetic plastic packaging by replacing the value-added packaging film derived from the corn waste-derived hemicellulose. Corn cobs and corn husks as an agricultural residue play an important role as a sustainable resource.



What is Hemicellulose?

Hemicellulose is a key component of lignocellulose, expecting the proper functional and barrier properties for packaging materials. Through the alkaline-ethanol mechanism, the hemicellulose can be isolated. Composite blending of hemicellulose with Polyvinyl Alcohol (PVA), Glycerol, Citric acid (CA) enhances the properties of biodegradable films.

Key Findings...

- **Optimized Hemicellulose Extraction:** Maximum yield of 20.4% ± 2.1% achieved under 4% NaOH, 6 h treatment, and 1000 rpm stirring.
- **Customizable Film Thickness:** Ranging from 0.21 ± 0.02 to 0.35 ± 0.3103 mm, adaptable for diverse packaging needs.
- **Enhanced Mechanical Strength:** Tensile strength peaked at 16.8 ± 1.5 MPa, with elongation at break reaching 27.6% ± 2.5%, ensuring flexibility and durability.
- **Improved Thermal Stability:** Films remained stable up to 200°C, with citric acid crosslinking enhancing heat resistance.
- **Proven Chemical Integrity:** FTIR analysis confirmed successful interactions between hemicellulose and PVA, verifying film composition.
- **High Biodegradability (%):** A 54.47 ± 20.92-95.70 ± 7.43 weight reduction in 5 days under composting conditions, significantly reducing environmental impact.

All the corn husk-derived hemicellulose-based films showed significantly higher level of elongation at break, solubility and biodegradability compared to the corn cob-derived hemicellulose-based films.

Future with Biodegradable Packing?

- **Tackling Plastic Waste:** Rapid decomposition minimizes long-term pollution.
- **Sustainable Resource Utilization:** Converting corn waste into high-value materials promotes a circular economy.
- **Market Feasibility:** Competitive production costs position biodegradable films as a realistic alternative to synthetic plastics.



Figure: Biodegradable packaging film

This is a non-technical summary of the project report titled "Development and Characterization of Biodegradable Packaging Film from Corn Waste-Derived Hemicellulose as a Sustainable Alternative to Synthetic Plastics" supervised by Prof. Janak Vidanarachchi, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. janakvid@agri.pdn.ac.lk.



Drops of Milk, Gallons of Water

N.A.M.M.N. Gunasekara

The Hidden Cost of Dairy Farming

Milk is a household staple, a symbol of nourishment and health. But behind every creamy sip lies an untold story—one of water, precision, and sustainability. Dairy farming, especially in intensive systems, relies on a delicate balance of resources, and water is at the heart of it all. In Sri Lanka, where only 45% of national milk demand is met locally, expanding dairy production is a national priority. However, with the global dairy industry already contributing 7% of the world's water footprint, efficient water management is more crucial than ever. Without careful monitoring, water wastage could escalate, threatening both agricultural productivity and environmental sustainability.

Measuring Every Drop



To uncover the real cost of milk production, our study at Ambewela Farm analyzed water consumption across different functional cow groups in a freestall dairy system. Through meticulous data collection and analysis, we measured water use from drinking, barn cleaning, milking parlor operations, and milk pre-cooling.

Findings revealed that:

- Lactating cows consume an average of 266 liters of water daily.
- High-producing cows (>40L/day) require nearly 96,000 liters per day across the herd.
- The water footprint per kilogram

A Sustainable Future for Dairy

The key to a more sustainable dairy sector lies in strategic water conservation. By implementing smart irrigation, recycling cleaning water, and improving hydration systems for cattle, we can significantly reduce unnecessary wastage. Technologies such as automated drinking systems and water-efficient cooling methods could play a transformative role in reducing dairy's water footprint.

But sustainability isn't just about saving water—it's about ensuring that Sri Lanka's dairy industry can thrive for generations to come. Every drop saved contributes to a more resilient food system, balancing the needs of farmers, consumers, and the environment.

Milk may seem simple, but its journey from farm to glass is shaped by every drop of water along the way. Understanding this connection is the first step toward a future where dairy farming is not only productive but also sustainable. After all, water isn't just part of milk—it's the foundation of life itself.



This is a non-technical summary of the project report titled "Essimation of the Water Footprint for zfree-Stall Dairy Cattle Management System" supervised by Dr.M.B.P. Kumara Mahipala*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *pmahi@agri.pdn.ac.lk .



Morphological Characterization of *Ex Situ* Conserved Sweet Potato Accessions in Sri Lanka

E.W.D.M. Nimalarathna

Background

Sweet Potato are a widely grown tuber crop and can be cultivated in many regions of Sri Lanka. They can be cultivated with easy management practices and provide important nutrients as food source. Researchers study different types of sweet potatoes conserved at the Plant Genetic Resource Center (PGRC) to ensure the best varieties are preserved and improved.



Purpose of the Research

The purpose of this study is identify and describe Sri Lanka's different sweet potato accessions. Researchers can identify which accessions are distinct, which are similar and which would be suitable for future breeding programs by looking thier morphological (physical) traits such as leaf color, internode length.

How the Research was Done

- Cuttings from different sweet potato accessions and recommended varieties were planted in filed
- Physical characteristics were observed such as leaf color, internode length, flower color and etc.
- Then results were found

Key Findings

- Some accessions were closely related to recommended varieties.
- Some accessions had unique characteristics
- Accessions with valuable traits such has leaf color, short internode length, leaf lobe type, petiole length, ground cover can be used for breeding purposes

Unique Color Variations

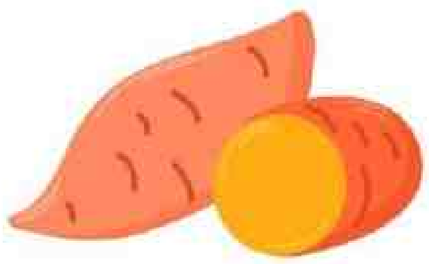


Vine Color Variations



Conclusions and Future Aspects

- This research helps to understand best sweet potato accession for breeding purposes.
- Future studies could involve more testing in different environments and advanced methods to confirm results.
- This will ensure that farmers get access to the best performing varieties

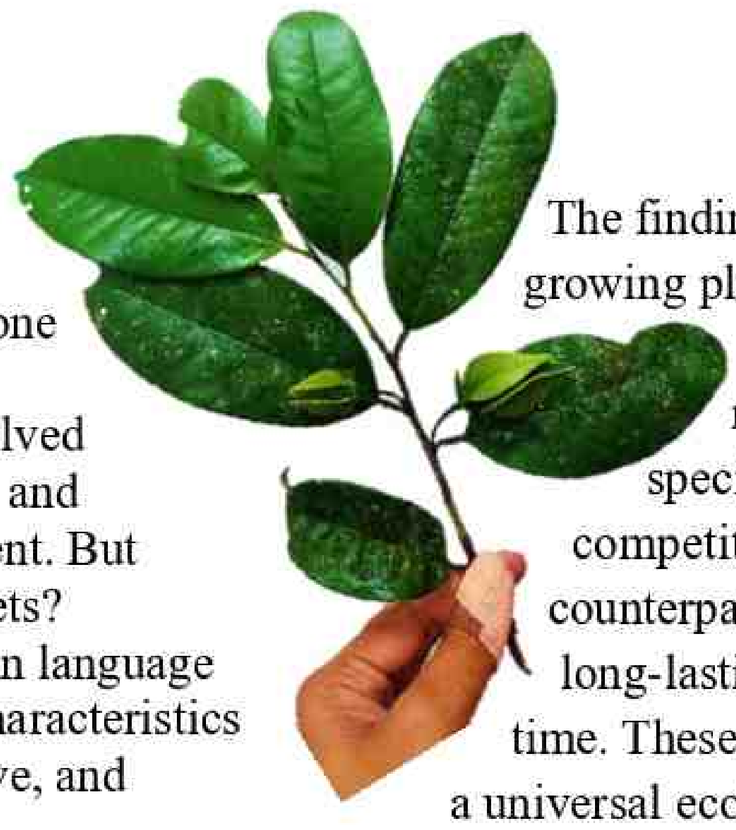


This is a non-technical summary of the project report titled "Morphological Characterization of ex situ conserved sweet potato accessions in Sri Lanka" supervised by Type your Internal Main Supervisor Name*, **Prof.J.P. Easwara**, Faculty of Agriculture, University of Peradeniya.
*jpeeswara@agri.pdn.ac.lk



Unveiling The Hidden Strategies of Forest Plants: A Leaf's Tale

Sulakshana Agalawaththa



Deep within the misty hills of lower montane forest remnants in Hantana, a silent battle unfolds one not fought with weapons, but with leaves. In the here, plants have evolved unique strategies to survive, adapt, and withstand in a changing environment. But what if we could decode their secrets? My research focuses into the hidden language of 'leaf functional traits', the key characteristics that define how plants grow, survive, and interact with their environment.

By analyzing 94 plant species, I explored differences in leaf structure, leaf nutrient content, and adaptation strategies across five plant groups, leaf lifespan (annual vs perennial), leaf lifestyle (evergreen vs non-evergreen), leaf form (simple leaves vs compound leaves), life form (tree, shrub, creeper, and herb), and origin (native, endemic, and invasive). Measuring traits such as leaf thickness, leaf total nitrogen and phosphorus content, specific leaf area (SLA), leaf dry mass content (LDMC) and so on, I uncovered patterns that reveal nature's blueprint for resilience.



The findings tell a fascinating story. Fast growing plants, like non-evergreens and annuals, prioritize phosphorus rich leaves to maximize energy capture. Invasive species, with their thicker leaves, gain a competitive advantage, outlasting their native counterparts. Trees, in contrast, invest in dense, long-lasting leaves, conserving resources over time. These strategies highlight a universal ecological trade-off, leaving us with a problem to should a plant grow quickly and risk fragility, or invest in toughness and withstand stress?



Understanding these strategies is more than scientific curiosity, also a gateway to conservation and sustainable forest management. In an era of climate change and biodiversity loss, recognizing how plants adapt helps us predict forest responses, enhance carbon sequestration, and protect fragile ecosystems. My research bridges the gap between ecology and conservation that offer insights for policymakers, foresters, and environmentalists can use to safeguard our forests for future generations.

Every leaf holds a story. It may a story of survival, adaptation, and resilience. By decoding these narratives, we unlock the potential to restore forests, battle against invasive species, and design more resilient ecosystems. The lower montane forests remnants of Hantana whisper their wisdom through their leaves.

Are you ready to listen?



This is a non-technical summary of the project report titled "Assessing differences in leaf functional traits across plant species grouped by leaf lifespan, leaf lifestyle, leaf form, life form and origin in the lower montane forest remnants in Hantana" supervised by Prof Lasantha Weerasinghe, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. lasanthaw@agri.pdn.ac.lk



Tales from the Field: When Maize and Sorghum found their Space with Pole Beans

✍ **W.K.N. Sandupama**

Friends That Work Together: A Farming Adventure

What if farms could produce more quality food, support more healthier livestock, and care for the environment simultaneously? This question was the beginning of a study in Sri Lanka's mid-country intermediate zone, where maize (corn), sorghum, and pole beans were combined to address the recurring issue of poor-quality feed for ruminants. The aim was to determine whether intercropping which is growing crops together, and adjusting the planting spacing could benefit farmers, animals, and the land.

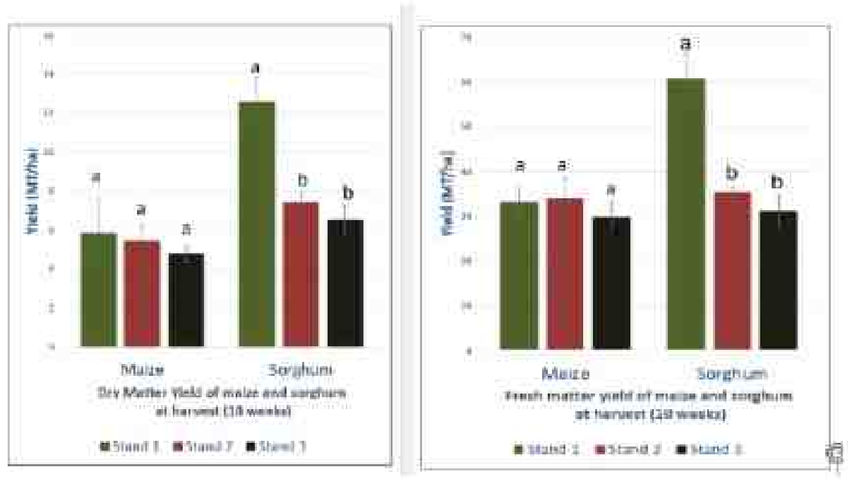
The Crop Circle: Meet the Players

It was a well-known fact that maize and sorghum are both tall cereal crops. While maize is rich in energy, sorghum is known for its drought tolerance and they serve as the foundation of the study. Pole beans, a climbing legume, was introduced after 35 days to maize and sorghum seeding to add protein and enhance soil nitrogen levels. These crops were tested in monoculture (solo) and intercropped setups at the experimental station at Dodangolla, Kundasale. Various spacings were trialed for a period of 10 weeks, amidst fluctuating sun and rain, to explore their impact on growth and yield.



Space Matters: The Spacing Effect Was Real

It was discovered that spacing significantly influenced outcomes. For sorghum, monoculture spacing was set at 0.46m between sorghum rows and 0.15m between plants (0.46 m ×0.15 m), while intercropping used medium (0.46 m × 0.46 m) and wider (0.46 m × 0.61 m) gaps alongside pole beans. In monoculture, sorghum reportedly achieved an impressive 60.83 tons of fresh matter per hectare and a height of 241 cm. However, when intercropped, yields were reduced to 31–35 tons though wider spacing was found to mitigate this drop by giving sorghum more room to thrive. Maize was also tested at standard spacing (0.61 m × 0.61 m) and wider (0.61 m × 0.76 m) spacings and results maintained steady yields of 29–34 tons and heights of 230–233 cm, regardless of spacing or intercropping. It was concluded that sorghum's performance depended heavily on space, while maize remained largely unaffected.



Is This Really Matters: A Big Yes

It was suggested that intercropping, when paired with optimum spacing between plants, could diversify feed by combining cereal energy with bean proteins, enhancing livestock health. For smallholder and medium scale farmers mainly, this new approach was seen as a healthier way to enhance incomes without increasing input costs like land and seeds. Environmentally, it can be introduced as a sustainable approach for enriching soil and reduce resource scarcity, offering practical and sustainable solutions for the future farmers.

This is a non-technical summary of the project report titled "Intercropping of maize and sorghum with pole beans in mid-country intermediate zone" supervised by Dr. Kumara Maheepala*, Department of animal science, Faculty of Agriculture, University of Peradeniya. *pmahi@agri.pdn.ac.lk

Unveiling The Mysteries of the World of Moths



Arundi Jayasekara

A 150-Year-Old Mystery...

The intricate patterns he observed on the wings of moths was one of the first things Dr. Thwaites, the director of Peradeniya botanical gardens found loveable about the tiny tropical island called Ceylon. Fascinated by the sketches of his native draftsman Mr. De Alwis, Dr. Thwaites reached out to the Governor with the request to use him for the purpose of producing sketches of the lepidopterous insects of Ceylon. It was this set of sketches that laid the foundation for the three volumes of Lepidoptera of Ceylon authored by Fredrick Moore, perhaps the oldest piece of literature in the world written regarding lepidopteran diversity.

Despite boasting such a prestigious history and Order Lepidoptera being the third largest and most aesthetically valued insect order of the world, moths in Sri Lanka have been poorly studied during the past one and half centuries.



Lepidoptera of Ceylon



As pollinators



Ecological indicators

Moths: The irreplaceable triple Ps

Moths play a remarkable role in agroecosystems as pollinators, pests and prey. While bees have been often portrayed as the super pollinators, moths are the unsung heroes who are adapted to pollinate the highest number of flowers within the shortest time span. Fall Armyworm moths continue to mock the agricultural entomologists worldwide, pushing farmers out of crop production, and the lack of understanding on the behavioural dynamics of nocturnal lepidoptera hinders the implementation of effective pest control programmes. On the other hand, moths serve as a major food source for insectivorous birds and bats, and many reptiles and amphibians who serve as the natural pest monitoring systems in farmlands.

The fool-proof eco-alarms

Moths are known to be more sensitive to environmental changes and habitat fragmentation compared to their diurnal counterparts, the butterflies. Therefore, they are one of the early indicators of a bigger issues such as the gradual destruction of an ecosystem or global climate change. Hence, researchers have a role to give them the long overdue respect and reveal to the world the science behind their behavioural patterns.

Moths from the misty hills and dry plains

With the aid of a white tent, the moth diversity of the Dilmah one Earth Climate Change Centre, Nawalapitiya and Mahailuppallama Sub Campus were studied, spending seven days at each location. Interestingly, none of the moth species were shared by the two locations and the family wise composition of the communities were noticeably different. For example, Crambidae, the most abundant family in the Dilmah Centre was completely absent in the Mahailuppallama community where the most abundant Erebidae family exceeded 50% of the sample.

Moths defying conventions

Previous research studies on moths have repeatedly concluded that moth activity (understood in terms of the number of moths discoverable from the traps) tend to increase with rise of temperature and tends to decline with increase of humidity. However, the moth counts in Nawalapitiya showed an increasing tendency with humidity while being unaffected by temperature, and the moth activity in Mahailuppallama was negatively related to temperature. While literature states that moths are less attracted to artificial lights when ambient moonlight levels are higher, the highest moth activity in Mahailuppallama was recorded during a full moon day. Despite their many differences the peak active hour for both communities was between 07:00PM and 08:00PM. Moths have been left in dark for too long for a single researcher to decode all their mysteries. However, this research will shed some light on the complexities of their world.

This is a non-technical summary of the project report titled "Assessment of the diversity of moth species in two selected locations of Sri Lanka" supervised by Professor K.S. Hemachandra*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. * ks_hemachandra@agri.pdn.ac.lk.



Sweet Success: Tuning The APSIM Model for Climate-Resilient Sugarcane & Smarter Nitrogen Use

Ayesha Thilini Wijesekara

Sugarcane (*Saccharum officinarum* L.) is a vital cash crop to both sugar and bioenergy production worldwide. Eighty percent of sugar is produced using sugarcane worldwide. Sri Lankan sugarcane faces difficulties with climatic variability and sub-optimal nitrogen fertilizer application.

The Blueprint of Discovery

The study focused on the objective of calibrating and validating the APSIM (**A**gricultural **P**roduction Systems **Sim**ulator) sugar model 7.9 version to simulate sugarcane growth and model performance at Lanka Sugar Company, Pelwatte, Sri Lanka using the sugarcane variety SL 96 128.



Figure 1-Procedure of study

The data were used as experimental data of the current field for calibrating, while experimental data from previous years were used for validating the model. Scenario analysis was conducted to optimize future climate change adaptation and Nitrogen fertilizer management with 17 years of past weather data and 2030, 2050 and 2100 Representative Concentration Pathways (RCP) future climate scenarios.

APSIM was calibrated with adjustments to leaf dimensions, crop height, Radiation Use Efficiency and thermal time development phases. Model calibration and validation were done by comparing model output with observed data in a 1:1 graph and using statistical indices: Root Mean Square Error (RMSE), Relative Root Mean Square Error (RRMSE), and Model Efficiency (ME). Model calibration was done using Aboveground Biomass, Leaf Area index (LAI) and Plant height. Calibrated and validated model was used for scenario analysis.

Findings and Insights

The APSIM model was calibrated well with site data, and high conformity between measured and simulated values. The APSIM model was accurately calibrated for Aboveground Biomass (RRMSE-14.6%), LAI (RRMSE-14.5%) and Plant height (RRMSE-13.2%) and validated for Aboveground Biomass (RRMSE-6.4%).

When doing scenario analysis, according to the RCP future climatic conditions, it showed that changing temperatures and variable rains can vary sugarcane production depending on levels of climatic change.

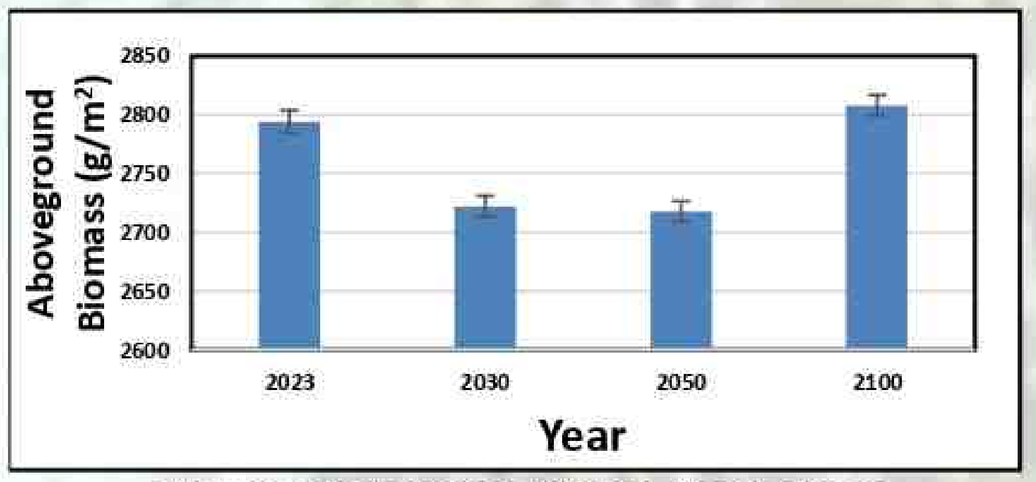


Figure2: Yield response in future climate change

Different nitrogen fertilizer scenarios showed slightly different responses. The recommendation is 50 kg of basal, 100 kg of top 1 and 100 kg of top 2 dressings of Urea fertilizer. Optimal nitrogen management was obtained with suggestions to avoid basal dressing and go with 50 kg/ha in the first and 100 kg/ha in the second top dressings. It maximized the potential production with less loss of nitrogen and environmental problems.

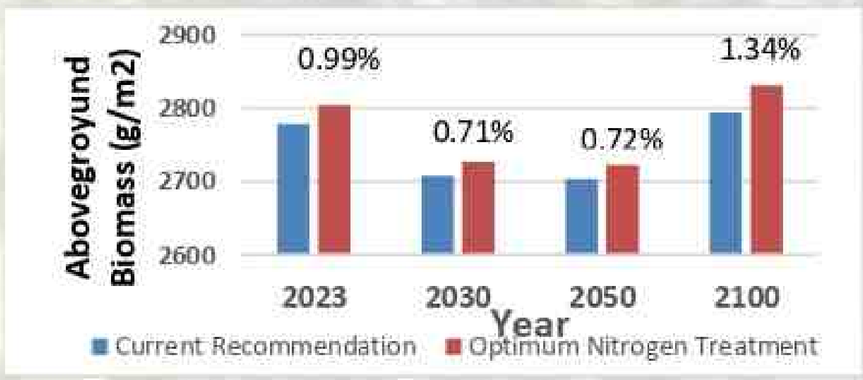


Figure 3- Yield increasement of optimum and recommendation

Derived optimum Nitrogen fertilizer treatment, resulted slightly higher or similar yields as current recommendation while drastically reducing the fertilizer input by 100kg and this response was same in future climate conditions as well.

This is a non-technical summary of the project report titled "Calibration and Validation of the APSIM Model for Sugarcane (*Saccharum officinarum* L.): Nitrogen Fertilizer Optimization and Climate Change Adaptation for Yield Improvemet" supervised by Dr. S.H.N.P.De Silva, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *sssnuwanp@agri.pdn.ac.lk



Break the Fertilizer Cycle – Reduce Maize Production Costs while Maintaining Yield and Quality

S.G. D.D. Jayarathna

In Sri Lanka, annual domestic milk production satisfies only about 40% of the national requirement. Dairy sector faces several challenges particularly meeting the growing demand of milk. Low milk productivity of improved milking dairy cows is a reflection of low nutrient availability. One of the major problems that faced by dairy industry is lack of availability of quantity and quality forage throughout the year. Most of the farmers depend on natural grass land, both the quantity and quality poor and leading to low milk production. Hybrid varieties and drought tolerance forage verities has emerged as promising crop for ruminant feed industry.

Why Maize?

Maize *(Zea mays L.)* drought tolerance and nutritive value is high when compare with other mostly abundant forage verities. Due to the high biomass yield and soluble carbohydrate level ideal for the silage production.

In recent years, introduces hybrid fodder maize seed varieties to the Sri Lankan market with an aim to uplift the dairy industry. Fertilizer recommendations for cultivation of hybrid fodder maize have not yet been established in Sri Lankan condition. Fertilization obviously influences maize growth, if we can reduce cost of fertilizer while maintaining yield and quality can provide cost-effective solution for the forage deficiency.



Why Harvesting Time is Important?

Harvesting maize at the optimal time is crucial. Plant maturity influence animal performance by affecting feed intake, palatability.

At ideal harvesting time Dry matter level should be around 30-35%. Harvesting within this range ensures a balance between moisture and nutrient content and also effective fermentation and preservation of forage. This can be identified by looking at the milk line (1/2 milk line)



According to my findings 10 % reduction in urea and TSP fertilization from the recommended rate will not affect to the yield and quality of hybrid maize.

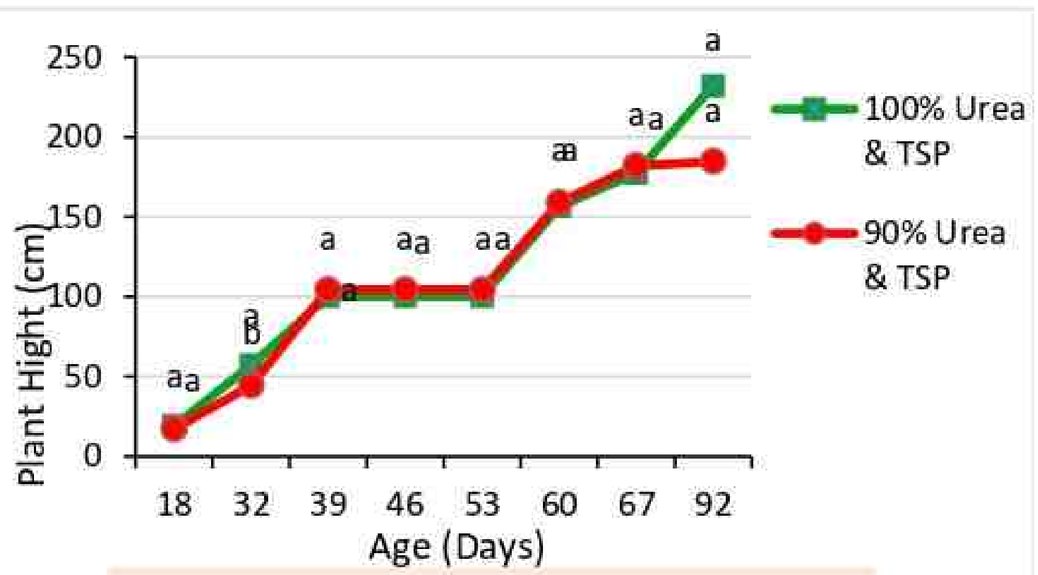


Figure 1- Maize Grwoth Under Recomended and 10% reduced fertilizer application

Harvesting at the correct stage optimizes forage yield and quality. Removing the cob drastically reduce nutritive value.

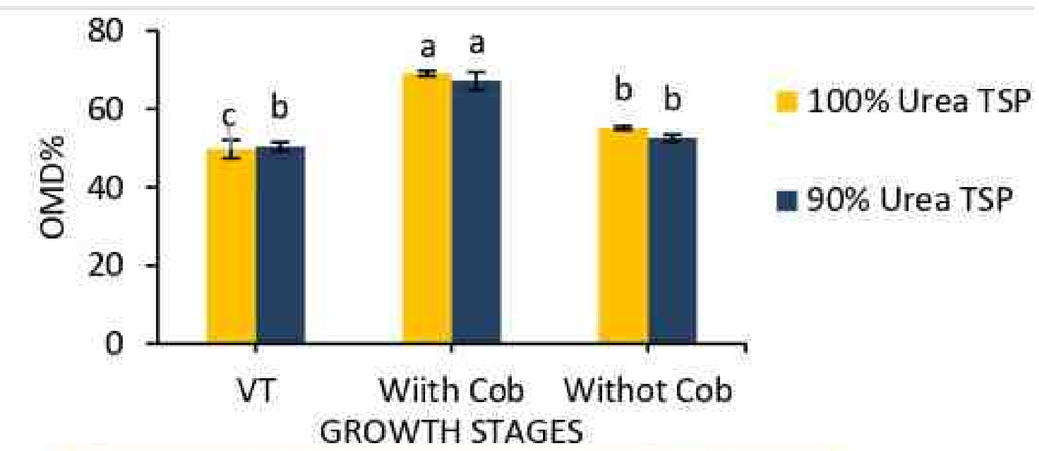


Figure 2-Variation of Dgestibility at VT and R5 Stages Under Two Different Fertilizer Levels

This is a non-technical summary of the project titled "Effect of Reduced Nitrogen Phosphorous Fertilization on Nutrient Assimilation at VT and R5 Stages in Fodder Maize" supervised by Dr. Kumara Mahipala*, **Department of Animal Science**, Faculty of Agriculture, University of Peradeniya. * pmahi@agri.pdn.ac.lk



The Variation of Career Aspirations of School Going Children of Estate Communities in Sri Lanka

D.M.S.L. Dissanayake

Title: The Variation of Career Aspirations of School Going Children of Estate Communities in Sri Lanka.

Author: Dissanayake Mudiyanselage Sudeepa Lakshmi Dissanayake.

Institution: University of Peradeniya, Sri Lanka.

Context: This study explores the career aspirations of 53 secondary school children and their households of Regional Plantation Company (RPC) tea estate in Hatton, Sri Lanka for the purpose of reducing labor outmigration challenge in the RPC tea sector.

Objectives:

1. To understand the aspirations of children and their families regarding work or non-work in the estate.
2. To explore why some children, plan to work in RPCs while others leave the estate.
3. To evaluate how socioeconomic factors affect for those aspirations.

Methodology:

Mixed method approach was practiced with the cross-sectional time horizon. Data was analyzed by using Expectancy theory which is an existing theory and Partial Least Squares Structural Equation Modelling (PLS-SEM). The study site is a well-established Regional Plantation Company (RPC) in Hatton, Sri Lanka.

Key Findings:

I. All children aspire to go outside the estate for work due to social stigma, lack of advancement and lack of technological integration in tea harvesting practices.

II. Parental aspirations strongly support children's aspiration about work or non-work in the estate ($P<0.05$) while concerning security and quality jobs either from estate or outside.

III. Household and housing conditions strongly support for career choices of children while worker skill development and available finance do not support.

IV. By in depth interviews with children and parents, it reveals that social rejection by external communities and structural barriers present in the estate managerial posts for the youth of estate are primary drivers for outmigration.

Implications:

Policy interventions by more focusing on their household and housing condition rather than worker skill development and available finance, integration of technology for harvesting practices and organizing programs to reduce social perceptions of external community about estate communities are the implications that can be handled to reduce outmigration of estate laborers.

This is a non-technical summary of the project report titled "Social and Economic Influences on Work Aspirations: The Case of Children in Secondary Education and Their Families Living in RPC Tea Estates." supervised by Prof. Shamala Kumar, Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya. skumar@agri.pdn.ac.lk.



Non-Target Effects of Herbicides: Impact on Plant Growth Promoting Bacteria

R.A.K. Sathsarani

Introduction

The global food demand has steadily increased. It has been driven by an ever-growing population and changing dietary patterns. Agrochemicals have become essential components of modern agriculture to increase productivity and total production. However, misuse of these chemicals causes environmental impacts. Plant growth-promoting bacteria (PGPB) are the plant-associated bacteria that contribute positively to the development of plants through direct and indirect mechanisms. Most of the PGPB species belong to the genus *Azotobacter*, *Bacillus*, *Clostridium*, *Pseudomonas*, and *Rhizobium*. Of these, *Bacillus* spp are spore-forming, gram-positive, rod-shaped bacteria colonies with specific characteristics like rough, waxy growth and irregular spreading edge. They can survive for extended periods under unfavorable environmental conditions due to spore formation. Further, *Pseudomonas fluorescens* are gram-negative rod-forming, producing soluble greenish pigments in iron-limited conditions that fluoresce when illuminated with UV light.

Objectives

To assess the effect of commonly used herbicides on plant growth-promoting bacteria by exposing bacterial cultures to different concentrations of herbicides and monitoring their growth.

Bacterial Isolation

The *Bacillus* spp. were isolated from the rhizosphere and plant roots. Each sample was divided into 2-4 g lots. Five grams of the rhizosphere-soil samples were added into 10 ml of sterilized distilled water to prepare the dilution series. All the test tubes were heated in a water bath at 80 °C for 20 min. Then the *Bacillus* spp was cultured in nutrient agar media. *Pseudomonas fluorescens* was isolated by using rhizosphere soil and it was added to 100 ml of sterilized 0.1M phosphate buffer solution. Then the *P. fluorescens* was cultured in King's medium B base. Thereafter, the culture plates were observed under an ultraviolet trans-illuminator at 366 nm and *P. fluorescens* bacteria showed fluorescent characteristics under UV light (Figure 1). Glyphosate, Pendimethalin, Topramezone and Nicosulfuron were used as the test-herbicides at three different dosages. The Isolated colony was planted on herbicides-treated culture plates and measure the colony expansion after 24 hours.



Figure 1: Fluorescent characteristics of the *P. fluorescens*.

Results

Glyphosate enhanced growth of *Bacillus* at recommended and half dosages. However, it suppressed the growth of *P. fluorescens* indicating that this bacteria is sensitive to glyphosate than the *Bacillus* spp. Increasing concentrations of glyphosate negatively affected both microorganisms. Pendimethalin showed a marginal inhibitory impact on microorganisms at its recommended dosage. However, some studies have shown that *Bacillus* spp has an ability to degrade pendimethalin. Topramezone enhanced *Bacillus* growth even at the double dosage. Recommended dose of topramezone did not have a significant negative impact the two bacterial species at the recommended dosage that effectively control weeds. Nicosulfuron reduced the growth of *Bacillus* spp., but, enhanced the growth of *P. fluorescens* at recommended and half doses. Previous studies have also shown that *P. fluorescens* utilizes Nicosulfuron as a nutrient source.

Conclusion

The recommended dosage of the four selected herbicides did not have a significant negative impact ($p<0.05$), while it effectively control weeds. Increasing the dosage of herbicide use may negatively affect the plant growth-promoting soil microbes *Bacillus* spp and *P. fluorescens*.

This is a non-technical summary of the project report titled "The Non target effects of herbicides impacts on plant growth promoting bacteria as *Bacillus* spp and *Pseudomonas fluorescens* in upland soils of Sri Lanka. Supervised Senior Professor B. Marambe *, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *bmarambe@gmail.com.



Sri Lanka's Poultry Industry: Can We Compete in Global Markets?

A.D. Samadhi Warnakula

Sri Lanka's poultry industry has achieved remarkable growth, largely driven by private sector investments in advanced technology, large-scale feed manufacturing, and vertically integrated production models. These improvements coupled with avian influenza free status of the country gives us comparative advantage in global poultry market. However, despite these strengths, Sri Lanka's poultry exports remain lower, contributing only 1-2% of total production. This raises a critical question;

Can we compete in the global market with our prices?

A major barrier to competitiveness is the high cost of key inputs, particularly feed ingredients such as maize and soybean meal. Feed costs account for 70-80% of total poultry production expenses, with maize alone making up around 50%. However, restrictive trade policies, such as taxes on maize and import quotas, have artificially inflated local maize prices. These quotas, intended to protect domestic maize farmers, have led to inefficiencies by limiting sourcing options, increasing aflatoxin risks, and discouraging productivity improvements. Similarly, restrictions on maize and soybean meal imports from key suppliers in the world further elevate feed costs, making production more expensive compared to global competitors.

To assess the extent of market distortions in Sri Lanka's poultry industry, I conducted a price incentive analysis to evaluate price incentives and trade protection. The results reveal key differences between the broiler and layer industries. While broiler products were on average lower than global market prices in previous years, recent cost increases have eroded this advantage. During 2016-2020 domestic chicken prices were lower compared to world prices and we could observe a clear increase in chicken exports during that period. But after 2021 domestic chicken prices has increased compared to world prices and it is the reason for falling exports.



In contrast, domestic egg prices remained significantly higher than international benchmarks, limiting their competitiveness in export markets. However, Sri Lanka has successfully exported a small portion of its egg production to countries like the Maldives, leveraging its quality advantage and geographic proximity.

According to the study, key feed ingredients such as maize and soybean meal have remained significantly more expensive than world market prices, further increasing production costs. These findings indicate that high feed costs, driven by restrictive trade policies, place Sri Lankan poultry farmers at a net disadvantage, limiting both competitiveness and export potential.

To unlock the full potential of Sri Lanka's poultry industry, key policy reforms are essential. Lowering feed costs by removing maize import quotas, reducing taxes, and easing restrictions on maize and soybean meal imports would enhance efficiency. Supporting domestic maize production with better seeds and modern techniques can boost productivity without relying on artificial protections.

Expanding export market access and offering duty rebates to exporters would strengthen global competitiveness. Sri Lanka has the potential to expand its presence in the global market—but it needs the right environment to truly thrive.

This is a non-technical summary of the project report titled "Price incentives and market distortions in Sri Lanka's poultry industry: an analysis of nominal and effective rates of protection during 2013-2024" supervised by Prof. Jeevika Weerahewa*, Department of Agricultural Economics and Business Management, faculty of Agriculture, University of Peradeniya. *jeevika.weerahewa@agri.pdn.ac.lk



Boosting Rice Yield with Smart Genetics

Pathumi Amarawansha

Rice is the staple food in Sri Lanka. It plays a significant role in the country's economy. In the past few years, Sri Lanka has been facing a huge rice crisis with declining yields and threatening food security and food safety due to many reasons. Among them, climate change, pest outbreaks, soil degradation, and the scarcity of cultivating lands are highlighted. Annually, Sri Lanka produces nearly 4.75 million metric tons per year in both seasons, Yala and Maha. Further, certain improvident policy decisions led to a crisis, resulting in drastic declines in production. High-end research is essential in rectifying these issues.

The Department of Agriculture has introduced 10 top-yielding rice varieties to Sri Lankan farmers, These varieties are different from each other with their yield, plant architecture, disease resistance, and crop duration. As we all know, genetics or genes are the basis for such variations within a species. Rice yield is a quantitative trait, and thus several genes contribute to the final phenotype. In rice, several yield parameters contribute to final yield: number of tillers per plant, number of panicles per plant, plant height, number of seeds per panicle, 1000-grain weight, and many more. For all these parameters, there is one or more genes controlling the phenotype.



Figure 2 Different varieties were grown in the pot experiment

I focused on the diversity of the yield-controlling genes in Sri Lankan high-yielding rice varieties. By assessing the diversity among top-yielding varieties, as plant breeders, we can produce super-performing rice varieties using breeding methods such as marker-assisted selection.

Marker-assisted selection is a breeding method used worldwide to increase crop yield.

With the help of this strategy, we can determine the interested trait even at the seedling stage. The procedure includes extracting DNA from the seedlings and testing it with known molecular markers, which can detect the yield-controlling gene. In my study, I identified huge variations in yield-controlling genes even among the top-10 varieties.

With the help of this study, we can produce new varieties targeting different yield parameters. As an example, if one variety has having higher number of productive tillers with shorter panicle length, we can cross it with a variety which having the highest panicle length.

Then the progeny plants have a higher number of tillers with longer panicles. Though all the visible variations are controlled by genes, by detection and manipulation of genes lead to an increase in rice yields by enhancing disease resistance, optimizing nutrient uptake, and increasing tolerance to environmental stresses. Accordingly, our food security and food safety would be assured.

So far, Sri Lanka has not adopted marker-assisted selection targeting yield parameters. So, plant breeders must initiate such high technologies, including marker-assisted selection in yield parameters. Marker-assisted selection can also help reduce time and cost used for the breeding programme.

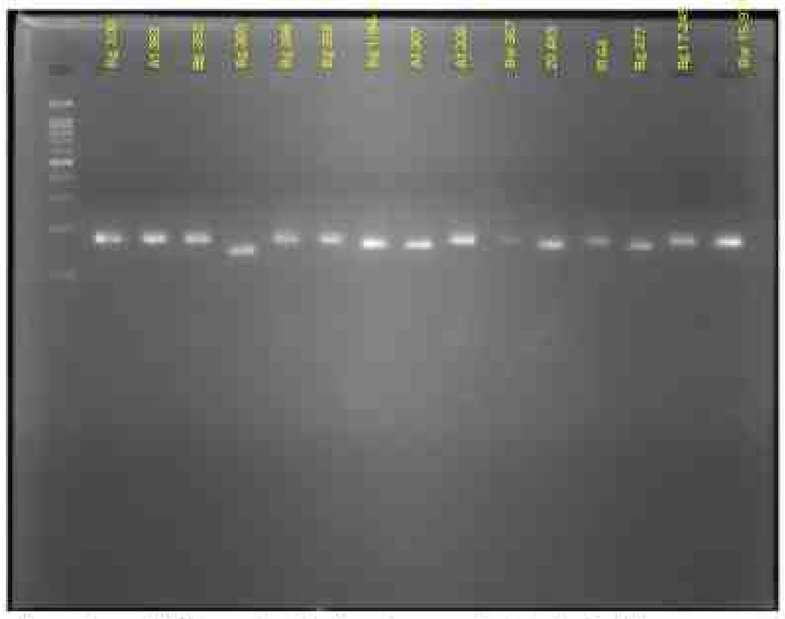


Figure 1 showing different alleles in a selected yield parameter

This is a non-technical summary of the project report titled "Molecular characterization of a panel of rice cultivars for allelic diversity for yield related functional markers." supervised by Prof. S.A.C.N Perera*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. * chandrikaperera@agri.pdn.ac.lk



Harnessing Machine Learning to Monitor Urban Lake Restoration

T.S. Warnakulage

Urban lakes are more than just scenic spots—they're lifelines for communities, supporting biodiversity and providing water resources. But with growing urbanization, pollution from runoff, waste, and other human activities has made it harder for these lakes to stay clean and healthy. One innovative approach to restoring these lakes is the use of Floating Treatment Wetlands (FTWs).

What are FTWs?

FTWs are terrestrial plants such as Cannas grown on soilless floating platforms. Their roots extend below the floating platforms, absorbing pollutants. These submerged roots also provide a habitat for beneficial microbes that further break down harmful substances, creating a self-sustaining water purification system.

Struggle in Monitoring FTW Performance

As amazing as FTWs are, monitoring their performance isn't easy. Lakes are highly complex systems and once FTWs are implemented they are influenced by numerous factors, such as water flow, temperature fluctuations, and nutrient levels. To measure their performance, it needs specific arrangements and designs tailored to compensate lake's design. Without a precise method to assess their impact, evaluating their performance remains a challenge.

What is machine learning:

Machine learning is a computer-based tool that can be trained to recognize patterns in data and make future predictions. Instead of manually analyzing data, machine learning can analyze environmental factors and predict FTW performance. This makes environmental monitoring more efficient and cost-effective.

Findings from my study:

My research offers a more efficient solution—using machine learning to predict how well FTWs remove pollutants, reducing the need for frequent field assessments. In my research, I used the Random Forest model to build two predictive tools—one for nitrogen and one for phosphorus removal. All I need to do is input environmental factors like lake size, FTW coverage, water and air temperature, planting density, nitrate and phosphate levels, lake depth, turbidity, and dissolved oxygen. The model then predicts how much nitrogen and phosphorus will be removed. It's like having a virtual environmental scientist at your fingertips!

Why This Research Matters:

This model allows engineers and environmental managers to make informed decisions about installation of FTW structures, design and optimization of the system for a more effective resource management and environmental purification. Beyond just one location, this model is generalized for use in any urban lake, making it a versatile and practical tool for water quality management. Under normal conditions, it can accurately predict the performance of FTWs, allowing researchers, policymakers, and environmental agencies to implement data-driven solutions with confidence and reduce the increasing strain on the organizations. This study also encourages utilizing real-time monitoring technologies.

Blending nature-based solutions with cutting-edge technology is the way forward. By harnessing the power of machine learning, we can make water treatment smarter, more efficient, and more sustainable. With continued development, this approach could change the way we monitor and restore urban lakes—ensuring they stay clean and vibrant for generations to come.



This is a non-technical summary of the project report titled "Performance Analysis of Floating Treatment Wetlands on Urban Lakes using Machine Learning" supervised by Prof. M.I.M Mowjood, Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya. mowjood@agri.pdn.ac.lk

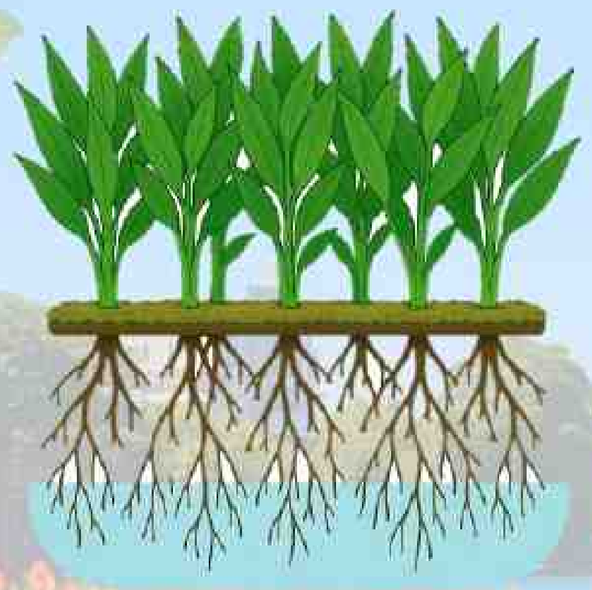


Floating Wetlands in Action: Transpiration as a Tool for Nutrient Removal in Urban Lakes

P.D.L.M. Gunasekara

Urban lakes are vital ecosystems, but they're increasingly under threat from nutrient pollution—especially **nitrogen** and **phosphorus**. As cities grow, so does the need for sustainable solutions. One promising approach? **Floating Treatment Wetlands (FTWs)**—nature-based systems that harness the power of plants to clean water.

FTWs are floating platforms planted with aquatic vegetation. Their roots dangle in the water, capturing nutrients and pollutants. But beyond root filtration, there's a quieter, powerful process driving purification: **transpiration**.



Transpiration: A Natural Engine for Clean Water

Transpiration is the process by which plants absorb water through roots and release it as vapor from their leaves. In FTWs, this movement of water helps transport dissolved nutrients like available nitrogen (AN) and available phosphorus (AP) into the plant, where they are stored as biomass. This makes transpiration a key mechanism in nutrient removal from polluted water.

Field and Lab: From Meewathura to Kandy Lake

Our research combined controlled and real-world testing. A mesocosm study at Meewathura Experimental Station used planted tanks to closely monitor water quality, plant growth, and transpiration rates. Simultaneously, a field study at Kandy Lake examined FTWs in action under natural conditions.

Weekly monitoring, using Class-A pan evaporimeters, UV-spectrophotometry, and Kjeldahl analysis, allowed us to track water nutrient loss and plant nutrient gain. The results showed a clear relationship: as transpiration increased, so did nutrient uptake by plants.



Measuring the Effect: Real-World Insights

The mesocosm study enabled us to calculate key constants (K1 and K2) that reflect how evaporation, transpiration, and nutrient uptake are connected. These values are crucial for predicting how much nitrogen and phosphorus can be removed using FTWs in similar lakes.

A Greener Future for Urban Waters

Transpiration isn't just a plant process—it's a natural, measurable, and sustainable force for urban lake restoration. FTWs powered by transpiration can transform polluted waters into thriving ecosystems—silently, efficiently, and beautifully.



This is a non-technical summary of the project report titled "Performance Analysis of Floating Treatment Wetlands (FTWs) in Urban Lake using Transpiration" supervised by Prof. M.I.M.Mowjood, Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya. mowjood@agri.pdn.ac.lk



An Oleoresin Blend for Chicken Curry Preparation

Senadhipathi Mudiyanselage Dileka Subodhani

What did you do as an undergraduate researcher?





As a researcher, I developed a convenient, high-quality oleoresin-blend for chicken curry to match the flavor of raw spices. A best Sri Lankan chicken curry recipe was selected through a sensory analysis. A suitable carrier agent was identified to blend the oleoresins properly. Each raw spice in the recipe was replaced with its oleoresin equivalent while maintaining the original flavor. The final formulation was tested for its physiochemical properties, and the Sensory evaluations were conducted to assess consumer acceptance.

Can you please tell me what are the advantages of using oleoresins in chicken curry preparation over raw spices?

Good question Mr. Tharindu. The use of oleoresins in chicken curry preparation offers a convenient and innovative alternative to traditional raw spices. Unlike whole or ground spices, oleoresins provide a consistent flavor profile, eliminating variations caused by agricultural and environmental factors. They are free from microbial contamination and reduce the risks of adulteration, ensuring better safety and quality. Additionally, oleoresins enhance stability, preventing flavor degradation due to oxidation or moisture absorption. With increasing urbanization and the demand for quick meal solutions, incorporating oleoresins into chicken curry simplifies preparation, reduces time, and maintains the authentic taste of traditional chicken curry.

What kind of carrier agents did you use to disperse oleoresins?

I chose maltodextrin and modified starch because they help turn the oleoresins into dry powder that's easy to use while keeping the flavor intact. Maltodextrin is great because it has no strong taste, mixes well, and helps protect the flavor from spoiling. Modified starch, on the other hand, improves the texture and makes the powder more stable. Research has shown that using both together works better than just one. Based on some tests I did earlier, I went with a 3:1 mix of modified starch to maltodextrin because it gave the best balance of texture, flow, and cost.

Can you tell us about the testing and findings of your developed spice blends?

Certainly. Over a four-week period, I evaluated the quality, stability, and safety of the blends. Both formulations proved to be stable and met safety standards, which was encouraging. However, we did notice that one blend absorbed moisture faster than the other, and both were prone to clumping, which made them a bit tricky to handle. Despite these issues, the blends showed great potential as a convenient and consistent alternative to traditional spice mixtures in chicken curry. With proper packaging to prevent moisture absorption, they could be a reliable solution for consumers."

Who is the main target group of this product?

My main target customer group is Sri Lankans living abroad. Many Sri Lankans who live overseas miss the authentic flavors of home, especially when it comes to traditional dishes like chicken curry. By offering a convenient, high-quality curry mix that incorporates oleoresins, we aim to provide them with an easy way to enjoy the familiar, rich taste of Sri Lankan spices without the hassle of finding and measuring individual spices.

This product brings the taste of home right to their kitchen, making it easier for them to recreate their favorite meals with consistency and convenience, no matter where they are in the world.

Finally, who do you want to thank for the success of this research?

I would like to express my sincere gratitude to my supervisor, Madam Prof. B.E.P. Mendis, for her constant guidance and support throughout this research. I also wish to thank Prof. Neranjan Rajapakse for his valuable insights and contributions. Special thanks to Stay Naturals Pvt. Ltd. in Mathale for providing the necessary resources and support during the course of this study. Their contributions have been invaluable to the success of this research. Finally, thank you for inviting me to this interview. I appreciate the opportunity to discuss my research and share my work with you.

This is a non-technical summary of the project report titled "Determination and Evaluation of Spice Oleoresin Blend as a Substitute for Raw Spice Mix in Chicken Curry Preparation" supervised by Prof B.E.P Mendis*, **Food Science and Technology**, Faculty of Agriculture, University of Peradeniya. *ereshamendis@agri.pdn.ac.lk



Beyond the Bowl: How Parboiling Transforms Rice into a Superfood for a Healthier Generation

Kusal Senarath Bandara

Rice, the staple food for more than half the world's population, is not only acting as the primary source of energy but a critical component that caters the food security. By 2050, the world population will increase to 9.2 billion, and the estimated demand for rice may increase by 30%. In contrast, burning health issues such as obesity, diabetes, and related noncommunicable diseases are prevailing worldwide at a massive rate, and research studies have disclosed the positive association between this and novel improved rice consumption. Hence, it is always favorable to check the effect of newly improved rice varieties on human nutritional and functional properties.

In the Sri Lankan scenario, the Department of Agriculture has introduced three novel rice varieties Ld 376, Bg 375, and Bw 372, to the field that may provide high yield to cater to the high demand utilizing minimum natural sources and climatic adaptations within a much shorter period time (3.5 months).



Currently, Sri Lankan farmers have tended to cultivate these varieties, and the comments on the yield were quite optimistic.

Understanding parboiling and its impact on these varieties.

In Sri Lankan and Asian culture, the most traditional and existing rice processing technique could be identified as parboiling, where rice is partially boiled in its husk before and after milling. Inside the Sri Lankan community, more than 60% of the rice consumption was recorded as parboiled, and findings have recognized multiple benefits of this: it lowers glycemic index (more controlled release of glucose), which is beneficial for managing blood sugar levels, and boosts antioxidant levels in rice as well as anti-obesity and anti-inflammatory activities. Hence, this study has investigated how the effect of the above new varieties interact with the parboiling effect and enhance their beneficial properties in rice.

Enhancement of carbohydrate profile

Amylose and Resistant Starch Content effects on starch digestibility and blood glucose response directly. Higher amylose and resistant starch content may lower the digestion and glycemic index, which is favorable for controlling diabetics and fat accumulation in the body. All of the above three varieties have been found and understood as high-amylose-content varieties (>25%), and research reveals that parboiling has significantly affected enhancing resistant starch levels and amylose content. The enhancement of resistant starch has a direct impact on the absorption more minerals into the human body and improving gut microbiota.

Enhancement of antioxidant activity and bioactive compounds

The research finding reveals that parboiling has the potential to improve antioxidant levels ranging from 7.47% to 274.86% in these novel rice varieties. These enhanced properties in rice may help to reduce the risk of chronic diseases, neutralize dangerous free radicals, support and boost immune function, promote healthy aging, improve skin and brain health, protect vision, reduce inflammation, enhance heart health, and boost metabolism.

Anti-obesity and Anti-diabetic properties

One of the most innovative findings of this research is enzyme inhibition activity. Parboiling enhances the inhibition of enzymes, which are related to obesity and diabetes. Here, after parboiling, IC50 values were recorded very low, and it denotes very lower amount of rice is enough to inhibit 50% of body enzymes that may promote obesity and diabetes, which could translate into better control over blood sugar levels and reduced fat accumulation.

What is the best novel rice variety among those?

Bw 372 (parboiled) was found to be the best variety because of its high level of antioxidant, total phenolic compound level, obesity and diabetic related enzyme inhibition rates, and low level of glucose releasing rates to the blood.

This is a non-technical summary of the project report titled "Comparative Analysis of *In Vitro* Glucose Releasing Rate, Anti-Obesity, and Bioactive Properties of Cooked Newly Improved Raw and Parboiled Rice Varieties in Sri Lanka" supervised by Dr. E.R.J. Samarakoon*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *rasanjalis@agri.pdn.ac.lk



Revolutionizing Food Drying with Waste Heat from Refrigerators

Sachini Samarasingha

In an era where energy conservation is a priority, an innovative food drying solution has emerged, that utilizes waste heat from domestic refrigerators.

This research explores the development of a food dryer powered by this wasted heat, offering an energy-efficient and cost-effective alternative for households.



Figure: Newly designed dryer

The system comprises four key components: a drying chamber, fans to control airflow, a heat recovery system to capture waste heat, and a heating element for rapid drying when necessary. The core idea of this innovation is utilizing the warm air that is released from a condenser of the refrigerator used to dry food items effectively, reducing both energy consumption and operational costs.

To evaluate the performance of the dryer, various tests were conducted under different conditions, such as changes in food load inside the refrigerator, door opening frequency, thermostat settings, etc.

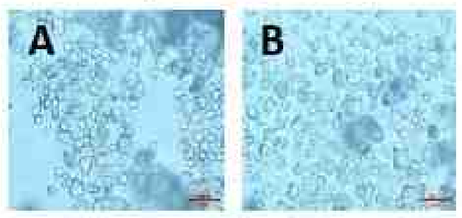
Temperature fluctuations inside the drying chamber were monitored using thermocouples, revealing that an average temperature of 40°C could be maintained only using waste heat. When the heating element was activated, temperatures could be controlled up to 60°C, allowing for quicker drying when needed.

Drying Performance and Efficiency

Several food commodities, including bitter gourd and jackfruit, were successfully dried using only waste heat. The drying process took 24 hours and was found to be highly energy-efficient, consuming just 0.236 kWh of electricity, costing less than 8 LKR per drying cycle.

To compare the new system (dryer) with commercially available dryer, a comparison study was conducted using sweet potatoes as a test material.

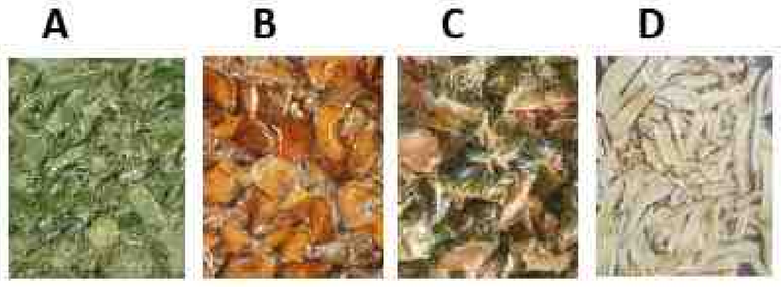
The same amount was dried in both the newly designed dryer and a reference commercially available dryer at 50°C until the moisture content reached 10%. The results were remarkable: Nutritional analysis using the Biuret test revealed that food dried in the new system retained more protein than the reference dryer. Lower moisture ratios and higher drying rates were observed in both sweet potatoes and brinjals using the waste heat-powered dryer. Microscopic analysis of the dried products showed no significant structural differences between the two drying methods. Color comparison tests confirmed that food dried in the new dryer maintained its natural color better than in the commercial dryer. Soaking dried sweet potatoes in hot distilled water (100°C for 1 hour) showed that food dried in the new system had a higher moisture reabsorption ratio than the reference dryer.



Microscopic structure of dried sweet potato (A- Using Reference dryer, B- Using newly designed dryer)

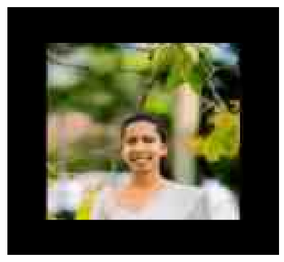
Most importantly, this dryer significantly reduces energy consumption by utilizing waste heat. While users can opt for the heating element when quicker drying is required, the energy consumption remains comparable to commercial dryers. However, when operating solely on waste heat, the system saves a significant amount of electricity, making it a sustainable alternative for food preservation.

By integrating food drying with existing household appliances, this innovation offers a cost-effective, eco-friendly solution to minimize food spoilage while making use of otherwise wasted energy. It is a promising step toward sustainable food processing for households and small-scale industries alike.



Dried product, only using waste heat from refrigerator in newly designed dryer (A-Moringa, B-Turmeric, C- Bitter Gourd, D-Jackfruit)

This is a non-technical summary of the project report titled "Design and optimization of a food dryer utilizing waste heat from refrigerator" supervised by Type your Internal Main Supervisor Mr. N. Y. Jayanath, Department of Food Science & Technology, Faculty of Agriculture, University of Peradeniya. *jayanathny@agri.pdn.ac.lk.



A Sip of Tradition: The Magic of Smooth and Spicy Masala Tea

Maleesha Prematthilaka

"Magic" would be an understatement of the feelings evoked by the rich aroma of masala tea. The warmth that seeps from a cup and its first sip that dances on the tongue bring that moment to life. It is passed like a family legacy and embodies all the tradition behind the drink in a cup. However, the real quest lies in the answer to this question: "what makes a perfect masala tea?" From balancing spices to harmony, and from turning simple ingredients into something extraordinary, is what makes masala tea magic.



The Magic Behind Masala Tea

Masala tea has a deep and incredible history. It blends some of the world's most iconic spices: ginger, cloves, and cinnamon, and gives them an ethereal type of healing. Ginger and cardamom keep your heart and breath fresh. Cloves are important for fighting bacterial growth on the teeth. But perhaps the most important ingredient that embodies the essence of a perfect masala tea is balance. Balance between equal parts bold and soothing.

Smooth or Spicy; Which One Speaks to You?

We know everyone has different preferences. Some people…. particularly those looking for comfort might want to have their masala tea smooth and creamy like a soft blanket on an early morning. Others will want the spicy kick, the bold fiery warmth that lingers on your lips and awakens your senses. Both have their charm, and that's the beauty of masala tea - indifferent to what each person wants, there's a perfect cup for every mood.

No More Hassle to Grind Spices for Your Masala Tea……

Extra Benefits of Masala Tea

While there is no doubt that masala tea is delicious, it is also a form of self-care as one cup a day can strengthen immunity, aid in digestion, and relieve stress. That may explain its increasing popularity around the world. As more people seek natural and herbal beverages, masala tea is no longer merely a tradition, it is becoming a phenomenon.

Why Masala Tea Tablets Stands Out?



Mark the difference by noting how effortless it is to prepare masala chai with a tablet versus other forms. One of the key steps of traditional preparation is boiling water, milk, tea leaves, and spices, all of which require measuring and can lead to imprecise results. However, masala tea tablets need no measuring, are mess free, and dissolve in an instant. They're ideal for hectic mornings or lazy evenings and provide convenience without skimping on taste.

In summary, when it comes to its preparation, masala tea is more an adventure than a drink. Each taste is rich in centuries of wellbeing, tradition, and a parade of flavors, whether you prefer it smooth or bold. With the convenience of these tablets, you can enjoy this flavorful journey anywhere. The next time you hold a warm cup of tea, be sure to cherish this moment because it is not 'just tea', but a sweet, sweet treasure.



This is a non-technical summary of the project report titled "Development and Physicochemical Evaluation of Oleoresin based Instant Masala Tea Tablets" supervised by Prof. B.E.P. Mendis*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *ereshamendis@agri.pdn.ac.lk



Let's Explore the Genome of Sri Lankan Giant Honeybee, "*Bambara*"

W.M.B.V. Wasala

"Genome is the instruction book for building the organism."

-American scientist John Craig Venter-

Giant honey bee?

Apis dorsata Fabricius known as giant honey bee is primarily distributed in South and South East Asian regions. It plays a vital role in ecological systems as a pollinator and it has an economical value as a honey producer.

Whole genome assembly and annotation?

Whole genome assembly is reconstructing the entire genome of a particular organism from the raw sequenced reads. Genome annotation is identifying the functional elements in the assembled genome. Genomic studies are important for understanding the true nature of an organism.

In this research, whole genome assembly and annotation of giant honey bee performed as the first whole genome sequencing project of giant honey bee in Sri Lanka.

Workflow

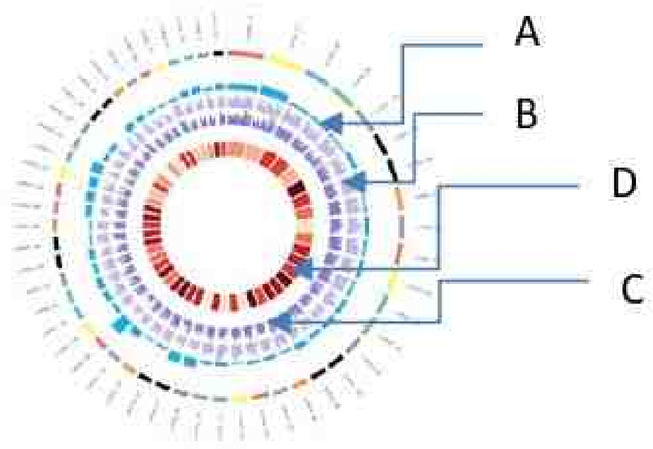
DNA extraction
↓
Sequencing
↓
Genome assembly
↓
Genome annotation
↓
Variants detection

DNA was extracted using Qiagen DNA extraction kit from the *A. dorsata* bio samples in Sri Lanka. Sequencing of extracted DNA was performed Illumina NovaSeq sequencing system. The genome assembly, annotation and variants detection process were performed using Galaxy web-based platform. This was done based on the NCBI reference genome of Apis dorsata (PRJNA174631) as a reference-based assembly FastQC, Bowtie2, Quast, BUSCO, RepeatMasker, AUGUSTUS, InterProScan, eggNOG Mapper, Snippy and circos tools were used for the process.

What have I explored?

The genome assembly resulted 95.9% completeness according to the BUSCO results. The genome size was 230.6. million bases. Total un gapped length was 220.3 million bases. There were 4040 scaffolds and scaffold N50 and L50 values were 732KB and 86 respectively. GC content of the genome was 31.73%. During genome annotation 12,006 genes were predicted. During protein identification 10,937 protein families representing 4,005 protein domains were identified. There were 6% of repeated areas in the genome was identified with fewer transposable elements.

According to the results, 843,062 Single nucleotide polymorphisms (SNP), 55,071 multiple nucleotide polymorphisms (MNP) and 216,088 indels were detected across the assembled genome. Gene densities, SNP densities, indel densities and GC content of the scaffolds, larger than 1 million base pairs were visualized using a circos plot.



Circos plot visualization

Outer track- scaffolds larger than 1 million base pairs
Track A- Gene density of the scaffolds
Track B – SNP density
Track C – Indel density
Track D – GC content of the scaffolds

Future directions of the research

This study would be an initial setup to identify variations between Sri Lankan and global *A. dorsata* populations.

The beneficial traits of *A. dorsata* can be used as biotechnological applications in future studies.

This is a non-technical summary of the project report titled "Unraveling the genome of Sri Lankan Giant Honeybee" supervised by Prof. H.M.V.G. Herath *, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. * venura@agri.pdn.ac.lk



The Fat-Fighting Mayonnaise: How Science is Making Your Favorite Condiment Healthier

A.T. Tharusha Menik Madhuwanthi

We all love the creamy, tangy goodness of mayonnaise. It's a staple in sandwiches, salads, and countless other dishes. However, traditional mayonnaise is known for its high fat content, which can be a concern for those watching their health. This has led to explore ways to create a healthier version of this popular condiment. One promising solution lies in the power of modified corn starch.

Why Does Mayonnaise Have So Much Fat?

Mayonnaise gets its rich texture primarily from vegetable oils. While these oils contribute to the taste and feel we enjoy, they also make mayonnaise a high-fat food. Too much fat in our diets can increase the risk of health problems like obesity, heart disease, and type 2 diabetes. This is why finding ways to reduce fat in common foods like mayonnaise is so important.

Transforming Corn Starch for Healthier Mayonnaise

Corn starch, a common kitchen ingredient, can be transformed to take on new roles in food. By modifying its structure, it can mimic the properties of fat. This modified starch can provide the thickness and creamy texture of fat, but with fewer calories. Think of it as a natural way to create a "lighter" mayonnaise without sacrificing what we love about it. In here, four different methods were experimented to modify corn starch:

- Citric Acid Treatment
- Acetylation
- Annealing
- Heat Moisture Treatment

Each of these methods changes the starch in a unique way, affecting its texture and how it behaves in food. These modified starches were used to make different versions of mayonnaise, replacing some of the oil to create healthier alternatives.

Two main variations were created:

- A version where 30% of the oil was replaced with modified starch.
- A version where 50% of the oil was replaced.

This allowed to see how much fat could be removed while still maintaining a good quality product.

Testing Taste and Quality

Mayonnaise were subjected to a series of tests:

- Analytical tests to measure physicochemical properties like thickness (viscosity), color, and stability.
- Sensory evaluation to check the consumer preference.

The Sweet Spot: Reducing Fat, Keeping

The results showed that modified corn starch can indeed be used to make lower-fat mayonnaise. The mayonnaise with 30% of the oil replaced was the most successful among these modification techniques, maintaining a good texture and taste that people liked.

A Healthier Future for Mayonnaise

Here, is a big step towards creating healthier versions of a beloved condiment. By using modified corn starch, it's possible to significantly reduce the fat content of mayonnaise without sacrificing its creamy texture and delicious flavor. This means people can enjoy their favorite foods as part of a healthier diet.



This is a non-technical summary of the project report titled "Investigation on Potential Utilization of Modified Corn Starch as a Fat Replacer in Mayonnaise" supervised by Dr. E.R.J. Samarakoon*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *rasanjalis@agri.pdn.ac.lk



Analysis Of Nutritional and Functional Components in Selected Black Tea Grades Across Major Elevations in Sri Lanka

Dilmi Ishanka Silva

Black tea is more than just a beverage. It is a cultural symbol, a source of relaxation and most importantly, a reservoir of beneficial nutrients and bioactive compounds. Sri Lanka, renowned for its high-quality tea production, has long been a leader in the global tea industry. However, despite its popularity, limited research has been conducted on both the nutritional composition and functional properties of black tea in Sri Lanka. My research aims to bridge this gap by analyzing the sugars, protein, fat, total ash content, as well as key functional properties such as polyphenol and caffeine content, in different black tea grades.

Research Focus and Methodology: The study investigates the nutritional composition and functional properties of black tea from three elevations: high, mid, and low grown regions. It also considers two processing methods—Crush, Tear, Curl (CTC) and orthodox—using three selected tea grades: BP1 (from CTC), and OP and BOP (from orthodox processing). By employing precise analytical methods, including the Kjeldahl and NIR techniques for protein analysis, soxhlet for fat analysis, NIR method for polyphenol determination, and for caffeine quantification, the research provides a comprehensive assessment of tea's bioactive components.

Key Findings: Black tea from high elevation (Nuwaraeliya, Udupussellewa, Uva and Dimbula) contains a high amount of sugars and low amount of sugars were found in mid elevation (Kandy) and low elevation (Sabaragamuwa, Ruhuna). Also between the elevations, protein, fat, fiber, total ash, polyphenol and caffeine contents were different. Preliminary results indicate that while tea is primarily known for its polyphenol and caffeine content, it also contains macronutrients that contribute to its overall nutritional profile. The analysis revealed variations in nutrient and bioactive compound composition based on elevation, grades and processing methods.

The study also confirmed that polyphenol levels were highest in high-grown orthodox teas, which are associated with enhanced antioxidant activity, while caffeine content varied across processing methods and tea grades. Also according to the study, sugar contents, protein, fat and total ash contents were high in orthodox processed tea and low in CTC processed tea. These CTC processed tea are usually taken for the tea bags. So according to the study, tea bags contains low amount of these components. Also fiber content was high in orthodox processed tea. Usually in black tea, if the black tea contains more fiber, it is considered as there are more impurities like stems, roots like things. So in CTC processed like tea bags have more impurities.

Implications for Consumers and the Industry

The findings of this study hold significant value for tea manufacturers, regulatory bodies, and consumers. Understanding both the nutritional profile and functional properties of black tea can help promote informed consumption choices, support labeling regulations, and enhance the global marketability of Sri Lankan tea.

Conclusion

Tea is not only a delightful drink but also a source of nutritional benefits and bioactive compounds that contribute to overall well-being. This study not only adds to scientific knowledge but also strengthens Sri Lanka's reputation in the global tea industry, offering a new perspective on the value of a daily cup of tea. Through continued research and innovation, we can further unlock the potential of Sri Lankan tea, ensuring that each sip is as functional as it is refreshing.



This is a non-technical summary of the project report titled "Analysis of Nutritional and Functional Composition of Selected Black Tea Grades across Major Elevations in Sri Lanka" supervised by Mr. N.Y. Jayanath*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *jayanathny@agri.pdn.ac.lk.



Unlocking the Potential of Queen Sago (Madu) Starch and Flour: An Underutilized Carbohydrate Source for Food Applications

K.M.C.P. Bandara

Introduction

Despite being a rich carbohydrate source, the seeds of queen sago (*Cycas* sp.) remain largely unexplored in food applications. Traditionally, seed flour has been used to prepare foods like '*roti*' and '*pittu*' by the locals. Not only flour but the seeds also yields starch which could be used as an alternative to conventional starch.

Understanding starch and flour in everyday food

Flour and starch are both essential ingredients in food formulation, each playing different roles. Flour contains protein, fiber and other components and is commonly used in baking and cooking whereas, starch is a purified carbohydrate commonly used as a thickening, gelling and stabilizing agent in foods such as soups, sauces and puddings.

About the study

This study aims to explore the potential of queen sago starch and flour for food applications through analyzing their morphological, structural and physicochemical properties.

Starch isolation method involved milling, fiber separation, centrifugation, purification with an alkali solution and drying. The flour was prepared by washing the seeds, followed by drying, grinding, and sieving them into a fine powder.



Queen sago starch and flour

Key Findings

Nutritional Profile: The starch was high in purity, containing 90% carbohydrates and minimal fat (0.27%) and protein (0.7%). The flour was found to be a rich source of carbohydrates (62%), protein (13.07%), fat (1.09%) and fiber (1.47%).

Morphology & Structure: The starch granules were round, with size ranging from 0.68 to 1.72 micrometers. The FT-IR spectrum confirmed the carbohydrate nature of the starch.



Light Microscopic image of queen sago starch granules.

Color: The starch exhibited a satisfactory whiteness making it suitable for food applications without altering the final product appearance. In contrast, the flour exhibited a more yellowish tone compared to wheat flour.

Amylose content: Starch had a low amylose content (15%), which indicates more digestibility, making it beneficial for dietary applications.

Functional Properties: The starch exhibited higher oil absorption capacities, making it a potential emulsifying agent. This characteristic could be valuable in producing foods like mayonnaise. Both starch and flour showed an increase in solubility and swelling power with temperature, indicating that these properties are temperature-dependent and increase as the temperature rises. The solubility of the flour was higher than that of starch. The highest solubility for both starch and flour was observed at 80 °C.

The study highlights queen sago seed flour and starch as promising food sources, with starch properties suggesting that they could replace conventional starches, playing a key role in developing innovative products while supporting locally sourced ingredients.



Queen sago seeds

This is a non-technical summary of the project report titled "Investigation of Morphological, Structural and Physicochemical Properties of Starch and Flour Extracted from Madu (*Cycas* sp.) Grown in Sri Lanka" supervised by Dr. E.R.J. Samarakoon*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. * rasanjalis@agri.pdn.ac.lk



Unlocking Pineapple's Secret Codes to Track the Power of Genetic Segregation

D.M.D.R. Dissanayake

Introduction

Pineapple is more than just a tropical delight- it's the result of generations of breeding. But what if we could unlock its genetic secrets to create even better varieties? This research explores how pineapple traits are passed down through DNA from their parents, paving the way for stronger, sweeter and more productive crops. F_1 population was used for the study which resulted from crosses between *Kew, Mauritius* and *Gal Annasi* varieties.






Why It Matters……

Farmers struggle with unpredictable weather, pests, and declining yield. By understanding the genetic diversity, we can develop resilient varieties that thrive in tough conditions while maintaining excellent fruit quality by selecting superior types.

Objectives

The main aim of this research is to confirm that the offsprings from the Kew, Mauritius and Gal Annasi parental crosses are genetically diverse. By studying how different traits are inherited, we can select superior pineapple varieties for breeding in future.

What I Did?

I have selected 26 plants from the F1 population and special method was used to study their genetic materials, focusing on areas of their DNA that are known to vary between different pineapple plants.

- **DNA extraction**

  First, I collected leaf samples from each plant and carefully extracted their DNA- the genetic material that contains all the information about the plant characters.



- **PCR**

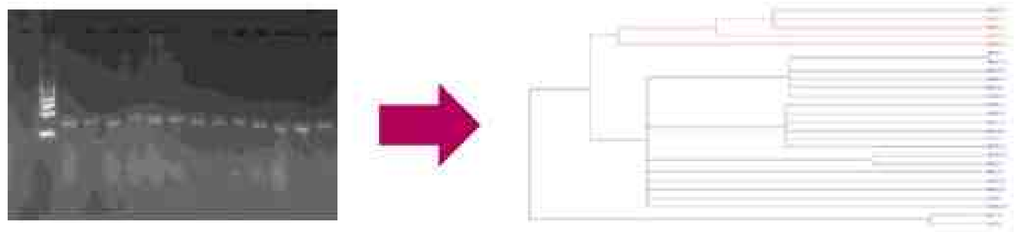
  Then I used a method called PCR to make many copies of specific parts of extracted DNA. It is like making photocopies of a page in a book. I focused on certain "markers" in the DNA that vary between different pineapple plants. TsuAC004, TsuAC010, TsuAC018, and TsuAc039 are the names of markers I have used. These markers start the copping process of DNA and each marker copping their respective areas of a DNA.

- **Gel Run**

  Once I had DNA copies I needed to see the results. For that I used a technique called "Agarose Gel Electrophoresis" which is a bit like a racetrack for DNA. The DNA copies were loaded into a gel, and when an electric current was passed through it, the DNA moved along the track. Different DNA copies travel different distances, so they form visible bands, kinds of like lanes on the track.

- **Analysis**

  Resulted bands were analyzed using computer software called "DARwin and Cervus". It resulted a tree called Dendrogram which shows the relationships among each progeny plants. In this study 26 plants were grouped into three main groups called clusters.



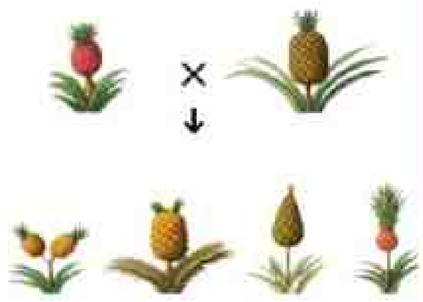
Resulted gel image Dendrogram

Key Findings…

We found different genetic patterns in the progeny, which confirms that the plants have inherited traits in a way that matches what we expected from cross breeding. This is exciting because it shows that, these offsprings are genetically diverse with lot of genetic variations.



Conclusion



This research confirms that, the F1 pineapple population follows expected genetic segregating patterns. By understanding how these traits are inherited, we can start to improve pineapple varieties that can meet the growing demand for this popular fruit.

Every Juicy bite of a pineapple carries a story of science leading the way to a future of smarter farming.

This is a non-technical summary of the project report titled "Genetic Diversity Analysis of a Segregating Population of Pineapple (Ananas comosus) using Molecular Markers" supervised by Prof. S.A.C.N. Perera*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. * Chandrikaperera@agri.pdn.ac.lk



Can Sri Lanka's Spice Industry Unlock Its Full Potential in the Global Market?

Hashan Dayarathna

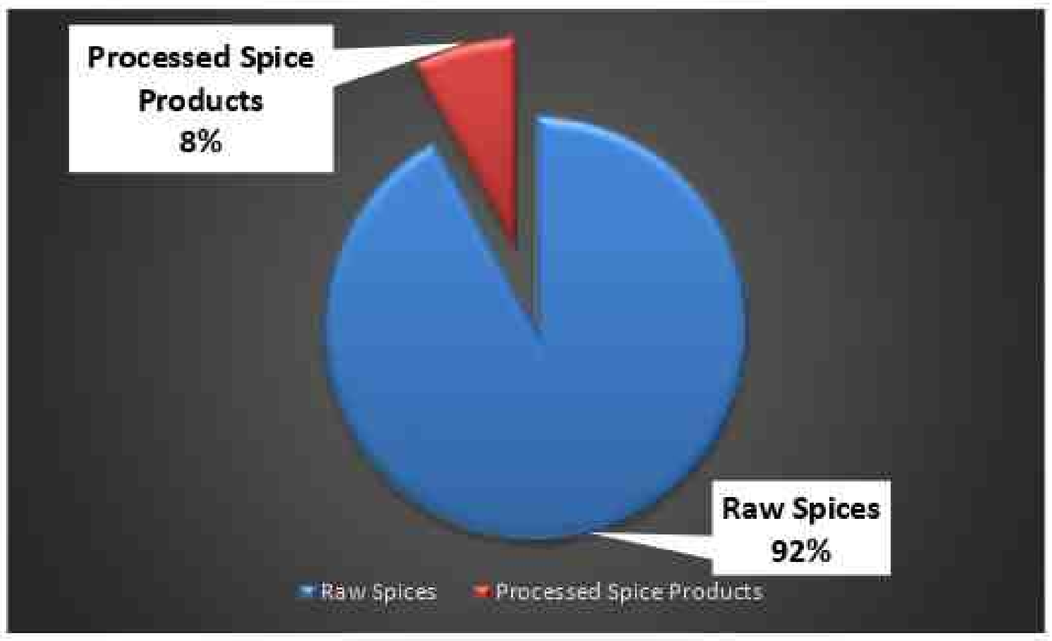


The Rich Legacy of Sri Lankan Spices in Exports

Sri Lanka, once known as the **'SPICE ISLAND'** for its rich history in spice production, has long been a global leader in the industry. A key milestone in this legacy came in 2022 when Ceylon Cinnamon received **Protected Geographical Indication (PGI)** status from the European Union, further strengthening its global recognition and market appeal. Despite these achievements, the industry now faces growing challenges due to shifting consumer preferences, increasing competition, and the complexities of international trade. To maintain its competitive edge, Sri Lanka must adapt and innovate.

This research examines strategies to enhance Sri Lanka's competitiveness in spice exports by analyzing raw and processed spice exports across key global markets.

Across almost all spices, raw export volumes are significantly higher than processed spice exports.

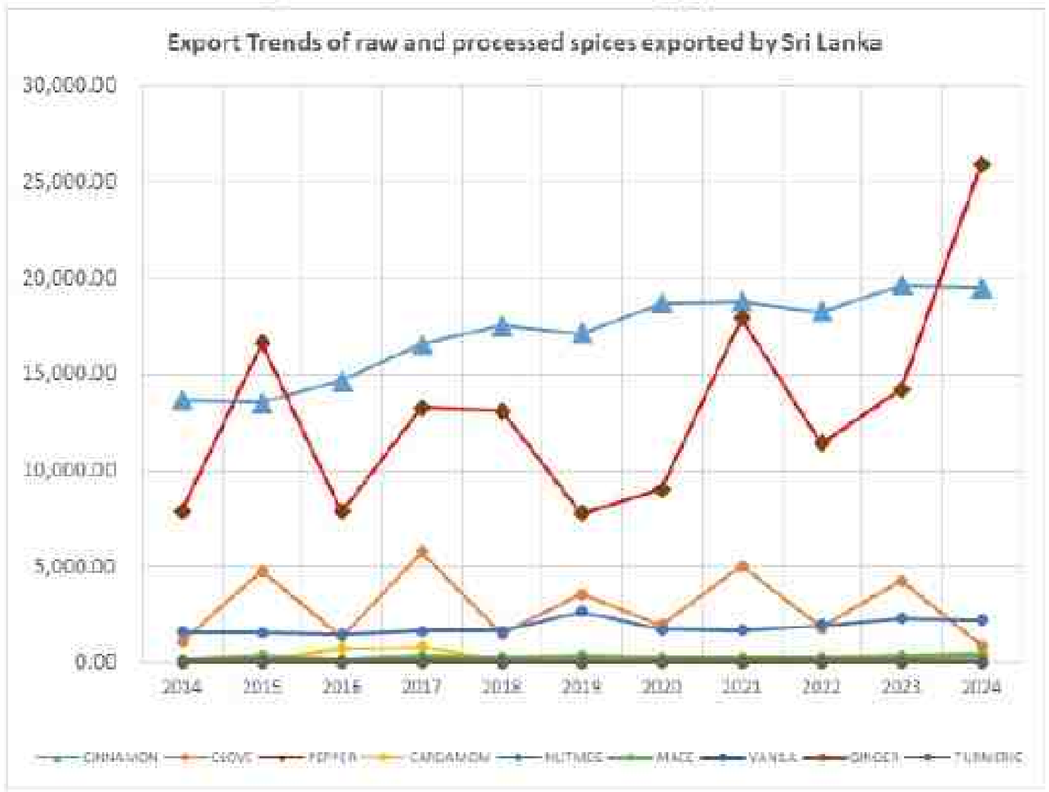


Key Challenges to Competitiveness

Sri Lanka's spice exporters face several challenges. Sri Lanka's spice exporters must comply with international food safety regulations such as GMP, HACCP, ISO 22000, and FSSC 22000. Countries like the European Union, the USA, and Australia impose strict standards on spice imports, requiring certifications such as organic, Fairtrade, and sustainably sourced products.

Small and medium-sized enterprises (SMEs) often lack the resources to meet these stringent requirements. Moreover, inefficiencies in the supply chain, including poor infrastructure, inadequate storage facilities, and high transportation costs, further hinder the competitiveness of Sri Lanka's spices in global markets.

Market Insights: Trends and Opportunities



Sri Lanka's spice export trends reveal distinct patterns across key spices. Cinnamon leads with an average annual export volume of 17,897.6 Mt, primarily dominated by non-organic whole quills. Europe and the USA markets demand high-quality spices and offer premium prices for certified products. Emerging markets such as China and Gulf Cooperation Council present significant opportunities as well.

Key Strategies for Growth

This research recommends several strategies to enhance Sri Lanka's competitiveness in the global spice industry

1) Promoting value added products
2) Regulatory Compliance and Certifications
3) Strategic marketing, including the promotion of Sri Lanka's unique **'Ceylon Spice'** brand, can enhance global recognition and demand

This is a non-technical summary of the project report titled "Enhancing Sri Lanka's Competitiveness in Spice Exports: A Strategic Analysis of Raw and Processed Spice Exports across Key Global Markets" supervised by Prof. B.E.P. Mendis*, Department of Food Science & Technology, Faculty of Agriculture, University of Peradeniya. * ereshamendis@agri.pdn.ac.lk



The Science of Mastication and How it Affects Glycemic Response

Methni Tennakoon

Glycemic Index and Mastication

The **Glycemic Index** (GI) is a widely explored concept in research and has gained popularity due to GI labeling and the development of dietary recommendations. It measures how quickly foods raise blood sugar levels after consumption. **This study examined how different bread types: white, finger millet, and multigrain with distinct compositions and structures, influence chewing behavior and glycemic response.**



Mastication, or chewing is the first stage of human digestion that contributes to the formation of swallowable food boluses and initial starch hydrolysis process through salivary α-amylase. Chewing behavior among individuals can vary significantly based on physiology and food type.

This study measured certain parameters, such as mastication frequency, starch hydrolysis extent in the oral cavity, and oral bolus particle size, and correlated these with individual GI and structural properties of bread.



A total of twenty-two non-diabetic healthy individuals, with a BMI of 21.3±1.5 kg/m^2, participated in both the *in vivo* GI and mastication studies.

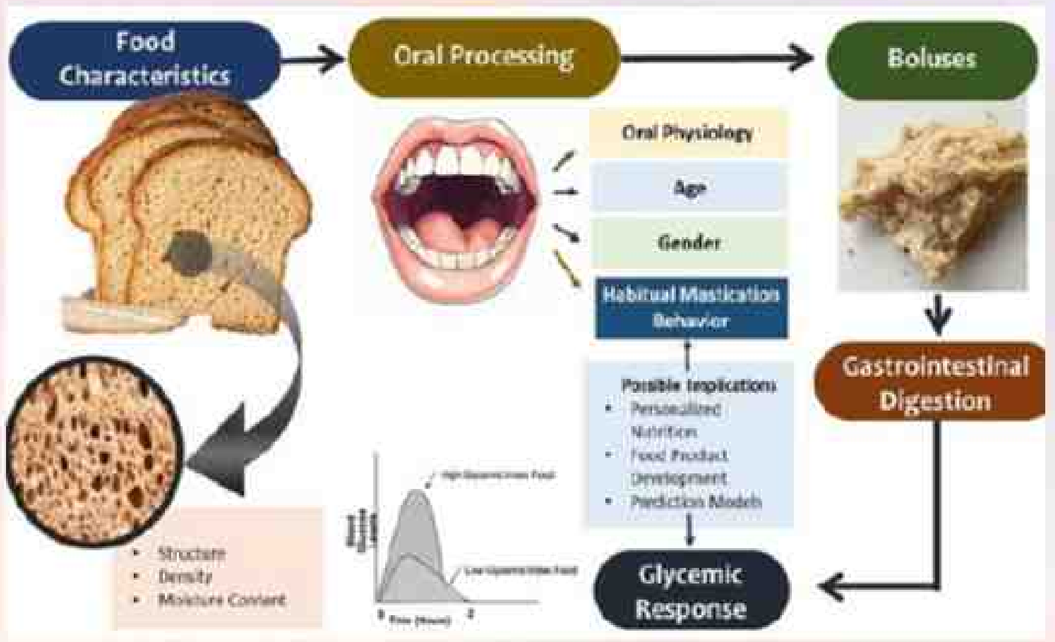
Key Insights from the Research

Both finger millet and multigrain bread had a low glycemic load, making them grate choices for managing blood sugar levels in healthy individuals and viable options for diabetic patients.

Since the human body is unique to each individual, some mastication parameters varied significantly ($p<0.05$), but aligned with certain theories, such as the critical particle size threshold theory, which could be utilized in developing food for people with specific mastication requirements.

Structural properties such as density, porosity, and average pore size of bread types influenced chewing behavior among individuals.

While potential relationships were there, further studies are required to measure more mastication parameters that could influence GI using advanced technologies to build direct, significant relationships.



Implications for Health and Nutrition

The study's insights open new avenues for personalized nutrition and diabetes management. Understanding the relationship between food texture, chewing habits and glycemic response could lead to smarter food choices, better meal planning, and even improved food processing.

As research in this area grows, one thing is clear; how we eat is just as important as what we eat. Paying attention to chewing habits and food texture could be a simple yet powerful tool for improving overall health of individuals.

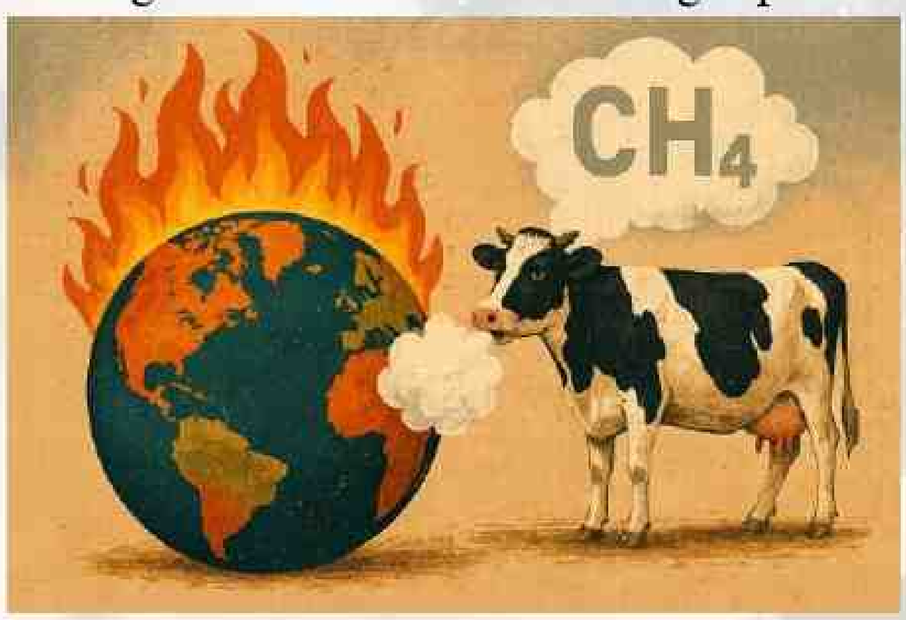
This is a non-technical summary of the project report titled "Role of Habitual Mastication Behavior on Glycemic Response to White, Finger Millet and Multigrain Breads with Structural Variations" supervised by Dr. Geeshani Somaratne*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *gsomaratne@agri.pdn.ac.lk



The Hidden Heat of Happy Cows

R.D.D.R.C. Jayarathna

Tucked in Sri Lanka's cool, green hills lies Watawala Dairy Farm, a buzzing spot where hundreds of cows chew away and fill milk jugs day and night. It's a postcard-perfect scene, but there's a catch. A silent troublemaker called **methane** sneaks out with every burp and manure pile. This gas doesn't just float away. It heats up the planet. At Watawala, a sharp research project took aim, tracking methane live and uncovering a fix that could shake things up.



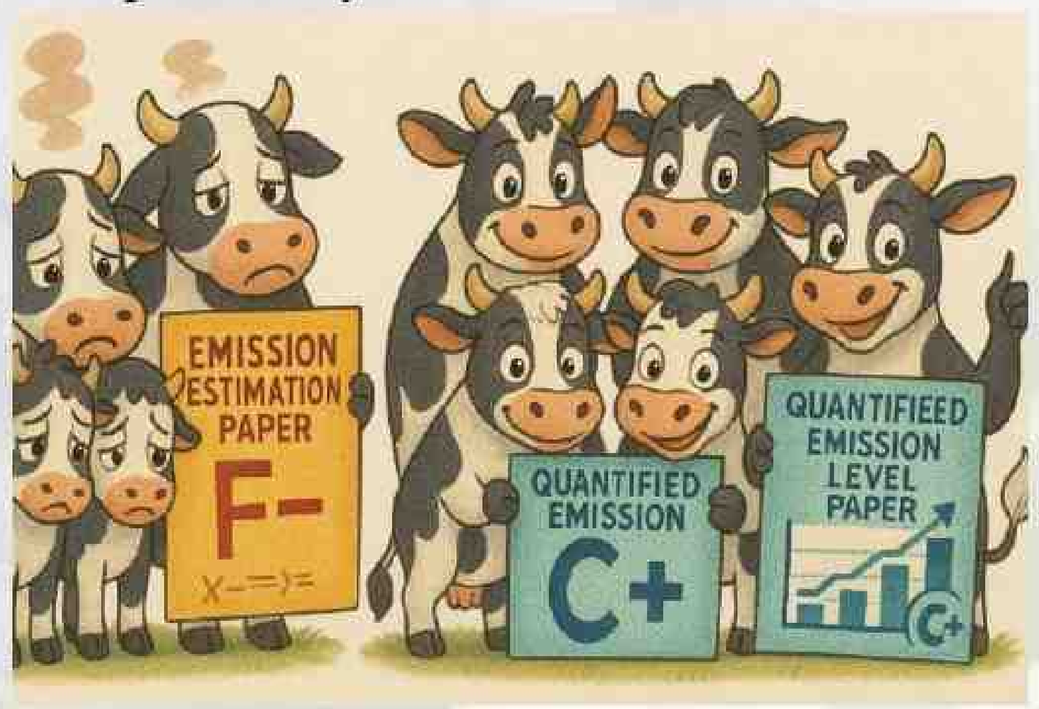
Outsmarting the Gas Game

The cows became the stars of a clever experiment. Sorted into teams - youngsters, fresh moms, milk champs, and those kicking back, they showed how diet drives methane. First attempts bombed. A bulky gas analyzer and muzzle freaked out the cows, and burps went quiet. The solution? A nimble sensor for spot-checks and a low-cost Arduino sensor to sniff manure piles. Paired with farm data and a simple Excel tool, the setup turned farmers into gas trackers. Watawala's milk clocked in at 3.36 kg CO_2e per kilo, smashing the region's 4.80 kg CO_2e average. Proof positive: real numbers beat rough estimates.



Methane's Ripple Effect

This isn't just cow talk. Methane stirs up crazy weather, spikes food costs, and dirties the air we all share. Watawala's project shows cheap tech can pin it down fast. Smarter feed or manure moves could slash emissions, and local data trumps broad assumptions every time.



A Dairy Dream for the Planet

Zoom out, and it's bigger than one farm. This is about keeping the planet comfy while milk stays on your table. Affordable methane-tracking tools could spread, lightening farms' climate load and sharpening Sri Lanka's green plans. Picture that next glass of milk. One farm's bright idea might just chill things out for all.



This is a non-technical summary of the project report titled "Quantifying the Carbon Footprint of Intensive Dairy Farming in Upcountry Sri Lanka: A Data-Driven Approach" supervised by Prof. Suranga Kodithuwakku*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *surangap@agri.pdn.ac.lk



Whispers Of Wellness: Secrets In the Leaves

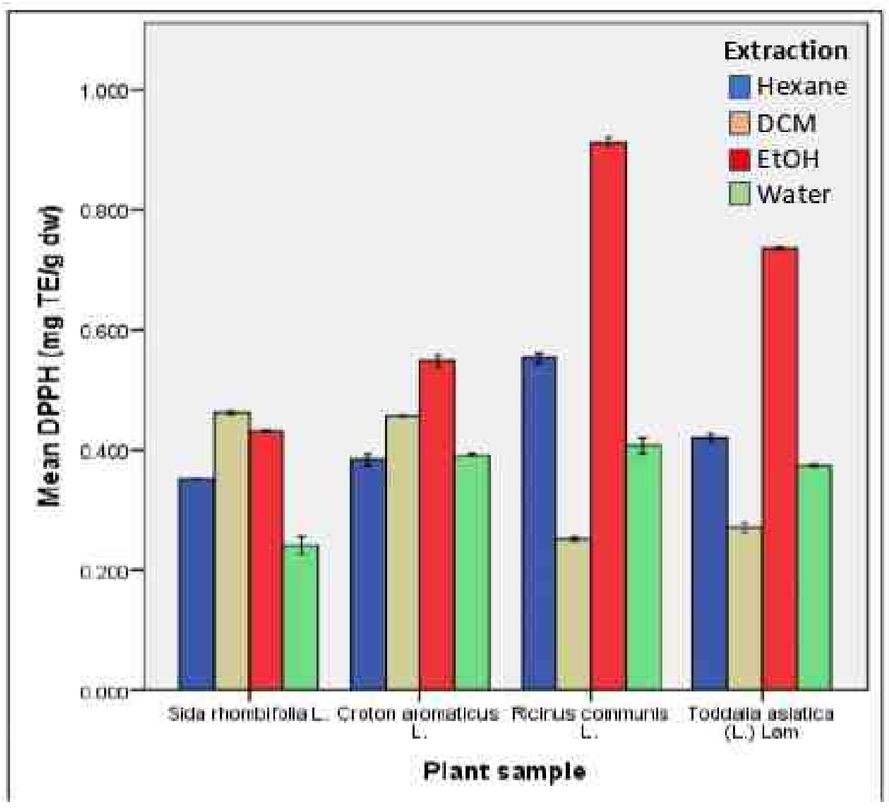
Sakuni Dantanarayana

Can leaves from the backyard become tomorrow's medicine? Every day, hundreds of medicinal plants grow silently around forests, home gardens, and roadsides - often ignored. But within their leaves might lie natural answers to today's biggest health challenges—like diabetes, obesity, and even chronic stress.

A study on four Sri Lankan plants—Babila (*Sida rhomifolia* L.), Wel Keppatiya (*Croton aromaticus* L.), Erandu (*Ricinus communis* L.), and Kudu Mirissa (*Toddalia asiatica* (L.) Lam) revealed surprising healing powers, hidden in plain sight.

Natural defenders against disease - These plants were evaluated for **antioxidant activity** using advanced techniques like DPPH, FRAP, and ORAC assays. Tests showed strong antioxidant activity in all four plants. Why does this matter? Antioxidants protect the body from harmful molecules called "free radicals," which are linked to aging and diseases. *Ricinus communis* L. stood out with the highest antioxidant levels.

Healing compounds in every drop - The plants were also rich in **phenolics** and **flavonoids**—natural chemicals known to reduce inflammation, fight bacteria, and support the immune system. These compounds are like the plant's natural medicine chest.



Hope for modern-day challenges - Beyond general wellness, these plants also revealed **anti-diabetic** and **anti-obesity** properties. Using an enzyme inhibition test, like α-amylase inhibition assay, extracts were checked for their ability to reduce sugar absorption. *Sida rhomifolia* L. and *Toddalia asiatica* L. (Lam) showed promising blood sugar-lowering activity, indicating potential in natural diabetes management. The pancreatic lipase inhibition test was conducted to see if the plants could help block fat digestion. *Croton aromaticus* and *Ricinus communis* showed strong fat-blocking potential, suggesting use in natural weight control products.



Safe, with smart use - It was important to ensure these plants are safe too. So, the **cytotoxicity test** was conducted—how toxic they might be to living cells. The good news? Three of the plants showed very low toxicity, with only *Croton aromaticus* L. and *Sida rhomifolia* L. showing a slightly higher level. However, with modern separation techniques, we can isolate the useful, safe compounds while removing any harmful ones.

what can we do with these plants? A lot! Their extracts can be used to produce herbal teas, dietary supplements, pharmaceutical drugs, and even natural food preservatives. And as food trends evolve, there's potential to develop new types of health-focused spice blends or flavorings from these plants. With further studies, innovation, and collaboration, Sri Lanka could pioneer natural, plant-based solutions for both health and food industries. By shining a scientific spotlight on traditional knowledge, we're not only preserving our heritage but also paving the way for a healthier, greener, and more sustainable future.

This is a non-technical summary of the project report titled "Evaluation of Antioxidant, Antidiabetic, Anti-obesity Properties and Cytotoxicity Effect of Leaf Extracts from four Selected Medicinal Plants in Sri Lanka" supervised by Prof. R.P.N.P.Rajapakse, Department of Food science and Technology, Faculty of Agriculture, University of Peradeniya. Niranjanp@agri.pdn.ac.lk



Sri Lanka's Superfood Secret: Exploring the Healing Powers of Native Spirulina

B.A.G.S. Balachandra

Imagine a tiny aquatic organism with the potential to fight aging, obesity, and diabetes, all while thriving naturally in Sri Lanka's waters. This isn't science fiction. It is *Spirulina subsalsa*, a native species of spirulina that could revolutionize health and wellness. Unlike its exotic cousin *Spirulina platensis*, this local variety flourishes in Sri Lankan reservoirs, making it a sustainable and eco-friendly option with immense commercial potential. Sri Lankan indigenous Spirulina is grown naturally without foreign influences while maintaining its ecological sustainability and nutritional value to become the best possible intersection of these elements.

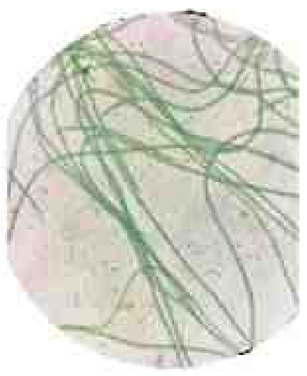


Image 1: *Spirulina subsalsa* under the microscope 40x

A Triple Threat Against Modern Ailments

Packed with potent antioxidants, *S. subsalsa*'s methanol extract provides a natural shield against cellular damage, the root cause of aging, obesity, and diabetes. Its water extract showed the ability to inhibit lipase activity, effectively slowing fat digestion and supporting weight management, while its methanol extract blocks carbohydrate breakdown, helping regulate blood sugar levels by showing better performance with inhibiting the Alpha amylase enzyme.

Slowing down aging

Research demonstrates that *S. subsalsa* ethanol extract provides 57% protection of DNA by mimicking the ability to combat oxidative stress related to aging. This finding allows scientists to consider new anti-aging applications in both cosmetic and medical fields.

From Local Wonder to Global Innovation.

Consumer-friendly formulations of pharmaceutical products such as tablets and liquid extracts and powders from this indigenous resource hold the potential to develop it into a worldwide health product. Production optimization will occur through using an indigenous species already adapted to Sri Lankan waters, which eliminates cost-efficiency obstacles linked with non-native alternatives.



As the world increasingly turns to nature for solutions to complex health challenges, Sri Lanka's *Spirulina subsalsa* represents not just a promising superfood but a model for responsible bioprospecting, leveraging indigenous resources while preserving local ecosystems. This tiny aquatic organism may soon establish Sri Lanka as a leader in natural wellness innovation, offering sustainable solutions for some of today's most pressing health concerns.



Image 2: Spirulina with its therapeutic versatility



This is a non-technical summary of the project report titled "Bioprospecting *Spirulina subsalsa* native to Sri Lanka: Assessment of Antioxidant, Antidiabetic, Anti-obesity & Anti-aging potentials" supervised by Prof. B. C. Jayawardena*, Department of Animal science and Fisheries, Faculty of Agriculture, University of Peradeniya. *.



Exploring the Effect of Heat Moisture Treatment, Acetylation and Their Combine Modification on Cassava Starch

H.I.S. Gunarathna

An introduction to starches

Starch is one of the most abundant constituent of plants. It serves as a carbohydrate reserve in roots, tubers, seeds, fruits and cereal grains. Maize is the major source of starch utilize in the food industry and it responsible for 80% of the commercial starch production followed by potato, cassava and wheat. Starch is utilize in several industries such as food industry, textile industry, paper production, biodegradable material production etc.

Utilization of starches in food industry

Starch is used in wide range of food products including bakery and pastry products, noodles, soups, soft drinks production of sweeteners etc.

Starches act as a thickening agent in some food products, enhance the texture and quality of baked foods, can be used as an emulsifier and as stabilizers, and in low fat foods, starch can mimic the creamy texture of fat without adding calories as a fat replacer.

Importance of doing modifications to starches

Although starch is widely used in food industry, native starches have certain limitations in some processing conditions such as poor stability under heat, low resistance to shear, high ability to retrograde.

Modifications are done to improve the desirable characteristics of starches and to enhance the applicability in border range of processing conditions. Modified starches are currently utilizing in many industries and there are many ways to explore more about starch modifications.

Why HMT and acetylation is selected as the modification methods?

According to the previous literature, both are very effective modification methods. HMT is a physical modification method and it is a safe and kind of a natural technique. Chemicals are not use in here.

Acetylation is a chemical modification method. Acetylated starches should contain a lower acetyl percentage (<2.5%) to be used in the food applications.

Why cassava starch is used?

Cassava is a well grown crop in Sri Lanka. Improving the morphological and physicochemical properties of cassava starch through these modifications could potentially reduce the reliance on imported starches.

Methodology of the study

MU 51, a Sri Lankan cassava variety is used for this study. Cassava starch is extracted from the cassava roots. Modifications to extracted native cassava starch was done as followed;

1. HMT → Adjusted the moisture content up to 22% and applied 120 °C for 2h
2. Acetylation → Acetylated with 8% of acetic anhydride
3. Dual-1 → HMT + Acetylation
4. Dual-2 → Acetylation + HMT

The results…

Acetyl percentage of dual modified and acetylated starches were within the food grade range (<2.5%). Starch granules showed a polygonal shape. Granule size and shape were not changed after the modifications. In FTIR analysis acetylated and dual modified samples showed a new peak at wavenumber 1245 cm^{-1}, proving the introduction of acetyl groups. Moisture content was decreased after HMT and acetylation followed by HMT. Color of the starch was not affected by the modifications. Water holding capacity of starch has increased after the modifications. Oil holding capacity of acetylation followed by HMT modified starch was increased after the modification. Solubility of HMT and dual modified starches were decreased and acetylated sample was increased at 90°C compared to native starch. Swelling power showed an increasing trend with the temperature and at the 90°C HMT and dual modified starches showed a decreased compared to native.

According to this study, dual modifications improve the properties of cassava starch than single modifications.

For further studies these treated starches can be used in actual food applications.

This is a non-technical summary of the project report titled "Effect of Heat Moisture Treatment, Acetylation and Dual Modification on Morphology, Structure and Physicochemical Properties of Cassava Starch" supervised by Dr. E.R.J. Samarakoon*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *rasanjalis@agri.pdn.ac.lk



The Impact of High Somatic Cell Count (Scc) In Milk and the Current Sri Lankan Dairy Sector

N.W.A.S.N.K. Nanayakkara

Sri Lankan dairy sector is growing rapidly, enhancing the self-sufficiency of the country's milk demand. Nevertheless, one major problem affecting the milk quality is the SCC, which measures the epithelial cells and white blood cells in milk. Elevated SCC is often an indicator of mastitis, an intra mammary infection, which deteriorates the milk composition.

How was the study done?

This study analyzed udder milk samples from a group of crossbred cows in an intensive management system, which were in mastitic condition using Fourier Transform Infrared Spectroscopy. All 24 cows' milk samples were collected over a five-day period. And categorized them into four groups based on their SCC as high-clinical ($2x10^6$-$10x10^6$ cells/mL), medium-clinical ($1x10^6$-$1.999x10^6$ cells/mL), low-clinical ($4.01x10^5$-$9.99x10^5$ cells/mL), and sub-clinical ($2x10^5$-$4x10^5$ cells/mL).

Our key findings?

It was revealed that, when the SCC exceeded $1x10^6$ cells/mL, some milk components changed significantly. Total solids and galactose levels decreased significantly, indicating a milk quality deterioration. Also, total proteins and caseins were significantly increased suggesting structural changes in milk composition that could affect dairy production processes. Lactose showed a similar decreasing pattern as galactose. But this effect was not significant. Free fatty acids also declined gradually with increasing SCC, but this was not significantly correlated. Interestingly, fat, solids-not-fat, titratable acidity, glucose and urea remained unaffected by changes in SCC.

The importance of the findings to the SL dairy sector?

These findings are beneficial to the Sri Lankan dairy industry, as it was revealed that, elevated SCC not only reduce the nutritional value of milk but also shorten the product shelf life and make it harder to process. This could affect economically to both farmers and processers. As a conclusion, it is necessary to manage SCC in cow's milk by implementing stricter quality standards and by educating farmers about udder health management, towards a better dairy industry in the country, where every citizen can consume good quality dairy products.





This is a non-technical summary of the project report titled "Relationship of Somatic Cell Count (SCC) and Chemical Composition of Milk from a Group of Crossbred Cows" supervised by Prof. R.M.C. Deshapriya*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *cdeshapriya@agri.pdn.ac.lk.



Beyond the Spoon: Revolutionizing Yoghurt as a High-Protein Drink

D.V.H.M. Thilakarathna

Yoghurt is shedding its spoon-fed image and stepping into the future as a powerful, protein-packed beverage. As consumers demand more convenient nutrition, drinking yoghurt is being reimagined to deliver both health benefits and great taste in every sip.

The Protein Revolution in Dairy

While traditional yoghurt offers about 3-4g of protein per serving, innovative formulations now deliver nearly double that amount. By carefully blending high-quality milk proteins, modern yoghurt drinks can provide **5g or more of protein per 100ml** - perfect for active lifestyles and health-conscious consumers.



Finding the Perfect Balance

Recent research reveals that more protein doesn't always mean better. A comparison of different protein levels showed that:

- Moderate protein enhancement (5%) created the ideal combination of nutrition, texture and flavor
- Higher protein versions became too thick over time, affecting drinkability
- The best-performing formula maintained smooth consistency while delivering 40%

Why This Matters for Your Health

1. Muscle Support - An excellent post-workout recovery drink
2. Gut Health - All the probiotic benefits of traditional yoghurt
3. Convenience - Nutrition you can take anywhere
4. Dietary Flexibility - Naturally lower in lactose than many dairy options



The Next Wave in Dairy Innovation

As nutrition science advances, drinking yoghurt is evolving from a simple snack to a targeted functional food. The success of these new formulations proves that smart protein enhancement - not just maximum protein - creates products people truly enjoy.

The spoon isn't going away, but now there's a powerful new way to enjoy yoghurt's benefits. One refreshing sip at a time.

Drink different. Drink better!

This is a non-technical summary of the project report titled "Formulation and quality assessment of high protein drinking yoghurt" supervised by Prof. P.H.P.Prasanna Edirimini*, Animal Science, Faculty of Agriculture, University of Peradeniya. *phpprasanna@agri.pdn.ac.lk.



The Puzzle of Soft Gherkins; Uncovering the Root Causes

Udani Samarasinghe

"Crunchiness is a critical textural attribute that significantly influence consumer acceptance of foods." Gherkins, a popular variety of cucumber often used for pickling, are highly valued for their crunchy nature.



What is Gherkin Softness?

Softening of gherkins refers to the undesirable change in the texture of gherkin fruits where they lose their characteristic firmness and turning into a mushy consistency. This issue observed when gherkins are transformed into pickles, rather than in their fresh forms.

General Observation…

It is often the harvest from *Yala* season that tend to soft, while those from the *Maha* season maintain their firm texture. What could be the hidden story?

Role of Ca in fruit firmness

Calcium plays a vital role in maintaining fruit firmness by strengthening cell walls. It binds pectin molecules in middle lamella, which help to cement plant cell walls together, providing structural stability.

But…

When the water limits? Can it influence the Ca uptake by the plants…

How was the study conducted?

This study utilized two different moisture levels in the growth media to identify root cause of reduced Ca uptake by plants. Additionally, different foliar Ca concentrations were applied to explore protentional improvements of Ca content within plants.

Gherkin plants are cultivated under both well-watered and water stress conditions, with three different foliar calcium concentrations (0g/16L, 25g/16L & 35g/16L of $Ca(NO_3)_2$) applied separately. Effect of both two factors were analyzed using vegetative, yield and fruit quality parameters.



Research findings revealed…

Water stress significantly reduces yield and vegetative growth, including plant height and stem diameter. Ca foliar application has minimal impact on yield under well-watered condition but plays a beneficial role in improving yield under water stressed condition.

Most Importantly…

The study found that the moisture content of the growth media has a significant impact on Ca uptake by the plant. Since Ca plays a key role in the softening of gherkins, variations in soil moisture level could be one of the underlying causes of this softening issue.

This is a non-technical summary of the project report titled "The Effect of Moisture Stress and Foliar Application of Calcium on Growth, Yield and Fruit Quality of Fresh and Pickled Gherkins" supervised by Prof. W.A.P. Weerakkody, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. wapweerakkody@agri.pdn.ac.lk



Worried About Sugar but Need Probiotics? Here's Your Gut-Friendly Solution!

✍ **P.P.J.C. Palihadeniya**

Drinking yoghurt is a widely popular and nutritious option, offering essential nutrients like protein, calcium, and vitamins that support bone health and aid digestion. However, conventional yogurt drinks often contain significant amounts of added sugars and artificial sweeteners, making them unsuitable for individuals with diabetes, especially those managing type 2 diabetes. With the rising healthcare costs associated with managing diabetes and its complications, particularly in low- and middle-income countries like Sri Lanka, there is an urgent need for healthier alternatives that address both taste and health concerns.

Solution??

By combining Thebu with Kithul treacle, a natural sweetener, this yogurt drink not only offers probiotic benefits for improved digestion but also supports blood sugar management, providing a healthier and more accessible beverage option for consumers seeking to reduce sugar intake while still enjoying a nutritious and flavorful drink with probiotics.

Why Thebu?

Thebu is a medicinal plant, also known as the "insulin plant," due to its antidiabetic properties, offering a natural and safer alternative for managing diabetes. Found across tropical regions, its leaves contain bioactive compounds like flavonoids, tannins, phenols, coumarins, terpenoids, steroids, alkaloids, and glycosides, which help,

✓ Improve insulin sensitivity

✓ Enhance glucose uptake

✓ Protect pancreatic β-cells

✓regulate blood sugar levels

✓α-glucosidase and α-amylase inhibitors



Why Kithul treacle?

Kithul treacle, derived from the sap of the *Caryota urens* palm, is a traditional Sri Lankan sweetener known for its low glycemic index (GI) value. This makes it a healthier alternative to white sugar, particularly for individuals with type 2 diabetes. Rich in bioactive compounds like flavonoids, alkaloids, and phenolics, Kithul treacle also contains antioxidant, anti-inflammatory, and antidiabetic properties. These benefits, along with essential minerals like calcium and potassium, make Kithul treacle a valuable addition to diabetic diets, helping to manage blood sugar levels while adding a natural, caramel-like sweetness to foods and beverages.

What the Research Shows:

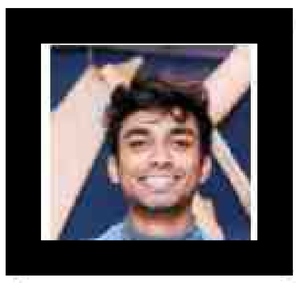
The yogurt drink made with Thebu and sweetened with Kithul treacle kept its quality over 14 days its pH, total solids, and color stayed mostly the same. It had lower acidity than regular yogurt.Nutritionally, it had 5.55% protein and 2.6% fat, making it a healthy option. The sweetness level (Brix value) was also lower, showing it has less sugar.

Future directions....

further studies are necessary for its hypoglycemic effect.



This is a non-technical summary of the project report titled "Development of a Low Fat Drinking Yogurt with Kithul Treacle fortified with thebu (*Costus speciosus*) targeting Type 2 diabetes patients" supervised by Prof. R.M.C. Deshapriya*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *cdeshapriya@agri.pdn.ac.lk.



Unveiling symptoms causing Hidden micro candidates in natural forest ecosystems in Sri Lanka

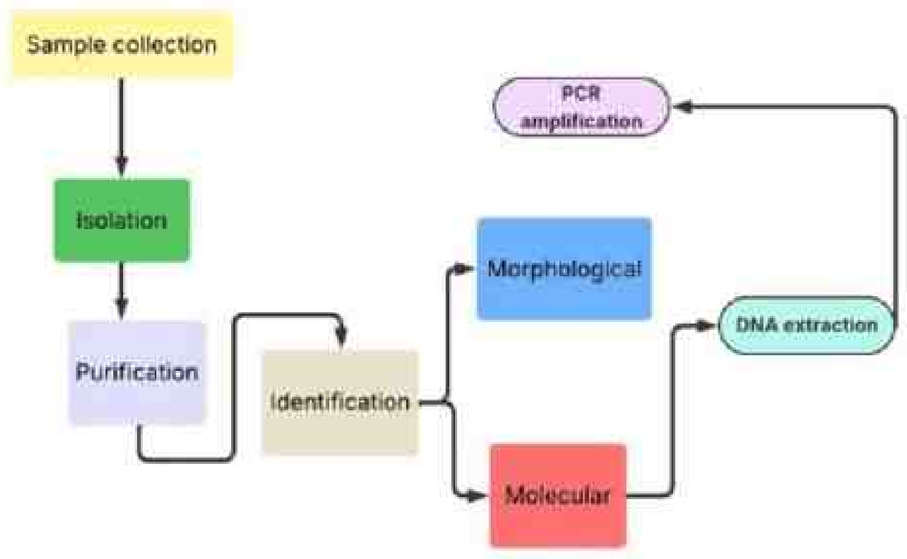
Nipun Ferdinand

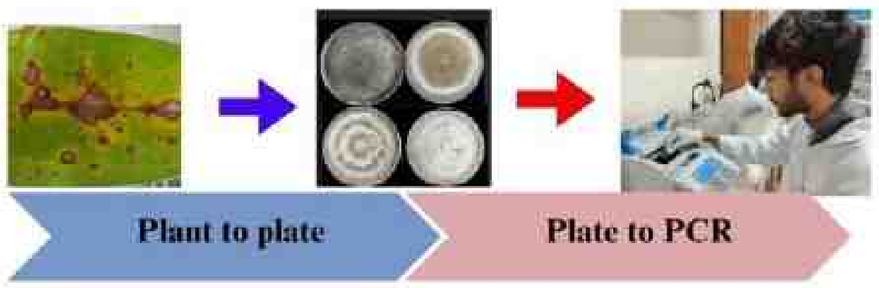
Investigating Candidate Pathogens in Forest Ecosystems

Who are they? Candidate pathogens, microorganisms associated with symptomatic plants but no yet confirmed as pathogen which having potential threat to natural forest ecosystems in Sri Lanka. Knuckles Conservation Forest (Biodiversity hotspot, UNESCO world heritage) and Hanthana Reserve, we observed widespread tree disease symptoms without confirmed pathogenic causes. This study systematically identifies and characterizes the candidate pathogens through combined morphological and molecular approaches, addressing a critical knowledge gap in forest pathology in Sri Lanka.

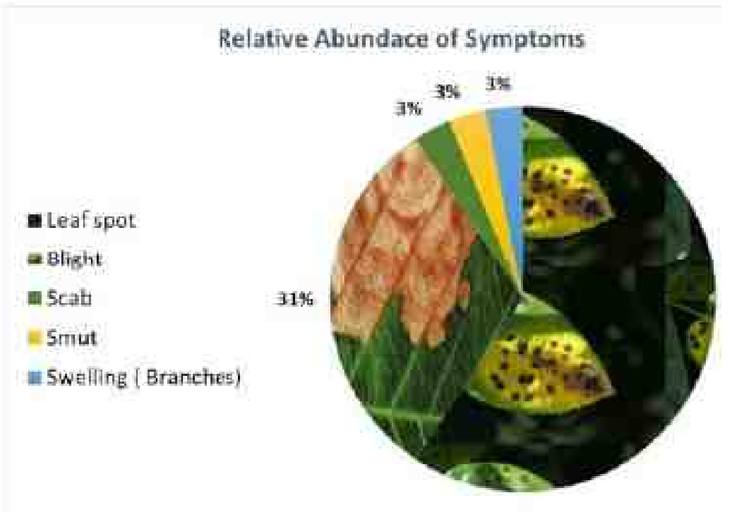
Building a Candidate Pathogen Database

- Isolate and preserve candidate pathogens from symptomatic trees.
- Develop optimized protocols for DNA extraction and PCR amplification of candidate pathogens.
- Characterize morphology and molecular features of candidate pathogens.
- Establish preliminary identification of microbial species requiring pathogenicity confirmation.

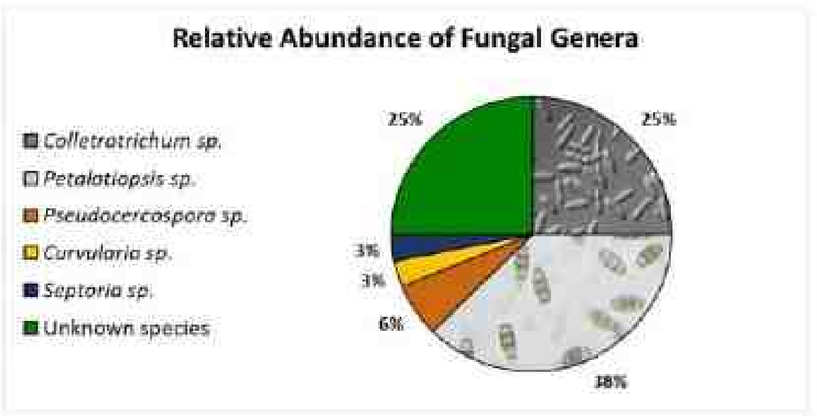




Prevalence of Plant Symptoms



Diversity of Candidate Pathogens

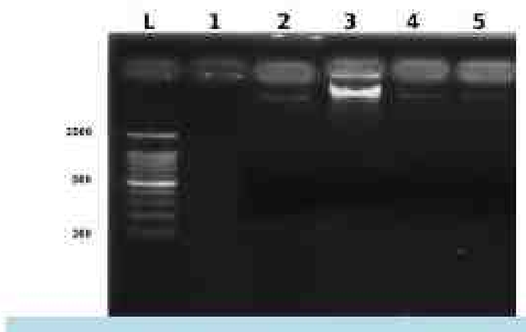


25% of candidates remained unidentified.

Optimal protocols

•SDS-Proteinase K method showed higher DNA yield and purity

•PCR success at 51°C annealing temperature



Extracted Genomic DNA



PCR success at 51°C

This study identified fungi that might be connected to tree diseases in Central Province, Sri Lanka and devised methods for identifying them. About 25% of these isolated species are currently unknown, thus further study is required to identify them. The base for monitoring forest health and directing conservation activities is established by our findings. We'll need to expand our surveys across the region and perform testing to see whether these candidate pathogens cause disease in order to completely understand and counter these potential challenges.

This is a non-technical summary of the project report titled "Morphological identification, optimization of DNA extraction and PCR protocols for identification of candidate plant pathogens isolated from symptomatic tree species of Central Province, Sri Lanka" supervised by Mr. K.D.R.C. Rienzie*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. *rayanrienzie@agri.pdn.ac.lk



මත්ස්‍යය සමෙන් කොලැජන් නිස්සාරණය කරමුද?

✍ **L. Akeshi Tharika Udani**

කොලැජන් යනු සමේ ප්‍රත්‍යාස්ථතාවය,ශක්තිය සඳහා වැදගත් වන ශරීරයේ බහුලව දක්නට ලැබෙන ව්‍යුහාත්මක ප්‍රෝටීනයකි. මත්ස්‍ය ශරීරයේ මෙම කොලැජන් සමෙහි සහ කොරපතුවල වල පවතී.

කොලැජන් වල ප්‍රයෝජන මොනවාද ?

මෙම කොලැජන් වෛද්‍ය ක්ෂේත්‍රය තුළ පටක ඉන්ජිනේරු විද්‍යාවටල ශරීරයෙහි ඖෂධ බෙදාහැරීම සහ තුවාල සුව වීමට යොදා ගනී. එමෙන්ම ආහාර ක්ෂේත්‍රයේදී අතිරේක ආහාරයක් ලෙසද රූපලාවන්‍ය ක්ෂේත්‍යේදී ක්‍රීම් වර්ග නිෂ්පාදනයටද යොදා ගනී. සමෙහි ශක්තිමත් භාවය පවත්වා ගැනීමටත්ල තරුණ පෙනුම රැක ගැනීමටත් කොලැජන් උපකාරී වේ. ශ්‍රී ලංකාවේ බොහෝ දෙනා මත්ස්‍ය ආහාර එදිනෙදා අනුභව කරන අතර දෛනිකව විශාල මසුන් සංඛ්‍යාවක් ධීවරයන් විසින් අල්ලා ගනියි.මීගමුව මත්ස්‍යය වෙළඳපොල යනු මෙසේ දෛනිකව මසුන් වෙළඳාම සිදු කරන ශ්‍රී ලංකාවේ වඩාත් කාර්ය බහුලම මත්ස්‍යය වෙළඳපොලකි.මෙම මුහුදෙන් අල්ලා ගන්නා මත්ස්‍යය විශේෂ වලින් සමහර මසුන්ගේ සම ඉවත් කර මුහුදට දැමීමට, මසුන් වෙළඳාම් කරන පුද්ගලයෝ පුරුදු වී සිටිති.එම නිසා එමඟින් සිදුවන පරිසර හානිය අතිමහත්ය. මෙය වළක්වා ගැනීමටත්,මත්ස්‍යය සමට ඉහළ වටිනාකමක් ලබා දී කොලැජන් නිස්සාරණය කිරීමටත් මෙම අධ්‍යයනයේදී බලාපොරොත්තු වෙයි.

කොලැජන් නිස්සාරණය කරන්නේ කෙසේද?

මෙම අධ්‍යයනය සඳහා තෝරාගනු ලබන මත්ස්‍යය විශේෂ වන්නේ, කෙලවල්ලා, බලයා සහ මුහුදු කුකුළා යන මත්ස්‍යය විශේෂයි.කොලැජන් නිස්සාරණය කිරීමට බොහෝ ක්‍රමෝපායන් ඇති අතර මෙම අධ්‍යයනය සඳහා තෝරාගනු ලැබුවේ ඇසිටික් ඇසිඩ් භාවිතයෙන් කොලැජන් නිස්සාරණය කිරීමයි.



මත්ස්‍යය සම

මෙහිදී එක් එක් විශේෂ වලින් ලබාගත් සම,හොඳින් සෝදා, රුධිරය, මාංශමය ද්‍රව්‍ය, කොරපොතු වැනි දෑ ඉවත් කර ගැනීම අත්‍යවශ්‍ය වේ. ඉන් අනතුරුව එක් එක් විශේෂ වලින් මත්ස්‍ය සම 100g පමණ ගෙන පෙර පිළියමක් ලෙස 0.1M සාන්ද්‍රණය සහිත සෝඩියම් හයිඩ්‍රොක්සයිඩ ද්‍රාවණයක පැය 24ක් තබන ලදී. පසුව හොඳින් සෝදා පිරිසිදු කරගන්නා ලැබූ මත්ස්‍ය සම0.75M සාන්ද්‍රණය සහිත ඇසිටික් ඇසිඩ් ද්‍රාවණයක පැය 48ක් 4°Cඋෂ්ණත්වයේ තබා කොලැජන් නිස්සාරණය කර ගන්නා ලදී.

ඉන්පසුව මෙම කොලැජන් කේන්ද්‍රාපසාරකය මඟින් වෙන් කර සෝඩියම් ක්ලෝරයිඩ මඟින් අවක්ෂේප කර Freeze dryer උපකරණය භාවිතයෙන් කොලැජන් වියළා ගන්නා ලදී.



කොලැජන් නිස්සාරණය



කොලැජන් අවක්ෂේප කිරීම



Freeze dryer උපකරණය භාවිතයෙන් කොලැජන් වියළීම

මෙසේ ලබා ගන්නා කොලැජන් වල ප්‍රෝටීනල වර්ණයල මේදය ආදී නොයෙක් තත්ත්ව පරීක්ෂාවන් සිදු කරීම අවශ්‍ය වේග

මෙම අධ්‍යයනයේ ප්‍රතිඵල ලෙස,0.75M සාන්ද්‍රණය සහිත ඇසිටික් ඇසිඩ් නිස්සාරකය මඟින් කෙලවල්ලා මත්ස්‍යාගෙන් කොලැජන් 7.57gක ප්‍රමාණයක් නිස්සාරණය කර ගත හැකිවිය. බලයා මත්ස්‍යාගෙන් කොලැජන් 3.7g ක ප්‍රමාණයක් නිස්සාරණය වූ අතර මුහුදු කුකුළා මත්ස්‍යාගෙන් කොලැජන් නිස්සාරණය නොවුණි.මෙසේ නිස්සාරණය කරගත් කොලැජන් වල ප්‍රෝටීන ප්‍රතිශතය 80% වූ අතර මේද ප්‍රතිශතය(0.03%) ද ඉතාම අඩු අගයක් විය.

එම නිසා ඇසිටික් ඇසිඩ් යනු, කොලැජන් නිස්සාරණය කර ගැනීමට භාවිතා කල හැකි, පරිසර හිතකාමී හා වඩාත් ලාභදායක නිස්සාරකයකි.මෙසේ නිස්සාරණය කරගන්නා කොලැජන්, වර්තමානයේ ආහාර නිෂ්පාදන ක්ෂේත්‍රයේ බහුලව භාවිතා කරයි.

This is a non-technical summary of the project report titled "Acid soluble Collagen Extraction from *Thunnus albacares, Katsuwonus pelamis* and Canthidermis *maculata* fish Skin" supervised by Dr.E.T.S. Madhubhashini*, Deparment of Animal Science, Faculty of Agriculture, University of Peradeniya. *thushanis@agri.pdn.ac.lk.



පොල් ලෙල්ලෙන් මැවෙනා කහවනු රැක ගැනීමටනම්...

✍ **B.D.M.S.**ශෂිකලා දිසානායක

කප්රුක යනු සිතූ පතූ සම්පත් ලබා දෙන දිව්‍යමය වෘක්ෂයකි. අතීතයේ පැරැන්නන් පොල් ගසද කප්රුක ලෙස හැදින්වූ අතර වර්තමානයටද එය සත්‍යයක් වන්නේ පොල් ගස ඩොලර් ආකරයක් නිර්මාණය කර ඇති බැවිනි.

පොල් ගෙඩියෙන් ඉවතලන පොල් ලෙල්ලෙන් සාදන කොහු බත් එයට හොඳම නිදසුනකි.

ලෝකයේ ප්‍රධාන කොහුබත් අපනයන කරුවකු වන ශ්‍රී ලංකාව වාර්ශිකව ඩොලර් මිලියන 70 වකට අධික ආදායමක් උපයයි. කොහුබත් අපනයනයෙන් අප දෙවනි වන්නෙ ඉන්දියාවට පමනි. වර්තමානය වන විට ඉන්දුනීසියාව, පිලිපීනය, වියට්නාමය වැනි රටවල්ද සැලකිය යුතු තරඟ කරුවන් බවට පත් වී ඇති අතර ශ්‍රී ලාංකීය කොහුබත් කර්මාන්තය මේ වන විට විවිධ අභියෝගයන්ටද මුහුණ දෙමින් සිටී. ජාත්‍යන්තර වෙළඳපල් තරඟ කාරීත්වය තුල තම වෙළෙඳපල පවත්වා ගැනීම සඳහා අපනයනය කරනු ලබන කොහුබත් වල ගුණාත්මක බව පවත්වා ගැනීම අත්‍යාවශ්‍ය කරුණකි.

අපනයන කොහුබත් තුල අන්තර්ගත වල් පැළැටි බීජ එහි ගුනාත්මක භාවයට කෙරෙනි එල්ලවන ප්‍රබල තර්ජනයකි. කොහු සැකසුම් ක්‍රියාවලියේදී මෙම බීජ කොහු හා මිශ්‍ර වන අතර අපනයෙන් පසුවද අපනයනය කරන ලද භූමියේදී ප්‍රරෝහණය වීමේ ඉහල සම්භාවිතාවයක් ඇත.වල් පැළැටි අනෙකුත් වගා කරන ලද ශාක සමඟ හිරු එළිය,ජලය,පෝශක වැනි සම්පත් සමඟ සටන් කරන අතර මෙතුලින් නව පරිසරයක් සඳහා නව විදේශීය, ආක්‍රමනික ශාක විශේෂ හදුන්වාදීමක්ද සිදුවේ.

එය එම රටෙහි ජෛව පද්ධතියට තර්ජනයකි. එම නිසා බොහෝ රටවල් ජෛව ආරක්ෂක පනත් මගින් සීමා පනවා ඇති අතර අප රටෙන් අපනයනය කරන ලද කොහුබත් සමඟ වල් පැලැටි හදුනාගැනීමක් සිදුවුව හොත් අපනයනය කල මුළු කොහුබත් තොගයම ප්‍රතික්ෂේප වීමේ අවදානමක් ඇති අතර එය ශ්‍රී ලාංකීයා කොහුබත් කර්මාන්තයට සිදු වන විශාල හානියකි.

මෙම ගැටලුව සඳහා පිළිතුරක් ලෙස ජාතික ශාක නිරෝධායන සේවය මගින් කොහුබත් ආපනයනය කරනු ලබන රටෙහි පාරිසරික සෞඛ්‍යයාරක්ෂිත බවට බලපෑමක සිදු නොවන බවට තත්ව සහතිකයක් ලබා දෙනු ලබයි. එහිදී දින 21 බීජ ප්‍රරෝහණය පරීක්ෂණ මගින් කොහුබත් සාම්පල තුල වල් පැළැටි වීජ තිබේ දැයි පරීක්ෂා කරනු ලැබේ. නමුත් බොහෝ බීජ, බීජ සුප්තතාවයෙන් යුතු බැවින් දින 21 තුලදී ප්‍රරෝහණය නොවේ. එබැවින් එම වල් පැළැටි අනාවරණය කල නොහැක. මේ නිසා බීජ සුප්තතාවය බිඳ දමන ක්‍රමයක් සොයා ගැනීම අත්‍යාවශ්‍ය කරුණකි.

යොදා ගනු ලබන පිළිවෙත් විශාල කොහු බත් තොගයක් සඳහා යොදා ගත හැකි විය යුතු අතර, ආර්ථිකමය වශයෙන් ලාබ දායකද විය යුතුය. මෙම කරුණු සලකා බැලීමෙන් පසු පොටෑසියම් නයිට්රේට (KNO3) ප්‍රතිකර්මය හා තාප ප්‍රතිකර්මය යොදා ගන්නා ලදි.

මෙම අධ්‍යයනය සඳහා මූලිකවම *Crotalaria pallida, Cuscuta reflexa, Mimosa pigra, Leucaena leucocephala, Mimosa pudica, Amaranthus viridis* සහ *Chromolaena odorata* යන වල් පැළැටි විශේෂ 7 යොදාගන්නා ලදී. මෙම විශේෂ කොහුබත් හි සුලභව දක්නට ලැබෙන වල් විශේෂ ලෙස ජාතික ශාක නිරෝධායන සේවය මගින් කරන ලද පරීක්ෂණ මගින් හඳුනාගෙන තිබීමත් එම විශේෂ භෞතික හා භෞතවිද්‍යාත්මක සුප්තතාවයෙන් යුක්ත වීමත් මෙම විශේෂ තෝරාගැනීමට හේතු විය.

නොදින් මේරූ ව්‍යාප්තියට සූදානම් වූ බීජ තෝරා එකතු කල අතර පොටෑසියම් නයිට්රේට (KNO3) සාන්ද්‍ර තුනක් (0.1%(w/v), 0.4% (w/v),0.75 (w/v)) හා කාල ප්‍රාන්තර තුනකදී තාපයට (50°C) නිරාවරණය (විනාඩි 10,30 සහ 60) කරමින් පරීක්ෂණය සිදු කර දින 21 තුල බීජ ප්‍රරෝහණය නිරීක්ෂණයෙන් විශේෂ 7 සඳහාම බීජ සුප්තතාව ඉහාම ඵලදායී ලෙස බිද දැමිය හැකි ප්‍රතිකර්මය පිළිබඳ නිගමනයකට එලබීමට මෙම පරීක්ෂණයේ මූලික පියවරේදී සිදු කිරීමට හැකි විය. එහිදී *A. viridis, C. pallida, C. reflexa* 50°C විනාඩි 30 ප්‍රතිකර්මයටත්, *M. pigra, L. leucocephala* විශේෂ එම උෂ්ණත්වයේම විනාඩි 60 ප්‍රතිකර්මයටත්, *C. odorata* හා *M. pudica* 0.75 (w/v) KNO_3 හා 50°C දී විනාඩි 10 බීජ ප්‍රතිකර්ම සඳහා පිළිවෙලින් ප්‍රතිචාර දැක්වීය. ඉහත නිගමනයන්ට එළඹීමෙන් පසුව බීජ ප්‍රරෝහනයට උචිතම කොහුබත් තට්ටුවේ ගැඹුර නීර්ණය කිරීම සිදු විය. *C. pallida* සහ *M. pudica* 2.5cm ගැඹුරෙනිත්, *A. viridis, C. reflexa* 1.5cm නිදීත් ඉහලම ප්‍රරෝහණ ප්‍රතිශතයක් පෙන්වූ අතර අනිකුත් සියළු විශේෂ 0.5cm නිදී එම ප්‍රතිචාරය දැක්වීය.

මෙම අධ්‍යයනයෙහිම ඉදිරි පියවරක් ලෙස ප්‍රරෝහණය වන බීජ අංකුර නිවැරදිව හදුනාගත යුතුය. සාම්ප්‍රදායික ක්‍රම එතරම් නිවැරදි නොවන බව පෙනී යන නිසා ඒ සඳහා නිවැරදි ක්‍රමවේදයක් නිර්මාණය කළ යුතු විය. එම නිසා තෝරා ගත් වල් විශේෂ හතෙහි බීජ පැළ හදුනා ගැනීමට මාර්ගෝපදේශන සහිත කුඩා අත්පොතක් නිර්මාණය විය. එමගින් බීජ පැළ කුඩා අවදියේදීම නිවැරදිව හදුනාගැනීමට හැකියාව ලැබේ.

ඉහත බීජ සුප්තතාවය බිඳ දමන ක්‍රමවේදයන් කොහුබත් හි ඇති වල් විශේෂ හදුනා ගැනීම පහසු කරන අතර අන්තර්ජාතික ජෛව ආරක්ෂක තත්වයන් හා ගැලපෙන ලෙස ශ්‍රී ලාංකේය කොහුබත් නිශ්පාදනය සඳහා මනා පිටුවහලක් සලකයි. එය ආක්‍රමණශීලී වල් විශේෂ නිසා සිදුවන ව්‍යසනයෙන් ගෝලීය ජෛව පද්ධතිය, ආර්ථිකය පමනක් නොව වාර්ෂිකව විශාල විදේශ විනිමයක් උපයන කොහුබත් කර්මාන්තයද ආරක්ෂා කරන ආරක්ෂක සුරයක් වැනිය.



This is a non-technical summary of the project report titled "Assessment of low-cost germination enhancing methods for selected weed species in coir and development of a seedling guide" supervised by Dr. V.N.S. Sirimalwatta*, Department of Agriculture Biology, Faculty of Agriculture, University of Peradeniya. *nipuni.siri@agri.pdn.ac.lk.



පිසූ ආහාරවල නැවුම් බව පිරික්සීමට නවෝත්පාදන විසඳුමක් !!

ධනුෂ්ක නවරත්න



එදිනෙදා ජීවිතයේදී ආහාර පිසීමෙන් පසු ඒවා බොහෝ වේලාවක් කාමර උෂ්ණත්වයේම තබන අතර ඉන්පසු ඉතිරි වන ආහාර ශීතකරණයක ගබඩා කිරීම බොහෝ විට සිදු කරනු ලැබේ. වර්තමානයේදී නිවෙස් වල පමණක් නොව වාණිජමය ලෙස ආහාර පිසිනු ලබන හෝටල් හා ආපනශාලා වැනි ස්ථාන වලද මේ ආකාරයෙන් ආහාර ශීතකරණයක් තුල කල්තබා ගනී. එලෙස ආහාර තබා ගන්නා කාලය පැය කිහිපයක සිට දින කීපයක් දක්වා දීර්ඝ විය හැකි අතර නැවත භාවිතයේ දී එම ආහාරදී පරිභෝජනයට සුදුසු තත්ත්වයේ පවතීද නැත්ද යන්න ආහාරයේ වර්ණය, ගන්ධය, වයනය හා රස වැනි භෞතික සාධක උපයෝගී කරගෙන බොහෝ විට තනි පුද්ගලයෙකු හෝ කිහිප දෙනෙකු විසින් නිර්ණය කරනු ලැබේ. එහිදී ආහාරයේ මෙම භෞතික වෙනස්කම් සංවේදනය වන ආකාරය පුද්ගලයාගෙන් පුද්ගලයාට වෙනස් වන බැවින් ආහාරය පරිභෝජනයට ආරක්ෂිත ද නැතිද යන්න නිවැරදිව නිගමනය කළ නොහැක.

ආහාරයක් නරක් වීම සඳහා ප්‍රධාන වශයෙන් ආහාරය තුළ සිටින ක්ෂුද්‍ර ජීවීන් ප්‍රමාණය ඉහළ යෑම බලපායි. ආහාරයක් පිසීමෙන් පසු කල්තබා ගැනීමේ දී එහි සිටින ක්ෂුද්‍ර ජීවීන් ප්‍රමාණය ශීඝ්‍රයෙන් ඉහළ යෑම නිසා ආහාරයේ ආරක්ෂිත බව කාලයත් සමඟ අඩුවේ. මෙම ක්ෂුද්‍ර ජීවීන් ආහාරය නරක් කිරීමට දායක වීමට අමතරව එම අනාරක්ෂිත ආහාර පරිභෝජනයෙන් පසු මිනිසාට ද හානිකර වේ. ආහාරය තුළ වැඩෙන ක්ෂුද්‍ර ජීවීන් විවිධ වායු වර්ග බාහිරට නිදහස් කරන අතර ආහාරයේ ආම්ලික භාවය ද බොහෝවිට වෙනස් කරයි.



ආහාරයක ආරක්ෂිත බව සනාථ කිරීමට ආහාර සාම්පල සඳහා පිළිගත් ක්ෂුද්‍ර ජීවී පරීක්ෂා සිදු කරයි. එමගින් ආහාරය පරිභෝජනයට සුදුසුද නුසුදුසු ද යන්න නිවැරදිව නිගමනය කළ හැකි නමුත් ඒ සඳහා අධික පිරිවැයක් සහ විශාල කාලයක් වැය වේ. එම ගැටලුවට ප්‍රායෝගික විසඳුමක් ලෙස අඩු කාලයකින් හා අඩු පිරිවැයකින් අදාළ ආහාරයක සුදුසු බව පහසුවෙන් පරීක්ෂා කළ හැකි උපකරණයක් මා විසින් හදුන්වා දී ඇත. මෙය හෝටල්, ආපනශාලා හෝ ගෘහාශ්‍රිත භාවිතයට ද යෝග්‍ය වීම මෙහි ඇති විශේෂත්වය වේ.

ආහාරයක් නරක් වීමේදී ප්‍රධාන වශයෙන් නිදහස් වන වායු වර්ග දෙකක් වන හයිඩ්‍රජන් සල්ෆයිඩ් සහ එතනෝල් යන වායූන් ද ආහාරයේ ආම්ලිකතාව ගණනය කිරීම සඳහා pH අගය ද පාදක කරගෙන මෙම උපකරණය නිපදවා ඇති අතර බාහිර තත්ත්ව හඳුනා ගැනීමට උෂ්ණත්වය හා ආර්ද්‍රතාවද මනිනු ලැබේ.

ඉහත වායු හඳුනාගැනීමට සංවේදක දෙකක් හා උෂ්ණත්වය, ආර්ද්‍රතාව මැනිය හැකි සංවේදකයක් පියනකට සවිකර ඇති අතර බාහිරින් pH සංවේදකයක් මෙම පද්ධතියට ඇතුළත් වේ. මෙම සංවේදක සියල්ල බාහිරින් ඇති Arduino Uno නම් කුඩා පරිපථයක් ඔස්සේ පරිගණකයකට සම්බන්ධවේ. ආහාර සාම්පල අදාල බඳුනට දමා පියන හොඳින් වසා පරිගණකයේ අදාළ යෙදවුම ක්‍රියාත්මක කර කෙටි වේලාවක් තැබූ පසු පහසුවෙන් එම ආහාරය භාවිතයට සුදුසුද නුසුදුසු ද යන්න තීරණය කළ හැක. එම පියවරේදී වායු සංවේදක මඟින් ලැබෙන ඇසුරින් ආහාරය භාවිතයට සුදුසු බව ප්‍රකාශ වුවත් එය තවදුරටත් සනාථ කිරීමට බඳුනේ පියන ඉවත්කොට pH සංවේදකය ආහාරයේ ගිල්වා පරිගණකයේ අදාළ යෙදවුම ක්‍රියාත්මක කිරීමෙන් පරිභෝජනයට සුදුසුදු නුසුදුසු ද යන්න පරීක්ෂා කළ හැක. ඉහත පියවර දෙකෙන්ම ආහාරය සුදුසු බව තීරණය වුවහොත් එම ආහාරය පරිභෝජනයට වඩාත් සුදුසු වේ.



මෙම උපකරණයේ අනෙක් විශේෂත්වය වන්නේ මෙහි සංවේදක දත්ත අදාළ ආහාරය සඳහාම විශේෂයෙන් සිදුකරන ලද ක්ෂුද්‍ර ජීවී පරීක්ෂණවල දත්ත සහ සම්බන්ධ කිරීමෙන් නිර්මාණය කරන ලද ඒවා වීමයි. මෙම උපකරණයේ අනෙකුත් වාසි ලෙස අනාරක්ෂිත ආහාර පරිභෝජනය අඩුකර ගැනීම සහ ඉවතලන ආහාර අපද්‍රව්‍ය ප්‍රමාණය අඩු කර ගැනීමට හැකිවීම සැලකිය හැක. මෙම උපකරණය විවිධ නවීන වායු සංවේදක භාවිතා කිරීමෙන් හා, වැඩි ආහාර ගණනක් සඳහා දත්ත විශ්ලේෂණය කිරීමෙන් ත වදුරටත් වැඩියුණු කළ හැකි අතර මෙයට අමතරව ජංගම දුරකතන සඳහාද යෙදවුම ලබා දීම දක්වා වැඩියුණු කළ හැක.



This is a non-technical summary of the project report titled "Development of an IoT-Enabled Real-Time Spoilage Detection Tool for Selected Ready-to-Eat Food Items in the Food Service Sector" supervised by Dr. G.M. Somaratne*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *gsomaratne@agri.pdn.ac.lk



විසඳුමට කුඩු කරමු

ඩබ්ලිව්. පී. ඒ. කේ. ලක්සර

හෙළයා කෙත බත ආශ්‍රිතව ආහාර සකසා ගනියි. සහල් ආශ්‍රයෙන් පිටි නිපදවා ගැනීමේදී ඔවුහු සුරුවෝ වෙති. ඉදි ආප්ප, පිට්ටු, ආප්ප වැනි ආහාර මෙන්ම රසකැවිලි නිෂ්පාදනයට අතිශය බහුලව සහල් පිටි යොදා ගනියි. ඉහළ ගුණාත්මක සහ ප්‍රමාණාත්මක බවින් යුතු සහල් පිටි පාරිභෝගිකයන් වෙත ලබා දීම සඳහා ව්‍යාපාරික ප්‍රජාව තරගයක යෙදී සිටී. එහිදී නවීන තාක්ෂණය සහ උපක්‍රම භාවිතා කරයි. එහිදී පාරිභෝගිකයා සහ නිෂ්පාදකයා යන දෙපාර්ශවයටම වාසි ගෙන දෙන අයුරින් නිෂ්පාදන ක්‍රියාවලිය සිදු කිරීම වැදගත් වේ.

සිලියැක් රෝගය එනම් ග්ලූටන් සඳහා ඇති සංවේදීතාවය ලෝකයේ සෑම පුද්ගලයන් සිය දෙනෙකුගෙන් එක් අයෙකු පෙළෙන බව පර්යේෂණ වාර්තා හෙළි කරයි. ග්ලූටන් යනු ප්‍රෝටීන වර්ග දෙකකි. ඒවා අඩංගු ප්‍රධාන භෝග වර්ගයක් වන්නේ තිරිඟුය. මෙම රෝගය ශරීරයේ ප්‍රතිශක්තිය පහළ දැමීම නිසා සෞඛ්‍ය ගැටලු රැසකට මග පාදන අතර එමගින් දෛනික කටයුතු අඩාල කරවයි. ඒ සඳහා ගත හැකි එකම විසඳුම ග්ලූටන් අඩංගු ආහාරවලින් වැළකී සිටීමයි. තිරිඟු පිටි ආශ්‍රිත නිෂ්පාදන ළදරුවන්ට සහ වයෝවෘද්ධ පුද්ගලයන්ට ජීරණය අපහසු කරන නමුත් සහල් පිටි වල පවතින මෘදු ස්වභාවය නිසා ජීරණය පහසු කරවයි. සහල් පිටි සතු මෙම මෘදු ස්වභාවය සහ විශේෂ රසජනනයක් නොමැති නිසා ආහාර නිෂ්පාදනයේදී අමුද්‍රව්‍යයක් ලෙස පහසුවෙන් භාවිතා කළ හැකිය.

ශ්‍රී ලංකාවේ සියළු පළාත් ආවරණය වන පරිදි කරන ලද සමීක්ෂණයකදී සහ සහල් පිටි ආශ්‍රිත නිෂ්පාදන පිළිබඳ පාරිභෝගිකයන් යොදාගෙන සිදු කරන ලද සංවේදක ඇගයීමකදී (sensory evaluation) වත්මන් සහල් පිටි වෙළෙඳපොළෙහි පවතින අඩුපාඩු රැසක් අනාවරණය විය. ප්‍රධාන වශයෙන්ම වර්ණය, ස්වභාවය, සුවඳ, රස සහ සහල්පිටි වලින් නිපදවාගත හැකි ප්‍රමාණය වැනි පරාමිතීන් පිළිබඳව ප්‍රධාන වශයෙන් සැලකිලිමත් වන බව තහවුරු විය. මෙම සමීක්ෂණයේදී වත්මන් වෙළඳපොළෙහි පවතින තරගකාරී සන්නාමවලින් යුතු සහල්පිටි වලින් සෑකසූ ඉදි ආප්ප පිටි පිළිබඳ එම අදහස් දක්වා තිබිණි. සහල් පිටි යොදාගෙන සිදුකරන නිෂ්පාදනවල ඇසට ප්‍රසන්න වූ වර්ණයක් කෙරෙහි සහ ස්වභාවය (texture) කෙරෙහි පාරිභෝගික ජනතාව විශේෂයෙන් සැලකිලිමත් වේ. මෙහිදී ඉදි ආප්ප තේමාව කරගත් අතර ශ්‍රී ලංකාවේ සහ ඉන්දියාවේ ජනයා බහුලව පරිභෝජනයට ගන්නා ආහාරයක් ලෙස එය හැඳින්විය හැකිය. ඉදි ආප්ප සෑදීම සඳහා නම්බන ලද සහල් පිටි යොදාගැනීම සාම්ප්‍රදායික ක්‍රමය වේ. නවීන තාක්ෂණය සමගින් අධෝරක්ත කිරණ මගින් උෂ්ණත්වය ඉහළ නැංවීම තුලින් යන්ත්‍රානුසාරයෙන් සහල් පිටි බවට පත්වන ක්‍රියාවලියේදීම තෙම්බීම මහා පරිමාණ නිෂ්පාදන ක්‍රියාවලියේදී සිදුවේ. එහිදී පිටි හැලීම සඳහා භාවිතා කරනු ලබන දැල් මගින් සහල් පිටි අංශුවල ප්‍රමාණය තීරණය වේ. මෙම සහල් පිටි අංශුවල ප්‍රමාණය සාදනු ලබන ආහාර වල ගුණාත්මකභාවය තීරණය කරන ප්‍රධාන සාධකයකි. ඒ කෙරෙහි පාරිභෝගිකයන්ගේ කැමැත්ත පිළිබඳව කරන ලද පර්යේෂණයේදී සහල් පිටි අංශුවල ප්‍රමාණය ප්‍රධාන සාධකයක් බව තහවුරු විය.

සහල්වල ආරම්භක ජල ප්‍රමාණය 15% ක් වූ සහල් මෙන්ම සහල්, පිටි බවට පත් කිරීමේදී යන්ත්‍රයට ඇතුළු කිරීමට පෙර සහල්වල ආරම්භක ජල ප්‍රමාණය 15% සිට 6% දක්වා අඩුකර පර්යේෂණය සඳහා යොදාගන්නා ලදී. මෙම ඉදි ආප්ප පිටි සාම්පල ගෙන එහි අංශු ප්‍රමාණවල ව්‍යාප්තිය සම්මත පෙරන (standard sieves) භාවිතා කර අධ්‍යයනය කරන ලදී. එහිදී ලද දත්ත මත ඉතා කුඩා ප්‍රමාණයේ අංශු සහ තරමක් විශාල අංශු ලෙස මුල් සාම්පල දෙකෙන් එකකින් හතර බැගින් සාම්පල හතරක් තෝරා ගන්නා ලද අතර ජලය රඳවා තබා ගැනීමේ ධාරිතාව, සහල් පිටි තැම්බීමේදී ප්‍රමාණය විශාල වීමේ ධාරිතාව සහ පිටි ජලය සමග දියකිරීමේදී එහි දුස්ස්‍රාවීතා අගය වැනි භෞතික පරාමිතීන් පිළිබඳව පරීක්ෂණ කරන ලදී. එම සාම්පල වලින් සාදන ලද ඉදි ආප්පවලින් සංවේදක ඇගයීමක් කරන ලදී. අන්තර්ගත මුල් ජල ප්‍රමාණය අඩුකොට ඉතා කුඩා ප්‍රමාණයේ අංශුවලින් සාදන ලද ඉදි ආප්පවල ගුණාත්මකභාවය ඉහළ බව තහවුරු විය. කුඩා අංශු සහිත ඉදි ආප්ප පිටිවලින් නිෂ්පාදනයේදී ඉහළ ජල ප්‍රමාණයක් භාවිතා වුවද ඉන් නිපදවා ගත හැකි ඉදි ආප්ප ප්‍රමාණය ඉහළ වේ. භෞතික ලක්ෂණ සැලකීමේදී කුඩා ප්‍රමාණයේ අංශුවලින් සාදන ලද ඉදි ආප්පවල දිලිසෙන ප්‍රසන්න වර්ණයකින්ද, සුවඳකින් සහ ඉහළ රසයකින් යුක්ත වූ බව සංවේදක ඇගයීමෙන් තහවුරු විය. ඉදිආප්පවලට ඇති ආවේණික ඇලෙන සුලු බව සැලකූ විටද කුඩා අංශු සහිත ඉදි ආප්පවල ඇලෙන සුලු බවට වැඩි කැමැත්තක් දක්වා තිබුණි. එමෙන්ම මෘදු ස්වභාවයටද ඉහළ කැමැත්තක් තිබුණි. මෙම කරුණු සැලකූ විට අංශු කුඩා වීම කෙරෙහි පාරිභෝගිකයන්ගේ වැඩි කැමැත්තක් හිමිවන බව තහවුරු වේ. එසේම නිෂ්පාදකයන්ගේ කෝණයෙන් සැලකූ විටද මෙහි වාසි ඇත. පිටිවල ගුණාත්මකභාවය ඉහළ යන විට ඒ සඳහා ඇති ඉල්ලුම වැඩිවේ. එමනිසා එය වාණිජමය වශයෙන් ඉතා ඵලදායී වේ. ප්‍රමාණය කුඩා කිරීම නිෂ්පාදන පිරිවැය ඉහළ නංවන කරුණක් වුවද කුඩා ප්‍රමාණවල අංශු කලවම් කිරීමෙන් මෙම පර්යේෂණයේදී අනාවරණය කරගත් ඉහළ ගුණාත්මකභාවයෙන් යුත් නිෂ්පාදන සිදු කළ හැකිය.

ජනගහනය වැඩිවෙමින් ආහාර නිෂ්පාදනය අඩුවෙමින් පවතින පසුබිමකදී කුඩා අමුද්‍රව්‍ය ප්‍රමාණයකින් වැඩි නිෂ්පාදනයක් ලබා ගැනීම කෙරෙහි කෘෂිකාර්මිකයා, නිෂ්පාදකයා මෙන්ම පාරිභෝගිකයාද අවධානය යොමු කරමින් සිටියි. මෙම පර්යේෂණයේදී අනාවරණය කරගත් තොරතුරු ඔවුන්ට ඉතා සුදුසු ප්‍රතිකර්මයක් විය හැකිය. පාරිභෝගිකයාට ප්‍රියමනාප සහල් පිටි නිෂ්පාදනයටත්, තිරිඟු පිටි භාවිතා කළ නොහැකි පුද්ගලයන්ට භාවිතා කිරීමට මෙන්ම සහල් පිටි කෙරෙහි ජනතාවගේ ඇති ඇල්ම වැඩි කිරීමටද මෙය ඉවහල් වනු ඇත.



වම්පස ඉහළ - ආරම්භක ජල ප්‍රමාණය 6% ක් වන මයික්‍රෝමීටර් 100-200 ත් අතර ප්‍රමාණය, වම්පස පහළ - ආරම්භක ජල ප්‍රමාණය 15% ක් වන මයික්‍රෝමීටර් 100-200 ත් අතර ප්‍රමාණය, දකුණුපස ඉහළ - ආරම්භක ජල ප්‍රමාණය 6% ක් වන මයික්‍රෝමීටර් 63 ට අඩු ප්‍රමාණය, දකුණුපස පහළ - ආරම්භක ජල ප්‍රමාණය 15% ක් වන මයික්‍රෝමීටර් 63 ට අඩු ප්‍රමාණයෙන් සාදන ලද ඉදි ආප්ප

This is a non-technical summary of the project report titled "Impact of Rice Flour Particle Size on Its Physical Characteristics and Preference for Sensory Attributes of String Hoppers" supervised by Prof. R.P.N.P. Rajapakse, Dept. of Food Science and Technology, Fac. of Agriculture, Uni of Peradeniya; Prof. K.S.P. Amarathunga, Dept of Agri. Eng., Fac. of Agriculture, Uni. of Peradeniya. niranjanp@agri.pdn.ac.lk, sanath@agri.pdn.ac.lk



බුලත් විටකට ඇබ්බැහි වීම - මරණයට අත වැනීමක් ද ?

ඩී. එම්. ඉෂිනි නිම්නාදි දිසානායක

බුලත් විටකට ඇබ්බැහි වීම - මරණයට අත වැනීමක් ද ?

ශ්‍රී ලාංකිකයන් බොහෝ පිරිසක් අතර අතිශයින් ප්‍රචලිත **'බුලත් විට'**, අද වනවිට ගැමි ජීවිතයේ අත්‍යවශ්‍ය ම අංගයක් වී අවසන්ය. අතීතයේ පටන්ම අප සංස්කෘතිය තුළින් පැවත එන මෙම පුරුද්ද අද වනවිට ඇතැමෙකුට ඇබ්බැහියක්ද, තවකෙකුට ආතතිය මග හරවා ගැනීමේ ක්‍රමෝපායක් ලෙසද දෛනික ජීවිතයට පිවිස ඇත.



» නමුත් සැබැවින්ම මෙහි එවන් බලපෑමක් තිබේද? නැතහොත් මෙය ශරීරයට අහිතකර බලපෑමක් එක්කරන්නේද යන්න අපි සොයා බැලුවෙමු.

විටෙහි අත්‍යවශ්‍ය අංගයක් වන **'පුවක්'** පිළිබඳව අප සොයා බැලීමු. මෙම ගවේෂණය තුළින්, ශ්‍රී ලංකාවේ වියළි, අතරමැදි හා තෙත් කලාපයන්හි වර්ධනය වන රට පුවක්, හම්බන් පුවක් සහ සාමාන්‍ය පුවක්, යන ප්‍රභේද තුන පරීක්ෂා කරමින්, එය සැබැවින්ම අපගේ සෞඛ්‍යයට ආරක්ෂිතද යන වග තහවුරු කිරීමට අපි උත්සාහ කරනු ලැබුවෙමු.

මීන් පෙර කරනු ලැබූ අධ්‍යනයන්ට අනුව, පුවක් හි අඩංගු වන්නාවූ 'ඇරිකොලීන්' නමැති රසායනිකය මිනිස් සිරුරේ පිළිකා සෛල වර්ධනයට හේතු වන බව සොයාගෙන ඇත. නමුත් එය විටක් ලෙසට **බුලත්, හුණු,** සහ **දුම්කොල** යනාදිය සමග එක්ව භාවිතා කරනවිට එහි බලපෑම අඩුද? වැඩිද? යන්න පිළිබඳව විවිධ අදහස් පැවතුණි.

» මීට අමතරව ශ්‍රී ලංකාව තුළ විවිධ කලාපයන්හි වර්ධනය වන විවිධ පුවක් වර්ගවල බාහිර ගුණාංගයන් හි වෙනසක් පවතීද? වැඩෙන පරිසරය මත එහි බාහිර ගුණ වෙනස් වේද? යන්න අපි සොයා බැලුවෙමු.



අපගේ මේ ගවේෂණය තුලින් හෙළිවූ වැදගත් කරුණු නම්,

☑ පුවක් වර්ගය අනුව සහ වර්ධනය වන කලාපය අනුව එහි පවතින රසායනික සංයුතිය සහ විෂ සම්භාවිතාව වෙනස් වේ.

☑ මීට අමතරවල වර්ගය සහ වර්ධනය වන කලාපය, පුවක් වල බාහිර ගුණාංග කෙරේ බලපෑමක් ඇති කරනු ලබයි.

මෙම අධ්‍යනයට අනුවල රට පුවක්වල, ගෙඩියේ බර සහ පරිමාව යන සාධක දෙකම වැඩි වන අතර බර සහ පරිමාව අඩුම වන්නෙ සාමාන්‍ය පුවක් වලය. ප්‍රමාණයෙන් විශාල පුවක්, එනම් රට පුවක්, තම පෝශක අවශෝශක කාර්යක්ෂමතාව උපරිම කරගනිමින්ල තම බර හා පරිමාව වැඩි කරගන්නා බවට පෙරදී කරන ලද පර්යේශන වලින් හෙළිවූ කරුණු මෙමගින් තවදුරටත් තහවුරු වේ. නමුත්, පුවක් වර්ග තුනම කලාප තුන තුලදීම ගෙඩියේ සනත්වයෙහි සැලකිය යුතු වෙනසක් නොපෙන්වයි.

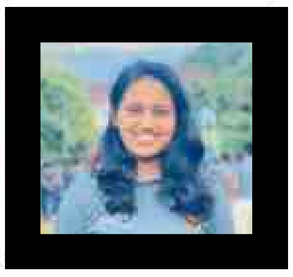
ප්‍රතිඔක්සිකාරක ගුණය සාමාන්‍ය පුවක්වල වැඩිම වන අතර එය අඩුම වන්නේ රට පුවක් වලය. ඇරිකොලීන් ප්‍රමාණය උපරිම වන්නෙ හම්බන් පුවක්වල වන අතර රට පුවක් හි එය අවම වේ. ඒ අනුව මෙම කරුණුවලින්, ප්‍රතිඔක්සිකාරක ගුණ වැඩිම සහ ඇරිකොලීන් මධ්‍යම ප්‍රමාණයට අඩංගු වන සාමාන්‍ය පුවක් පරිභෝජනය සඳහා සුදුසු යැයි නිර්නය කළ හැක.

»» මීට අමතරව බුලත් විටකට හුණු සහ දුම්කොල යනාදිය එක් කිරීම තුළින් එහි ප්‍රතිඔක්සිකාරක ගුණය සැලකියයුතු මට්ටමකින් අඩුවන අතර, පුවක් සහ බුලත් පමණක් මිශ්‍ර බුලත් විට පරිභෝජනය ශරීරයට හිතකර වේ. මෙහිදී බුලත් හි පවතින අධික ෆීනෝලික සංයෝග නිසා එහි ප්‍රතිඔක්සිකාරක ගුණය පුවක් වලට වඩා ඉහල බව තහවුරු වී ඇත.

ඉතිං, දැනගෙන විට කනවාද? නොදැන විස කනවාද? යන්න සිතා බැලීම ඔබට භාරයි.



This is a non-technical summary of the project report titled "Comparative Analysis of Physical Parameters & Carcinogenic Potential in Different Arecanut Types Grown in Different Climatic Zones of Sri Lanka" supervised by Prof. S.P.Nissanka, Departm6ent of Crop Science, Faculty of Agriculture, University of Peradeniya. *spn@agri.pdn.ac.lk



ඒකාකාරී තීරු බදු අනුපාතයක් යටතේ සහල් ආනයනයෙන් ශ්‍රී ලංකාවේ සහල් අර්බුදය විසඳිය හැකි ද?

ජී.ජී.එන්.වී. ගුණසේන

"සහල් අර්බුදය" කියූ විට මේ කියන්නේ කුමන අර්බුදය ගැන දැයි හරිහැටි හඳුනා ගැනීමට නොහැකි තරම් අර්බුද රාශියක් සහල් වෙළඳපොළ තුළ පවතී. නාඩු, සම්බා, සහ කැකුළු යනාදී ශ්‍රී ලංකාව තුළ බහුලව පරිභෝජනය කරනු ලබන සහල් වර්ග වල මිල ක්‍රමත් ක්‍රමයෙන් ඉහළ යාමත්, කාලෙන් කාලෙට පැන නගින සහල් හිඟයත්, මහා පරිමාණ සහල් මෝල් හිමියන්ගේ ඒකාධිකාරීත්වයත් ඉන් කිහිපයකි.

සහල් මිල ඉහළ යාම වළක්වාලීමට පිළියමක් ලෙස පාලන මිලක් නියම කිරීමටත්, සහල් හිඟයට පිළියමක් ලෙස සහල් හිඟ කාල වලදී පමණක් විශේෂ වෙළඳ භාණ්ඩ බද්දක් යටතේ සහල් ගෙන්වීමට අවස්ථාව ලබා දීමටත්, අනෙක් කාලවලදී ආනයන සීමාවන් පනවමින් දේශීය ගොවියා ආරක්ෂා කර ගැනීමටත් රජය කටයුතු කරයි. නමුත් රජයේ අරමුණු, රටේ ආර්ථික තත්වය වැනි බොහෝ කරුණු මත පදනම් වෙමින්, මෙම ප්‍රතිපත්ති කාලයෙන් කාලයට වෙනස් වන අතර, තවමත් මෙයින් තමන්ට සහනයක් නොලැබෙන බව කියමින් ගොවිජනතාව සහ පාරිභෝගික ජනතාව හඬනගන ආකාරය දක්නට ලැබේ. නිරන්තරයෙන් වෙනස් වන ප්‍රතිපත්ති හමු වේ වී සහ සහල් වෙළඳපළට ලැබෙන ආයෝජන ද සීමා වෙමින් පවතී. මෙය මෙම ක්ෂේත්‍රයේ වර්ධනයට සහ ව්‍යාප්තියට බෙහෙවින් බලපායි. එබැවින්, කාලයෙන් කාලයට වෙනස් වන ප්‍රතිපත්ති වෙනුවට වෙළඳපල අවිනිශ්චිත බව තුරන් කරන නිශ්චිත නව ප්‍රතිපත්තියක අවශ්‍යතාවය පැන නගී.



එම නිසා මෙම පරීක්ෂණය ඔස්සේ සහල් වෙළඳපොළේ පවතින අර්බුදකාරී ස්වභාවයට පිළියමක් ලෙස, වෙළඳපොළේ දැනට පවතින සියලු රාජ්‍ය මැදිහත් වීම් ඉවත්කොට, මේ වන විටත් බොහෝ රටවල භාවිතා වන ආකාරයේ ඒකාකාරී තීරු බදු අනුපාතයක් යටතේ වසර පුරාවටම සහල් ආනයනයට අවශ්‍ය වටපිටාව සකසා දීම සුදුසු යැයි ප්‍රමාණාත්මකව තහවුරු කරනු ලැබේ.

මෙහි දී තීරු බදු අනුපාත 3 ක් සලකා බලනු ලැබූ අතර ඒවා නම්, 0%, 15% සහ 25% වේ. 2020 අප්‍රේල් මාසයේ සිට 2024 දෙසැම්බර් මාසය දක්වා වන මාස 56 සඳහා පාලන මිල සහ ආනයන රෙගුලාසි යන ප්‍රතිපත්ති පදනම් කර ගනිමින් ගොඩනගන ලද ආංශික සමතුලිතතා ආකෘති 56 ක් භාවිතයෙන්, පවතින වත්මන් ප්‍රතිපත්ති හමු වේ සහ සියලු ප්‍රතිපත්ති ඉවත් කර ඒකාකාරී තීරු බදු අනුපාතයක් යටතේ සහල් ආනයනය මගින් පාරිභෝගිකයාට, නිෂ්පාදකයාට, රජයට සහ මුළු මහත් සමාජයට සිදු වන බලපෑම වෙන් වෙන් වශයෙන් ගණනය කරන ලදී. සලකන ලද කාල සීමාව තුළදී සහල් වෙළඳපොළේ එකල පැවති රාජ්‍ය ප්‍රතිපත්ති සියල්ල ඉවත් කොට, 15% ක ඒකාකාරී තීරු බදු අනුපාතයක් යටතේ සහල් ආනයනය කළේ නම්, නාඩු, සම්බා සහ කැකුළු සහල් සිල්ලර මිල 4.48% කින් පහළ බසින අතර, රාජ්‍ය ආදායම 359% කින් ඉහළ යනු ලැබේ. සමස්ත සමාජයටම ලැබෙන ප්‍රතිලාභයද 1.54% කින් ඉහළ යනු ඇත. 0% ඒකාකාරී තීරු බදු අනුපාතයක් යටතේ සහල් ආනයනය කළ හොත්, පාරිභෝගිකයාට සහ සමස්ත සමාජයටම ලැබෙන ප්‍රතිලාභය තව දුරටත් ඉහළ යන අතර, එනයින් රජයට කිසිදු ආදායමක් හිමි නොවේ.



මෙම පරීක්ෂණයේ ප්‍රතිඵල මත දැනට සහල් වෙළඳපොළේ පවතින අකාර්යක්ෂම රාජ්‍ය ප්‍රතිපත්ති වෙනුවට 15% ක් වැනි ඒකාකාරී තීරු බදු අනුපාතයක් යටතේ වසර පුරාවටම සහල් ආනයනයට අවශ්‍ය වටපිටාව සකසා දීම වඩාත් ඵලදායී ප්‍රතිපත්තියක් ලෙස ඉදිරිපත් කළ හැක. තවද මෙහි වැදගත් ප්‍රතිඵලයක් වනුයේ සහල් ආනයනය හරහා වෙළඳපොළ තරඟකාරීත්වය ඉහළ නංවමින් මහා පරිමාණ සහල් මෝල් හිමියන්ගේ ඒකාධිකාරීත්වයද පාලනය කිරීමට හැකි වීමයි.

නමුත් සහල් ආනයනය දේශීය ගොවියාට ඍණාත්මකව බලපානු ඇත. පාරිභෝගිකයාට සහනයක් හිමි වූවත්, 15% ක තීරු බදු අනුපාතයක් සහිතව සහල් ආනයනය ගොවියාට ලැබෙන වී මිල 18.65% පහළ හෙළන අතර එය වී නිෂ්පාදන වියදම ඉතා ඉහළ කුරුණෑගල සහ කළුතර යන ප්‍රදේශවල ගොවිජනතාවගේ පැවැත්මට බෙහෙවින් බලපානු ලබයි. එයට පිළියමක් ලෙස බදු ආදායම් භාවිතයෙන් වෙළඳපොළ තරඟකාරීත්වයට හැඩ ගැසීම සඳහා රජය මගින් ගොවි ජනතාවට අවශ්‍ය පුහුණුව සහ තාක්ෂණික දැනුම ලබා දීමට කටයුතු කළ හැක.

This is a non-technical summary of the project report titled "Evaluating the Economic Effects of a Uniform Tariff on Rice Imports in Sri Lanka: A Partial Equilibrium Analysis" supervised by Prof. Jeevika Weerahewa*, Department of Agricultural Economics & Business Management, Faculty of Agriculture, University of Peradeniya. *jeevika.weerahewa@agri.pdn.ac.lk



බ්‍රොයිලර් කුකුලන් සඳහා ශ්‍රී ලංකාවේ බහුලව වගා කරන වී ප්‍රභේද (At 362 හා Bg 352) දෙකක දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය නිර්ණය කිරීම

ජ.ඒ. මියුරු නිම්සර

බඩඉරිඟු වලට ආදේශකයක් ලෙස සහල්

සාමාන්‍යයෙන් කුකුළන්ගේ ආහාර සලාක වල 70% පමණ අඩංගු වන්නේ ශක්ති පරිපූරකයි. ශ්‍රී ලංකාවේ ඒ සඳහා බහුලව භාවිතා වන්නේ බඩඉරිඟුය. එනමුත් වසරකට සත්ව ආහාර සඳහා අවශ්‍ය වන බඩඉරිඟ මෙට්‍රික් ටොන් 600,000ක් පමන වූ අවශ්‍යතාව සපුරාලීමට ශ්‍රී ලංකාව තුල බඩඉරිඟු වගාවේ අස්වැන්න කිසිසේත්ම ප්‍රමාණවත් නොවේ. මේ හේතුවෙන් සත්ව ආහාර කර්මාන්තයට දිගින් දිගටම බඩඉරිඟු ආනයනය මත රදාපැවතීමට සිදුව ඇත. මෙසේ එක් ආනයනික අමුද්‍රව්‍යයක් මත බලාපොරොත්තු තබා සිටීමට සිදුවීම සත්ව ආහාර කර්මාන්තයට භයානක වූ තත්වයකි.

ආනයනික බඩඉරිඟු වල මිල අධිකව ඉහල යාමත් සමග සත්ව ආහාර මිල අහස උසට නැගීමෙන් කුකුලු පාලනයේ නිරත වන්නන් කබලෙන් ලිපට වැටී ඇත. මේ නිසා බඩඉරිඟු සඳහා ආදේශකයක් සත්ව ආහාර සඳහා යොදාගැනීමේ අවශ්‍යතාවය මතුවී ඇත. සුදුසු ආදේශක අමුද්‍රව්‍යයක් යනු කිසියම් හෝ අමුද්‍රව්‍යයක් නොව අවශ්‍ය අවස්ථාවලදී ලබාගැනීම සඳහා සුලබ වන්නාවූ, දැනට භාවිතා වන අමුද්‍රව්‍ය සමග තරගාකාරී මිලක් දරන, පෝෂණ සංයුතිය පිලිබඳව දැනුවත්ව ඇති අමුද්‍රව්‍යයකි.

සහල් යනු එසේ බඩඉරිඟු වෙනුවට ආදේශ කලහැකි ශක්ති පරිපූරකයකි. ශ්‍රී ලංකාවේ වැඩිම භූමි ප්‍රමාණයක වගාකර ඇති බෝගය වී වන අතර කන්න වල අස්වනු නෙලීමත් සමග අස්වනු අතිරික්තයක් ඇති වන බෝගයකි. සහල් සත්ව ආහාර නිෂ්පාදනය සඳහා යොදා ගැනීම තාවකාලිකව රජය විසින් ගෙන ඇති තීරණයක් අනුව තහනම් වූවත් ස්වයං ආහාර නිෂ්පාදකයන් සහ ආහාර නිෂ්පාදන සමාගම් ශක්ති ප්‍රභවයක් ලෙස දැනටත් බහුලව භාවිතා කරන අමුද්‍රව්‍යයකි.

සහල් වල දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය

සත්ව ආහාරයක් සතෙකු අනුභව කලවිට එහි ශක්තිය සියල්ල පරිවෘත්තීය ක්‍රියා සඳහා යොදා නොගනී. එම ආහාරයේ අඩංගු ශක්තිය කොටසක් මල මුත්‍රා ලෙස හෝ වායූ වර්ග ලෙස හෝ පිටව යයි. පරිවෘත්තීය ශක්තිය යනු යම් ආහාරයක් ආගනුව කර පරිවෘත්තීය ක්‍රියා සඳහා යොදා ගන්නා ශක්ති කොටසයි. දල පරිවෘත්තීය ශක්තිය යනු ආහාරමය නොවන ප්‍රභවයක් සහිත ශක්තියද, ආහාරමය ප්‍රභවයක් සහිත ශක්තියද අඩංගු වන ශක්ති පද්ධති සංකල්පයකි. එසේම සත්ව ශරීරය තුල තැන්පත් වන යූරික් අම්ලය වැනි සංයෝග ද ශක්තිය නිපදවිය හැකි බැවින් දල පරිවෘත්තීය ශක්තිය නයිට්‍රජන් සඳහා නිවැරදි කිරීමක් කොට නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය ලබාගනී. මෙම අගය සත්ව ආහාර සූත්‍රායණ සැදීමේදී බහුලව භාවිතා කරයි.

නමුත් ශ්‍රී ලංකාවේ බහුලව වගා කරන වී ප්‍රභේද සඳහා දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය අගයන් නොමැති නිසා කුකුලු ආහාර සූත්‍රායණ වලදී අප වී ප්‍රභේද සඳහා නොගැලපෙන්නා වූ පොදු අගයන් යොදාගනී. මෙම පොදු අගයන් සෑම දේශීය ප්‍රභේදයකටම භාවිතා කිරීම පෝෂණ විෂමතා ඇති කිරීමට මෙන්ම ආර්ථිකව අලාභ සිදුකිරීමට හේතු විය හැක.

At 362 හා Bg 352 වී ප්‍රභේද දෙකක පොතු ඉවත් කරන ලද සහල් වල දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය

ආචාරධර්ම හා සත්ව සුභසාධනය සුරකිමින් ,කොබ් 500 පිරිමි බ්‍රොයිලර් සතුන් 60ක් යොදා ගනිමින් සිදුකල පරීක්ෂණය අවසානයේ ශ්‍රී ලංකාවේ ජනප්‍රියතම රතු කැකුලු ප්‍රභේදය (At 362) සහ සුදු නාඩු ප්‍රභේදයේ (Bg 352) දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය නිර්ණය කරන ලදී. At 362 ප්‍රබේදයේ දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය පිලිවෙලින් කිලෝ ග්‍රෑමයක් සඳහා කිලෝ කැලරි 3,473 සහ 3,275 විය. Bg 352 ප්‍රබේදයේ දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය පිලිවෙලින් කිලෝ ග්‍රෑමයක් සඳහා කිලෝ කැලරි 3,739 සහ 3,540 විය.

මෙම පරීක්ෂණයේ ජාතික වැදගත්කම වනුයේ, ප්‍රථම වරට ශ්‍රී ලාංකීය වී ප්‍රබේද දෙකක් සඳහා මෙම දල පරිවෘත්තීය ශක්තිය හා නයිට්‍රජන් සඳහා නිවැරදි කරන ලද දල පරිවෘත්තීය ශක්තිය අගයන් සොයාගැනීමට හැකි වීමයි. එසේම ශ්‍රී ලාංකීය වී ප්‍රභේද සඳහා විශේෂිත මෙම අගයන් යොදාගනිමින් කුකුලු ආහාර සූත්‍රායණ සැකසීම තුලින් පෝෂක සමතුලිත, ආර්ථිකව වාසිදායී සත්ව ආහාර නිෂ්පාදනයක් සිදුකල හැක.



This is a non-technical summary of the project report titled "Apparent Metabolizable Energy and Nitrogen- corrected Apparent Metabolizable Energy of Two Common Sri Lankan Rice Varieties (At 362 and Bg 352) in Broiler Chicken" supervised by Prof. J.K. Vidanarachchi* Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *janakvid@agri.pdn.ac.lk



ආක්‍රමණික ටැංකි සුද්දාගෙන් ගැලවුමක් - කැල්සියම් උෆණතාවයට විසඳුමක්

✍ කේ.ඒ.නිර්මාණී කලංසූරිය

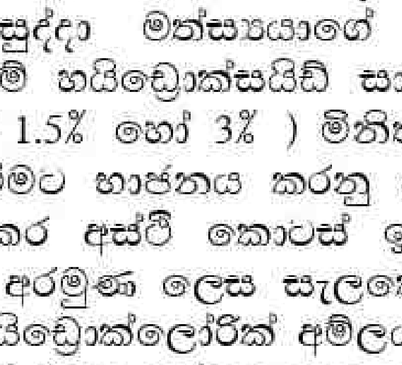
ආක්‍රමණික ටැංකි සුද්දා ශ්‍රී ලංකාවේ මිරිදිය ජලාශ සියල්ලකම පාහේ අද වන විට පැතිරී ඇත. මෙම මත්ස්‍ය විශේෂය පාරිසරික , ආර්ථික, සමාජයීය වශයෙන් අයහපත් ප්‍රතිඵල උදාකරලීමට සමත් වී ඇත. ශ්‍රී ලංකාවේ මිරිදිය ධීවර කර්මාන්තයට ටැංකි සුද්දාගෙන්වන හානිය ලඝු කොට සිතිය නොහැක. මනුෂ්‍ය පරිභෝජනය සුදුසු මත්ස්‍ය විශේෂ ටැංකි සුද්දා මසුන් විසින් ආහාරයට ගනු ලැබීම හා මසුන් ඇල්ලීමට යොදාගන්නා දැල්වලට මොවුන්ගේ ඇමීනීම හේතුවෙන් සිදුවන හානි ඒ අතර ප්‍රධාන වෙයි. මෙම ආක්‍රමණික මත්ස්‍ය විශේෂය මර්ධනය කළ හැකි මාර්ගයක් අද වනතුරු සොයාගැනීමට අපහසු වී ඇත.

ටැංකි සුද්දා මත්ස්‍ය විශේෂය අනෙකුත් මත්ස්‍ය විශේෂයන්ට සාපේක්ෂව වෙනස් වූ දේහ ලක්ෂණයන්ගෙන් සමන්විත වේ. ඉතා විශාල අස්ථිමය හිසක් සහ කටු වැනි ස්වභාවයක් ගන්නා සම, වරල් ඒ අතර ප්‍රධාන වේ.

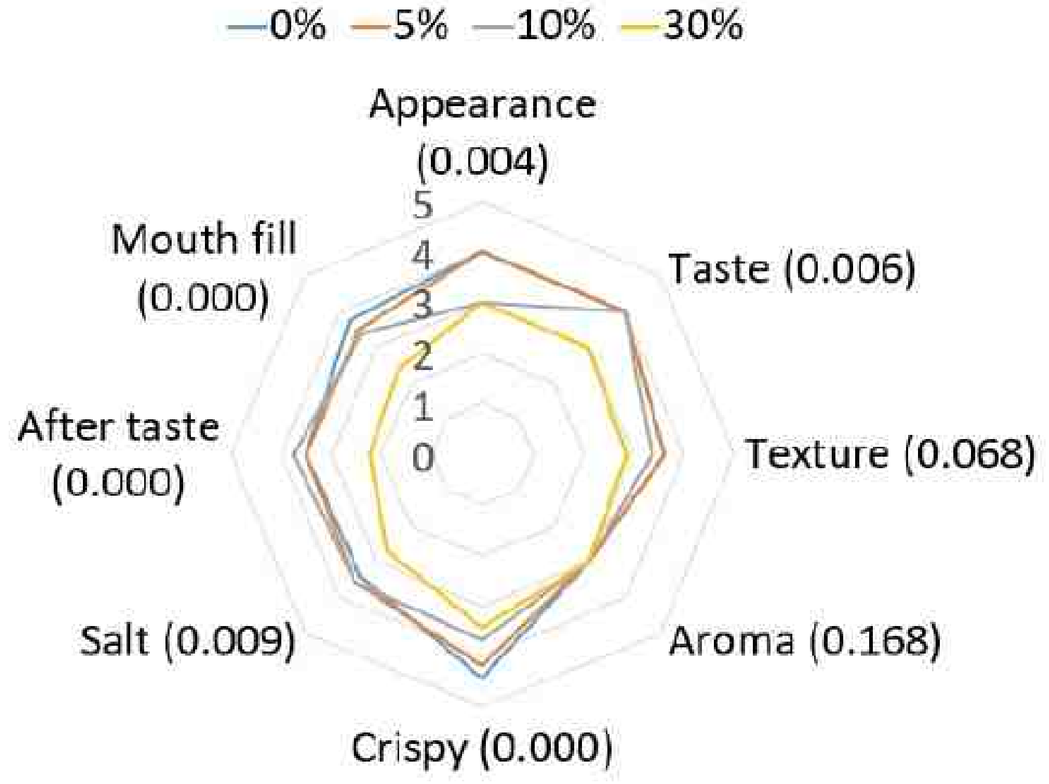


මෙම අධ්‍යයනය තුළින් ටැංකි සුද්දා මත්ස්‍යයාගේ අස්ථිමය ශරීර කොටස් මගින් කැල්සියම් වලින් පොහොසත් අස්ථිමය පිටි නිෂ්පාදනය කරනු ලබයි. මෙහිදී ටැංකි සුද්දා මත්ස්‍යයාගේ ඉවතලන ශරීර කොටස් සෝඩියම් හයිඩ්‍රොක්සයිඩ් සාන්ද්‍රනයන් තුනක් යටතේ (1% හෝ 1.5% හෝ 3%) මිනිත්තු (30 හෝ 60) කාලයක් නැටවීමට භාජනය කරනු ලබයි. කාබනික කොටස් ඉවත් කර අස්ථි කොටස් ඉතිරි කර ගැනීම මෙම පියවරෙහි අරමුණ ලෙස සැලකේ. වෙන් කරගත් අස්ථි කොටස් හයිඩ්‍රොක්ලෝරික් අම්ලය භාවිතා කරමින් උදාසීන මාධ්‍යයක් බවට පත්කර ගනු ලැබෙයි.

ඉහත පියවරෙන් පසු ලබාගත් අස්ථිමය කොටස් 100^0C උෂ්ණත්වයේ පැය 24 විදුලි උඳුන තුළ තැන්පත් කරනු ලැබෙයි, ඉන්පසු ඇඹරීමට ලක් කරනු ලබන අස්ථි කොටස් ඉතා කුඩා සිදුරු සහිත පෙනේරයක් භාවිතා කර සියුම් පිටි සකසා ගනු ලබයි.
සකසා ගත් කැල්සියම් සහිත මාළු අස්ථිමය පිටි, (5% හෝ 10% හෝ 30% හෝ 0%) අනුපාතයට සහල් පිටි සහ අවම පරිභෝජනයක් සහිත ටැංකි සුද්දා මසුන්ගේ මාංශ සමග මිශ්‍ර කර කෙටි බිස්කට් වර්ගයක් පහසුවෙන් සකසා ගැනීමට හැකියාව ඇත.



අධ්‍යයනයෙන් ලද ප්‍රතිඵලවලට අනුව මත්ස්‍ය අස්ථි උපයෝගී කර ගනිමින් සැකසූ පිටි 1g ප්‍රමාණයක් 0.37g කැල්සියම්ද 0.034 g ප්‍රමාණයක් පොස්පරස් වලින්ද සමන්විතය. 60% වඩා වැඩි ජීරණ හැකියාව මනුෂ්‍ය පරිභෝජනය සඳහා උචිත බව තහවුරු කරනු ලබයි. තවද පරීක්ෂකයන් 30 සංවේදක පරීක්ෂා ප්‍රතිඵලයන්ට අනුව අනුපාතයෙන් තුනක් යටතේ කැල්සියම් සහිත අස්ථිමය පිටි මිශ්‍ර කර සැකසූ බිස්කට් නියැදි අතුරින් 5% අනුපාතයෙන් කැල්සියම් මිශ්‍ර කරන ලද නියැදිය වැඩිම කැමැත්තක් හිමිකර ගනු ලැබීය.



ඉතා අවම පරිභෝජන මට්ටමේ පවතින ටැංකි සුද්දා මසුන් ඵලදායිව ප්‍රයෝජනයට ගැනීම තුළින් ටැංකි සුද්දා මත්ස්‍ය ගහනය පාලනය කරගත හැකි අතර ජෛව විවිධත්වය ආරක්ෂා කර ගැනීමට හැකිවනු නියතය. තවද මත්ස්‍ය සම්පත අඩු කාලයන්හි ධීවරයන්ගේ ආර්ථිකයට එමගින් සහනයක් ලබා ගැනීමට හැකියාව පවතී. කැලරි, සීනි සහ සෝඛ්‍යයට අහිතකර කෘතිම බිස්කට් වර්ග ආහාරයට ගැනීමට සාපේක්ෂව කැල්සියම් වලින් පොහොසත්, ප්‍රෝටීන අධික, ස්වභාවික අමුද්‍රව්‍ය උපයෝගී කරගත් මෙම නිෂ්පාදනය වයස් භේදයක් රහිතව විශ්වාසයෙන් රස විඳීමට හැකියාව පවතී.

කරදරකාරී ආක්‍රමණිකයෙක් ලෙස ටැංකි සුද්දා සම්බන්ධව ඇති කළු පැල්ලම් නැති කරමින් මුදල් ජනිත කරවන සම්පතක් ලෙස යොදාගැනීමට හැකි මෙවැනි නව නිපැයුම් තුළින් සාමාජීය ආර්ථික හා පාරිසරික ගැටලූ අවම කිරීමට හැකියාව පවතී.



This is a non-technical summary of the project report titled Analysis of Extracted Calcium from Sucker Mouth Catfish Fish Bones and Its Fortification in Fish Crackers supervised by Dr. E.T.S. Madhubashini*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *thushanis@agri.pdn.ac.lk.



කුරුලු උණට ජපන් බටු ?

ජේ. ඒ. එන්. පී. ජයම්පති



ජපන් බටු

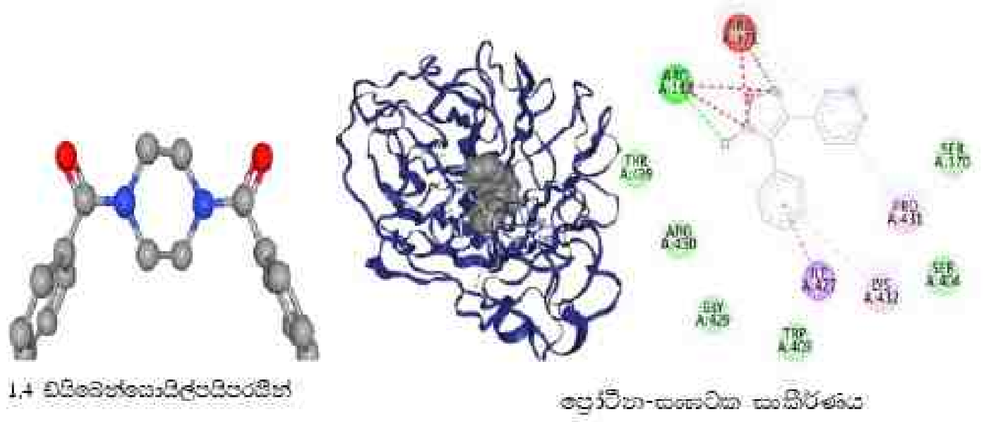
ඉන්ෆ්ලුවෙන්සා වෛරසය

කුකුළා හා කුකුල් මස් පරිභෝජනය සම්බන්ධයෙන් මගේ කියවීම වෙනමම එකකි. ඒ කෙසේ වෙතත් කුකුළා තරම් නූතන මනුෂ්‍ය වර්ගයාගේ රස නහර පිනවීමට කැපවන වෙනත් සත්වයකු වර්තමානයේ නැති තරම්ය. ආහාර දත්ත විශ්ලේෂණයට අනුවත් ප්‍රායෝගිකව කුකුල් මස් නැති සාදයක් කුකුල් මස් නැති මගුල් ගෙදරක් කුකුල් මස් නැති ප්‍රිය සම්භාෂණයක් කොටින්ම කුකුල් මස් නැති හෝටලයක් නැති තරම්ය.ඒ අනුව වර්තමාන ආහාර වේල තුළ කුකුළා වැදගත් සන්ධිස්ථානයක් ගනී.

මනුෂ්‍යයන්ට මෙන්ම කුකුළන්ටද බෝ වන රෝග අතර ඉන්ෆ්ලුවෙන්සා (Influenza) වෛරසය නිසා ඇති වන රෝගී තත්වයන් ඉතාමත් ඉහළ බව ලෝක සෞඛ්‍ය සංවිධාන දත්ත අනුව පෙනී යයි. මෙය සමාජීය භාවිතයේදී කවුරුත් කුරුලු උණ නමින් ද ඒවියන් ඉන්ෆ්ලුවෙන්සා (Avian Influenza) යන විද්‍යානුකූල නාමයෙන් ද හැඳින්වේ. මේ නිසා කුකුළන් නිරතුරුව ආසාදන තත්ත්වයට පත්වන අතර මිය යන සත්ව සංඛ්‍යාවද සැලකිය තරම් වේ.මෙම තත්ත්වය මත ඒවියන් ඉන්ෆ්ලුවෙන්සා සම්බන්ධයෙන් අප විසින් දැඩි විශ්ලේෂණයක් කළ අතර ඒ අනුව සෛල බිත්තිය මත ඇති නියුරමිනිඩේස් (Neuraminidase) නැමැති ප්‍රෝටීනය නිසා ප්‍රධාන වශයෙන් මෙම වෛරසයේ වර්ධනය හා පැවැත්ම සිදුවන බවත් තහවුරු කර ඇති බව දත්ත විශ්ලේෂණයේදී හඳුනා ගන්නා ලදී. මේ අනුව මෙම ප්‍රෝටීනය විනාශ කිරීම මගින් මෙම රෝගී වෛරසය විනාශ කළ හැකි බව ද, දැනටමත් මේ සඳහා බටහිර වෛද්‍ය ක්‍රමය තුළ සැනමිවියර් හා ඔසෙල්ටමිවියර් ඖෂධ යොදා ගන්නා බව ද හඳුනා ගන්නා ලදී.



දෙවනුව මා විසින් පරීක්ෂණය සඳහා යොදා ගනු ලැබුවේ ශ්‍රී ලංකාවේ ගෘහණියන් අතර රසවත් පලා වර්ගයක් ලෙස ප්‍රකට බොහෝ ප්‍රදේශවල සශ්‍රීකව ඉබේම වර්ධනය වන ජපන් බටු නැමැති ශාකයයි. මෙම ශාකයේ විද්‍යාත්මක නාමය වනුයේ *Breynia androgyna* යන්නයි. දැනටමත් දේශීය ආයුර්වේද වෛද්‍ය ක්‍රමයේදී මෙම ශාකය උණට හෙම්බිරිස්සාවට ඖෂධයක් ලෙස යොදා ගන්නා අවස්ථා ද ඇත.අප විසින් පරීක්ෂණාගාරය තුළදී ශාක කොටස් විච්ඡේදනය කළ අතර ඒ අනුව ශාක පත්‍රය තුළ 1,4 ඩයිබෙන්සොයිල්පයිපරසීන් නැමති ද්‍රව්‍ය අඩංගු බව නිරීක්ෂණය විය. තව ද මෙම සංඝටකය සැලකිය යුතු මට්ටමෙන් ඒ තුළ ඇති බව තහවුරු කරගන්නා ලදී.



1,4 ඩයිබෙන්සොයිල්පයිපරසීන්

ප්‍රෝටීන-සංඝටක සංකීර්ණය

ජපන් බටු ශාක පත්‍රයේ ඇති 1,4 ඩයිබෙන්සොයිල්පයිපරසීන්, (1,4-dibenzoylpiperazine) වෛරස ප්‍රෝටීනය සමග කෙසේ ප්‍රතික්‍රියා දක්වන්නේ දැයි නොයෙක් ආකාරයේ පරීක්ෂණ කිහිපයක් අප විසින් පරිගණක යෙදවුම් සහ උපාංග යන විවිධ ක්‍රම අනුගමනය කරමින් සිදු කරන ලදී. මේ සම්බන්ධයෙන් කරනු ලැබූ පරිගණක දත්ත විශ්ලේෂණ සැසඳීමේදී ජපන් බටු ශාකයේ ඇති 1,4 ඩයිබෙන්සොයිල්පයිපරසීන් සංඝටකය ප්‍රෝටීන බිත්ති හා තදින් බැඳී එම ප්‍රෝටීන-සංඝටක සංකීර්ණය සමතුලිත හා ස්ථායි කරන අතර වෛරසයේ ක්‍රියාව ඒ තුළින් බොහෝ දුරට නහර කිරීමට හැකි බව තහවුරු කරගන්නා ලදී.ලබාගෙන ඇති සාර්ථක පරිගණක විද්‍යාත්මක දත්ත විශ්ලේෂණ ප්‍රතිඵල අනුව මෙම සංඝටක පරීක්ෂණාගාරයේදී පරීක්ෂාකර ගොවිපළ නියැදි අත්හදා බැලීමක් දක්වා ඉදිරි පියවර ගැනීමට අප කටයුතු යොදමින් සිටිමු.

මනුෂ්‍ය පරිභෝජනයේ රස නහර පිනවන සත්ත්වයකු ලෙස කෙසේ වෙතත් පරිසර හිතකාමී සත්ත්වයකු ලෙස කුකුළා වෙත ප්‍රවිෂ්ඨව උන් නිරන්තරයෙන් පීඩා විඳින ඉන්ෆ්ලුවෙන්සා රෝග තත්වයෙන් උන් මුදවා ගැනීමට ද,මෙතෙක් නිසි අවධානයක් නොලැබූ වටිනා දේශීය ශාකයකින් උපරිම පල නෙළා ගැනීමට ද අවසානයේ හැකිවනු ඇතැයි විශ්වාස කරන්නෙමු

ඒ අනුව ඉදිරියේදී මෙම ශාක පත්‍ර යොදා ගනිමින් නිෂ්පාදනය වන නව ප්‍රතිජීවකයක් සම්බන්ධයෙන් ශුභවාදී ආකල්පයෙන් යුතුව බලා සිටිමු.

This is a non-technical summary of the project report titled "Computational Analysis of *Breynia androgyna* Constituents for Druggability against Influenza A Virus Neuraminidase" supervised by Dr.Lakmal Ranathunga,Department of Animal Science, Faculty of Agriculture, University of Peradeniya. lakmalr@agri.pdn.ac.lk



දේශීය කිරි ගොවියාගේ අතමිට සරු කරමින් කිරි අස්වැන්න ඉහළ නැංවීමට දෙමුහුම් තණකොළ ප්‍රභේද වගා කිරීමෙන් පිළිතුරක්.

ශෂිනි ඉෂාරා අබේසිංහ

2023 වර්ෂයේ සත්ත්ව නිෂ්පාදන හා සෞඛ්‍ය දෙපාර්තමේන්තුවේ වාර්තාවට අනුව ශෘහස්ථ කිරි නිෂ්පාදනය ඉල්ලුම හා සසඳන විට විශාල අඩුවක් ලෙස දැක ගත හැකිය. ඒ හේතුවෙන් පිටරටින් ගෙන්වන ලද කිරි නිෂ්පාදනවල ප්‍රමාණයට 32.3% ප්‍රමාණයකින් ඉහළ ගොස් ඇත. දේශීය කිරි නිෂ්පාදනය පහළ වැටීමට හේතුවක් ලෙස තත්ත්වයෙන් උසස් හා පෝෂක වලින් ඉහළ තණකොළ ප්‍රභේදයන් නොමැති වීම හඳුනාගත හැක. මේ සඳහා පිළිතුරක් ලෙස දෙමුහුම් තණකොළ ප්‍රභේදයන් ශ්‍රී ලංකාව තුළ ප්‍රචලිත කිරීම 1999 දී පසු ප්‍රජා සංවර්ධන ව්‍යාපෘතිය යටතේ CO3 ප්‍රභේදය සමඟ ආරම්භ කෙරිණි. මේ වන විට ශ්‍රී ලංකාව තුළ CO3, CO5,පැක්චෝන්ග්, රෙඩ් නේපියර් සහ සාම්පූර්ණා වැනි දෙමුහුම් තණකොළ ප්‍රභේද හඳුන්වා දී ඇත.

මෙම දෙමුහුම් තණකොළ ප්‍රභේද ඉතා ලාභදායී වන අතර වගා කිරීම, පවත්වාගෙන යාම හා අස්වනු නෙළීම ඉතාමත් පහසු කාර්යයකි. පර්චස් 20ක ප්‍රමාණයක් තුළින් දෙමුහුම් තණකොළ ප්‍රභේද පඳුරු 500ක් පමණ වගා කල හැකය. ඒ සඳහා ජලය සහ පොහොර ක්‍රමානුකූලව ලබාදීමෙන් දින 30-45ක් අතර කාලය තුළ පළමු අස්වනු නෙලීම සිදු කළ හැකි අතර වරකට එක් තණකොළ පඳුරකින් කිලෝ ග්‍රෑම් 3-4ත් අතර ප්‍රමාණයක අස්වැන්නක් ලබා ගතහැකිය.

නව පර්යේෂණ වාර්තාවකට අනුව;

මෙම විවිධ ප්‍රභේදයන් අතරින් CO5, CO6 සහ පැක්චෝන්ග් ප්‍රභේදයන්ගේ වර්ධන වේගය ඉහළ වන අතරේ පැක්චෝන්ග් වල අස්වැන්න CO5 සහ CO6 සාපේක්ෂව ඉහළය. මෙම ප්‍රභේදයන් ඉහළ පෝෂක ප්‍රමාණයන්ගෙන්, ඉහළ ජීවකතාවයක් සහ ඉහළ ශක්ති ප්‍රමාණයන්ද යුක්ත වේ. දෙමුහුන් තණකොළ ප්‍රභේද අතරින් CO5 ප්‍රභේදය හෙක්ටයාර 1ක් තුළින් මෙට්‍රික් ටොන් 30ක ඉහළ අස්වැන්නක්, 938.29 kgක ප්‍රෝටීන ප්‍රමාණයක්, ජීරණය කළ හැකි කාබනික ද්‍රව්‍ය 2456.77 kgක ප්‍රමාණයක් හා 41.88 MJක ශක්ති ප්‍රමාණයක් ලබා දෙයි. ඒ අනුව මෙම ප්‍රභේදය අනෙකුත් ප්‍රභේදවලට සාපේක්ෂව ඉහළ පෝෂක ප්‍රමාණයකින් යුක්ත වේ.

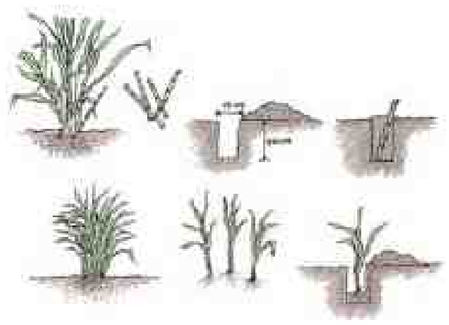
<u>දෙමුහුම් තණකොළ වගා කිරීමේ ක්‍රියා පිළිවෙල:-</u>

පළමුව සුදුසු ඉඩකඩක් මේ සඳහා තෝරා ගැනීම අත්‍යවශ්‍ය කරුණකි. ඒ සඳහා ගවගාල අවට ප්‍රදේශය වුවද තෝරාගත හැකිය.



-දෙමුහුම් තණකොළ ප්‍රභේද-

බිම් සැකසීම; බිම් සැකසීමෙන් අනතුරුව පඳුරු දෙකක් අතර පරතරය මීටර් 1ක් වන ආකාරයට වලවල් කැපීම සිදුකල යුතුය. පාත්තිය ආකාරයට සකසා ගැනීම යම් ආකාරයකින් අස්වනු නෙළීමේදී ප්‍රයෝජනවත් වේ. ඉන්පසුව, ගවගාලෙන් ඉවත් කරන දිරා යමින් පවතින ගොම පොහොර හෝ කුකුල් පෙහොර කිලෝග්‍රෑම් 2ක ප්‍රමාණයක් හා මතුපිට පස් සමාන ප්‍රමාණයක් මිශ්‍ර කර වල පොළොව මට්ටම දක්වා පුරවා ගන්න.



-වල සකසා ගන්නා සහ දඬු සිටුවා ගන්නා ආකාරය-

ගුණාත්මකභාවයෙන් ඉහළ පුරුක් දෙකක් සහිත දෙමුහුම් තණකොළ ප්‍රභේද දඬු තෝරා ගැනීම; තණකොළ ප්‍රබෝධයන්ගේ දඬු ලබා ගැනීමට (ඔබ නුවර අවට කෙනෙක් නම් පශු වෛද්‍ය පර්යේෂණස්ථානය ගොවිපළෙන් ද එසේ නොමැති නම් වීරවිල නොරොච්චෝලය පර්යේෂණ ගොවිපළවල්වලින්ද ලබාගත හැකිය). මෙවා බීජ මඟින් පැළ කර ගත නොහැකි නිසා ගුණාත්මක භාවයෙන් ඉහළ දඬු ලබා ගැනීම ඉතා වැදගත් කරුණක් වේ. දඬු 2ක් එක් වලකට ප්‍රමාණවත් වේ.



-ගුණාත්මක බවින් ඉහළ පුරුක් දෙකක් සහිත දඬු-

1. දඬු සිටුවීමෙන් පසු දෙනිකව වතුර දැමීම තුළින් මූල පද්ධතිය වේගයෙන් වර්ධනය කර ගත හැකිය.
2. දඩ සිටුවීමෙන් දින 12-15ත් අතර යූරියා:TSP:MOP (අනුපිළිවෙලින්,20g:15g:10g)එ ක් කිරීම; පොහොර එක් කිරීමෙන් පසුව පැලය වටා පස් එක් රොක් කිරීමෙන් පැළ ඉහළට වර්ධනය වීම සිදුවන අතර එසේත් නොමැති නම් පැළය පොළොව හා සමාන්තරව වර්ධනය වීම සිදුවේ.
3. අස්වනු නෙළීම; පළමුවර අස්වනු නෙළීම දින 60-70ත් අතර සිදු කළ හැකි අතර ඉන් අද අනතුරුව පොහොර යොදා නැවත වතුර දෙනිකව එකතු කිරීමෙන් දෙවන, තුන්වන සහ ඉදිරි අස්වනු නෙලීමේ වට සඳහා යා හැකිය.

මෙම දෙමුහුම් තණකොළ වගාවන් සිදුකරමින් කිරි නිෂ්පාදන ප්‍රමාණය ඉහල නංවා ගැනීමට කිරි ගොවීන්හට හැකියාව පවතී.

මෙම ප්‍රභේදයන් ශ්‍රී ලංකාවේ දේශගුණික තත්ත්වයන්ට ඉතාමත් සමීප වේ. දේශීය කිරි නිෂ්පාදනයට දායකත්වය සපයන ඔබත් මෙම දෙමුහුම් තණකොළ ප්‍රභේද වගා කරමින් කිරි අස්වැන්න මෙන්ම කිරි නිෂ්පාදන පිරිවැය අවම කරගනිමින් දෛනික ආදායම් ඉහළ මට්ටමක පවත්වා ගැනීමට උත්සහ කරන්න.

This is a non-technical summary of the project report titled "Comparison of Growth and Nutrients Assimilation of Three Different Hybrid Napier cultivars, in Mid Country Wet Zone" supervised by Dr. MBP. Kumara Mahipala*, Department of Animal Science, Faculty of Agriculture, University of Peradeniya.*pmahi@agri.pdn.ac.lk



පාංශු කාබනික ද්‍රව්‍යය දිරාපත් වීම පිළිබඳ සැගවුණු කතාව

✍ G.H.P අල්විස්

පස යනු ජලය,වාතය,ඛනිජ සහ කාබනික ද්‍රව්‍ය වලින් සමන්විත ගතික දේහයකි. පාංශු කාබනික ද්‍රව්‍ය යනු පසක සංයුතියෙන් 5% ක් සහිත, ක්ෂුද්‍ර ජීවීන් මගින් පසට එක් වන ශාක සහ සත්ව අපද්‍රව්‍ය ජීරණය වෙමින් සහ රසායනිකව වෙනස් වෙමින් සැදෙන විෂමජාතීය මිශ්‍රණයකි. පාංශු කාබනික ද්‍රව්‍ය වියෝජනය පෘථිවිය තුළ ජීවයේ පැවැත්මට අත්‍යවශ්‍ය ක්‍රියාවලියකි. මිනිසා ඇතුළු සත්වයින් මියගිය පසු දිරාපත්වීමෙන් එක් වන්නේ මෙකී කාබනික ද්‍රව්‍ය තුලටයි. ඊට අමතරව ශාකවලට අවශ්‍යය පෝෂක සැපයීම,ක්ෂුද්‍ර ජීවීන්ට ශක්ති ප්‍රභවයක් ලෙස ක්‍රියාකිරීම ආදියද මෙමගින් සිදුවේ.

කාබනික ද්‍රව්‍ය වියෝජන ක්‍රියාවලිය තෙතමනය උෂ්ණත්වය වැනි පාරිසරික සාධක මගින් ද පසේ භෞතික සහ රසායනික ගතිගුණ මගින්ද පස තුල ජීවත්වන ඇසට පෙනෙන නොපෙනෙන ජීවී කොටස් මගින්ද යාමනය වේ.කෘෂිකාර්මික පරිසර පද්ධතියක මෙම ක්‍රියාවලිය පසට එක් කරන යෙදවුම් මත තීරණය වන අතර වනාන්තරවලදී මෙම ක්‍රියාවලිය ශාක විශේෂ දිරාපත් වන කොළරොඩු වල රසායනික ලක්ෂණ මත වෙනස් වේ. මෙම පර්යේෂණය මගින් පාංශු කාබනික ද්‍රව්‍ය වියෝජන ක්‍රියාවලිය කෘෂිකාර්මික සහ වනාන්තර පරිසර පද්ධතිවල වෙනස් වන ආකාර පිළිබඳ පැහැදිලි කරයි.

කෘෂිකාර්මික පරිසර පද්ධතිය

කෘෂිකාර්මික පස පරීක්ෂාව සදහා සාම්පල රැස්කර ගැනීම නුවරඑළිය දිස්ත්‍රික්කයේ පූර්වකාලීන වගාවන් සිදු කරන ගොවිබිම් 14 ක් පදනම් කරගෙන සිදුකළ අතර මූලික නිර්ණායක ලෙස වගාකරන ලද බෝගය ලෙස ලීක්ස් සහ යොදන ලද කාබනික පොහොර වර්ගය ලෙස ගොම පොහොර,කුකුළු පොහොර සහ කොම්පෝස්ට් යොදාගන්නා ලදි. මූලික දත්ත ලෙස පාංශු pH අගය,විද්‍යුත් සන්නායකතාවය, කාබනික කාබන් ප්‍රතිශතය, නයිට්‍රජන් ප්‍රතිශතය, ක්ෂුද්‍ර ජීවී ජෛව ස්කන්ධ ප්‍රතිශත පරීක්ෂා කරන ලද අතර පොහොර ආමූකුලනය කරන ලද පරීක්ෂණයක් මගින් දින 30ක කාලයක් තුල පොහොර වර්ග තුන සංසන්දනය කරමින් විමෝචනය වන CO_2 වායුව මනිනලදි. එම පොහොර යෙදු පස් වල දිලීර හා වියෝජකයින් පරීක්ෂාව සදහා විශේෂ රෝපණ මාධ්‍ය 03ක් :ඍදැ ඊැබට්කලසෙලියුලෝස්,ලිග්නින්* යොදා ගන්නා ලදි. ලබාගත් දත්ත වලට අනුව වැඩිම කඩෘ වායු විමෝචනය සහ ක්ෂුද්‍ර ජීවී ජෛව ස්කන්ධයන් ඇතුලු ක්ෂුද්‍ර ජීවී ප්‍රතිශතයන් ගොම පොහොර යෙදූ පසෙහි දක්නට ලැබූ අතර අඩුම කඩෘ වායු විමෝචනය කොම්පෝස්ට් යෙදූ පසේ දක්නට ලැබිය. එමෙන්ම ක්ෂුද්‍ර ජීවී ජෛව ස්කන්ධයන් ඇතුලු ක්ෂුද්‍ර ජීවී ප්‍රතිශතයන්ද කොම්පෝස්ට් යෙදූ පසේ අවම විය.

වනාන්තර පරිසර පද්ධතිය

අදාළ පස් සාම්පල රැස්කර ගැනීම හොර්ටන්තැන්න ජාතික උද්‍යානය ආශ්‍රිතව සිදු වූ අතර ඒ සදහා නිර්ණායක ලෙස ශ්‍රී ලංකාවට ආවේණික ශාක විශේෂ 03ක් වන වල් කුරුඳු,කීන සහ මහරත්මල් යොදා ගන්නා ලදී. අධ්‍යයන දත්ත මගින් හෙළිවූ අන්දමට වැඩිම කඩෘ වායු විමෝචනය සිදු වූයේ වල් කුරුඳු ශාකය ආශ්‍රයෙන් ලබාගත් පස් මගිනි. ඊට සාපේක්ෂව කීන ශාක විශේෂය ආශ්‍රිතට ලබාගත් පස් මගින් අඩුම කඩෘ වායු විමෝචනයක් දක්නට ලැබිය. ක්ෂුද්‍ර ජීවී ගහණය සලකා බැලූ කළ සෙලියුලෝස් වියෝජකයින් ප්‍රමාණය කීන ශාකය ආශ්‍රිතව අධික වූ අතර ලිග්නින් වියෝජකයින් ප්‍රමාණය වල් කුරුඳු ශාකය ආශ්‍රිතව අධික විය. පද්ධති 02 සැසඳීමේදී සියලු වියෝජකයින් වනාන්තර පරිසර පද්ධතිය තුල ඉහළ අගයක් වාර්ථා කළ අතර කළ අතර කාබන් ප්‍රතිශතයද කෘෂිකාර්මික පරිසර පද්ධතිය මෙන් තුන් ගුණයක් විය.

මෙසේ සැලකූ කළ තහවුරු වන්නේ කාබනික ද්‍රව්‍ය වියෝජනයට හේතු වන එක් සාධකයක් ලෙස පරිසර පද්ධතිවල පාංශු කාබනික ද්‍රව්‍යය වල රසායනික සංයුතීන් සැලකිය හැකි බවයි.



ගොම පොහොර යෙදූ පස් යොදාගනිමින් රෝපණ මාධ්‍ය 03 (Rose Bengal, සෙයුලෝස්, ලිග්නින්) තුළ දක්නට ලැබූ දිලීර සහ වියෝජකයින්



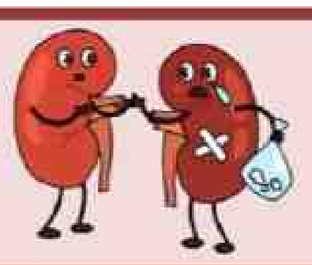
යොදාගත් ශාක ප්‍රභේද,

1 කීන *(Calophyllum walkeri)*
2 මහරත්මල් *(Rhododendron arboreum* subsp. *zeylanicum)*
3 වල් කුරුඳු (*Cinnamomum ovalifolium*)

This is a non-technical summary of the project report titled "Decomposition of soil organic matter in intensively cultivated vegetable fields in Nuwara-eliya and under three tree species in Horton-Plains" supervised by Prof R.M.CP.Rajapaksha, Department of Soil Science, Faculty of Agriculture, University of Peradeniya *chandir@agri.pdn.ac.lk



දැනුවත් වෙමුල පියවර ගමුල මුත්‍රා ගල් පරදවමු



ඒ.ජී ක්‍රිෂානි චමෝදිනී

මුත්‍රා ගල් , එසේ නැතිනම් වකුගඩු වල ගල් රෝගය හේතුවෙන් ඔබත් පීඩාවට පත් වී තිබේද?. සෑම පුද්ගලයන් දස දෙනෙකුගෙන් එක් අයකු මෙම රෝගය නිසා ජීවිතයේ කෙදිනක හෝ අපහසුතාවයට පත් වියහැක. මුත්‍රා ගල් වල සංයුතිය අනුව ඒවා වර්ගීකරණය කර ඇති අතර ඒවා නම් කැල්සියම් ඔක්සලේට් ගල්, කැල්සියම් පොස්පේට් ගල්, යූරික් අම්ල ගල්, ස්ට්‍රෝවිට් ගල්, සිස්ටීන් ගල් සහ මිශ්‍ර ගල් වේ. ලෝක ජන ගහනයන් තුල බහුලවම ඇති වන්නේ **කැල්සියම් අන්තර්ගත මුත්‍රා ගල්ය**. එය ප්‍රතිශතයක් ලෙස **75-80%** ක් පමණ වේ. මෙම රෝගය මුත්‍රා පද්ධතිය ආශ්‍රිත රෝග වලින් ආසාත්මික මට්ටම අතින් තුන්වන ස්ථානයේ පසුවන රෝගයයි. එබැවින් රෝගය පිළිබඳ නිසි දැනුමක් මෙන්ම එම රෝගයෙන් වැළකීමට ක්‍රියා මර්ග අනුගමනය කිරීම අත්‍යාවශ්‍යය.

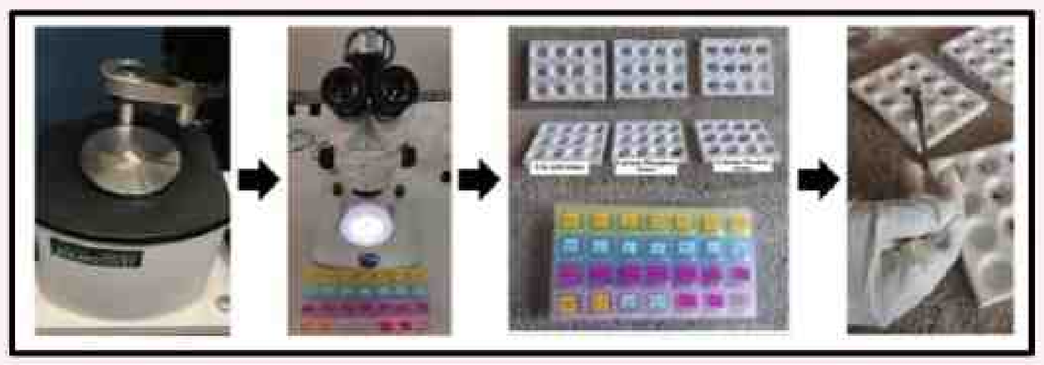
ඇත්ත වශයෙන්ම මුත්‍රා ගල් දිය කල හැකි ශාක සාර තිබිය හැකිද? එසේ නැතිනම් මුත්‍රා ගල් සෑදීම වළක්වන ශාක සාර තිබිය හැකිද? ඔය කියන්නාවූ ශාක සාර වලට සෑම වර්ගයේම මුත්‍රා ගල් දිය කල හැකිද? මෙම ලිපියෙන් ඔබට ගෙන එන්නේ එම ප්‍රශ්න වලට පිළිතුරු සෙවූ පර්යේෂණ අධ්‍යයනයේ ප්‍රතිඵලයි.

මෙම පරීක්ෂණය මුත්‍රා ගල් රෝගය වැලඳී ඇති රෝගීන් 13 දෙනෙකුගේ මුත්‍රා ගල් භාවිතා කල සිදු කල අතර, ශාක සාරයන් ලෙස භාවිතා කරන ලද්දේ **අක්කපාන කොල, කටු අනෝනා, සැපතිල්ලා, කැකිරි** සහ **ගොරකා වල ඵලය**, සහ **මෙනේරි සහල්** වලින් සාදා ගත් සාරයන්ය. පර්යේෂණයේ ප්‍රතිඵල අනුව තහවුරු වූයේ **කැල්සියම් සහිත මුත්‍රා ගල් දිය කිරීමට ගොරකා, සැපතිල්ලා සහ මෙනේරි සහල්** දායක වූ බවය. ඒවායේ ගල් දිය කිරීමට ඇති හැකියාවද බටහිර වෛද්‍ය විද්‍යාවේ භාවිතා කරන පොටෑසියම් සිට්‍රේට් නම් ඖෂධයට ආසන්න වශයෙන් සමානය. **යූරික් ඇසිඩ් ගල් සහිත පුද්ගලයන්ගේ ගල් දිය කිරීමට අක්කපාන කොල** වලට හැකියාවක් තිබූ අතර අනෙක් ශාක සාරයන් එයට අපොහොසත් වී තිබුනි.





මුත්‍රා ගල් සෑදීම වැළකිය හැකි ශාක සාර තිබේද? එම ප්‍රශ්නයටද උත්තරය ඔව්ය. මෙම පර්යේෂණයේ දෙවන අදියරයේදී මෙම ප්‍රශ්නයටද අගනා පිළියමක් සොයා ගන්නා ලදි. මෙම පරීක්ෂණය පරීක්ෂණාගාර තත්ව යටතේ කෘතිමව මුත්‍රා නිෂ්පාදනය කරමින් සිදු කල අතර එහිදී පෙනී ගියේ ශාක සාරයන් සියල්ලම පාහේ **කැල්සියම් ඔක්සලේට් කැටිති සෑදීම අඩු කිරීමට** දායක වූ බවයි. ඒ අතරින් මෙසේ කැටිති ඇති වීමට ඒරෙහිව හොඳින්ම ක්‍රියා කර තිබුනේ ගොරකා සාරයයි. මෙම පරීක්ෂණයද සිදු කරන ලද්දේ දැනට වෙළඳපොලේ මුත්‍රා ගල් රෝගයට නිර්දේෂ කරන ආයුර්වේද ඖෂධයක් සමග සංසන්දනය කරමින් වූ අතර ශාක සාරයන් හයටම මේ කියන්නාවූ කැල්සියම් ඔක්සලේට් කැටිති මුත්‍රා වල සෑදීම වැළකීමේ අද්විතීය හැකියාව තිබුණි.





දැන් ඔබට මේ කියන්නා වූ ශාක සාරයන් මෙතරම් විශ්මිත හැකියාවක් පෙන්වූයේ කෙසේදැයි පැනයක් නැගෙනවා නොඅනුමානය. එයට හේතුව ඒවායේ අන්තර්ගත්වන විවිධාකාර ජෛව ක්‍රියාකාරී සංයෝගයි. ගොරකා වල අන්තර්ගත වන **හයිඩ්‍රොක්සි සිට්‍රික් අම්ලය**, අක්කපාන වල ඇති **කාබනික** අම්ල සහ **ෆීනෝල**, කැකිරි වල අඩංගු **කාබනික** අම්ල සහ **ප්‍රති ඔක්සිකාරක සංයෝග**, සැපතිල්ලා වල **ග්ලයිසීන් (glycine), බීටා ඇලනීන් (β-alanine)** සහ **hippuric** අම්ලය, කටු අනෝනා වල අන්තර්ගත වන **ඇසිටොගෙනින්ස් (Acetogenins), පොලි ෆීනෝල් (Phenol)** සහ **ෆ්ලෙවනොයිඩස් (Flavonoids)** වැනි ජෛව ක්‍රියාකාරී සංයෝග මෙම අද්විතීය හැකියාවට සහභාගී වේ.

This is a non-technical summary of the project report titled "Assessment of Potential Dietary and Lifestyle Risk Factors and the Role of Plant-Based Therapies in Managing Urolithiasis Among Sri Lankan Patients" supervised by Dr. G.M Somaratne*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *gsomaratne@agri.pdn.ac.lk



සෞඛ්‍යමත් ආහාර රටාවක් තුළින්, දියවැඩියාවෙන් තොර සුවැති දිවියකට මග පෙන්වන හිතවතා: "Predict GL"

G.S.K. භාග්‍යා

සෞඛ්‍ය සම්පන්න පුද්ගලයා තමන්ට මෙන්ම සමාජයටද සම්පතකි. සීඝ්‍රයෙන් නවීකරණයට ලක්වන වත්මන් සමාජය ගෝලීය වශයෙන් මෙන්ම ජාතික වශයෙන්ද මුහුණ පා ඇති අභියෝගයක් වන්නේ බෝ නොවන රෝගවල සීඝ්‍ර ව්‍යාප්තියයි. මෙරට තුළ බෝ නොවන රෝගවලට ගොදුරු වීමෙන් සිදුවන පුද්ගල මරණ සංඛ්‍යාව දිනෙන් දින ඉහළ යාම කණගාටුවට කරුණකි.

දියවැඩියාව ඇතුළු බෝ නෝවන රෝග වළක්වා ගැනීම සඳහා යහපත් ආහාර රටාවකට හුරුවීම බෙහෙවින් වැදගත් වේ. ආහාර රටාව තුළින් දියවැඩියාව පාලනය කර ගැනීමේදී සැලකිල්ලට ගැනෙන ප්‍රධාන දර්ශකයන් දෙකක් වන්නේ ආහාර වල **Glycemic Index (GI)** සහ **Glycemic Load (GL)** ය. නමුත් මේ පිළිබඳව ජනතාව එතරම් දැනුවත් නොමැති බව මා හට පසක් වූයේ, පර්යේෂණයට අදාළව සිදුකරන ලද වැඩසටහනකිනි.



GI, ආහාර රුධිරයේ සීනි මට්ටම කෙතරම් ඉක්මනින් ඉහළ නංවයිද යන්න අනුව ශ්‍රේණිගත කරන අතර, ඔබ කොපමණ ප්‍රමාණයක් අනුභව කරනවාද යන්න මත පදනම්ව රුධිරගත සීනි මට්ටම ඉහළ යාමේ සැබෑ බලපෑම GL මගින් පැවසේ. **කෘතිම බුද්ධිය** භාවිතා කර ආහාරවල GL පුරෝකථනය කළ හැකි යෙදුමක් **(“Predict GL”)** මාගේ පර්යේෂණය තුළින් සොයා ගන්නා ලදි. මෙය සංකීර්ණ විද්‍යාත්මක තොරතුරු සරල අයුරින් ඔබ වෙත ගෙන එන, ජංගම දුරකථනය හෝ පරිගණකය තුළින් භාවිතා කළ හැකි **වෙබ් යෙදුමකි.**



GI සම්බන්ධ සිදු කෙරුණු පර්යේෂණ පත්‍රිකා රාශියක් ගවේෂණය කර ආහාර වර්ග 775 ක පමණ පෝෂණ සංයුති දත්ත භාවිතා කොට කෘතිම බුද්ධියේ කොටසක් වන Machine Learning තුළින් පුහුණු කළ ආකෘතිය, ඔබට පහසුවෙන් භාවිතා කළ හැකි වෙබ් යෙදුමක් ලෙස නිර්මාණය කරන ලදි.

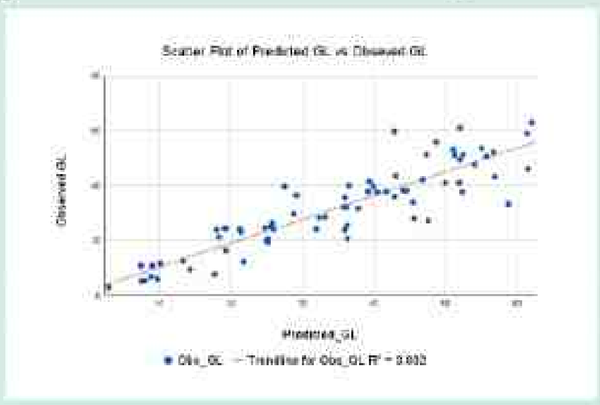
ඇසුරුම් කරන ලද ආහාරවල ලේබලයේ සඳහන් පරිදි ග්‍රෑම් 100 ක පවතින කාබෝහයිඩ්‍රේට්, ප්‍රෝටීන්, මේදය සහ තන්තු ප්‍රමාණය සහ ඔබ අනුභව කරන ආහාරයේ බර ඇතුළත් කළ විට, GL අගය තිරයේ දිස් වේ. එමෙන්ම එය කුමන කාණ්ඩයේද (අඩු GL, මධ්‍යම Gl, වැඩි GL) ද යන්න වර්ණ තීරුවකින් දිස්වෙයි.





එමෙන්ම පෝෂ්‍ය පදාර්ථ අගයන් නොදන්නා, ඔබ නිවසේ පිළියෙළ කරන මිශ්‍ර ආහාර සඳහාද GL පුරෝකථනය කළ හැක.
ඔබ ගත් ආහාරවල නම් සහ බර වෙන වෙනම ඇතුළත් කිරීමෙන් එම සම්පූර්ණ ආහාරයේ GL අගය තිරයේ දිස්වේ.

වෙබ් යෙදුමෙන් ලබා දෙන දත්ත සත්‍ය අගයන් සමඟ පරීක්ෂා කිරීමේදී එහි නිරවද්‍යතාව විද්‍යාත්මකව තහවුරු කර ගැනීමට හැකිවිය. එමෙන්ම විශේෂඥයින් විසින් සිදුකළ සමාලෝචනයේදීද මෙම යෙදුමේ නිරවද්‍ය බව හා සමස්ත යෙදුම සම්බන්ධ ධනාත්මක ප්‍රතිචාර ලැබුණි.



දිනෙන් දින නව තාක්ෂණය සමඟ ඉදිරියට යන මේ ලෝකයේ, මෙම වෙබ් යෙදුමේ මිළඟ පියවර, ආහාරවල ඡායාරූපයක් මඟින් GL පුරෝකථනය කිරීමයි. මෙය ආහාර රටාව කළමණාකරණයට GL සංකල්පය යොදා ගැනීමේ නව මානයක් වනු ඇති බවට නිසැකයි. ඉතින් දියවැඩියාව ඇති ඔබට වුවත් ඔබ කැමති ආහාරයක්, පමණ දැනගෙන ආහාරයට ගැනීමෙන් රෝගය පාලනය කරගෙන සතුටින් සිටීමට මෙම යෙදුම උපකාර වනු ඇත.

This is a non-technical summary of the project report titled “Design and Development of a Web Application with AI-Based Glycemic Load Prediction Model Using Nutritional Composition Data” supervised by Dr. G.M. Somaratne*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *gsomaratne@agri.pdn.ac.lk

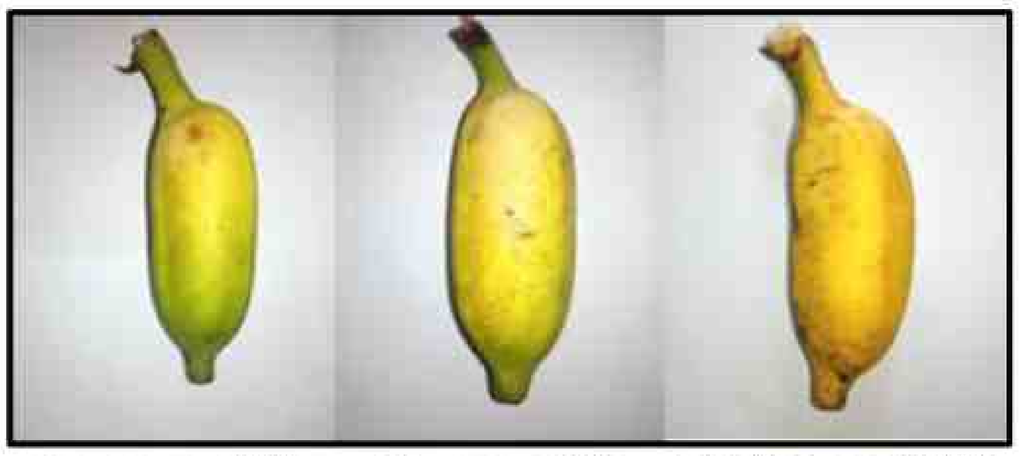


කෙසෙල් සහ රුධිර සීනි: විවිධ ඉදීමේ අවධි ඔබේ සෞඛ්‍යයට බලපාන්නේ කෙසේද?

✍ **ලකීෂ උත්පල අතුකෝරල**

හැඳින්වීම

කෙසෙල්, ලොට පුරා බාල මහලු සියලු දෙනාගේම ප්‍රියතම පලතුරකි. නමුත් එහි විවිධ ඉදීමේ අවධි ඔබගේ රුධිරයේ සීනි මට්ටමට බලපාන බව ඔබ දැන සිටියාද? ග්ලයිසීමික් දර්ශකයට හා කෙසෙල් වල ඇති ප්‍රතිඔක්සිකාරක මට්ටමට විවිධ ඉදීමේ අවධි විශේෂ බලපෑමක් ඇති කරන බව නවතම අධ්‍යයනයකින් අනාවරණය වී තිබේ. මෙම අධ්‍යයනයේ දී ශ්‍රී ලංකාවේ බහුලව පරිභෝජනය කරන කෙසෙල් ප්‍රභේද තුනක් වන සීනි කෙසෙල්, ඇඹුල් කෙසෙල් හා කෝලිකුට්ටු, ඒවායේ ඉදීමේ අවධි තුනක් වන කහ-කොළ අවධිය, වඩා කහ අවධිය සහ සම්පූර්ණ කහ අවධිය යන අවධි තුන යටතේ අධ්‍යයනය කරන ලද අතර එම ඉදීමේ අවධි කෙසෙල් වල රුධිරගත ග්ලූකෝස් මට්ටමට, ප්‍රතිරෝධී පිෂ්ට මට්ටමට, හා ප්‍රතිඔක්සිකාරක මට්ටමට බලපාන අයුරු පරීක්ෂා කෙරිණි.



කහ-කොළ අවධිය වඩා කහ අවධිය සම්පූර්ණ කහ අවධිය

රුධිරගත ග්ලූකෝස් සාන්ද්‍රණයට විවිධ ඉදීමේ අවධි වල බලපෑම

මෙම පර්යේෂණය තුලින් හෙළි වූ වැදගත්ම කරුණක් වූයේ කෙසෙල් ගෙඩියේ ඉදීමේ අවධිය මත එහි ග්ලයිසීමික් දර්ශකය වෙනස් වීමයි. ග්ලයිසීමික් දර්ශකය යනු රුධිරයේ අඩංගු සීනි (ග්ලූකෝස්) මට්ටම මැනීමේ විද්‍යාත්මක ක්‍රමවේදයකි. එහිදී, සියලුම කෙසෙල් වර්ග සඳහා සම්පූර්ණ කහ අවධිය කහ-කොළ අවධියට වඩා වැඩි අගයක් පෙන්නුම් කෙරිණි. එමනිසා කහ-කොළ අවධියේ පසුවන කෙසෙල් වලින් සීනි, රුධිරය වෙත මුදාහැරීම මන්දගාමී කරන බව උපකල්පනය කල හැක. සම්පූර්ණයෙන් කහ අවධියේදී සීනි මුදාහැරීම වේගවත් අතර එය රුධිරගත ග්ලූකෝස් මට්ටම වේගයෙන් ඉහල යාමට හේතු වේ. විශේෂයෙන්ම එම අවධියේම සීනි කෙසෙල් ප්‍රභේදය සැලකූ විට එය අනෙක් ප්‍රභේද දෙකටම වඩා වැඩි ග්ලයිසීමික් දර්ශකයක් පෙන්නුම් කල අතර මෙය විශේෂයෙන්ම සීනි කෙසෙල් පරිභෝජනය කිරීමට පෙර සලකා බැලිය යුතු කරුණකි.

කෙසෙල් වල අඩංගු ප්‍රතිරෝධී පිෂ්ටයේ වෙනස්වීම

කෙසෙල් වල පෝෂණීය ගුණය විවිධ ඉදීමේ අවධි අනුව වෙනස් වේ. විශේෂයෙන්ම ප්‍රතිරෝධී පිෂ්ටය ලෙස හැඳින්වෙන පදාර්ථය කෙසෙල් ඉදීමත් සමගම පහල යයි. ප්‍රතිරෝධී පිෂ්ටය යනු ශරීරය විසින් පහසුවෙන් ජීර්ණය නොවන පිෂ්ට වර්ගයකි. එමගින් දිරවිය හැකි පිෂ්ටය ට වඩා ආහාර ජීර්ණය මන්දගාමී කරන අතර රුධිර සීනි මට්ටම පාලනය කිරීමට, ආහාර මාර්ගයේ සෞඛ්‍ය තත්වය වැඩිදියුණු කිරීමට ඉවහල් වේ.

මෙම පර්යේෂණය අනුව, කහ-කොළ අවධියේ දී කෙසෙල් වල ප්‍රතිරෝධී පිෂ්ටය කැපීපෙනෙන වැඩිවීමක් ඇති බවත්, එය කෙසෙල් ඉදීමත් සමග, එනම් සම්පූර්ණ කහ අවධියේ දී කුඩා කොටස් වලට කැඩී සරල සීනි (ග්ලූකෝස්, සුක්‍රෝස් හා ෆෘක්ටෝස්) බවට පරිවර්තනය වන බවත් සනාථ වී තිබේ. සම්පූර්ණයෙන් ඉදුණු අවස්ථාවේදී (සම්පූර්ණ කහ) කෝලිකුට්ටු හා ඇඹුල් ප්‍රභේද වල ප්‍රතිරෝධී පිෂ්ටයේ වෙනසක් පෙන්නුම් නොකල අතර සීනි කෙසෙල් ප්‍රභේදය සඳහා කැපීපෙනෙන තරම් තරම් අඩු මට්ටමක් පෙන්නුම් කලේය. එමනිසා පෙර සඳහන් කල ග්ලයිසීමික් දර්ශකයේ වෙනස් වීමට මෙය සෘජු බලපෑමක් ඇති බවත්, සීනි කෙසෙල් ප්‍රභේදය අනෙක් ප්‍රභේද වලට වඩා වැඩි ග්ලයිසීමික් දර්ශකයක් පෙන්නුම් කිරීමට මෙය හේතුවක් වී ඇති බවත් උපකල්පනය කල හැක.

ප්‍රතිඔක්සිකාරක ගුණාංග හා තවත් සෞඛ්‍ය වාසි

රුධිරයේ සීනි කෙරෙහි ඇති බලපෑමට අමතරව, කෙසෙල් වල ඉහල ප්‍රතිඔක්සිකාරක ගුණාංග ද අඩංගු වන අතර ඒවා මගින් ශරීරය හානිකර සංයෝග වලින් ආරක්ෂා කර ගැනීමට වැදගත් කාර්යභාර්යයක් ඉටු කරයි. මෙම ප්‍රතිඔක්සිකාරක, විශේෂයෙන්ම ෆීනෝලික සංයෝග මගින් ශරීරයේ සෛල හානි වීම වැලැක්වීම හා නිදන්ගත රෝග අවදානම අඩු කිරීම සඳහා තීරණාත්මක කාර්යභාර්යයක් ඉටු කරයි. මෙම අධ්‍යයනයෙන් හෙළි වූයේ සීනි කෙසෙල් අඩු ප්‍රතිඔක්සිකාරක ගුණාංග පෙන්නුම් කරන බවත්, කෝලිකුට්ටු ඉතා වැඩි ප්‍රතිඔක්සිකාරක ගුණාංග අඩංගු ප්‍රභේදයක් බවටයි. කෙසේ වෙතත් විවිධ ඉදීමේ අවස්ථා වලදී ප්‍රතිඔක්සිකාරක ගුණාංගවල අඩුවීමේ හෝ වැඩිවීමේ නිශ්චිත රටාවක් පෙන්නුම් නොකලේය. එමනිසා මේ සඳහා වැඩිදුර පර්යේෂණ සිදුකිරීම අත්‍යාවශ්‍ය සාධකයකි.

ඔබ දැනගත යුතු දේ මෙන්න...

ඔබට රුධිරයේ සීනි මට්ටම පාලනය කිරීමට අවශ්‍ය නම්, කහ-කොළ අවධියේ කෙසෙල් තෝරාගන්න. මන්ද, එම අවධියේ දී වැඩි ප්‍රමාණයක් ප්‍රතිරෝධී පිෂ්ටය අන්තර්ගත නිසා අඩු ග්ලයිසීමික් දර්ශකයක් පෙන්නුම් කරයි. ඉක්මනින් වැඩි ශක්ති ප්‍රමාණයක් අපේක්ෂා කරන්නේ නම්, සම්පූර්ණ කහ අවධියේ ඉදුණු කෙසෙල් හොඳ තේරීමක් වන්නේ ඒවායේ ශරීරයට ඉක්මනින් අවශෝෂණය වන සරල සීනි වැඩි ප්‍රමාණයක් අඩංගු බැවිනි. ප්‍රතිඔක්සිකාරක ගුණයෙන් පිරිපුන් පලතුරක් සොයන්නේ නම් කෙසෙල් ගෙඩියේ විවිධ ඉදීමේ අවස්ථා නොයෙක් ප්‍රතිලාභ ලබා දිය හැක. එබැවින් ඔබේ ආහාර වේලට විවිධ අවස්ථා වල ඉදුණු මට්ටම් මිශ්‍රණයක් ඇතුළත් කිරීම හොඳ උපායමාර්ගයක් විය හැක.



This is a non-technical summary of the project report titled "Effect of ripening stages on antioxidant properties, resistant starch content and *in-vivo* glycemic index of three commonly consumed banana varieties in Sri Lanka" supervised by Prof. B. D. R. Prasantha*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. *bdrp@pdn.ac.lk



ආක්‍රමණශීලී ඇපල් ගොළුබෙල්ලාගෙන් තිරසාර විසඳුමක්

✍ මහේෂ් දම්සර

විසිතුරු මසුන් ඇතිකිරීම බොහෝ දෙනා අතර ජනප්‍රිය, බොහෝ දෙනා සතුටින් සිදු කරන විනෝදාංශයක්. මේ අතර, ගප්පි යනු ඔබත් මමත් හොඳින්ම දන්නා විසිතුරු මත්ස්‍යයෙකු බව නොඅනුමානයි. එහෙත් ශ්‍රී ලංකාව තුල අභිජනනය කොට, මෙරටින් පිටරටට අපනයනය කරන ගප්පි මත්ස්‍ය විශේෂ සඳහා අන්තර්ජාතික වෙළඳපොලෙහි අසීමිත ඉල්ලුමක් ඇති බවත්, ශ්‍රී ලංකාවෙන් වැඩිම වශයෙන් අපනයනය කරන මත්ස්‍ය විශේෂය ගප්පි බවත් ඔබ නොදන්නවාද වෙන්නට පුලුවනි.

මෙම මසුන් අභිජනනය සිදු කරන මහා පරිමාණ මත්ස්‍ය ගොවිපල වල මත්ස්‍ය ආහාර සඳහා ප්‍රධානම අමුද්‍රව්‍ය ලෙස යොදාගන්නේ කරදිය ධීවර කර්මාන්තයෙන් අස්වනු ලෙස ලබාගන්නා කුඩා මත්ස්‍ය පැටවුන්ල සහ ඉවතලන මත්ස්‍ය විශේෂ (By catch species) වලින් සාදන මාළු කුඩු :සියයපැක* බවත් ඔබ නොදන්නවා ඇති.

මෙම මාළු කුඩු භාවිතය තිරසාර නොවීමට හේතු මෙපමණක් යැයි කීමට නොහැක. සාගරය තුල ජීවත් වන මත්ස්‍යයින් සංඛ්‍යාව ඉතා සීමිත වීමත්ල ලෝකය පුරා සාගර දැනටමත් උපරිම මට්ටමෙන් ධීවර කර්මාන්තය සඳහා භාවිතා වීමත් ඉන් අතලොස්සකි. තවදල උක්ත මහාපරිමාණ මත්ස්‍ය ආහාර ඉල්ලුම සැපයීමට නීතිවිරෝධී උපක්‍රම පවා භාවිතයෙන් මසුන් ඇල්ලීම දැනටමත් සිදුවීමල එහි අස්තිරසාර බව මනාව විදහාපාන්නකි.

මෙම විනාශකාරී උවදුරට පිලියමක් සොයන අතරතුරල ශ්‍රී ලංකාව තුල හමුවන විදේශීය ජලජ ගොළුබෙල්ලන් විශේෂයක් වන ඇපල් ගොළුබෙල්ලා, (Spike topped Apple snail) ආක්‍රමණශීලී විශේෂයක් ලෙස ශ්‍රී ලංකාවේ දේශීය සහ ආවේණික මත්ස්‍යයින්ටත්ල ජලජ ශාක වලටත් තර්ජනයක් ඇති කිරීමට ප්‍රභවයක් ඇති විශේෂයක් ලෙස හඳුනාගත් සත්ත්වයෙකි.



:ඇපල් ගොළුබෙල්ලා (Spike topped Apple snail)

ශ්‍රී ලංකාවේ පරිසර පද්ධති තුල ස්වභාවික විලෝපිකයෙක් නොමැති වීමත්ල ඇපල් ගොළුබෙල්ලා සතු වේගවත් ප්‍රජනන හැකියාවත් නිසා තවදුරටත් ව්‍යාප්ත වීමට මත්තෙන් ඵලදායී ගහන පාලන ක්‍රමයක ජාතික අවශ්‍යතාවය ඉතාමත් සෘජු ලෙස පැවති.

මෙම පැනයට විසඳුමක් ලෙසල මෙම ආක්‍රමනශීලී ගොළුබෙල්ලන් විශේෂයල විසිතුරු මත්ස්‍ය කර්මාන්තයේ මසුන්ට ආහාර ලෙස භාවිතා කිරීමේ හැකියාව ඵලදායී පිලියමක් ලෙස ඉස්මතු විය. එහිදී, ගප්පි මත්ස්‍යයින් වෙත සාමාන්‍යයෙන් ආහාර වල ප්‍රධාන ප්‍රෝටීන ප්‍රභවය ලෙස ලබා දෙන මාළු කුඩු වෙනුවට, ආක්‍රමණශීලී ගොළුබෙල්ලන් විශේෂයෙහි මාංශමය කොටස මගින් සාදන ලද ප්‍රෝටීනමය කුඩු (Snail meal), විකල්ප ප්‍රෝටීනයක් ලෙස ලබදීමෙන් මත්ස්‍ය වර්ධනය සසඳා බැලීමට පේරාදෙණිය විශ්වවිද්‍යාලයේ පර්යේෂකයන් කොටසක් සමත් විය.

පර්යේෂණයේ ප්‍රතිඵල ලෙස මාළු කුඩු වෙනුවට ආදේශකයක් ලෙස 75 ක් දක්වා ගොළුබෙල්ලන්ගේ මාංශමය කොටස ඉතා සාර්ථක ලෙස **භාවිත** කල හැකි බවත්ල එලෙස භාවිත කිරීමෙන් අතිරේක ප්‍රතිලාභ ලෙස මත්ස්‍යයින්ගේ වර්ණ තීව්‍රතාවය වැඩි වීම සහ මාලු කෑම වල ගුණාත්මය දියුණුවීමත් වැනි වාසි ද ලැබෙන බවට තහවුරු කරන ලදී.

තවද ආර්ථික ප්‍රතිලාභ ලෙසල ආනයනික මිලෙන් අඩක මාළු කුඩු වෙනුවටල ගොලුබෙල්ලන්ගේ මාංශමය කොටසින් සාදන ප්‍රොටීන ප්‍රභවය භාවිතා කිරීමෙන් මත්ස්‍ය වගාකරුවෙකුට රු. 58 -175 ක් අතර ලාභයක් ද අත්කරගත හැකි වීම තවත් වාසි සහගත තත්තවයකිග

අවසාන වශයෙන්ල ලෝකයෙන්ම ප්‍රථම වතාවට සිදුකල මෙම පර්යේෂණයල ශ්‍රී ලංකාවට ආක්‍රමණශීලී විශේෂයක් යොදාගෙනල ශ්‍රී ලංකාවේ ප්‍රධානතම අපනයන නිෂ්පාදනයක අභිවෘද්ධිය සඳහා යොදා ගැනීමල ශ්‍රී ලාංකිකයන් ලෙස අප සැවොම ලබාගත් ජයග්‍රහනයක්.



This is a non-technical summary of the project report titled "Spike-Topped Apple Snail (*Pomacea diffusa*) Meal as an Alternative to Fishmeal in Guppy (*Poecilia reticulata*) Diets" supervised by Dr. Pabodha Weththasinghe, Department of Animal Science, Faculty of Agriculture, University of Peradeniya. *pabodhaw@agri.pdn.ac.lk



සැඟවුණු කුසගින්නට විසඳුමක්

K.G.S. දිල්ෂානි නවරත්න

වර්තමානය වන විට ලෝක ජනගහනය බිලියන නවයකට ආසන්න අගයක පවතී. ඉන් බිලියන දෙකකට ආසන්න ප්‍රමාණයක් සැඟවුණු කුසගින්න නොඑසේ නම් ක්ෂුද්‍ර පෝෂක ඌනතාවයෙන් පෙළෙන බව පෙර කරන ලද සංගණන වාර්තා වලින් හෙළි වී ඇත. ක්ෂුද්‍ර පෝෂක ඌනතාවය යනු ශරීරයේ යහපත් වර්ධනයට හා පැවැත්මට අවශ්‍ය කරන විටමින් හා ඛනිජ ලවණ නියමිත මට්ටමට වඩා අඩුවීමයි. මෙම විටමින් හා ඛනිජ ලවණ ශරීරය තුළ අති විශාල කාර්යභාරයක් සිදු කරන අතර ඒවා නිසි අගයන්ගෙන් ශරීරය තුළ නොමැති වීම බොහෝ රෝගාබාධයන්හි උපතට හේතු වෙයි.

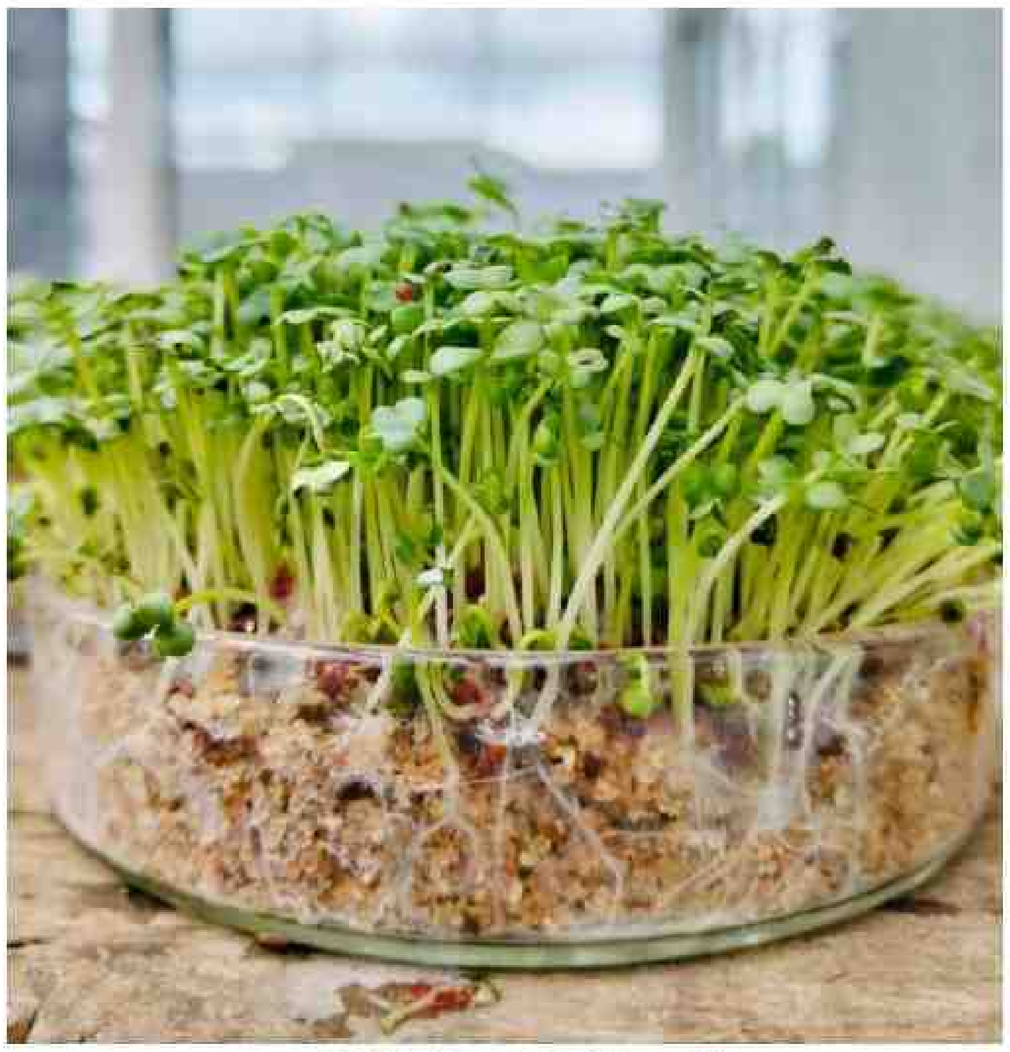
ශරීරයට අත්‍යවශ්‍ය ක්ෂුද්‍ර පෝෂක අතරින් සින්ක් (Zn) හා යකඩ (Fe) ප්‍රධාන වෙයි. ප්‍රතිශක්තිකරණ පද්ධතිය, රුධිර සංසරණ පද්ධතිය, ස්වසන පද්ධතිය, ආහාර ජීර්ණ පද්ධතිය, ස්නායු පද්ධතිය, ප්‍රජනක පද්ධතිය ඇතුලු බොහෝ පද්ධතීන්ගේ නිවැරදි ක්‍රියාකාරීත්වය පවත්වා ගැනීම සඳහා මේවාට පැවරෙන්නේ විශාල වගකීමකි. වෙනත් රෝගාබාධ මෙන් නොව ක්ෂුද්‍ර පෝෂක ඌනතාවය හේතුවෙන් ඇතිවන රෝගාබාධ වල රෝග ලක්ෂණ මතුපිටට දර්ශනය වීමට දිගු කාලයක් ගතවෙන නමුත් ඒ අතර කාලයේදී ශරීරය තුළ ඉන්ද්‍රියන් හා පද්ධති අකර්මණ්‍ය වීම කෙමෙන් කෙමෙන් අබණ්ඩව සිදුවෙමින් පවතී.

පසුකාලීනව නමුත් හඳුනාගන්නා මෙකී රෝගාබාධයන්ට විසඳුම වශයෙන් වෛද්‍ය ප්‍රතිකාර ලබා ගැනීම බොහෝ දෙනා අනුගමනය කරන ක්‍රමයයි. සින්ක් හෝ යකඩ අඩංගු ඖෂධ භාවිත කිරීම වෙනුවට තිරසාර විසඳුමක් ලෙස සින්ක් හෝ යකඩ අඩංගු පරිභෝජනය කළ හැකි ශාකමය ආහාරයක් නිර්මාණය කිරීමට හැකිවීම කෘෂිකර්මය ඇසුරින් ලැබූ අති විශාල ජයග්‍රහණයකි.

මෙලෙස ක්ෂුද්‍ර පෝෂක ශාකවලට ඇතුළු කිරීම සඳහා යොදා ගන්නා ක්‍රමය 'ජෛව සුගුණනය' (biofortification) ලෙස හඳුන්වනු ලබයි. මෙය ආකාර .තුනකට සිදු කළ හැකි අතර පළමු ආකාර දෙකහිම ජාන වෙනස් කිරීම තුළින් ශාක තුළ පෝෂක තත්ත්වය ඉහළ නැංවීමට කටයුතු කරන අතර, තෙවන ආකාරයේදී සිදුවන්නේ 'කෘෂිකාර්මීය ජෛව සුගුණනය' යි. එනම් මෙහිදී ශරීරයට අවශ්‍ය කරන ක්ෂුද්‍ර පෝෂක මගින් ශාක පෝෂණය කර එසේ පෝෂිත ශාක ආහාරයක් ලෙස මිනිසා විසින් පරිභෝජනය කිරීමයි.

මෙවැනි රෝගාබාධයන්ට විසඳුම කල්ගත වෙමින් සිදු කරන ක්‍රියාවක් වෙනුවට ඉතා කෙටි කාලයකින් ළඟා කර ගත හැකි වීම ඉතා අගනා කාරණාවක් වන අතර මයික්‍රොග්‍රීන්ස් නමැති කුඩා වයසේදී ආහාරයට ගත හැකි පැළ වලට ඉහත කී ජෛව සුගුණය සිදු කිරීම අපේක්ෂිත ප්‍රතිඵල කරා කෙටි කාලයකදී ළඟාවීමට ඇති නිර්මාණශීලීතම විසඳුමයි.

මයික්‍රොග්‍රීන්ස් නොඑසේ නම් මෙකී කුඩා පැළ දින 7-21 අතර කාලය තුළදී ආහාරයට එකතු කර ගත හැකි අතර, බීජයකින් පැළයක් නිර්මාණය වීම සිදුවන කාලය සක්‍රීයව පෝෂක අවශෝෂණය කරගන්නා කාල වකවානුවක් බැවින්, පරිණත ශාකයකට වඩා දස ගුණයකට වඩා වැඩි වේගයකින් කුඩා පැළ පෝෂක වලින් සන්නද්ධ වීම සිදුවේ. එබැවින් මෙකී පෝෂිත පැළ ආහාරයට එක්කර ගැනීම තුළින් අවශ්‍ය කරන්නා වූ ක්ෂුද්‍ර පෝෂක ඉතා පහසුවෙන් ශරීරගත වීම ද සිදුවේ. තවද ඒවා නැවුම් ස්වභාවයෙන් ආහාරයට ගත හැකි වීම පරිභෝජනය කරන්නාගේ ආහාර රුචිකත්වය ඉහළ නැංවීමට ද හේතු වේ.



සාරවත්ව වැඩුණු අබ මයික්‍රොග්‍රීන

මෙලෙස සින්ක් සහ යකඩ දියරමය ශාක පෝෂකයක් ලෙසින් තෝරාගත් මයික්‍රෝගීන්ස් වර්ග 4 ක් වන ගෝවා, බීට්, අබ හා කුරක්කන් වලට ජෛව සුගණනය සිදුකොට දින දහයක කාලය තුළ ඒවායේ පෝෂක අවශෝෂණ හැකියාව කොතෙක්ද යන්න පර්යේෂණය කිරීම සිදුකළ අතර පර්යේෂණ ප්‍රතිඵල වලට අනුව මයික්‍රොග්‍රීන්ස් මෙලෙස ක්ෂුද්‍ර පෝෂක මගින් ජෛව සුගුණනය කිරීමට විශාල විභවයක් ඇති බව තහවුරු වූ අතර දියරමය ශාක පෝශක ලබා දිය යුතු සාන්ද්‍රණ අගයන් පිළිබඳව ද තහවුරු කිරීම මෙම අධ්‍යයනය තුළදී සිදුවිය. මේ අයුරින්, බිලියන ගණනක් ජනතාව තුළ සැඟව වාසය කරන මෙකී කුසගින්න නොහොත් ක්ෂුද්‍ර පෝෂක ඌනතාවය ජෛව සුගණනය තුළින් ජයගැනීමට හැකිවීම තිරසාර කෘෂිකර්මය තුළ නව මංපෙත් විවර කරනු නොඅනුමානය.

This is a non-technical summary of the project report titled "Identifying the Potential of Zn and Fe Agronomic Biofortification for Selected Microgreen Species." supervised by Dr. L.M. Rankoth, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. lalithrankoth@agri.pdn.ac.lk



ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තයේ නියැලෙන ගොවීන්ගේ වෙළඳපොළ තතු

විරුනි ෂෙනාරා ප්‍රේමශ්‍රී

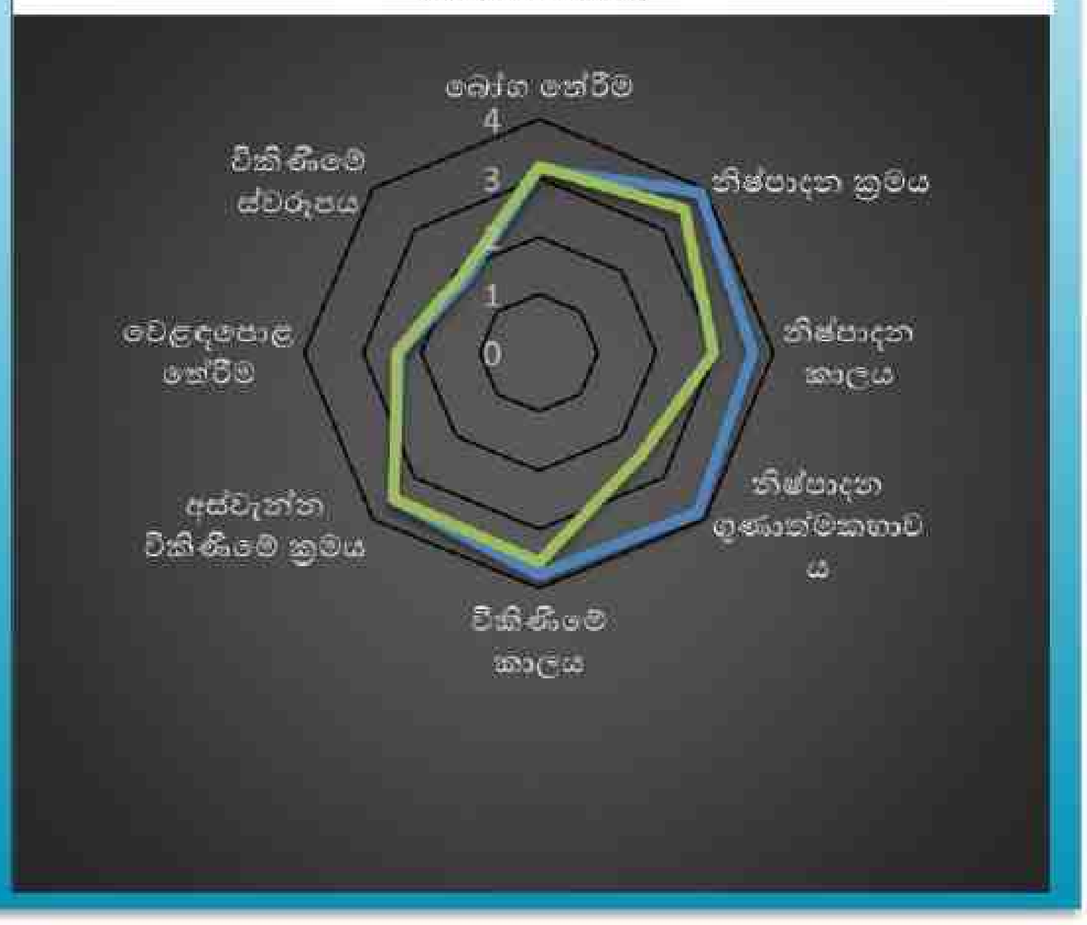
2021 වර්ෂයේ පටන් ශ්‍රී ලංකාවේ ප්‍රධාන කෘෂිකාර්මික කලාපයක් වන මහවැලි එච් කලාපයේ ගොවීන් හට ආරක්ෂිත ගෘහ තුළ බෝග වගා කිරීම සඳහා රජයෙන් සහ ආසියානු සංවර්ධන බැංකු මූල්‍ය ප්‍රතිපාදන මත ක්‍රියාත්මක කෘෂිකර්ම ව්‍යාපෘති යටතේ ආරක්ෂිත ගෘහ ඉදිකිරීම සඳහා ආධාර ලබාදීම ආරම්භ කරන ලදී.සමාන පාරිසරික තත්ත්ව යටතේ වුවද ඇතැම් ගොවීන් තම වගා කටයුතු නිසිපරිදි පවත්වා ගෙන ගියද ඇතැම් ගොවීන්ට ඔවුන්ගේ අස්වැන්න සුදුසු වේලාවට සහ සුදුසු ගැනුම්කරුවන්ට විකිණීමෙන් වැඩිපුර මුදල් උපයා ගැනීමට අපොහොසත් වීම නිසා ආරක්ෂිත ගෘහ තුළ බෝග වගාව අතහැර දමා ඇත.

මෙයට හේතුව කුමක් විය හැකිද? සැබැවින්ම එය වෙළඳපොළ ඉල්ලුම පිළිබඳ අවබෝධ කර ගැනීමට නැකියාවක් නොමැති වීමයි.

මෙම පර්යේෂණයෙන්, ආරක්ෂිත ගෘහ තුළ බෝග වගා කරන ගොවීන්ගේ "වෙළඳපල පිළිබඳ නැඹුරුව" කෙසේද යන්න විමර්ශනය කරන ලදී. මෙයින් අදහස් කරන්නේ වැඩි ලාභයක් ලබා ගැනීම සඳහා ගැනුම්කරුවන් කැමති බෝග, නිවැරදි ගුණාත්මක ඛවින් සහ නියමිත වේලාවට වගා කරනවාද යන්න අධ්‍යනය කිරීමයි. මෙහිදී, දැනට ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තය සහ සාම්ප්‍රදායික විවෘත භූමි කෘෂිකර්මාන්තය යන දෙකෙහිම එළවළු වගා කරන ගොවීන් 92 දෙනෙකු තෝරා ගත් අතර ඔවුන්ගේ බෝග නිෂ්පාදන තීරණ ගැනීම පිළිබඳව එනම්, ඔවුන්ගේ බෝග තේරීම්, නිෂ්පාදන ක්‍රමය, නිෂ්පාදන කාලය, නිෂ්පාදන ගුණාත්මකභාවය, අස්වැන්න විකිණීමේ ක්‍රමය, විකිණීමේ කාලය, වෙළඳපොළ තේරීම්, විකිණීමේ ස්වරූපය සහ ඔවුන්ගේ අධ්‍යාපනය, ස්ත්‍රී පුරුෂ භාවය, කෘෂිකාර්මික අත්දැකීම් හෝ ප්‍රාථමික රැකියා භූමිකාව වැනි සාධක ඔවුන්ගේ වෙළඳපල නැඹුරුතාවයට බලපෑම් කරන්නේද යන්න පිළිබඳ අධ්‍යනය කරන ලදී.

පහත රූපයේ දැක්වෙනුයේ ගොවීන්ගේ ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තය සහ විවෘත භූමි කෘෂිකර්මාන්තය අතර වෙළඳපල නැඹුරුතාවයේ ස්වභාවයේ වෙනස්කම් පෙන්වීම සඳහා මධ්‍යනයන් ඇසුරින් අඳින ලද ජාල සටහනකි.

නිල් - ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තය , කොළ - විවෘත භූමි කෘෂිකර්මාන්තය



මෙම අධ්‍යනයෙන් සොයාගත් දේ...?

මෙම අධ්‍යනයේ ප්‍රතිඵල වලට අනුව ගොවීන් ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තයේදී වෙළඳපල කෙරෙහි දැඩි අවධානයක් යොමු කරන අතර ඔවුන් විවෘත භූමි කෘෂිකර්මාන්තයේදී මධ්‍යස්ථ වෙළඳපල නැඹුරුතාවයක් දක්වයි. ගොවීන් ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තයේදී බෝග නිෂ්පාදනයන් සිදු කිරීමේදී, බෝග නිෂ්පාදන කාලය, නිෂ්පාදන ගුණාත්මකභාවය සහ අස්වැන්න විකිණීමේ කාලය යන කරුණු කෙරෙහිද විවෘත භූමි කෘෂිකර්මාන්තයේදී සාමාන්‍යයෙන් ඔවුන් බෝග තේරීම සහ වෙළඳපොළ තේරීම යන්න කෙරෙහි වැඩි අවධානයක් යොමු කරයි. තවද ඩිප්ලෝමාවක්/උපාධියක් වැනි උසස් අධ්‍යාපනයක් ලැබූ ගොවීන් වෙළඳපල අවශ්‍යතා අවබෝධ කර ගැනීමට සහ සපුරාලීමට බොහෝ දක්ෂ වේ. උගත් ගොවීන් , විශේෂයෙන්ම ජලය සහ සෙවන වැනි තත්වයන් පාලනය කළ හැකි ආරක්ෂිත ගෘහ තුළ උසස් තත්ත්වයේ එළවළු වගා කිරීමට සහ වඩා හොඳ මිලක් ලබා ගැනීම සඳහා ඔවුන්ගේ විකුණුම් කාලය සැලසුම් කිරීමට දක්ෂ වේ. නිදසුනක් වශයෙන්, ගොවීන් ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තයේදී විවෘත භූමි කෘෂිකර්මාන්තයේදීට වඩා ගුණාත්මකභාවය කෙරෙහි වැඩි අවධානයක් යොමු කරන අතර එමඟින් ගැනුම්කරුවන්ගේ ඉල්ලීම් සපුරාලීමට ඔවුන්ට හැකි වේ. ස්ත්‍රී පුරුෂ භාවය, ගොවිතැන් අත්දැකීම් හෝ කෘෂිකර්මාන්තය ඔවුන්ගේ ප්‍රධාන රැකියාවද යන්න වැනි අනෙකුත් සාධක විශාල වෙනසක් සිදු නොකරයි.



මෙම රූපයේ දැක්වෙනුයේ පොලිතීන් මලු තුළ මුල් ව්‍යාප්තිය අවනීර වීම වැළැක්වීම සඳහා ගොවිමහතෙකු ගත් උපක්‍රමයක් ලෙස වියළි පොල් අතු වට කිරීමෙන් සාදන ලද උස් වැටියක බෝග

මෙම අධ්‍යනය වැදගත් වන්නේ ඇයි.....?

ශ්‍රී ලංකාවේ කෘෂිකර්මාන්තය ග්‍රාමීය පවුල්වලින් 70% කට සහාය වන අතර එළවළු අපගේ ආර්ථිකයට 0.9% ක් දායක වේ.එබැවින්, නිවැරදි වේලාවට නිවැරදි බෝග වගා කිරීමෙන් ගොවීන්ට ඔවුන්ගේ ගොවිතැන් කටයුතු වලින් සිය ආර්ථිකය ශක්තිමත් කරගත හැකිය. එහෙත් දේශගුණික විපර්යාස, අනපේක්ෂිත වැසි සහ නියං කාලයන් ගොවිතැන වඩාත් දුෂ්කර කරයි. ආරක්ෂිත ගෘහ තුළ කෘෂිකර්මාන්තය එවැනි උපද්‍රව වලින් බෝග ආරක්ෂා කරගැනීමට උපකාරී වේ, නමුත් මෙම අධ්‍යයනයෙන් පෙනී යන්නේ අධ්‍යාපනය ඊටත් වඩා උපකාර වන බවයි.එය ගොවීන්ට වෙහෙස මහන්සි වී පමණක් නොව වඩා දක්ෂ ලෙස වගා කිරීමට දැනුම ලබා දෙයි. නිදසුනක් වශයෙන්, උගත් ගොවියෙකුට මීල ගණන් ඉහළ මට්ටමක පවතින විට මිරිස් වගා කිරීමට ඉගෙන ගත නැකි අතර, නුගත් ගොවියෙකු නොදින් අලෙවි නොවන සාම්ප්‍රදායික බෝගවලට ඇලී සිටිය හැකිය. එය වෙනස් වන ලෝකයක මෙය ගොවීන්ට සාර්ථක වීමට උපකාර කිරීමේ මෙවලමක් වන අතර ශ්‍රී ලංකාවේ දේශීය සහ අපනයන වෙළඳපොළ එළවළු සැපයුම ශක්තිමත් කිරීමට ඉවහල් වනු ඇත.

This is a non-technical summary of the project report titled “An Assessment of Market Orientation Towards Protected Agriculture and Open Field Farming among Protected Agriculture Farmers in Mahaweli System-H” supervised by Prof. K.A.S.S. Kodithuwakku*, Department of Agricultural Economics & Business Management, Faculty of Agriculture, University of Peradeniya. *sarathsk@agri.pdn.ac.lk.



තක්කාලි බෝගයේ බැක්ටීරියා හිටුමැරීමට තිරසාර විසඳුමක්.....

D.R.I. මධුශානි

පාංශුගත රෝගකාරකයක් හේතුවෙන් හටගන්නා බැක්ටීරියා හිටුමැරීම (Bacterial wilt) ශ්‍රී ලංකාවේ තක්කාලි වගාවට ඉතා විනාශකාරී ප්‍රතිඵල ගෙන දෙන රෝගයක් ලෙස හඳුනාගෙන ඇත.



ස්ථානය : දඹුලගල, ශ්‍රී ලංකාව

මෙම රෝගකාරක බැක්ටීරියාව අස්වනු නෙළීමෙන් පසු වසර දෙකක් පමණ ගතවනතුරු ද පසෙහි ජීවත් වීමේ හැකියාවෙන් යුතු අතර මෙම රෝගය පාලනය සඳහා කිසිදු කෘෂිරසායනයක් හෝ දැනට වෙළඳපොලේ දක්නට නොමැත. නමුත් දැඩි ආර්ථික හානි හමුවේ, වගාකරුවන් විවිධ කෘෂිරසායන අතිරික්තව භාවිත කරමින් සිය අස්වැන්න ආරක්ෂා කරගැනීමට උත්සහා දැරීමත් සමඟ අහිතකර පාරිසරික බලපෑම් ඇති වී ඇත.

එබැවින් මෙම ශාක රෝග පාලනය සඳහා ආරක්ෂිත සහ තිරසාර පිළියමක් ලෙස ජෛව පාලනය හඳුන්වා දී ඇත. ශාක රෝග පාලනය සඳහා ක්ෂුද්‍රජීවී සමූහ (Microbial consortia) භාවිතා කිරීම අද වන විට ලෝකයේ ප්‍රමුඛත්වයක් දරයි. එය කෘෂිරසායන භාවිතයට ද තිරසාර විසඳුමක් ලෙස ලොව පුරා ප්‍රචලිත වී ඇත. එනම්, අප වගාවන් සඳහා භාවිතා කරන පසෙහිම ජීවත්වන, අපගේ පියවි ඇසට පවා නොපෙනෙන, ක්ෂුද්‍රජීවී සමූහයකට මෙම රෝගයට පිළියමක් ලබා දිය හැකි බව ඔබ මොහොතකට සිතුවා ද?

මෙහිදී මාගේ අධ්‍යනයේ අරමුණ වුයේ පසෙහි ජීවත් වන හිටුමැරීමේ රෝගකාරකය පාලනය කළ හැකි බැක්ටීරියා සහ දිලීර ඒකලිත කරගනිමින් (isolate) තක්කාලි බෝගයේ බැක්ටීරියා හිටුමැරීම පාලනය කිරීමේ සහ බෝග වර්ධනය ප්‍රවර්ධනය කිරීමේ හැකියාව සහිත ක්ෂුද්‍රජීවී සමූහ නිර්මාණය කිරීමයි. මෙහිදී ඒකලිත කරගත් බැක්ටීරියා හා දිලීර ඝනාවාස (isolates) නයිට්‍රජන් තිරකිරීම, අද්‍රාව්‍ය පෝස්පේට් ද්‍රාව්‍ය පෝස්පේට් බවට පත් කිරීම, බෝග වර්ධනය උත්තේජනය කරන ශාක හෝර්මෝනයක් වන ඉන්ඩෝල් ඇසිටික් ඇසිඩ් නිෂ්පාදනය සහ බීජ ප්‍රරෝහණය ප්‍රවර්ධනය සඳහා ද පරීක්ෂා කර බැලිණි. ඊට අමතරව තනි තනිව සහ සමූහ වශයෙන් හිටුමැරීම පාලනය සහ ශාක වර්ධනය ප්‍රවර්ධනය සඳහා මොවුන්ගේ ඇති හැකියාව ශාක ගෘහ තුළ දී පරීක්ෂා කරන ලදි.

ඒ අනුව ඒකලිත කරගත් ඝනාවාස රෝගකාරකයට එරෙහිව පරීක්ෂා කිරීමේදි තහවුරු වුයේ ඒකලිත වූ සියලු බැක්ටීරියා සහ දිලිර අතුරින්, බැක්ටීරියා ත්‍රිත්වයකට සහ එක් දිලීරයකට, හිටුමැරිමේ රෝගකාරකය පාලනය කිරීම කළ හැකි බවයි. එම බැක්ටීරියා සහ දිලීරය යොදා ගනිමින් ක්ෂුද්‍රජීවී සමූහ ද්විත්වයක් නිර්මාණය කරන ලදී.

එනම් බැක්ටීරියා විශේෂ තුන භාවිත කරමින් එක් සමූහයක් හා බැක්ටීරියා විශේෂ දෙකක් සහ දිලීරය භාවිත කරමින් තවත් සමූහයක් වශයෙනි. පරීක්ෂණ ප්‍රතිඵලවලට අනුව මෙම සමූහයන්ට ඇතුලත් කරන ලද ඇතැම් බැක්ටීරියා සහ දිලිරයට ශාකවල පැවැත්මට අත්‍යවශ්‍ය පෝෂක වන නයිට්‍රජන්, පොස්පරස් සපයා දීමට ද ශාක වර්ධනය ප්‍රවර්ධනය කරන ඉන්ඩෝල් ඇසිටික් ඇසිඩ් නම් ශාක හෝර්මෝන නිෂ්පාදනය කිරීමටද හැකි බව සොයා ගැනිණි.

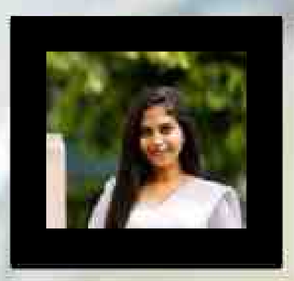
බීජ ප්‍රරෝහණය පිළිබඳ පරීක්ෂණයේ දී බැක්ටීරියා සමූහ යොදාගෙන ප්‍රතිකාර කරන ලද බීජවල, බීජාංකුරවල දිගෙහි වැඩිවීමක් නිරීක්ෂණය වූ අතර බීජමුලයෙහි දිගෙහි කිසිදු වෙනසක් නිරීක්ෂණය නොවුණි.

රූප විද්‍යාත්මක ලක්ෂණ වලට අනුව, බැක්ටීරියා විශේෂ *Bacillus* spp. (සුලබ වශයෙන් ජෛවපාලනය සඳහා යොදාගන්නා බැක්ටීරියාවකි) ලෙසත් දිලීර විශේෂ *Trichoderma* sp. (සුලබ වශයෙන් ජෛවපාලනය සඳහා යොදාගන්නා දිලීරයකි) ලෙසත් හඳුනාගැනිණි. ශාක ගෘහතුළ සිදුකරන ලද පරීක්ෂණයේ දී පාලිත බෝග කණ්ඩායමට සාපේක්ෂව ක්ෂුද්‍රජීවී සමූහ ද්විත්වය යොදන ලද ශාක කණ්ඩායම්හි රෝගය ඇති වීමේ සම්භාවිතාවයේ පැහැදිලි අඩුවීමක් දක්නට ලැබිණි.

ඒ අනුව නිර්මාණය කරන ලද ක්ෂුද්‍රජීවී සමූහ ද්විත්වය බැක්ටීරියා හිටුමැරීම පාලනය කරමින් ශාකයට අවශ්‍ය ඇතැම් පෝෂක සැපයීමේ හැකියාවෙන් ද යුතු බව තහවුරු විය.

අධ්‍යයන ප්‍රතිඵල වලට අනුව කුඩා ප්‍රමාණයේ ක්ෂේත්‍ර අධ්‍යයනයකින් පසුව මෙම ක්ෂුද්‍රජීවී සමූහ ද්විත්වය ශ්‍රී ලංකාවේ තක්කාලි වගාවේ හිටුමැරීම පාලනය සහ ශාක වර්ධනය ප්‍රවර්ධනය සඳහා ද්විත්ව කාර්ය හැකියාවන් සහිත ජෛව පාලන ක්‍රමයක් ලෙස භාවිත කිරීමේ ඉතා ඉහළ හැකියාවකින් යුතු බවට නිර්දේශ කළ හැකිය.

This is a non-technical summary of the project report titled "Isolation and Characterization of Soil Antagonistic Microorganisms for Development of Microbial Consortia for the Management of Bacterial Wilt Caused by *Ralstonia solanacearum* and Plant Growth Promotion in Tomato" supervised by Dr. P.A.I.U.Hemachandra*, Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya. *ishankah@agri.pdn.ac.lk



ජීවිතයට පුරුද්දක්-ළදරු වියෙන් පදනමක් :පැණි රසින් හා ජෙලටින් වලින් තොර ළදරු යෝගට්

චානිකා ගමගේ

මව් කිරි කුඩා ළදරුවන් සඳහා ඉතාම සුදුසු පෝෂණ මූලාශ්‍රය වුවත් වයස මාස හය ඉක්මවූ පසු එමඟින්ම පමණක් ඔවුන්ගේ පෝෂණ අවශ්‍යතා සපුරාලිය නොහැකි බව ඔබ දන්නවාද?

එබැවින්, මාස 6 ඉක්මවූ ඔබේ දරුවාට මව්කිරි සමඟ අතිරේක ආහාර ද ලබාදීම ඉතා වැදගත් වේ. ප්‍රෝටීන්, කැල්සියම්, විටමින් සහ ප්‍රෝබයෝටික්ස් ඇතුළුව පෝෂක බහුල සංයුතියක් ඇති යෝගට් මේ සඳහා ඉතාමත් සුදුසු ආහාරයකි. යෝගට් වල අඩංගු ප්‍රෝබයෝටික් සහ ප්‍රීබයෝටික් ළදරුවන්ගේ ආන්ත්‍රික සෞඛ්‍ය හා රෝග වලට ප්‍රතිරෝධය වැඩිදියුණු කිරීමට දායක වේ. නමුත් දේශීය වෙළඳපොළේ තිබෙන බොහෝ යෝගට් නිෂ්පාදන වලට එකතු කරන සීනි ප්‍රමාණය 10-20% අතර බවත් ජෙලටීන් අඩංගු බවත් ඔබ තවමත් නොදැනුවත් ඇති.

ඉතා කුඩා වියේ සිට සීනි හඳුන්වා දීම මඟින් පැණි රස ආහාර වලට දක්වන ඉල්ලුම වැඩි වී එය ඔබේ දරුවා වැඩිහිටි වන විට යලි නිවැරදි කිරීමට අපහසු වැරදි ආහාර පුරුද්දක් බවට පත්විය හැක.එය සෞඛ්‍යයට දැඩි බලපෑම් එල්ල කරමින් පසු කාලීනව ඔවුන් කරා එන්නේ දත් දිරා යාම, තරබාරුබව, දියවැඩියාව,සහ බෝ නොවන රෝග වැනි මුහුණුවරකින් විය හැකිය.එබැවින්, කුඩා දරුවන් සඳහා වන ආහාරවල අමතර සීනි අඩු කිරීම අත්‍යවශ්‍ය කරුණකි.

ජෙලටින් නිශ්පාදනය කිරීමට සුකර හා ගව සම්බන්ධක පටක භාවිතා කිරීම නිසා ජෙලටින් භාවිතය හා බැඳුණු යම් සමාජ,සංස්කෘතික සීමාවන් හා සැක සංකා පවතී. කෙසේවෙතත් කුඩා ප්‍රමාණවලින් ජෙලටින් භාවිතය ළදරුවන්ගේ සෞඛ්‍යයට සැබැවින්ම අහිතකර නොවේ.නවතම ආහාර තාක්ෂණික ප්‍රවණතා අනුව, ජපානය වැනි රටවල් ජෙලටින්වලට විකල්පයක් ලෙස ට්‍රාන්ස්ග්ලූටමිනේස් (TGase) එන්සයිමය ආහාර සඳහා එකතු කරනු ලබයි.විශේෂයෙන්ම කුඩා දරුවන්ගේ ආහාර නිෂ්පාදන සඳහා ජෙලටින් වැනි ජීර්ණය අපහසු ස්ථායිකාරක වලට වඩා ට්‍රාන්ස්ග්ලූටැමිනේස් එන්සයිමය යෙදීම සැබැවින්ම අගනා විකල්පයකි.

උක්ත පසුබිම යටතේ, මෙම පර්යේෂණයේ ප්‍රධාන අරමුණ වූයේ ළදරුවන් සඳහා, ට්‍රාන්ස්ග්ලූටැමිනේස් එන්සයිමය භාවිතයෙන් ,අමතර සීනි සහ ජෙලටින් රහිත ප්‍රෝබයෝටික් සපිරි, ස්ටර්ඩ් ආකාරයේ යෝගට් පැකට්ටු නිශ්පාදනය හා වැඩිදියුණු කිරීමයි. මෙහිදි පිරිසිදු නැවුම් එළකිරි වලට ළදරුවන් සඳහාම වාණිජව සැකසූ ප්‍රෝබයෝටික් මුහුම් සහ ට්‍රාන්ස් ග්ලුටැමිනේස් එන්සයිමය යොදා ඉතාම සෞඛ්‍යාරක්ශිත ලෙස ස්ටර්ඩ් යෝගට් නිශ්පාදනය කරනු ලැබීය.එය ඉතා සාර්ථක නිශ්පාදනයක් බවට පත් වුයේ රසායනාගාර හා විද්‍යාගාර තුලදී සිදුකරන ලද භෞත- රසායනික හා ක්ෂුද්‍ර ජීව විද්‍යාත්මක පරීක්ෂණ වලින් ඉතා සතුටුදායක ප්‍රතිඵල ලබාදෙමිනි.



ඇසුරුම් නව්‍යකරණය කරමින් මෙම ස්ටර්ඩ් ආකාරයේ (ගනකමින් අඩු, තරමක් දියරමය) යෝගට් ආකර්ෂණීය, නම්‍යශීලී පැකැට්ටුවකින් ඉදිරිපත් කරනුයේ ඔබටත් දරුවාටත් පහසු හා ආරක්ෂිත නව අත්දැකීමක් වන පරිද්දෙනි. ඊට අමතරව කුඩා දරුවන් සිටින දෙමාපියන්ට මෙම නව යෝගට් හදුන්වා දීම සිදු කළ අතර බොහෝ දෙමාපියන්ගේ තේරීම පරිදි එන්සයිම 0.01% පමණ ඉතාමත්ම අඩු සාන්ද්‍රණයකින් සෑදූ නව ස්ටර්ඩ් යෝගට් දැනට වෙළඳපොළේ ඇති ජෙලටින් යෙදූ යෝගට් වලට බෙහෙවින් සමාන ලක්ෂණ පෙන්වීය.පැණි රසින් තොර ,ජෙලටීන් රහිත මෙම නව යෝගට් පිළිබඳ දෙමාපියන් ඉතා දැඩි උනන්දුවක් හා ආකර්ෂණයක් ද පෙන්විය.

මේ වන විටත් ලංකාව තුළ ළදරුවන් සඳහාම සැකසූ යෝගට් නිශ්පාදනයක් වෙළඳපොල තුළ නැත. සමීක්ෂණ මඟින් මතුවූ අවශ්‍යතාවත්, සාර්ථක පර්යේෂණ ප්‍රතිඵලත්, වෙළඳපොල තුළ නව ළදරු යෝගට් නිශ්පාදනයක් සඳහා ඇති මහා ඉඩකඩත් සැලකිල්ලට ගැනිමෙන් නුදුරු අනාගතයේදි ඔබේත් මගේත් දරුවාගේ සෞඛ්‍ය සම්පන්න හෙට දවස උදෙසා මෙම නිශ්පාදනය වැඩිදියුණු කර නුදුරේදීම වෙළඳපොලට ඉදිරිපත් කරනු ඇත.



This is a non-technical summary of the project report titled "Formulation of Gelatin-free & Added Sugar-free Stirred Yogurt Pouches for Toddlers Using Transglutaminase Enzyme" supervised by Dr. G.M.Somaratne*, Department of Food Science & Technology, Faculty of Agriculture, University of Peradeniya. *gsomaratne@agri.pdn.ac.lk

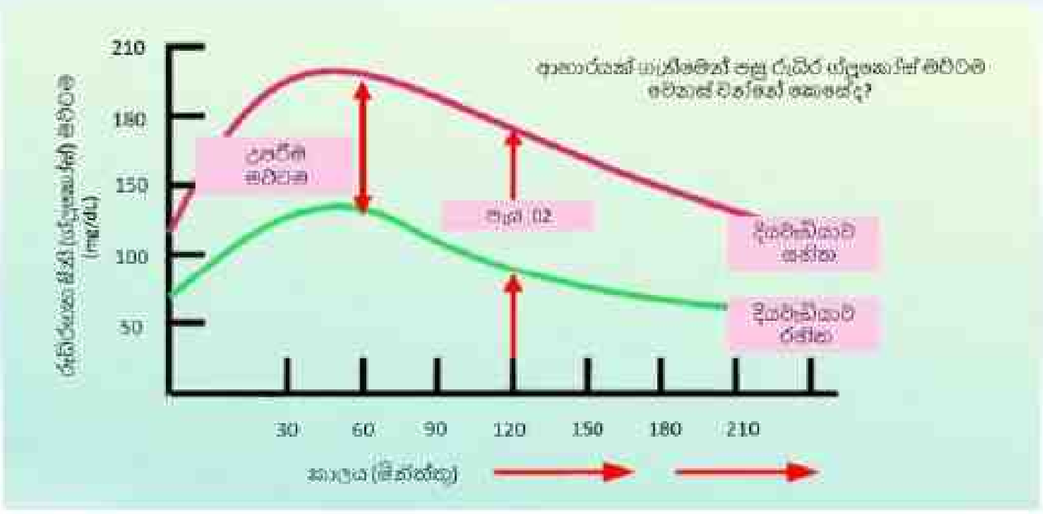


නිතරම ආහාරයට ගන්නා සහල් ආශ්‍රිත ආහාර වර්ග කීපයක් ඔබේ රුධිරගත සීනි මට්ටම වෙනස් කරන ආකාරය හඳුනාගනිමු.

සඳුනිකා පියුමාලි විජේසේකර

ආහාරයක් ගැනීමෙන් පසු රුධිර ග්ලූකෝස් මට්ටම වෙනස් වන්නේ කෙසේද?

සාමාන්‍යයෙන් කිසියම් ආහාරයක් ගැනීමෙන් පසු ආහාර අවශෝෂණය නිසා නීරෝගී පුද්ගලයෙකුගේ රුධිරගත සීනි (ග්ලූකෝස්) මට්ටම ක්‍රමයෙන් වැඩි වීමට පටන් ගනී. එසේ පැයක පමණ කාලයක් ගත වන විට රුධිර සීනි මට්ටම උපරිමයකට ළඟා වී ආහාර ගැනීම ආරම්භ වූ මොහොතේ සිට පැය දෙකක් තුනක් ඇතුළත නැවත සාමාන්‍යය මට්ටමට පැමිණීම සිදුවේ.



ආහාරයක ග්ලයිසිමික් දර්ශකය (Glycemic Index –GI අගය) යනු කුමක්ද ?

අප ගන්නා විවිධ ආහාර වර්ග මඟින් එසේ අපගේ රුධිරගත සීනි මට්ටම වෙනස් කරන ආකාරයද විවිධාකාර වේ. ඇතැම් ආහාර වඩාත් ඉක්මණින් සහ විශාල වශයෙන් අපේ රුධිර සීනි මට්ටම වෙනස් කරන අතර ඇතැම් ආහාර එය සෙමෙන් මෙන්ම සාපේක්ෂව අඩුවෙන් සිදු කරයි. මෙම සංසිද්ධිය පදනම් කරගෙන විද්‍යාඥයින් විසින් ආහාර මඟින් රුධිරගත සීනි මට්ටම ඉහළ නැංවීමේ විභවය පිළිබඳ මිනුමක් වන ග්ලයිසිමික් දර්ශකය (Glycemic Index – GI අගය) හඳුන්වා දී ඇත.

ආහාරයක GI අගය ගණනය කරනු ලබන්නේ ග්ලූකෝස් වලට සාපේක්ෂවය. ග්ලූකෝස් වල මෙම අගය 100 ක් වේ. වඩාත් ඉක්මණින් සහ විශාල වශයෙන් අපේ රුධිර සීනි මට්ටම වෙනස් කරන ආහාර සඳහා වැඩි GI අගයක් ද සෙමෙන් සහ අඩුවෙන් රුධිර සීනි මට්ටම ඉහළ නංවන ආහාර සඳහා සාපේක්ෂව අඩු GI අගයක් ද පවතී. අප ගන්නා ආහාරවල GI අගය 55 ට සමාන හෝ අඩු නම් අඩු GI අගයක් සහිත ලෙසද 56 සිට 69 දක්වා සීමාව තුල පවතී නම් මධ්‍යම GI අගයක් සහිත ලෙසද GI අගය 70 හෝ ඊට වැඩි නම් වැඩි GI අගයක් සහිත ලෙසද වර්ගීකරණය කෙරේ. සාමාන්‍යයෙන් දියවැඩියාව වැනි තත්ත්ව වලින් පෙලෙන පුද්ගලයින් සඳහා නිර්දේශ කරනු ලබන්නේ අඩු GI අගයක් සහිත ආහාර වේ.

ලාංකික අපේ ප්‍රධාන ආහාරය වන්නේ බත් ය. එමෙන්ම සහල් ආශ්‍රිත වෙනත් ආහාර රැසකට අපේ එදිනෙදා ආහාර වේල තුළ සුවිශේෂී ස්ථානයක් හිමිවේ. මෙම අධ්‍යනයේ ප්‍රධාන අරමුණ වූයේ තෝරාගත් සහල් වර්ග කීපයකින් සකස් කල එවන් සහල් ආශ්‍රිත ආහාර වර්ග කීපයක GI අගය ගණනය කිරීමත් ඒ තුළින් දියවැඩියාව වැනි රෝග තත්ත්ව පාලනය මෙන්ම වළක්වා ගැනීම සඳහා වඩාත් වැදගත් ආහාර නිර්දේශ සකස් කිරීමට අවශ්‍ය දැනුම ලොවට දායාද කිරීමත් ය.

මෙම අධ්‍යනය සඳහා සී. අයි. සී. (CIC) සමාගම විසින් හඳුන්වා දුන් නව සහල් ප්‍රභේද කීපයක් යොදා ගන්නා ලදී. ඒ අනුව CIC සැවන්දරා මිශ්‍ර සහලක් (Savandara Mix), CIC සුවඳ රතු සුනු සහලක් (Red Fragrant Broken), CIC සුපර් කර්නල් (Super Kernel) සහලක් මේ සඳහා යොදා ගන්නා ලදී.

ග්ලයිසිමික් අගය නිර්ණය කිරීමේ ISO ක්‍රමවේදය යටතේ මෙම අධ්‍යනය පවත්වන ලදී.

අධ්‍යනයේ අනාවරණ

මෙම අධ්‍යනයේදී යොදා ගන්නා ලද එක් එක් සහල් වර්ගවලින් සාදන ලද ආහාර වර්ගද එම ආහාරවල ගණනය කරන ලද GI අගයන්ද පහත රූප රාමුවේ සාරාංශගත කර ඇත.



මේ අනුව පෙනී යන්නේ සැවන්දරා මිශ්‍ර සහලෙන් සාදා ඇති දියබත් එහි අඩු GI අගය සලකා බලන විට දියවැඩියා රෝගීන් හට යෝග්‍ය ආහාරයක් ලෙස නිර්දේශ කල හැකි බවයි.

තෙම්පරාදු බත් යනු ලොකු කුඩා භේදයකින් තොරව බොහෝ දෙනා කැමති ආහාරයකි. එය සාමාන්‍ය බතට වඩා අධික කැලරි ප්‍රමාණයක් සහිත මෙන්ම එලවළු අඩංගු බැවින් තන්තු වලින්ද අනූන වේ. තෙම්පරාදු බත් සඳහා ලංකාවේ බහුලව භාවිතා කෙරෙන්නේ කීරි සම්බා වැනි සාමාන්‍යයෙන් මධ්‍යම GI අගයන් සහිත සහල් වර්ග වේ. නමුත් මෙවැනි අඩු GI අගයක් සහිත සහල් ප්‍රභේදයකින් (සුපර් කර්නල් වැනි බාස්මතී වර්ග වලින්) සාදන ලද තෙම්පරාදු බතක් මන්දපෝෂණයෙන් පෙලෙන කුඩා දරුවන් සඳහා නිර්දේශ කළ හැක.

පෙර සිදු කර ඇති බොහෝ අධ්‍යනයන්ගෙන් හෙළි වී ඇත්තේ බොහෝ බත් කැඳ වර්ග අඩු GI අගයක් සහිත ආහාර බවයි. නමුත් මධ්‍යම GI අගයක් සහිත සුවඳ රතු සුනු සහලෙන් සෑදූ මෙහි සඳහන් මධ්‍යම GI බත් කැඳ පෝෂ්‍යදායී, ශක්තිජනක පානයක් ලෙස ඔබේ ආහාර වේලට එකතු කර ගත හැකියි.

බොහෝ අධ්‍යනයන්වලදී ඉඳි ආප්ප වැඩි GI අගයක් සහිත ආහාරයක් ලෙස අනාවරණය වුවද ඉඳි ආප්පවල GI අගය භාවිත කරන සහල් පිටි වර්ගය අනුව වුවද වෙනස් විය හැක. මධ්‍යම හෝ අඩු GI අගයන් ඇති සහල් පිටි භාවිතයෙන් සෞඛ්‍යට වඩා හිතකර GI අගයක් සහිත ආහාර නිපදවා ගත හැකි බවට මෙහිදී ඉඳි ආප්ප සඳහා මධ්‍යම GI අගයක් වාර්තා වීම සාක්ෂි සපයයි. තවද එකම සහල් ප්‍රභේදය වුවද විවිධ පිසුම් ක්‍රම භාවිත කර පිසීමෙන් රුධිරගත සීනි මට්ටම කෙරෙහි ඇති කල හැකි බලපෑම් වෙනස් කර ගත හැකි බවට මෙම අධ්‍යනය පෙන්වා දෙයි. ඒ අනුව මේ වන විට ශ්‍රී ලංකාව තුල විශාල ගැටළුවක්ව පවතින දියවැඩියා රෝගය වළක්වා ගැනීමේ සටන, නිවැරදි ආහාර තෝරාගැනීම් සහ සුදුසු පිසුම් ක්‍රම භාවිතය තුළින් නිවසේ මුළුතැන්ගෙයින්ම ඇරඹීමට අපිත් අදිටන් කර ගනිමු.

This is a non-technical summary of the project report titled "Evaluation of the Impact of Selected Rice Based Diets on Postprandial Blood Glucose Levels in Healthy Sri Lankan Adults" supervised by Dr. G. M. Somaratne*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. * gsomaratne@agri.pdn.ac.lk



පශ්චාත් ආර්තවහරණයේ ඇස නොගැටී පැතිකඩ කාන්තාවනි, දැස් විවර කිරීමට කාලය එළඹ ඇත !

කේ. ආර්. ඩබ්. එම්. ජී. එම්. කේ. කරුණාතිලක

ආර්ත්වහරණය යනු ඔබේ මාසික ආර්තවය ස්ථීරවම නැවතීමයි. මේ තත්වය සෑම කාන්තාවකටම අත්විඳීමට ලැබෙන ස්වභාවික ක්‍රියාවලියක් වන අතර වාර්ශිකව මිලියන 1.5 අධික කාන්තාවන් පිරිසක් ආර්තවහරණයට ලක්වෙයි.

ආර්තවහරණයෙන් පසුව සිදුවන්නේ කුමක්ද?

මෙම කාලය තුලදී අනපේක්ෂිත සොඛ්‍ය ගැටලු වලට මුහුණ දීමට සිදුවීම සහ එම ගැටලු නොසලකාහැරීමත් හරියාකාරව වටහා නොගැනීමත් සුලභ කරුණක් බවට පත්ව ඇත.

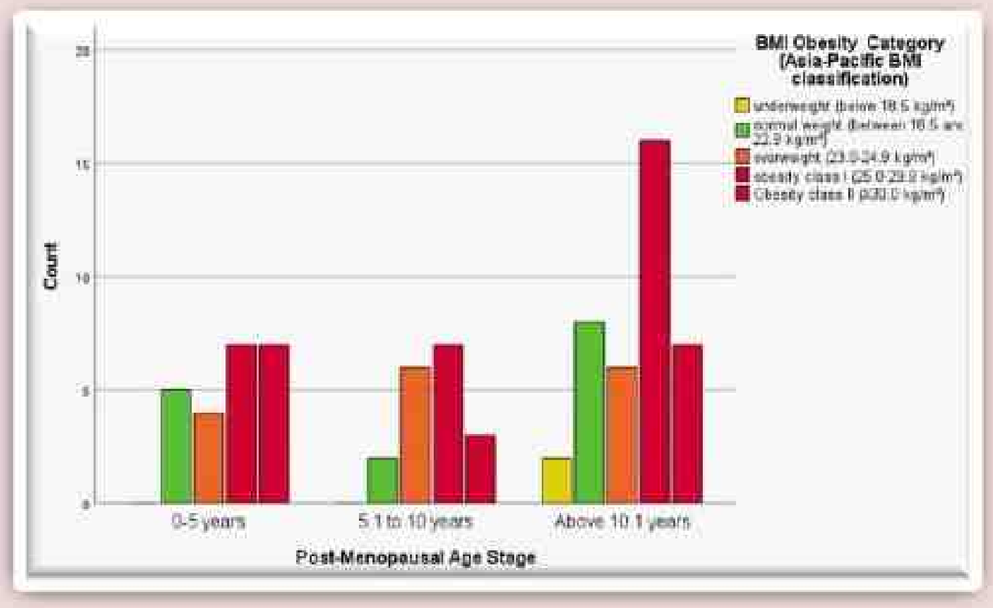
ආර්තවහරණයට පසු කාලපරිච්ඡේදය ප්‍රධාන අවධි 03 කට වෙන්කර දක්වන්නේ මුල් ආර්තවහරණ අවධිය (ආර්තවහරණයෙ සිට වසර 0 - 5), මැදි අවදිය (ආර්තවහරණයෙ සිට වසර 6-10) අවසන් ආර්තවහරණ අවධිය (ආර්තවහරණයෙ සිට වසර 10+ට වැඩි) වශයෙනි.

පසුආර්තවහරණ සමය අධ්‍යයනය වැදගත් වන්නේ කුමක් නිසාද?

කාන්තාවක් තම ජීවිතකාලයෙන් 1/3කට ආසන්න කාලයක් පසුආර්තවහරණ අවධිය ගතකරන අතර, නිවැරදි අවබෝධය මෙම කාල පරිච්ඡේදයේදී අත්‍යාවශ්‍යය කරුණකි. පසුගිය වසර පහක කාලයක සිට ජාත්‍යන්තර අවදානය ආර්තවහරණයට ලක්වූ කාන්තාවන්ගේ සෞඛ්‍ය ගැටලු කෙරෙහි ආහාර රටාවන් සහ ශාරීරික ක්‍රියාකාරකම්වල බලපෑම අධ්‍යයනය කෙරෙහි යොමුවී ඇත.

ශ්‍රී ලංකාවේ පළමු වරට මූලික හරස්කඩ අධ්‍යයන පර්යේෂණයකින්, පසු ආර්තවහරණ අවධියේ ආහාර රටාවන්, ශාරීරික ක්‍රියාකාරීත්වය සහ සෞඛ්‍ය ගැටලු පිළිබඳව ගවේශනය කිරීමට අප විසින් සිදුකරනු ලැබීය.

පේරදෙණිය ශික්ෂණ රෝහලේ නාරී වෛද්‍ය ඒකායනය මූලික කරගනිමින් මෙම අධ්‍යනය පැවත්වුනු අතර මේ සඳහා වයස 45 - 65 අතර කාන්තාවන් 80ක් සම්බන්ද කරගනු ලැබිණි.



අධ්‍යයනයෙන් සිදුකල සොයගැනීම් :

මෙම අධ්‍යයනයේදී අධ්‍යයනය කණ්ඩායමෙන්,

⚠ 78% ක් අධිබර වූ අතර, 58% ක් තරබාරු මට්ටමේ පසුවිය.

💊 බෝනොවන රෝග වැඩි වශයෙන් ව්‍යාප්තව පැවතීමක් දැකිය හැකියි.

- ආහාර රටාවන් මූලිකවම පිෂ්ඨය මත පදනම් වන අතර පලතුරු සහ ශරීරය හිතකර මේද පරිබෝනජනයේ සැලකිය යුතු අඩුවක් දැකිය හැකිය.
- මෙම පිරිසෙන් 36% ක ප්‍රමාණයක් මාසිකව රුපියල් 50000 කට අඩු ආදායමක් සහිත වෙයි.
- ආදායම් මට්ටම සහ ධාන්‍ය ඌපරිභෝජනය අතර සැලකියයුතු සම්බන්ධතාවයක් ඇතිබව සංඛ්‍යාත්මකව තහවුරු වී ඇත.
- පළතුරු සහ සීනි සහිත ආහාර පරිභෝජනයේ සැලකිය යුතු අඩු වීමක් ආර්තවහරණයෙන් අවුරුදුක 10ට වැඩි පිරිස අතර දක්නට ලැබේ.
- මෙම කාන්තාවන්ගේ දෛනික ක්‍රියාකාරීත්වයේ මට්ටමේ විශාල අඩුවක් දැකිය හැකි අතර දිනයක මධ්‍යයන අසුන් කාලය පැය 3.64 පමණ වේ.

යෝජනාව

පෝෂ්‍යයදායී ආහාර රටාවන්, සහ මනා ශාරීරික ක්‍රියාකාරකම් පසු ආර්තවහරණ අවධියේ බෝ නොවන රෝග වළක්වා ගැනීමට හෝ ප්‍රමාද කිරීමට බලපන ප්‍රධානම සාධකයන් වේ. ජීවන රටාවේ සිදුකරන සරල වෙනස්කම් සමස්ත සෞඛ්‍ය මත විශාල වෙනසක් කිරීමට හැකියාව පවතී. කාබෝහයිඩ්‍රේටමය ආහාර පරිබෝජනය අඩුකිරීම, පළතුරු සහ එළවලු පරිබෝජනය වැඩි කිරීම, Exercies වෙනුවට ගෙවතු වගාවල නිරත වීම, ගේදොර පිරිසිදු කිරීම ආදී ක්‍රියාකාරකම් ක්‍රියාශීලී ජීවන රටාවකට උපකාරීවන අතර, එමගින් සෞභාග්‍යමත් සැඳෑ සමයක් ජීවිතයට ලඟාකරගැනීම ආර්තවහරණයට ලක්වූ කාන්තාවන්ට තවදුරටත් සිහිනයක් නොවේ.

ඉදිරි ගමන

මේ අධ්‍යනයේ මූලික අරමුණ වනුයේ පසුආර්තවහරණයේ කාණතාවන්ගෙ සෞඛ්‍ය සහ පෝශණ ගැටලු හඳුනාගැනීමත්, එම දැනුම තුලින් කාන්තාවත් දැනුවත් කිරීමත්, ඔවුන් සවිබල ගැන්වීමත්, සෞඛ්‍ය ක්ශේත්‍රයේ නීතිසම්පාදකයන් ගේ අවධානය ඔවුන් වෙත ලබාදීමත්ය. .

තවමත් නිසිආකාරයෙන් අවදානයට ලක් නොවූ ආර්තවහරණයට ලක්වූ ඇය වෙනුවෙන් අපේ අවදානය ලබදෙමින් අපේ වගකීම ඉටුකරමු!

This is a non-technical summary of the project report titled dietary patterns, physical activity, and health complications among post-menopausal women visiting peradeniya teaching hospital: a preliminary cross-sectional study supervised by Prof. R.P.N.P. Rajapakse, Department of Food Science and Technology Faculty of Agriculture, University of Peradeniya. niranjanp@agri.pdn.ac.lk



සල්ලි වෙනුවට පුංචි මිත්‍රයෙක්

සංයත අසන් සුනිල්තිස්ස

හැදින්වීම

බඩඉරිඟු ලොව පුරා ඉතා ප්‍රචලිත ධාන්‍ය වර්ගයකි. ලෝක ජනගහනයෙන් විශාල පිරිසක් බඩඉරිඟු සිය ප්‍රධාන ආහාරයක් වශයෙන් අනුභව කරන අතරම එය සත්ව ආහාර නිෂ්පාදනයේ දී අත්‍යවශ්‍ය ධාන්‍ය වර්ගයක් ලෙස හඳුන්වාදිය හැකිය. නමුත් අනෙකුත් බෝග සමග සැසඳීමේදී ඉහළ අස්වනු ලබාදෙන බඩඉරිඟු ප්‍රභේද සඳහා යෙදිය යුතු කෘතිම පොහොර ප්‍රමාණයද සාපේක්ෂව ඉහළ අගයක් ගනී. විශේෂයෙන් බඩ ඉරිඟු නයිට්‍රජන් බහුලව අවශ්‍ය කරන බෝගයක් වන අතර සාමාන්‍ය සාම්ප්‍රදායික කෘෂිකර්මයේදී අවශ්‍ය කරන නයිට්‍රජන් යූරියා පොහොර මගින් ලබාදීම සිදු කරනු ලබයි. කෘතීම පොහොර මගින් සිදුවන පරිසර දූෂණය මෙන්ම මුදල් නාස්තියද අවම කළ හැකි අපූරු විකල්පයක් සොයා ගැනීම මෙම පරීක්ෂණයේ ප්‍රධාන අරමුණක් විය.

පර්යේෂණය සඳහා සිටුවන ලද බඩඉරිඟු ශාක

අපූරු පිළියම

පියවි ඇසට පවා නොපෙනෙන ඉතා කුඩා බැක්ටීරියාවකට ඉහත දැක්වූ සංකීර්ණ ගැටලු සඳහා පිළියම් යෙදිය හැකිවීම ඔබටත් මටත් මහත් පුදුමයක් ගෙන දෙන්නක් විය හැකිය. නමුත් සත්‍ය නම් බඩඉරිඟු බෝගයේ ශාක වර්ධනය සඳහා අවශ්‍ය කරන යූරියා පොහොර වෙනුවට කදිම විකල්පයක් ලෙස ඇසටොබැක්ටර් නම් ඉතා කුඩා බැක්ටීරියාව යොදාගත හැකි වීමයි.

ඇසටොබැක්ටර් යනු ශාක මූල පද්ධතිය ආශ්‍රිතව නිදහසේ ජීවත්වන බැක්ටීරියාවකි. මෙම බැක්ටීරියාව සතු සුවිශේෂී ගුණාංගයක් වන්නේ වායුගෝලයේ ඇති නයිට්‍රජන් ග්‍රහණය කර, තිර කිරීම මගින් එම නයිට්‍රජන් ශාකයට අවශෝෂණය කරගත හැකි ආකාරයට පත් කරනු ලැබීමයි. ඉහළම සංයුතියකින් වායුගෝලයේ අඩංගු වන්නේ නයිට්‍රජන් වායුව වන අතර ප්‍රතිශතයක් ලෙස එය 78% ක් පමණ වේ.

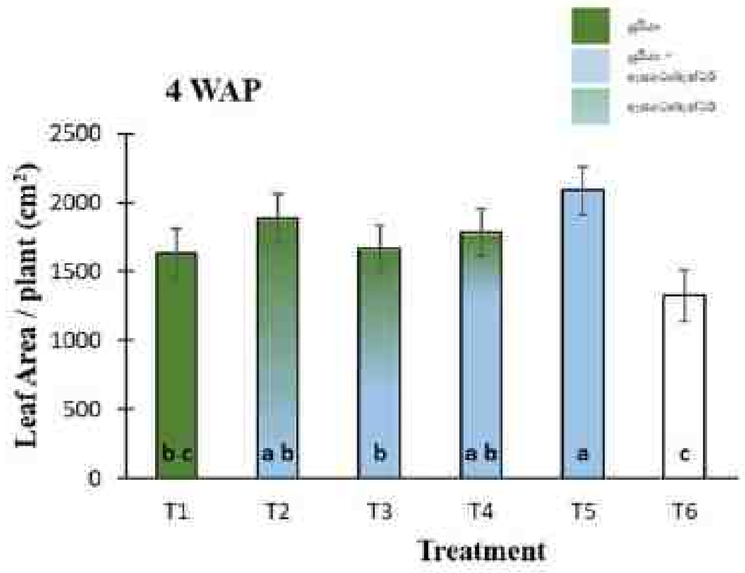


වර්ධනය වූ ඇසටොබැක්ටර් බැක්ටීරියා

මෙතරම් ඉහළ ප්‍රමාණයකින් වායුගෝලය තුළ නයිට්‍රජන් අඩංගු වුවත් ශාක වලට එය අවශෝෂණය කරගත නොහැකිය.නමුත් මෙම ඉතා කුඩා ජීවියාට එය පහසුවෙන් සිදු කළ හැකි අතර එමඟින් පසේ අන්තර්ගත ශාක වලට අවශෝෂණය කර ගත හැකි නයිට්‍රජන් ප්‍රමාණය ඉහළ දැමීම සිදුකළ හැකිය.

තිරසාර විකල්පයක්

මෙම ක්ෂුද්‍ර ජීවියා ඉහළ ප්‍රමාණවලින් ගහණය කර පසට මුදා හැරීම තුළින් පසෙහි අන්තරගත නයිට්‍රජන් ප්‍රමාණය සැලකිය යුතු ලෙස ඉහළ ගිය බව මෙම පර්යේෂණය මගින් සනාථ වූ අතර එමඟින් බඩඉරිඟු ශාකයේ ශාක වර්ධනය සඳහා අවශ්‍ය නයිට්‍රජන් පෝෂකය සාර්ථකව ලබාදිය හැකි විය. ශාකවල හරිතප්‍රද ප්‍රමාණය, නයිට්‍රජන් ප්‍රමාණය, වියලි බර, පත්‍රවල වර්ගඵලය, ශාකයේ උස, මූල පද්ධතියේ දිග, පත්‍ර සංඛ්‍යාව ආශ්‍රයෙන් සිදු කළ මෙම පරීක්ෂණයේදී සනාථ වූයේ යූරියා පොහොර යෙදූ ශාකවල වර්ධනයේත් ඇසටොබැක්ටර් බැක්ටීරියාව යෙදූ ශාකවල වර්ධනයේත් කිසිදු සැලකිය යුතු වෙනසක් නොමැතිබවයි.



බඩඉරිඟු ශාකවල පත්‍ර වර්ගඵලය

පරිසර දූෂණයටත් මුදල් නාස්තියටත් කදිම පිළියමක් සපයන මෙම අපූරු බැක්ටීරියාව සාර්ථකව භාවිතා කිරීම තිරසාර කෘෂි කර්මාන්තයක් සඳහා මහඟු පිටිවහලක් සපයනු නියතය. තවද කිසිදු මුදලක් අය නොකර තමාගේ වර්ධනය සිදුකර ගන්නා මෙම පුංචි මිත්‍රයා මගින් මුදල් වියදම් වන යූරියාවැනි පොහොරක් ප්‍රතිස්ථාපනය කිරීමට හැකිවීම බඩඉරිඟු ගොවි මහතුන්ට කෙතරම් නම් සතුටු සහගත පණිවිඩයක් වනු ඇතිද?

This is a non-technical summary of the project report titled "Identifying the Effects of Free-Living *Azotobacter* on Growth and Development of Maize" supervised by Dr. L.M. Rankoth*, **Department of Crop Science**, Faculty of Agriculture, University of Peradeniya. *lalithrankoth@agri.pdn.ac.lk



மண;ணையீன; ஈரப;பதன; மற;றும; சைற;சூராகைனயீனயீன; ,லைவடியீ வயீசயீறல;ழே பாசயீப;பயறு தாவர வர;க;கமான ‘ர;சாவயீன; வயீத;துக;களயீன;ழே வயீத;துக;கனெத;தன;மை உருவாவதயீல; சேல;வாக;கு சேலுத;துமா ?

தயீவ;வயீயா தயீ;ருநாகூக;கரசு

அறயீமுகம;

பாசயீப;பயறு ஒரு அவரைக; குடும;ப தாவரப;பயயீராகும;. அவரைக;குடும;ப தாவரளூ;கள; ஒன;றயீயவாடியீ உள;ட;த;தயீன; ரூலம; மண;ணையீன; நைதரசன; சூதவையை ழு+ர;த;தயீ சேய;யக; ஸ்ரீயெவை. ஆதலால; ,ப;பயயீர;களுக;கு குறைந;தளகூ பசளைப; பயீரசூயாகசூம சூமற;கோள;ளப;படுகயீறது. மண;ணையீன; தரத;தை உயர;த;துதல; மற;றும; அதயீகளவான ழுரதச;சத;தை கோண;டுள;ள ,ப;பாசயீப;பயறு தாவரமானது மக;களயீடைசூய பயீரசயீத;தமானது.

ஆயயீனும; வயீத;துக;கனெத; தன;மை தற;சூபாது பாரயீய பயீரச;சயீனையாக வயீவசாயயீகள; மத;தயீயயீலும; நுகர;சூவார; மத;தயீயயீலும; கருதப;படுகயீறது. கனெ வயீத;துக;கள; சாதாரண வயீத;துக;களை சூபால முளைப;பது மற;றும; அவயீவதும;; ,ல;லை. ,தனால; வயீவசாயயீகளயீன; வயீளைச;சல; குறைவது மட;டுமயீன;றயீ நுகர;சூவார; சந;தைஹம; வயீவசாயயீகளுக;கு குறைகயீறது. ,துவரை ,ந;த வயீத;துக;கனெத;தன;மைக;கான துல;லயீயமான காரணளூ;கள; கண;டறயீயப;படவயீல;லை.

முந;தைய ஆய;கூகளயீன; பெ சு+டில;காரணயீகளும;ழே வயீத;துமரழுரயீமைக; காரணயீகளும; வயீத;துக;கனெத; தன;மை உருவாக;கத;தயீல; சேல;வாக;கு சேலுத;துவதாகக; கண;டறயீயப;பட;டுள;ளது.





ஆய;வயீன; சூநாக;கம;

,ந;த ஆய;வயீன; சூநாக;கமானது மண;ணையீன; ஈரப;பதன; வயீத;துக;கனெத; தன;மை உருவாக;கத;தயீல; சேல;வாக;கு சேலுத;துகயீன;றதா ? அவ;வாறு மண; ஈரப;பதன; சேல;வாக;கு சேலுத;தயீனால; தாவர ஒசூமானான சைற;சூராகைனயீனயீன; பயன;பாடு வயீத;துக;கனெத;தன;மை உருவாக;கத;தைக; குறைக;கயீன;றதா என;பதை கண;டறயீதல;.

சேயன;முறை

,வ; ஆய;வானது வயீவசாய பளுடத;தயீன; தாவர ,ல;லத;தயீல; சூமற;கோள;ளப;பட;டது. நாற;பது பரயீசூசாதனைச; சாகெள; ஒடீளூ;கமைக;கப;பட;டது. அவற;றயீல; ,ருபது சாகெளுக;கு தாவர வளர;ச;சயீக;கு சூதவையானளகூ மண; ஈரப;பதனும; மற;றைய ,ருபது சாகெளுக;கு குறைந;தளவான மண; ஈரப;பதனும; வடிளூ;கப;பட;டது. குறைந;தளகூ மண; ஈரப;பதனும; வடிளூ;கப;பட;ட 10 சாகெளுக;கும; சூபாதுமானளகூ நஞர; வடிளூ;கப;பட;ட 10 சாகெளுக;கும; சைற;சூராகைனயீனயீன; ,லைவடியீ வயீசயீறல; சூமற;கோள;ளப;பட;டது. அறுவடையயீன; பயீன; வயீத;துக;கள; தனயீத;தனயீயாக கோள;கலனயீல; ,டப;பட;டு ஊறவயீடப;பட;டன. பயீன; கனெ வயீத;துக;கள; கணக;கேடுக;கப;பட;டன.





முகெூ

முகெூகளயீன;;பெ குறைந;தளகூ மண; ஈரப;பதன; வடிளூ;கப;பட;ட, சைற;சூராகைனயீனயீன; பயீரசூயாகம; சூமற;கோள;ளப;பட;ட தாவர வயீத;துக;கள; 5.7ரூ வயீத;து கனெத;தன;மையைஹம;ழே சூபாதுமானளகூ நஞர; வடிளூ;கப;பட;ட சைற;சூராகைனயீனயீன; பயீரசூயாகம; சூமற;கோள;ளப;படாத தாவர வயீத;துக;கள; 57.5ரூ வயீத;துக;; கனெத;தன;மையைஹம; காண;பயீத;தது. ஆகையால; குறைந;தளவான மண; ஈரப;பதனும; சைற;சூராகைனயீனயீன; பயீரசூயாகமும; வயீத;தயீன; கனெத;தன;மையை குறைக;கயீன;றன. ஆனால; குறைந;தளவான மண; ஈரப;பதன; மோத;த வயீளைச;சல; அளவை குறைக;கயீன;றது.



This is a non-technical summary of the project report titled “Influence of soil moisture levels and cytokinin application on the formation of hard seeds in mung bean (*Vigna radiata* L.) variety ‘Harsha’” supervised by Prof. L.D.B. Suriyagoda*, Department of Crop Science, Faculty of Agriculture, University of Peradeniya. *lalith.suriyagoda@agri.pdn.ac.lk

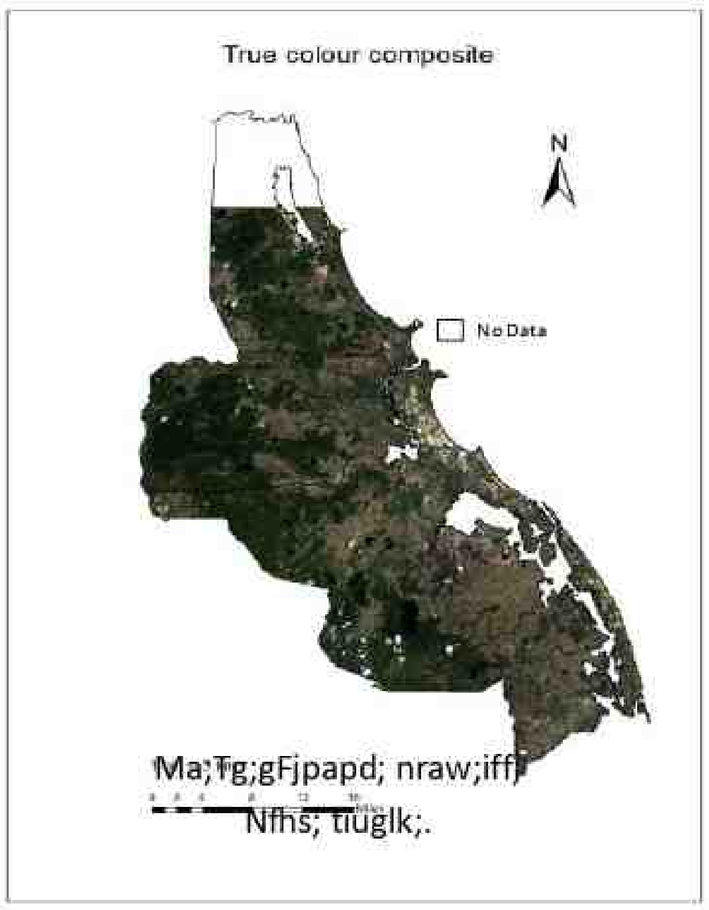


சேயற;கைக; சூகாள;கள; ரூலம; வயீவசாயம; சாத;தயீயமானதா ?

ஸனும்ஃயீகா சயீவகைலையன;குமாரன

நேற;பயயீரயீன; முக;கயீயத;துவமும; சவால;களும;

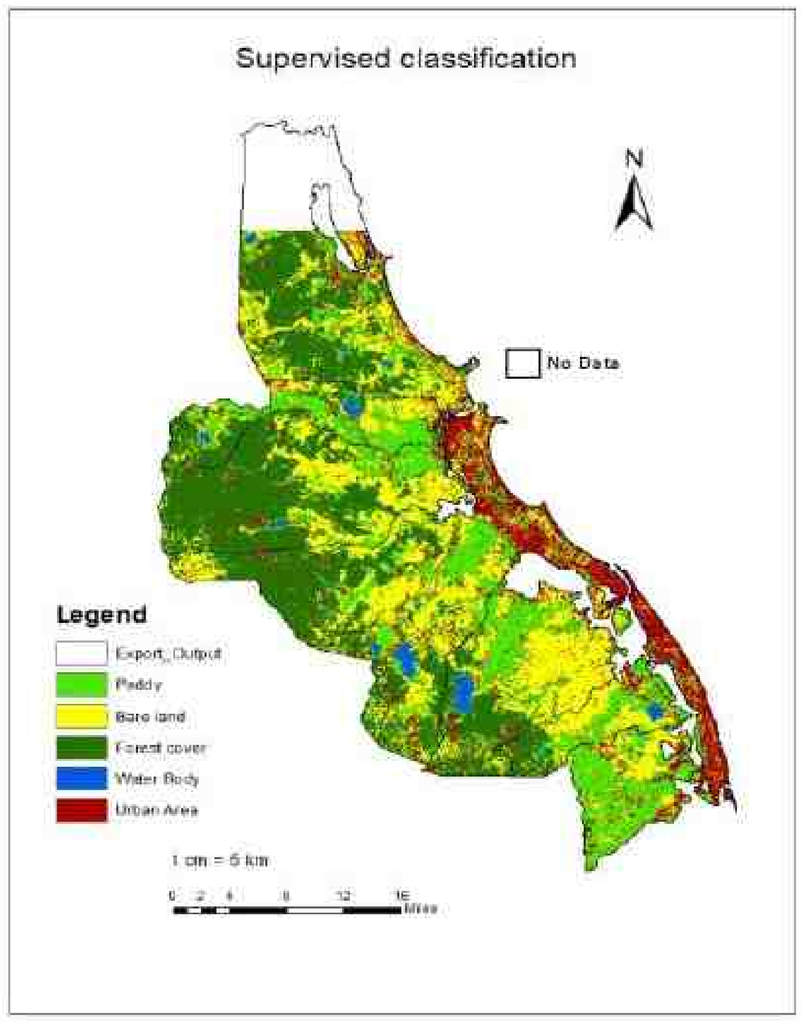
வயீவசாயம; உணகூப; பாதுகாப;பயீல; முக;கயீய பளூ;கு வகயீக;கயீன;றது. பாரம;பரயீய வயீவசாயமுறைகள; பல சவால;களை எதயீர;சூநாக;குகயீன;றன. காலநயீலை மாற;றம;ழே சனத;தோகைப; பேருக;கம;ழே நஞர;ப;; பற;றாக;குறை என;பன வயீவசாய உற;பத;தயீயைக; குறைக;கயீன;றன. நவஞன தோடியீநுட;பளூ;கள;ழே குறயீப;பாக தோலைஹணர;கூ (சுந அடிவந ளுநளேளைபே) மற;றும; ழுவயீயயீயல; தகவல; அமைப;ழு (ழுநடிபசயயீாஎ ஐகேடிச அயவடைடே ளுலளவநஅ– ழுஐளு) என;பன வயீவசாயத;தயீல; பேரும; ழுரட;சயீயை ஏற;படுத;த வடியீவகுக;கயீன;றன.



தோலைஹணர;கூ (சுளு) மற;றும; ழுவயீயயீயல; தகவல; அமைப;ழுகளயீன; (ழுஐளு) முக;கயீயத;துவம;

தோலைஹணர;கூழே சேயற;கைக;சூகாள; தரகூகள; ரூலம; நயீலப;பரப;பை ஆய;கூ சேய;ய உதகூகயீன;றது. ழுவயீயயீயல; தகவல; அமைப;ழு ,த;தரகூகளை ஒடீளூ;குபடுத;தயீ பகுப;பாய;கூ சேய;து காட;சயீப;படுத;த உதகூகயீன;றது. ,வ;வயீரு தோடியீநுட;பளூ;களயீன; ஒருளூ;கயீணைந;த பயன;பாடு வயீவசாய சேயற;பாடுகளயீல; பல வடியீகளயீல; உதகூகயீன;றன.

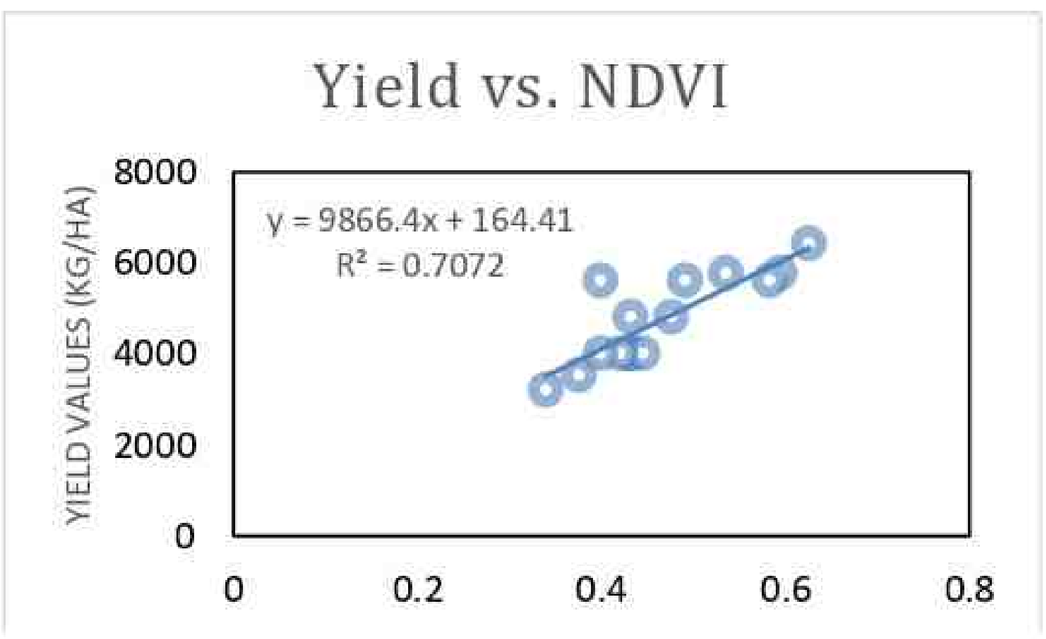
- பயயீர;க;; கண;காணயீப;ழு.
- வயீளைச;சல; கணயீப;ழு.
- நஞர;வள முகாமைத;துவம;.
- உர முகாமைத;துவம;.
- ழு+ச;சயீ மற;றும; சூநாய;க;கட;டுப;பாடு.
- நயீலப; பயன;பாட;டுத;தயீட;டமயீடல;.



சூமற;பார;வை வகைப;படுத;தல; ரூலம; பகுப;பாய;கூ சேய;யப;பட;ட நயீலப;பயன;பாட;டு வரைபடம;

ஆய;வயீன; கண;டுபயீபெ;ழுக;களும; எதயீர;கால வயீவசாயத;தயீல; ,தன; பளூ;கும;

சேயற;கைக;சூகாள; படளூ;கள; பகுப;பாய;கூ சேய;யப;பட;டு பயயீர; ஆசூராக;கயீயத;தைக; குறயீக;கும; தாவரக; குறயீயஞடுகளைப; (ஏநபநவயவடைடே ஐனேஎைஉநள) பயன;படுத;தயீ வயீளைச;சல; கணயீப;ழு மாதயீரயீகள; உருவாக;கப;பட;டன. ,ம; மாதயீரயீகள; ரூலம; அறுவடைக;கு முன;னசூர வயீளைச;சலைக; கணயீக;க முஹெமேன ,வ; ஆய;வயீன; ரூலம; அறயீயப;பட;டது. ,து வயீவசாய உற;பத;தயீயை அதயீகரயீக;ககூம;ழே உணகூப;பாதுகாப;பை உறுதயீப;படுத;தகூம; உதகூகயீன;றது. ,ந;த நவஞன தோடியீநுட;பளூ;கள; வயீவசாயத;துறையயீல; ஒரு ழுதயீய சகாப;தத;தைத; தோடளூ;கயீ வைத;துள;ளன.



This is a non-technical summary of the project report titled "Rice Crop Growth Monitoring and Yield Assessment Using Remote Sensing and GIS- A Study in Batticaloa District of Sri Lanka" supervised by Prof. N.D.K. Dayawansa*, Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya. *ndkdayawansa@agri.pdn.ac.lk



வருடி;ச;சயீயடுநு;து வெரும கயீராமப;ழுறளுரு;களை நகர;ப;ழுற குரூசூயறயீகளால; மருணை;டும மருளுருவாக;கம சேய;ய முஹெமா ? : ஸப;பானயீன; சயீக;கயீ ஒரூகாசயீ கயீசூயார;யோகுதாய; (Chiiki Okoshi Kyouryokutai) ஃாகா(saga) மாகாணத;தை அபெ;படுயாகக; கோண;டு ஓர; ஆய;கூ

நாதுர்ஷா நல்லநாதன்

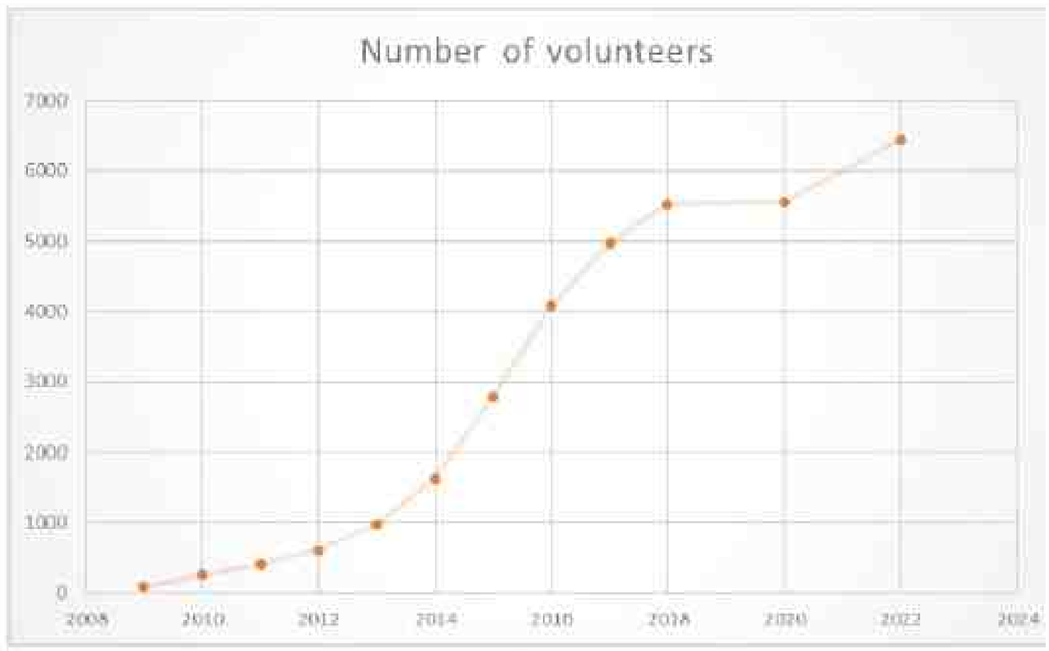
உலகளாவயீய ரஞுதயீயயீல; நகர;ப;ழுறமயமாதல; அதயீ தஞுவயீர சேல;வாக;கயீனை சேலுத;துகயீன;றது.காலசூவாட;ட;த;தயீன; பயீயெயீல; மக;கள; ஜடி;நயீலைக; கைதயீகளாகயீய நயீலையயீல; நகர;ப;ழுறளுரு;களை சூநாக;கயீ பல;சூவறுபட;ட எண;ண நகர;கூகளை சூமற;கோள;கயீன;றனர;. அதற;கமைவாக,ஸப;பானயீன; கயீராமப;ழுறப; பயீரசூதசளுரு;கள;ழு குறயீப;பாக சூடாக;கயீசூயா சூபான;ற நகரப;ழுறம; அல;லாத பயீரசூதசளுரு;கள; தோடர;ச;சயீயாக கடுமையாக மக;கள; தோகைச;சரயீகூழு போருளாதாரக; குறைகூழுசரூகப;பயீரயீவயீ னைகள; என;பனவற;றை எதயீர;சூநாக;குகயீறது.

,தற;கு தஞுர;கூ காஷ்ம; முகமாக ஸப;பான; அரசாளுரு;கம; பல;சூவறுபட;ட கயீராமப;ழுற ழுத;துயயீர;ப;பாக;கல; தயீட;டளுரு;க ளை சூமற;கோணை;டுள;ளது. அதயீல; உள;ளடளுரு;குகயீன;ற ஓர; தயீட;டமாக சயீக;கயீ ஒரூகாசயீ கயீசூயார;யோகுதாய; (உளாமைமை டீமடிளாமை முலடிரசலடிமரவயமை) எனும; ,த;தயீட;டம; 2009,ல; உள;துறை மற;றும; தகவல; தோடர;ழு அமைச;சயீனால; ஆரம;பயீக;கப;பட;டது.,தன; ரூலம; நகர ப;ழுற வாடி; மக;களயீன; ஆதரகூ கயீராமப;ழுற முன;சூனற;ற த;தயீற;கு கயீடைக;க வடியீவுகுக;கப;பட;டது.நகரப;ழுற வாசயீ களை கயீராமப;ழுற சரூகளுரு;களயீல; உள;ளஞர;த;து அவர;க ளுடாக கயீராமப;ழுற பகுதயீகளை மருணை;டும; வளர;ச;சயீய டையச; சேய;வதற;கான ஒரு சயீறந;த சந;தர;ப;பமாக ,து கருதப;படுகயீன;றது. ,த;தயீட;டமானது கயீராமப;ழுற பகுதயீகளயீல; மருணை;டும; மக;கள; வசயீக;கயீன;ற ,டமாக மாற;றுவசூதாடு மட;டுமல; லாது தயீறமையான நகர;ப;ழுற மக;களயீன; பளுரு;களயீப;பயீனு னூடாக போருளாதாரச; சேயற;பாடுகளை உளக;குவயீக;ககூ ம; கலாச;சாரப; பரயீமாணத;தை சூமம;படுத;தகூம; நஞுதெ;த சரூகத;தை தன;மையை உருவாக;கும; சூநாக;கத;சூதாடு உருவாகயீஹள;ளது.

ஸப;பானயீல; பேரும;பாலான கயீராமளுரு;களயீல; தளுரு;கயீவாடி;கயீன;றவர;கள; (65வயதயீற;கு சூமற;பட;டவர;கள;) அதயீகளவயீலாசூனார; உள;ளனர;. ஏனைய தயீட;டளுரு;களுடன; ஓப;பயீடுகயீன;ற சூபாது ,த;தயீட;டத;தயீல; பளுரு;குபற;றுனர;களுக;கு அதயீகளவயீலான சுதந;தயீரம; காணப;படுகயீன;றது. ஏனேனயீல; சம;பளமானது ரூன;று வருட தயீட;ட காலத;தயீற;கு 4.8 மயீல;லயீயன; ஸப;பானயீப யேன; பணமும; குறயீத;த பயீரசூதசத;தயீல; வசயீப;பதற;கான ,லவச வஞுடும; அத;சூதாடு பல தரப;பட;ட பயயீற;சயீ நேறயீகளுரும; வடிளுரு;கப;படுகயீன;றது.

மாறயீவரும; வாடி;க;கை முறை அபயீலாசைகள; மற;றும; அளுரு;களுகாரம; ஆகயீய காரணயீகளால; உந;துதல; அடைந;து கயீராமப;ழுறளுரு;களை சூநாக;கயீவரும; நகரவாசயீ களுக;கும; உள;ளுர; மக;களுக;கும; ,டையயீல; ஏற;படு கயீன;ற ஒருளுரு;கயீணைப;ழு ,த;தயீட;டத;தயீன; சூநாக;கத;தை வேற;றுயீயடைச; சேய;கயீன;றது.

2009ஆம; ஆண;லெ; ,த;தயீட;டத;தயீனை ஆரம;பயீக;கயீன;ற சூபாது 89 பளுரு;குபற;றுனர;களும; 39 நகராட;சயீ மையத;தயீல; சூமற;கோள;ளப;பட;டது. 2022ஆம; ஆண;டு ழுள;ளயீவயீபரவயீயல; நயீலவரப;பெ 6447 பளுரு;குபற;றுனர;க ளும; 1065 நகராட;சயீ மையளுரு;களயீல; வேற;றுயீகரமாக முன;னேடுத;துச; சேல;லப;பட;டது.



(உள;துறை மற;றும; தகவல; தோடர;ழு அமைச;சு ழு2025)

14 சயீக;கயீ ஒரூகாசயீ கயீசூயார;யோகுதாய; (உளாமைமை டீமடிளாமை முலடிரசலடிமரவயமை) உறுப;பயீனர;களயீனதும; 19 உள;ளுர; மக;களயீனதும; ஆடிமான சூநர;காணல;களயீன; ரூலம; உறுப;பயீனர;களயீன; உந;துதல; காரணயீகளைஹம; அதற;கு சாதகமாக கட;டமைக;கப;பட;ட ,த;தயீட;டத;தயீன; கோள; கைகளைஹம; நகர;ப;ழுற மக;களை ஏற;றுக;கோள;–ளும; உள;ளுர; மக;களயீன; நயீலைப;பாட;னைஹம; சரூக வளர;ச;சயீச; சேயற;பாடுகளயீன; உள;ளுர; வதயீவயீட வாசயீ களயீன; வயீவசாயம;ழு மருன;பயீழுகாடு வளர;ப;ழுழுசுற;றுலா மையமாக;குதல;ழு கலா சாரம; சார; கைவயீனைப; போருட;களைத; தயாரயீத;தல;ழு வேளயீப;ழுற மக;களை கவருகயீன;ற நயீகடி;ச;சயீத;தயீட;ட ளுரு;களை நடாத;துதல; சூபான;ற பல;துறை சார;ந;த சேயற;றயீடளுரு;களை சூமற;கோள;ளுவதன; ரூலமாக நகர;ப;ழுறத;தயீல; வாடி;கயீன;ற மக;களை கயீராமப;ழுறத;தயீற;கு உள;ளஞர;ப;ழுச;சேய;யமுஹெம;.

ஆதயீகார கட;டுப;பாடுகளயீற;கு ட;பட;டு அத;துடன; சுய சுதந;தயீரத;தயீன; அபெ;படையயீல; மக;கசூள மக;களயீன; வளர;ச;சயீயை நயீர;ணயயீக;கும; ,த;தயீட;டம; மக;களயீன; முன;சூனற;றத;தயீற;கு மட;டுமல;லா து நாட;னெ; நயீலைத;தன;மையை உறுதயீப;படுத;துகயீன;–றது. “உன;னால; என;ன சேய;ய முஹெம; என;பதை வயீட கயீராம மக;களை சூமம;பாடடையச; சேய;வதற;கு என;ன வடியீ என;பதை ஆராய;ந;து அதனை நஞு சேய;வசூத சயீறப;ழு”

(யமசூமாட;சூடா சுகுறு)

ஐப;பானயீல; சேய;யப;பட;ட ,ந;த தயீட;டத;தயீனை ஆய;கூப; போருளாக;கயீயதன; சூநாக;கம; ஏனைய நாடுகளுக;கும; ,தனை போருத;தயீப; பார;த;து ,த;தயீட;டத;தயீனை நடைமுறைப;படுத;த முஹெம; என;பசூத எனது சூநாக;குநயீலை ஆகும;.

This is a non-technical summary of the project report titled “Can urban in-migrants Revitalize Declining Rural Regions? An exploratory study on Chiiki Okoshi Kyouryokutai program in Saga Prefecture,Japan.” supervised by Dr Anuradha Jayaweera*, Department of Agricultural Extension, Faculty of Agriculture, University of Peradeniya. *anuradhaj@agri.pdn.ac.lk



கடல; சூகாடியீ மஞனயீல; ,ருந;து ழுரத சத;து மற;றும; ஒசூமகா 3 கோடீப;பமயீலம; நயீறைந;த சுவைஹ+ட;தெ;துனூள;.

தயீசூனாஃயீகா சூதவராசா

படீஞ;காலம; தோட;சூட மக;கள; உணவயீன; சுவையை மேருஹூட;டுவதற;கா பல;சூவறறுபட;ட சுவைஹ+ட;தெ;துனூள;களை உணகூடன; சூசர;க;கும; படிக;கத;தை கோண;டுள;ளனர;. ,ன;றைய காலகட;ட த;தயீல; வஞட;லெ; சுவைய+ட;கெள; தயாரயீப;பதை வயீட சந;தைகளயீல; ,ருந;து கோள;வனகூ சேய;ஹம; வடிக;கசூம அதயீகமாக உள;ளது. அத;துடன; சந;தைகளயீல; கயீடைக;கும; பேரும;பாலான சுவைஹ+ட;தெ;துனூள;கள; ,றைச;சயீ மற;றும; மசாலா போருட;களயீல; ,ருந;சூத தயாரயீக;கப;பட;டது. மஞனயீல; ,ருந;து தயாரயீக;கப;படும; சுவைஹ+ட;தெ;துனூள;கள; மயீக மயீக அரயீதானவை.

மஞனயீல; ,ருந;து தயாரயீக;கப;படும; சுவைஹ+ட;யொனது ,யற;கையாகசூவ சுவை மயீகுந;ததாககூம; ழுரத சத;து மற;றும; ஒசூமகா 3 நயீறைந;ததாககூம; ,ருக;கும;. கடல; சூகாடியீ மஞனானது ,லஞ;கை ப+ராககூம; சந;தைகளயீல; வருடம; முடீவதும; கயீடைக;க ழூயெ மஞனாகும;. ,தன; சுவையானது சூகாடியீ ,றைச;சயீயயீன; சுவையை ஒத;ததாககூம; ,தன; ழுரத சத;தானது ஏறத;தாள சூகாடியீ ,றைச;சயீக;கு சமமானதாககூம; உள;ளது. ,ருப;பயீனும; ,ந;த மஞனுக;கான சந;தைப; பேறுமதயீஹும; நுகர;கூ வஞுதமும; மக;களயீடைசூய குறைவாகசூவ உள;ளது.



,ந;த ஆய;வயீன; சூநாக;கமானது ழுரத சத;து மற;றும; ஒசூமகா 3 நயீறைந;த ஒரு மஞன; சுவைஹ+ட;யை ,லஞ;கையயீல; அறயீமுகப;படுத;துவதுடன; கடல; சூகாடியீ மஞனயீன; நுகர;கூ வஞுதத;தைஹம; அதயீகரயீக;க சேய;வதாகும;. கடல; சூகாடியீ மஞனானது நஞராவயீயயீன; 15 நயீமயீடஞ;கள; சூவக வைக;கப;பட;டு பயீன;னர; 50°C ,ல; 16 மணயீத;தயீயாலஞ;கள; உலர;த;தப;பட;டு (டீஎநமே னசலலைபே), போயொக அரைக;கப;பட;டு கடல; சூகாடியீ மஞன; துனூளானது தயாரயீக;கப;பட;டது. கடல;சூகாடியீ மஞன; துனூள;, வேஞு;காயத;துனூள;, ,ந;த சுவைய+ட;யெயீல; நுணண;ணஞு;கயீ தாக;கஞு;களை குறைப;பதற;காக உலர;த;தல; மற;றும; உப;ழு சூசர;த;தல; சூபான;ற ,யற;கை முறைசூய பயன;படுத;தப;பட;டது. மற;றும; வேஞு;காயத;துனூள;, ழு+ண;டுத;துனூள;, ,ணு;சயீத;துனூள;,, மயீளகுத;;துனூள; சூபான;றவற;றயீலும; ,யற;கையாகசூவ நுணண;ணஞு;கயீ தாக;கஞு;களை கட;டுப;படுத;தக; ழூயெ ,ராசாயன பதார;தஞு;கள; ,ருப;பதனால; ,ந;த சுவைஹ+ட;யெயீனுடைய ஆஹட;காலம; அதயீகமானதாகும;. ஆய;வயீன; சூபாது ஏனைய உள;ளடக;கஞு;கள; மாறாது ,ருக;க வேஞு;காய–ழு+ண;டு கலவையயீன; அளவை பபெ;பயொக குறைத;து மஞன; துனூளயீன; அளவானது முறைசூய 0ஞு, 20ஞு, 30ஞு, 40ஞு, 50ஞு என அதயீகரயீக;கப;பட;ட சூசர;க;கைகள; உருவாக;கப;பட;டது.

,ந;த சூசர;க;கைகள; உயயீரயீயல;, ,ரசாயன, பேளதயீக பகுப;பாய;கூகளுக;கு உட;படுத;தப;பட;டதுடன; சுவை அபெ;படையயீலான நுகர;சூவாரயீன; கருத;தும; பேறப;பட;டது. ,ந;த ஆய;வயீன; முவெயீல; 50ஞு மஞன; தூள; சூசர;க;கப;பட;ட சூசர;வையானது அதயீகளவான நுகர;சூவாரயீனுடைய வயீருப;பத;ததைப; பேற;றதாககூம; சூபாசனை மயீகுந;ததாககூம; உள;ளது. ,தன; ழுரதசத;து அளவானது 49.06ஞு, கோடீப;ழு வஞுதமானது 3.44ஞு மற;றும; மாப;போருள; அளவானது 10.92ஞு ஆககூம; உள;ளது.



,ந;த சுவைய+ட;தெ;துனூளயீன; அடர;த;தயீ மற;றும; போதயீ சேய;ஹம; தன;மைஹம; சயீறந;ததாக காணப;படுவதுடன; ,தன; உற;பத;தயீ சேலவானது வேளயீநாடுகளயீல; ,ருந;து ,றக;குமதயீ சேய;யப;படுகயீன;ற மஞனயீல; ,ருந;து தயாரயீக;கப;பட;ட சுவைஹ+ட;கெளை வயீட குறைவாகசூவ காணப;படுகயீறது.

This is a non-technical summary of the project report titled "Development of fish seasoning powder from sea chicken fish (*Canthidermis maculata*)" supervised by Dr .E.T.S. Madhubhashini*, Department of Animal Science and Fisheries , Faculty of Agriculture, University of Peradeniya. thushani@agri.pdn.ac.lk *.

Insight of competitions - FAuRS 2024

3MT Competition

3MT is a research communication competition that aims to develop academic, presentation and research communication skills by effectively explaining the undergraduate research with a report of large number of pages in 3 minutes to a non-specialist audience. Students have to present a compelling oration on their research to general public and only a single PowerPoint Slide can be used. The founder university of 3MT competition is University of Queensland, Australia and we were the first institute from Sri Lanka to receive permission from University of Queensland to conduct this competition in Sri Lanka.

Winner - T.C.U.Peiris





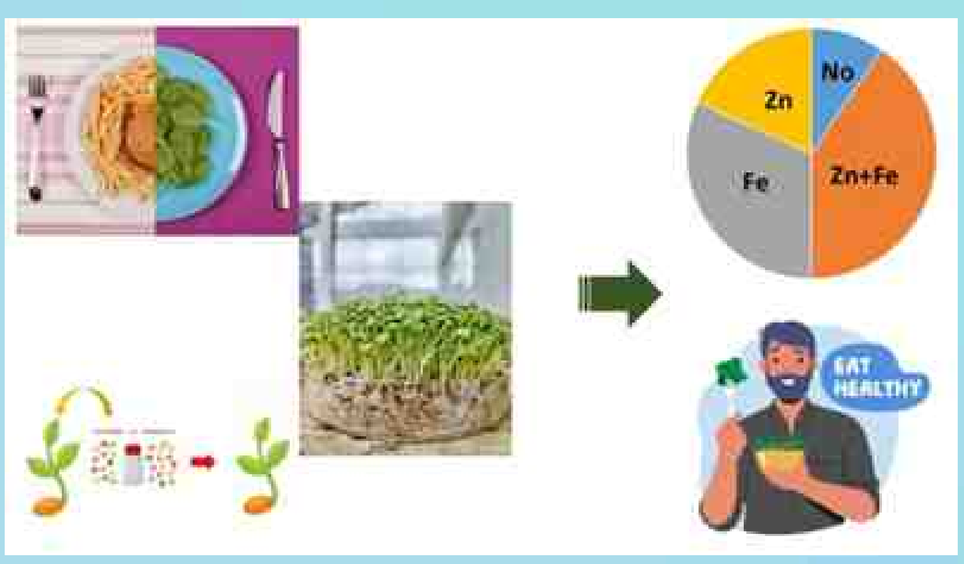
1st Runners-up - K.K.M.M.Dharmasara





2 nd Runners-up - K.G.S.D.Nawarathne





Coordinated by:

- Prof. C.K. Beneragama
- Dr. S.S.K. Chandrasekara
- Dr. S. Daundasekara

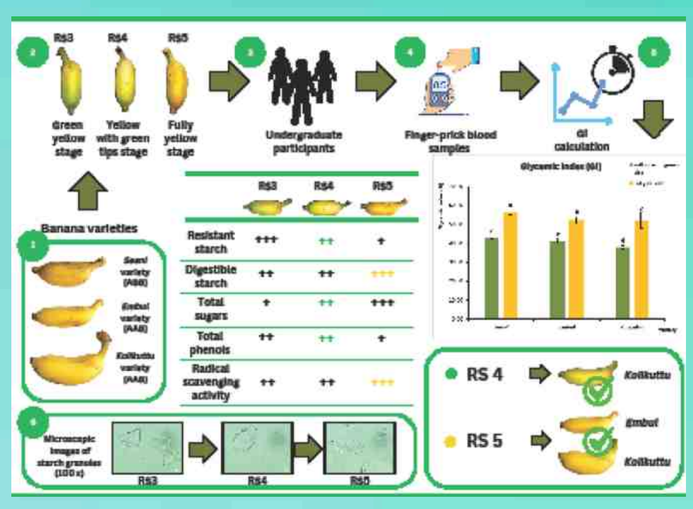
Insight of competitions - FAuRS 2024

Graphical Abstract Competition

In this competition, students can present the important findings of the entire project or just a fraction of it as a pictorial and visual summary. A graphical abstract helps capturing the content of the article or the project report for readers at a single glance. Therefore, readers can understand the main message of the article/report without having to read through the entire text.

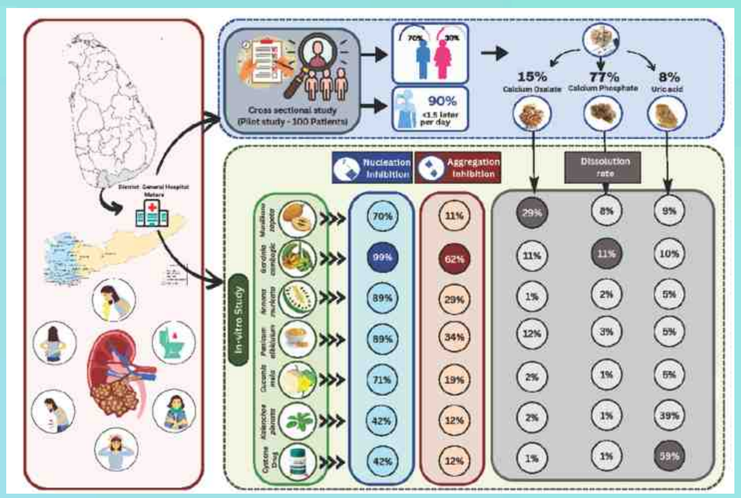
Winner - L.U.Athukorala





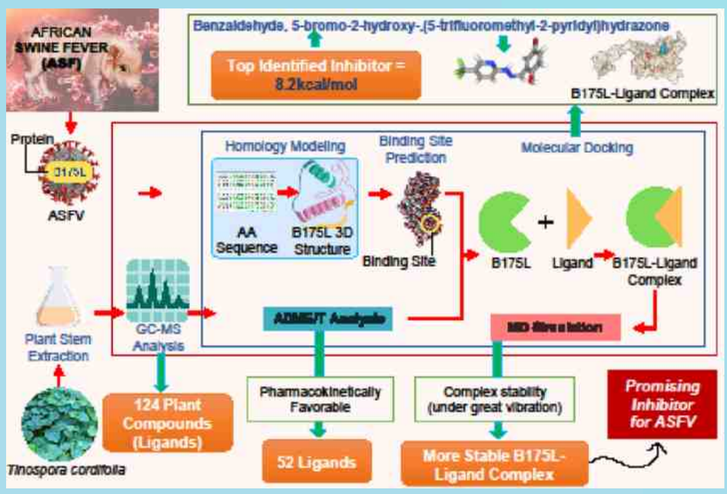
1st Runners-up - A.G.K.Chamodini





2 nd Runners-up - K.K.P.Karunarathne





Coordinated by:

- Dr. S.H.N.P. De Silva
- Mrs. T.LG. Prabashwari

Insight of competition - FAuRS 2024

Invention and Innovation Competition

Invention & Innovation competition provides an opportunity for final year students to present their research output/s, promising inventions and innovations. Applicants will also have the opportunity to compete under National level competition "Sahasak Nipayum" organized by the Sri Lanka Inventors commission. This plays a vital role in the process of promoting innovative culture within the undergraduate community of the Faculty of Agriculture, University of Peradeniya.

Winner - A.G.K.Chamodini





1st Runners-up - N.M.B.D.Nawarathne





2 nd Runners-up - T.P.G.K.Upathissa





Coordinated by:

- Dr. R. Abeyrathne
- Mr. W.H.T.D. Wickramahewa

Insight of competitions - FAuRS 2024

Research Toon Competition

The "ResearTOON" competition allows final year research students to visualize their research findings in cartoon drawings to deliver the message to the general public effectively. Cartoons are used to stimulate inquiries, to initiate discussions, and to enhance the scientific thinking. The sense of humor is the most attractive feature of the cartoons. The "ResearTOON" also disseminates the message to the public fast.

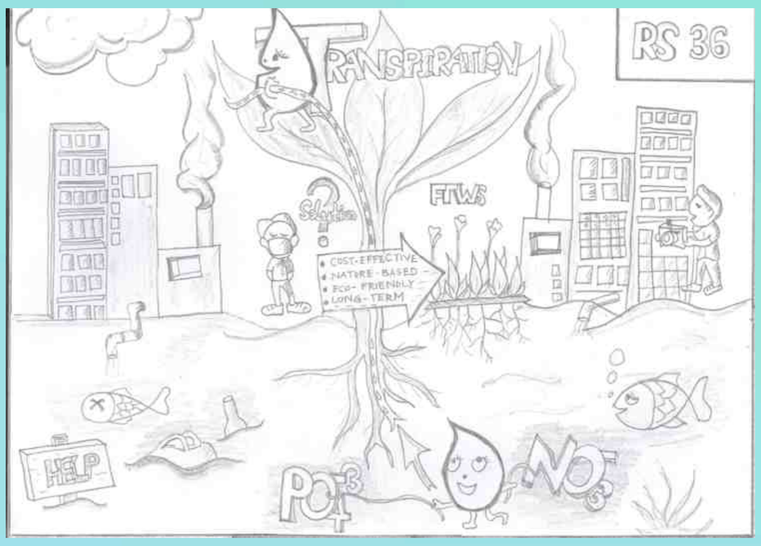
Winner - K.R.W.M.A.M.K.Karunathilake





1st Runners-up - P.P.L.M.Gunasekara





2 nd Runners-up - B.A.T.T.Wijedasa





Coordinated by:

- Dr. R. Samarakoon
- Mrs. T.LG. Prabashwari

Insight of competitions - FAuRS 2024

Research Briefs Competition - Sinhala Medium

A research brief is a one-page article that carries the findings of the final year research project, written to the non-scientific community. This allows cascading undergraduate research findings to all the stakeholders including the policy makers, other students, and farming community. Finally, the best of the research briefs are published as trilingual popular articles in the Hanthana Blossoms magazine.

Winner - N.M.B.D.Nawarathne





පිසූ ආහාරවල නැවුම් බව පිරික්සීමට නවෝත්පාදන විසඳුමක් !!

1st Runners-up - A.G.K.Chamodini

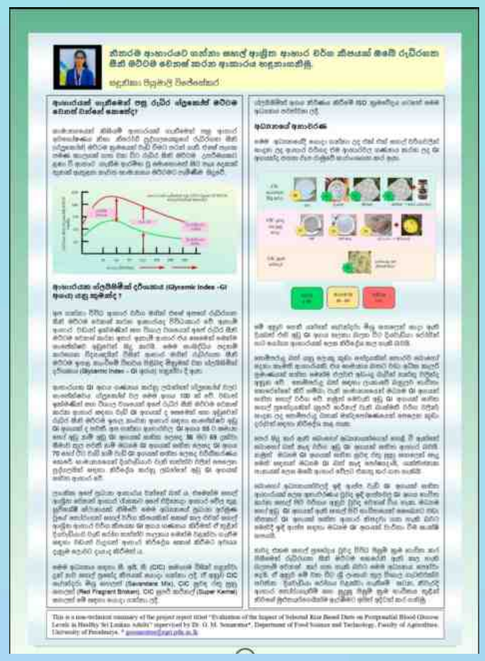




දැනුවත් වෙමු, පියවර ගමු, මුත්‍රා ගල් පරදවමු

2 nd Runners-up - S.P.Wijesekara





නිතරම ආහාරයට ගන්නා සහල් ආශ්‍රිත ආහාර වර්ග කිහිපයක් මගේ රුධිරයෙහි සීනි මට්ටම වෙනස් කරන ආකාරය හඳුනාගැනීම.

Coordinated by:

- Prof. T. Sivanathewerl
- Dr. L.M. Rankoth
- Dr. G.M. Somaratne

Insight of competitions - FAuRS 2024

Research Briefs Competition - Tamil Medium

A research brief is a one-page article that carries the findings of the final year research project, written to the non-scientific community. This allows cascading undergraduate research findings to all the stakeholders including the policy makers, other students, and farming community. Finally, the best of the research briefs are published as trilingual popular articles in the Hanthana Blossoms magazine.

Winner - T.Thevarasa





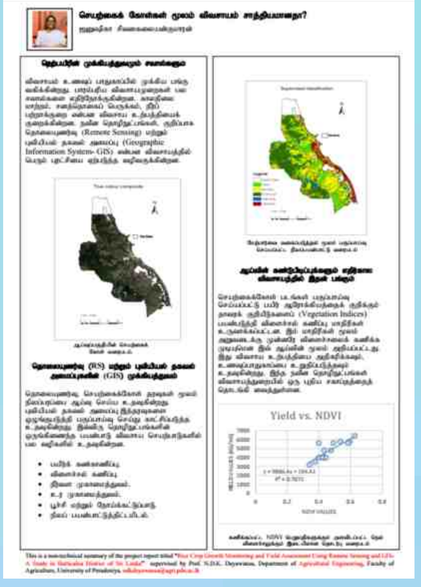
1st Runners-up - T.Thirunavukkarasu





2 nd Runners-up - S.Janushika





Coordinated by:

- Prof. T. Sivanathewerl
- Dr. L.M. Rankoth
- Dr. G.M. Somaratne

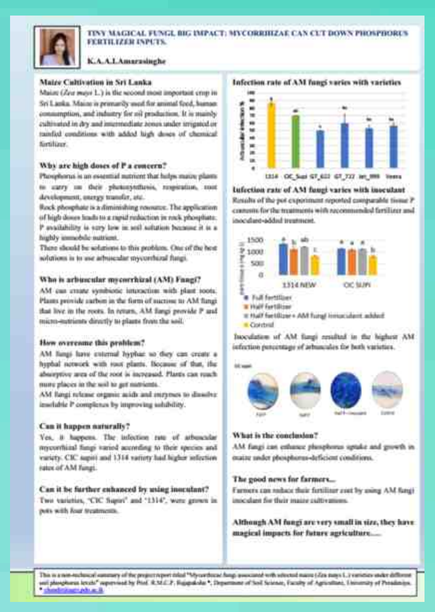
Insight of competitions - FAuRS 2024

Research Briefs Competition - English Medium

A research brief is a one-page article that carries the findings of the final year research project, written to the non-scientific community. This allows cascading undergraduate research findings to all the stakeholders including the policy makers, other students, and farming community. Finally, the best of the research briefs are published as trilingual popular articles in the Hanthana Blossoms magazine.

Winner - K.R.W.M.A.M.K.Karunathilake





TINY MAGICAL FUNGI, BIG IMPACT: MYCORRHIZAE CAN CUT DOWN PHOSPHORUS FERTILIZER INPUTS.

K.A.A.I.Amarasinghe

Maize Cultivation in Sri Lanka

Maize (*Zea mays* L.) is the second most important crop in Sri Lanka. Maize is primarily used for animal feed, human consumption, and industry for oil production. It is mainly cultivated in dry and intermediate zones under irrigated or rainfed conditions with added high doses of chemical fertilizer.

Why are high doses of P a concern?

Phosphorus is an essential nutrient that helps maize plants to carry on their photosynthesis, respiration, root development, energy transfer, etc.
Rock phosphate is a diminishing resource. The application of high doses leads to a rapid reduction in rock phosphate. P availability is very low in soil solution because it is a highly immobile nutrient.
There should be solutions to this problem. One of the best solutions is to use arbuscular mycorrhizal fungi.

Who is arbuscular mycorrhizal (AM) Fungi?

AM can create symbiotic interaction with plant roots. Plants provide carbon in the form of sucrose to AM fungi that live in the roots. In return, AM fungi provide P and micro-nutrients directly to plants from the soil.

How overcome this problem?

AM fungi have external hyphae so they can create a hyphal network with root plants. Because of that, the absorptive area of the root is increased. Plants can reach more places in the soil to get nutrients.
AM fungi release organic acids and enzymes to dissolve insoluble P complexes by improving solubility.

Can it happen naturally?

Yes, it happens. The infection rate of arbuscular mycorrhizal fungi varied according to their species and variety. CIC sapiri and 1314 variety had higher infection rates of AM fungi.

Can it be further enhanced by using inoculant?

Two varieties, "CIC Sapiri" and "1314", were grown in pots with four treatments.

Infection rate of AM fungi varies with varieties

Infection rate of AM fungi varies with inoculant

Results of the pot experiment reported comparable tissue P contents for the treatments with recommended fertilizer and inoculant-added treatment.

Inoculation of AM fungi resulted in the highest AM infection percentage of arbuscules for both varieties.

What is the conclusion?

AM fungi can enhance phosphorus uptake and growth in maize under phosphorus-deficient conditions.

The good news for farmers...

Farmers can reduce their fertilizer cost by using AM fungi inoculant for their maize cultivations.

Although AM fungi are very small in size, they have magical impacts for future agriculture.....

This is a non-technical summary of the project report titled "Mycorrhizal fungi associated with selected maize (*Zea mays* L.) varieties under different soil phosphorus levels" supervised by Prof. R.M.G.P. Rajapaksha *, Department of Soil Science, Faculty of Agriculture, University of Peradeniya.
* rmgpr@ageng.pdn.ac.lk

1st Runners-up - P.P.L.M.Gunasekara





ELEVATING YOGURT: WHERE RICE MILK MEETS DAIRY

S. K. N. Sathsarani

"Yogurt" is a daily nutrient dose for many, loved for its instantly refreshing nature and known for gut-friendly benefits. What if we could add your daily staple, rice to make yogurt even more inclusive and nutritious? This research explored the idea of replacing a part of cow milk in yogurt with rice milk, using two rice varieties: CIC - Savandara having low amylose content and CIC - Red fragrant rice with high amylose content.

Why rice milk?

Rice milk is a liquid extracted from rice, having starch as the key component, that closely resembles a milk-like texture and functionality. Rice milk is widely regarded as the best hypoallergenic milk alternatives available with a range of vitamins and minerals, a variety of bioactive phytochemicals, and dietary fibers. Moreover, it can provide resistant starch, known for providing health benefits, such as improved digestion and better blood sugar control.

What we did .....

Six different types of yogurts were formulated by replacing 20%, 30%, and 40% of cow milk with rice milk of above mentioned two rice varieties and 100% cow milk yogurt (Control) were also produced. The yogurts were stored under refrigerated conditions, and tests were conducted on both fresh samples and those stored for up to four weeks to assess changes in physicochemical, microbial, and sensory properties over time.

a. Rice milk incorporated yogurts.
b. CIC- Red fragrant rice
c. CIC- Savandara rice
d. Red fragrant rice milk
e. Savandara rice milk

What we found .....

A fascinating interplay of factors was noted, as pH, titratable acidity, total soluble solid levels, and syneresis rates shifted dynamically over four weeks of shelf-life analysis. The changes in these properties which involved in determining the quality of yogurt varied based on the rice variety used, the rice milk to cow milk ratio of the yogurt and also the day of the shelf-life study.
According to the results of the study, there are notable advantages over cow milk yogurt.

- Rice milk incorporated yogurts, contain resistant starch (0.08% - 0.9%) which was absent in cow milk yogurt.
- The pH of rice milk yogurts declined more slowly over time, maintaining a mildly sour flavor.
- The survival rate of *Lactobacillus* spp. (good bacteria) was higher, indicating potential probiotic benefits.
- Although the fat content of rice milk incorporated yogurt was relatively lower, yogurt made with red fragrant rice milk showed no noticeable difference in protein content compared to cow milk yogurt.
- Another interesting finding was that the syneresis rate (whey separation) under room temperature was lower in rice milk incorporated yogurt, maintaining its consistency for longer time compared to cow milk yogurt.

To conclude, the developed rice milk incorporated yogurts proved to be a viable alternative with desirable quality characteristics.

The future of rice milk incorporated yogurt .....

To move from a novel concept to a widely accepted functional food item, further evaluation of the nutritional aspect, including the probiotic effect and assessing the viability of large-scale production, and exploring the cost-effectiveness and feasibility of producing rice milk yogurt at a commercial level will be important steps.

This is a non-technical summary of the project report titled "Evaluating the Potential of Incorporating the Rice Milk of High and Low Amylose Rice Varieties into Yogurt" supervised by Ms. S.V. Jayasuriya*, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya. * jayasuriyasv@agri.pdn.ac.lk

2 nd Runners-up - B.A.T.T.Wijedasa





A COLORFUL GUIDE TO TRACK THE FRESHNESS OF BUFFALO CURD

K. Punsara Nirmal

Imagine you're about to enjoy a creamy, tangy spoonful of buffalo curd, but suddenly, you wonder is it still fresh? You glance at the expiration date, but that's not always a reliable guide. What if your curd could simply signal when it's no longer fresh? That's exactly the idea behind this research; a color-changing freshness indicator that transforms freshness detection into a visual experience, making it easier than ever to know when your curd is at its peak.

The Magic of Color

At the heart of this revolutionary innovation lies nature's very own pH-sensitive artist, anthocyanins. These vibrant, plant-based pigments are found in foods like red cabbage, butterfly pea flower, and beetroot, and they have an incredible ability to change color depending on the acidity of their surroundings. Imagine using this natural ability to create a smart, visual signal for buffalo curd's freshness. No more guesswork, no more sniffing, no more relying on the expiration date. Just a simple color shift that tells you exactly when your curd has reached its prime or gone beyond it.

The Freshness Indicator

This research takes the concept of anthocyanins and transforms it into a practical, everyday solution. By embedding these pigments into small gel discs made from natural gelling agents like carrageenan and agarose, the freshness indicator is born. These tiny discs are placed on the surface of the buffalo curd and act as a visual display of its freshness. As the curd's pH changes over time, the color of the gel disc shifts, providing an immediate, visual clue to whether the curd is still safe to eat. The color change is small but clear, giving consumers a simple and easy way to tell how long the curd has been stored.

Why it's a Game Changer

This innovative freshness indicator is a true game changer. It offers instant clarity and allows consumers to determine the freshness of their curd with a simple glance. No more uncertainty or wasting perfectly good food because you weren't sure whether it was still fresh. Thanks to its reliance on food-grade, plant-based ingredients, it's natural and safe for use, aligning perfectly with the growing demand for eco-friendly and sustainable food products. Additionally, this approach reduces reliance on lab-based spoilage tests, offering a consumer-friendly and biodegradable solution that makes freshness detection accessible to everyone.

Looking Ahead

But this is just the beginning. The potential for this color-changing gel extends far beyond buffalo curd. In the future, we could see this technology applied to a wide range of dairy products and perishable foods, creating smarter, more sustainable packaging systems that help consumers avoid food waste while ensuring food safety. This innovation represents a leap toward intelligent packaging.
Next time you reach for buffalo curd, imagine if it could tell you instantly whether it's still fresh. Thanks to this research, that future is closer than you think. The color changing gel could soon be the new standard in freshness monitoring, and with it, the future of smarter food storage is unfolding right before our eyes.

A label to cover the lid of the curd tub, enabling to see the color changing smart gel disc

Development of Anthocyanin-Based Colorimetric Freshness Indicator to Validate the Shelf Life of Buffalo Curd under Refrigerated Storage. Supervised by Prof. R.P.N.P. Rajapaksa, Department of Food Science and Technology, Faculty of Agriculture, University of Peradeniya.
nirmalpunsara@ageng.pdn.ac.lk

Coordinated by:

- Prof. T. Sivanathewerl
- Dr. L.M. Rankoth
- Dr. G.M. Somaratne

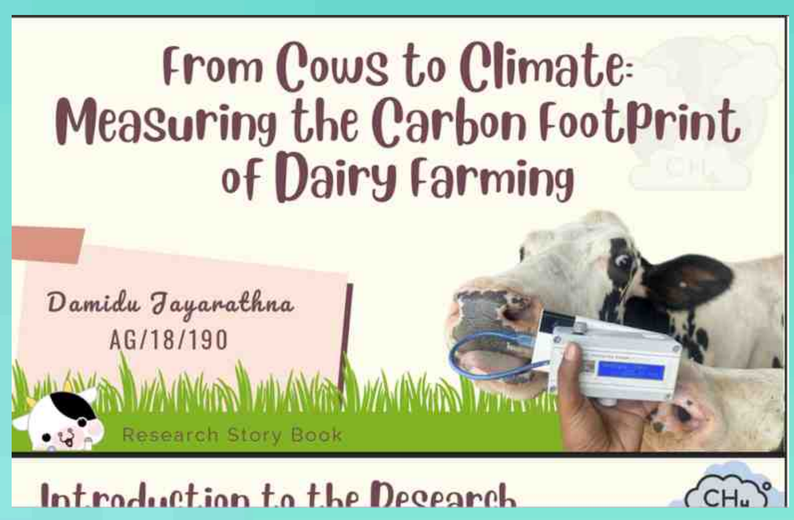
Insight of competitions - FAuRS 2024

Research Storybook Competition

Photography has turned out to be a frontline tool for all scientific research, not only in registering what the eye perceives, but also, in many cases, in registering what is impossible to see our naked eyes. Research storybook will allow the students to present their findings to the general audience in more abstract and illustrative manner using 10-15 photos of their entire research study.

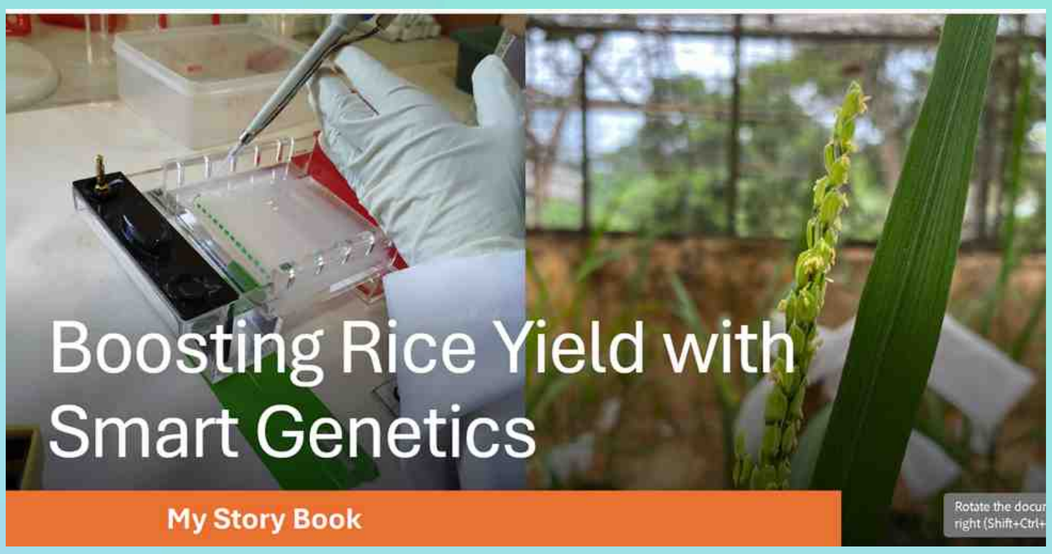
Winner - R.D.D.R.C.Jayarathne





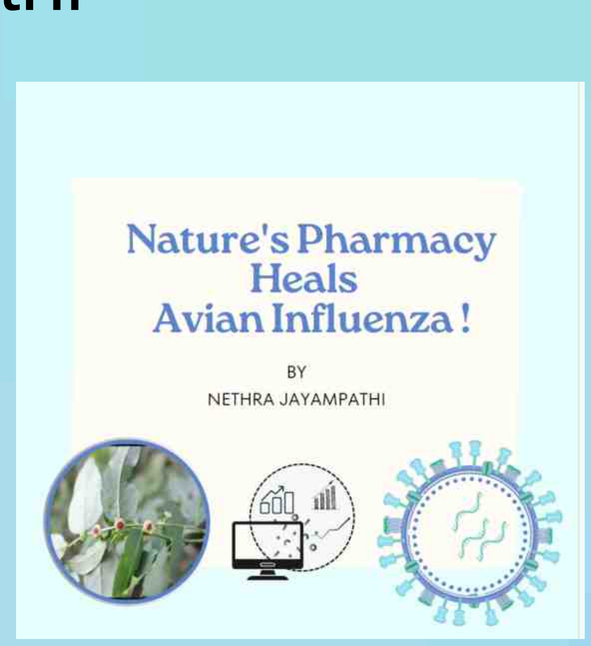
1st Runners-up -M.G.P.K.S.Amarawansha





2nd Runners-up J.A.N.P.Jayampathi





Coordinated by:

- Prof. A.J. Mohotti
- Dr. P.D. Dissanayake

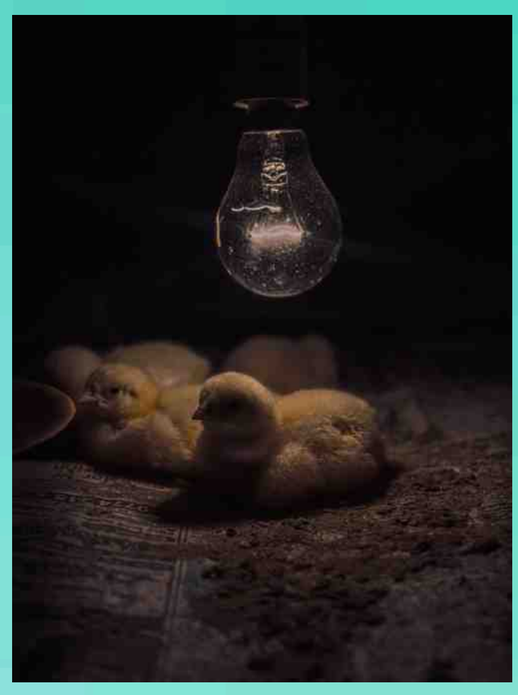
Insight of competitions - FAURS 2024

Scientific-Eye Photography Competition

Scientists use photo imaging techniques to disseminate scientific information to the general public in a more abstract and illustrative manner. The challenge is to produce a photograph presenting the research outcomes to a wider audience in an abstract manner that visually illustrate the value of the research

Winner - K.H.M.N.B.Konthasinghe





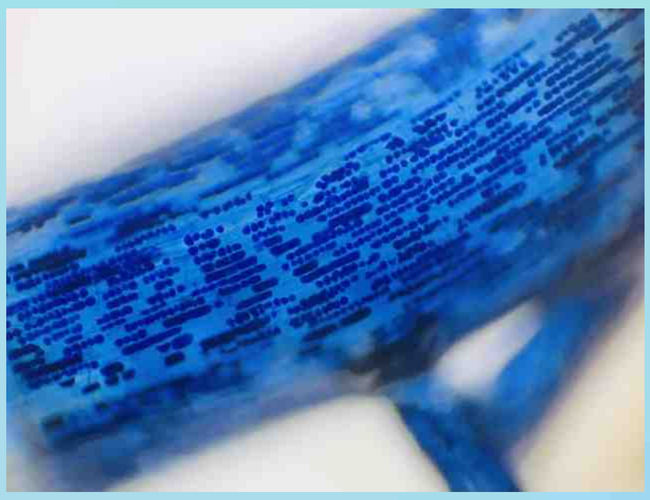
1st Runners-up - N.Nathursa





2nd Runners-up - K.A.A.I.Amarasinghe





Coordinated by

- Dr. M. Hulugalla

Insight of competitions - FAuRS 2024

Research Video Competition

This open competition assesses the ability of the final year undergraduate students to communicate their final year research findings in a short video to a non-specialist audience. Scientists extensively use this tool at present to disseminate research outcomes to the general public, industry stakeholders, policy makers and development practitioners**.**



Winner

R.D.I.S.Jayathissa

Development and Characterization of Active Bioplastic Film from Carrageenan, Chitosan, and Modified Starch: A Sustainable Alternative for Petroleum-Based Plastics Packaging



1nd Runner Up

R.D.D.R.C.Jayarathne

Quantifying the Carbon Footprint of Intensive Dairy Farming in Upcountry Sri Lanka: A Data-Driven Approach



2nd Runner Up

B.G.U**.**Janith

Effectiveness of Chitosan Coating to Preserve the Postharvest Quality and Prolong the Shelf Life of Guava Fruit (Psidium guajava L.

Coordinated by:

- Dr. J.M.P.N. Anuradha
- Dr. Sandaruwan Subasinghe

Insight of competitions - FAuRS 2024

Thechnical Competition - Merit Awards

The Merit Awards for Undergraduate Research acknowledge the scientific merit of research projects carried out by final year undergraduates in the faculty. The first selection is at the respective department level. Applications submitted by selected students are evaluated in the second round by external (outside the faculty) panel of subject matter specialists to select top three research projects under each theme of FAURS.



Theme I - Agricultural production &- productivity improvement

S.K.Dantanarayana

Evaluation of Antioxidant, Antidiabetic, Anti-obesity Properties and Cytotoxicity Effect of Leaf Extracts from Four Selected Medicinal Plants in Sri Lanka

Dantanarayana S.K., Liyanage R. and Rajapakse R.P.N.P.M



Theme II- Technological Interventions & Applications in Agriculture

W.M.B.V.Wasala

Unraveling the Genome of the Sri Lankan Giant Honey Bee

Wasala WMBV, Herath V. and Jayasinghe WHE



Theme III - Food Quality, Safety & Product Development

S.P.Wijesekara

Evaluation of the impact of Salected Rice Based Diets on Postprandial Blood Glucose Levels in Healthy Sit Lankan Adults

Wijesekara S. P, Somaratne G. M. Gunasekara D.C.S. Chandrasekara A, Abeysiriwardena D.S.DZ and Bhagya G.SK



Theme Iv- Community, Environment & Management

V. Raveendirarasa

Assessing Effects of Climate Change and Climate-Smart Interventions on Paddy Farming: An Analysis Using the APSIM Model

Vithyashangavi R., Weerahewa J., De Silva S.H.N.P and Dissanayake S

Coordinated by:

- Prof. L. Weerasinghe
- Dr D.M.S.B. Dissanayake
- Dr. V.N.S. Sirimalwatta

Insight of competitions - FAuRS 2024

Poster Presentation

Theme I - Agricultural production &- productivity improvement

The Merit Awards for Undergraduate Research acknowledge the scientific merit of research projects carried out by final year undergraduates in the faculty. The first selection is at the respective department level. Applications submitted by selected students are evaluated in the second round by external (outside the faculty) panel of subject matter specialists to select top three research projects under each theme of FAURS.



Winner

D.R.I.Madushani

Isolation and Characterization of Soil Antagonistic Microorganisms for Development of Microbial Consortia for the Management of Bacterial Wilt Caused nagement of Bacterial Wilt Caused by Ralstonia solanacearum and Plant Growth Promotion in Tomato

Madhushani D.RI, Hemachandra PALU. and Rienzie K.D.R.C.



1st Runner Up

K.M.S.M.Koralegama

Reconstructing Phylogeny of Argyreia Species (Convolvulaceae) Found in Sn Lanka

Koralegama K.M.S.M., Jayasuriya K.M.G.G. Yakandawala D.M.D., and Sirimalwatta V.N.S



2nd Runner Up

E.A.P.A.H.Arachchi

Evaluation of Locally Produced Rice Distillers Dried Grains with Solubles as a Sustainable and Cost-Effective Feed Ingredient for Layer Chicken Diets

Arachchi EAPA.E., Vidanarachchi J.K.. Alwis K.S.A.K. and Jeyaharan T

Coordinated by:

- Prof. G.LL.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

Poster Presentation

Theme II- Technological Interventions & Applications in Agriculture



Winner

A.M.N.Rangana

Impacts of Deficit Irrigation Strategies on the Growth of Chili (Capsicum annum L.) Cultivated in Reddish Brown. Earth Soil in Sri Lanka

Rangana A.M.N., Vidana Gamage D.N. and Perera R.AC.J



1st Runner Up

S.P.Samarasinghe

Design and Optimization of a Food Dryer Utilizing Waste Heat from Refrigerators

Samarasingha S P, Chandrasiri KAKL and Jayanath N. Y



2nd Runner Up

N.M.D.B.Nawarathne

Development of an IoT-Enabled Real-Time Spoilage detection Tool for Selected Ready-to-Eat Food items in the Food Service Sector

Nawarathne N.M.D.B., Somaratne G.M., Senevirathna H.P.R.J. and Konara K.M.SL

Coordinated by:

- Prof. G.LL.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

Poster Presentation

Theme III - Food Quality, Safety & Product Development



Winner

R.D.I.S.Jayathissa

Development and Characterization of Active Bioplastic Film from Camageenan, Chitosan and Modified Starch: A Sustainable Alternative for Petroleum-Based Plastics Packaging

Jayathissa R.DIS., Vidanarachchi JK, Bandaranayake P.C.G., Rajapaksha G.D.S.P., Adassooriya N.M., Chamara H.K.B.S., Priyashantha Hand. Jayarathna S



1st Runner Up

W.H.D.S.Senevirathne

Development of a Tropical Fruit-Based Salsa Dip, Physicochemical Analysisil and Microbial Safety

Senevirathne W.H.D.S., Arampath P.C., Lakmali K.M. and Rajapaksha R.PAD



2nd Runner Up

W.T.W.Y.K.Perera

Comparative Analysis of Drying Methods on Antioxidant Antidiabetic, Anti-obesity, Antimicrobial, and Anti-ag Activities in Kappaphycus alvarezii An in-vitro Study

Perera T.W.Y.K., Jayawardana B.C. Weththasinghe P. and Liyanage R

Coordinated by:

- Prof. G.LL.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

Poster Presentation

Theme Iv- Community, Environment & Management



Winner

R.D.D.R.C.Jayarathne

Quantifying the Carbon Footprint of intensive Dairy Farming in Upcountry Si Lanka: A Data Onven Approach

Jayarathna R.D.DR.C., Vidanarachchi J.K., Silva G.L.L.P, Nissanka SP and Kodithuwakku S.P



1st Runner Up

S.Kariyawasam

A Study of Motivations for Starting Additional Businesses Among Pluriactive Farmers in Imaduws. Galle

Kariyawasam S., Kodithuwakku KASS and Kandangama N.B



2nd Runner Up

W.R.M.R.L.K.Wickramasinghe

Developing a Subjective Tool to Assess Social Capital in Rural Agrarian Communities: A Psychometric Approach

Wickramasinghe WR.MR.LK, Jayaweera A and Weerahewa J

Coordinated by:

- Prof. G.LL.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

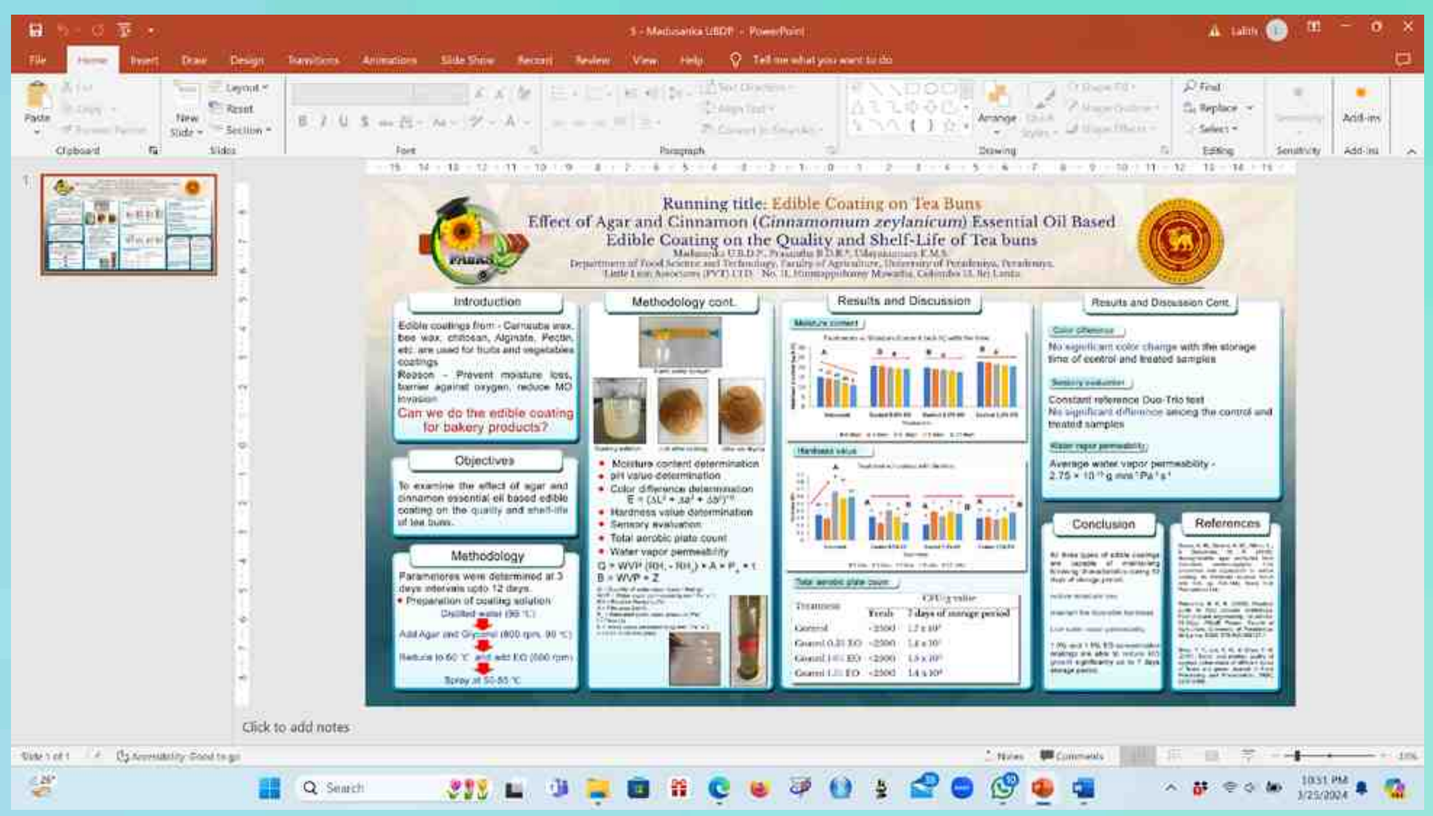
Insight of competitions - FAuRS 2024

Poster Presentation

Overall Best Presentation

Winner - A.M.N.Rangana





Impacts of Deficit Irrigation Strategies on the Growth of Chili (Capsicum annuum L.) Cultivated in Reddish Brown Earth Soil in Sri Lanka

Rangana A.M.N., Vidana Gamage DN. and Perera RACJE

Coordinated by:

- Prof. G.LL.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

Oral Presentations

Theme I - Agricultural production &- productivity improvement

The final year students of all three-degree programs offered by the Faculty of Agriculture orally present their findings under four themes in parallel sessions at the main event of FAURS. The best three oral presentations from each session as well as the overall best oral presenter are selected.



Winner

K.K.M.M.Dhamsara

Spike Topped Apple Snail (Pomacea diffusa) Meal as an Alternative to Fishmeal in Guppy (Poecilla reticulata) Diets

Dhamsara M., Weththasinghe P Jayawardana B.Cand Withanage PM



1st Runner Up

H.D.S.Himasha

Assessment of Fruit Quality Charactenatics en Newly Developed Hybrids Resistant to Aceria Mite

Himasha H.D.S., Weerasinghe LK.. Thilakarathne O. and Dissanayakal H.D.M.A.C.



2nd Runner Up

V.S.A.Vidanapathirana

Dietary Supplementation of Yeast Fractions (Safmannan) on Growthill Performance and Nutrient Digestibility in Broiler Chicken under Highil Stocking Density

Vidanapathirana VSA Weththasinghe P, Jayawardana B.C Samarakoon R., Jayawardene LPINP Singh S. and Konthasinghe KH.M.N.B

Coordinated by:

- Dr. R. Abeyrathne
- Mr. W.H.T.D. Wickramahewa

Insight of competitions - FAuRS 2024

Oral Presentations

Theme Iv- Community, Environment & Management

The final year students of all three-degree programs offered by the Faculty of Agriculture orally present their findings under four themes in parallel sessions at the main event of FAURS. The best three oral presentations from each session as well as the overall best oral presenter are selected.



Winner

T.C.U.Peiris

Development of an A-Driven Decision Support System Based on Physicochemical Properties of Ceylon Black Tea to Validate and Predict Ten Tasting Assessments Conducted by the Tea Tasters

Peris T.C.U, Mendis B. E.P, Nissanka SP, Jayawardena. KAM.K., Samarasinghe M.D. and De Silva ELC



1st Runner Up

V.C.Wijesundara

Morphological Characterization and Molecular Markers-Based Genetic Diversity Analysis of Avocado Accessions in Sri Lanka

Wijesundara V. G., Perera U.L.P. and Somaratne L.H.MYK



2nd Runner Up

W.M.B.V.Wasala

Unraveling the Genome of the Sri Lankan Giant Honey Bee

Wasala WMBV, Herath V. and Jayasinghe WIL

Coordinated by:

- Prof. G.L.L.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

Oral Presentations

Theme III - Food Quality, Safety & Product Development

The final year students of all three-degree programs offered by the Faculty of Agriculture orally present their findings under four themes in parallel sessions at the main event of FAURS. The best three oral presentations from each session as well as the overall best oral presenter are selected.



Winner

R.M.U.G.N.M.Rajanayake

Development and Characterization of Biodegradable Packaging Film from Com Waste Derived Hemicellulose as a Sustainable Altemative to Synthetic Plastics

Rajanayaka R.M.U.G.N.M., Vidanarachchi J.K., Bandara N., Chamara H.K.B.S., Dissanayake T. Jayarathna S Priyashantha H



1st Runner Up

A.S.Polwattage

Comparative Analysis of Bioactive Compounds, Antioxidant Potential Development of a Decision-Supportive Mobile Application Using Machinell Leaming Based Image Processing for Quality Assessment of Thredi Watermelon Varieties

Polwattage AS, Mendis B.E.P Nissanka S.P, Liyanage R. and De Silva EIC



2nd Runner Up

S.K.Danthanarayana

Evaluation of Antioxidant, Antidiabetic, Anti-obesity Properties and Cytotoxicity Effect of Leaf Extracts from Four Selected Medicinal Plants in Sri Lanka

Dantanarayana S.K., Liyanage R. and Rajapakse R.P.N.P.

Coordinated by:

- Prof. G.L.L.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

Oral Presentations

Theme Iv- Community, Environment & Management

The final year students of all three-degree programs offered by the Faculty of Agriculture orally present their findings under four themes in parallel sessions at the main event of FAURS. The best three oral presentations from each session as well as the overall best oral presenter are selected.



Winner

D.H.T.A.Janmaweera

Evacuate Now or Never: Framing Effects on Public Response to Early Waming Messages of Floodplain Residents in Sri Lanka

Janmaweera D.H.T.A. and Subasinghe S



1st Runner Up

A.G.K.Chamodini

Comprehensive Morpho-Constitutional Characterization of Urinary Calculi and in-Vitro Litholytic Activity Evaluation of Selected Medicinal Plant Extracts for Urolithiasis Management in Sri Lanka

Chamodini A. G.K., Somaratne G.M., Wimalasiri KMS, Didulanga AG.K.C, Bandara A, and Shiwantha H.T.L



2nd Runner Up

D.M.I.N.Dissanayake

Comparative Analysis of Physical Parameters and Carcinogenic Potential of Different Arecanut (Areca catechu L.) Types Grown in Different Climatic Zones of Sri Lanka

Dissanayake D.M.I.N., Jayasinghe Y.A, Pieris P., Jayasinghe L., Fernando R Jayasinghe R.D., Senavirathne J.M. and Nissanka SP

Coordinated by:

- Prof. G.L.L.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

Insight of competitions - FAuRS 2024

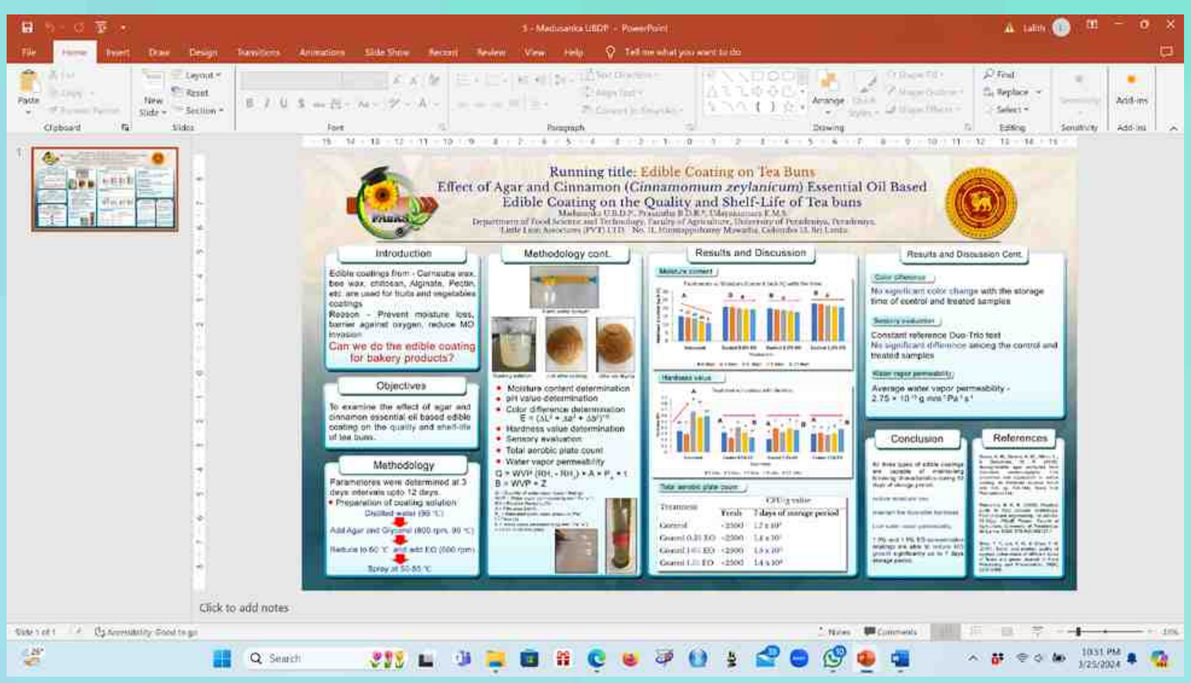
Oral Presentations

The final year students of all three-degree programs offered by the Faculty of Agriculture orally present their findings under four themes in parallel sessions at the main event of FAURS. The best three oral presentations from each session as well as the overall best oral presenter are selected.

The most Outstanding Emerging Researcher

Winner - T.C.U.Peiris





Spike-Tapped Apple Snail (Pomace fusa) Meal as an Alternative to Fishmeal in Guppy (Poecilla reticulata) Diets

Dhamsara M., Weththasinghe P Jayawardana B. C and Withanage PM.

Coordinated by:

- Prof. G.L.L.P. Silva
- Prof. J.K. Vidanarachchi
- Prof. S.A.C.N. Perera
- Prof. B.E.P. Mendis

EVENT HIGHLIGHTS































EVENT HIGHLIGHTS













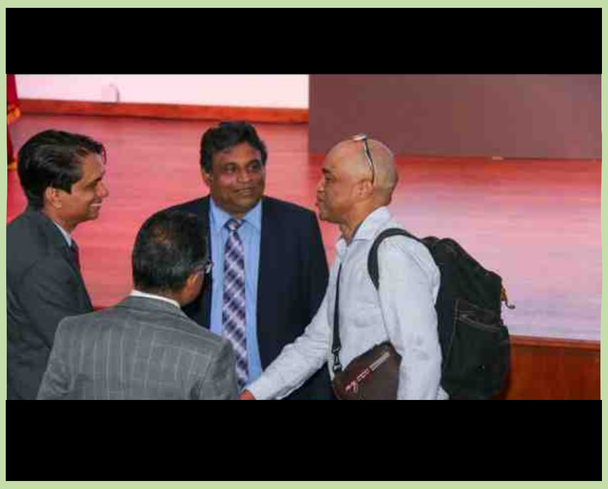


















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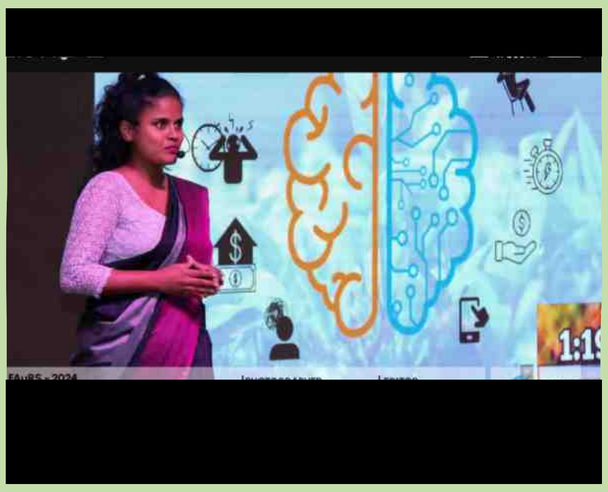


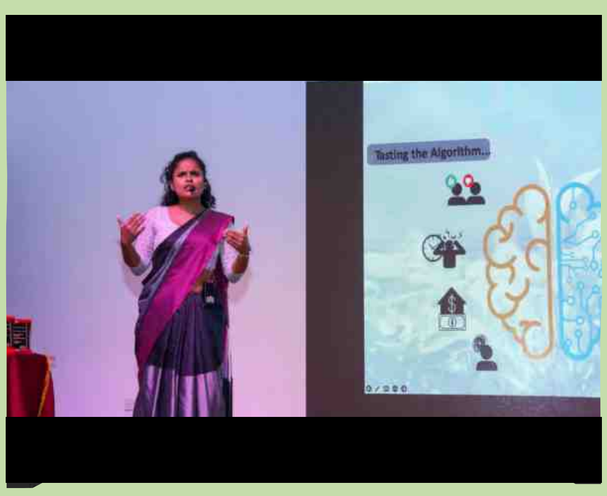




























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- Dr. Madushan Fernando, Postdoctoral Researcher/Research Officer in Cancer Biology and Therapeutics, Children's Medical Research Institute, Westmead, New South Wales, Australia
- Dr. Reshan Jayawardhana, Food Technologist/Biotechnologists, Waitaki Biosciences International Ltd. Hillsborough, Christchurch, 8022, New Zealand
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The Team Behind "Hanthana Blossoms" - FAURS 2024

Editors:

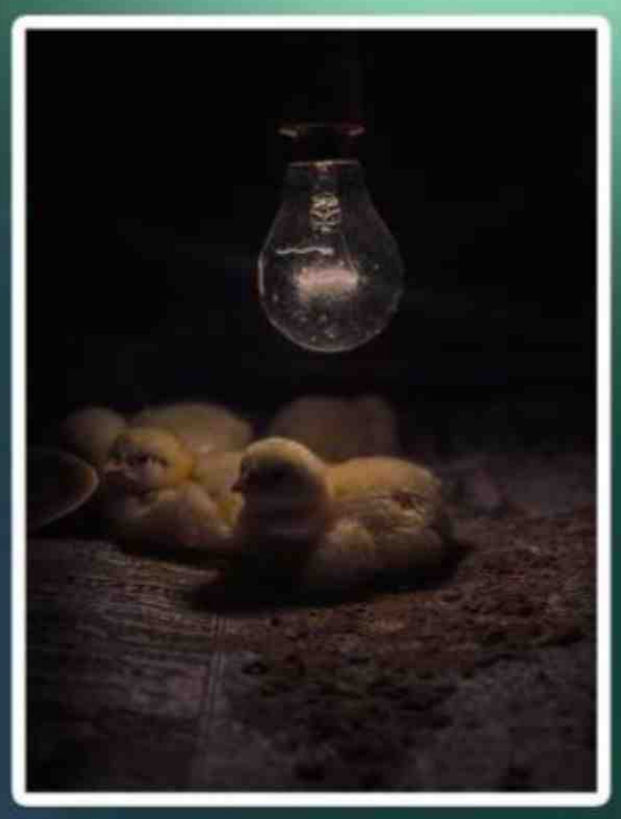
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Graphic Designing (Volunteer Contributors)

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Under the gentle glow of a single bulb, dreams begin to flutter, tiny wings warmed by hope and light.

Newly hatched chicks rest under an incandescent bulb, which emits light and essential heat during brooding. Chicks, unable to thermoregulate efficiently, depend on external warmth for optimal physiological function. The bulb's dim glow and dust indicate a low-light, possibly rural setting, common in traditional poultry systems. This artificial heat replicates a brooding hen's warmth, critical for chick survival and early growth, supporting metabolic processes in a controlled microclimate typical of small-scale farming.

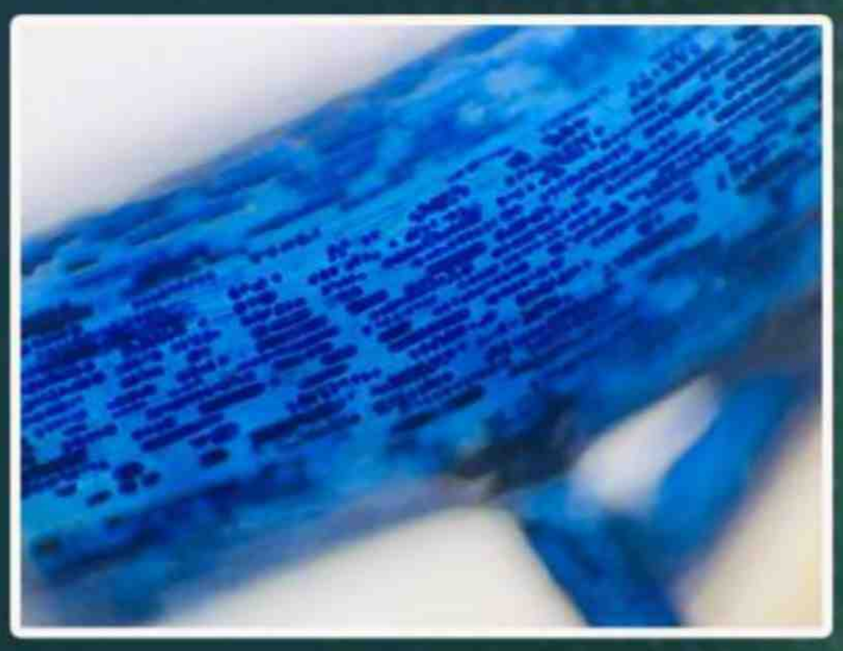
Winner: K.H.M.N. Konthasinghe (AG/18/ASF/026)



Zassou man

This photograph titled Zassou Man depicts a symbolic character replanting weeds on a freshly mown mountainside in rural Japan. Created by Chiiki Okoshi Kyouryokutai member Mr. Yamamoto Suguru, the image highlights the ongoing struggle of elderly mountain residents to manage recurring weed growth. As depopulation increases, fewer people remain to maintain the land. This creative act raises awareness about rural labor shortages and the challenges of sustainable landscape upkeep in aging, mountainous communities

1st Runner-up: Nathursa Nallanathan (AG/ 18/ 106)



Mycorrhizal Highways: Mycorrhizae boosting maize growth under limited phosphorus levels

This microscopic image shows a maize root colonized by arbuscular mycorrhizal (AM) fungi under half phosphorus with AM fungi inoculant. In the dense area, trypan blue-stained arbuscules within cortex cells highlight the fungi's role in increasing phosphorus use efficiency under phosphorus-limited conditions. This image shows the symbiotic relationship between plants and fungi. This research demonstrates how biological solutions can reduce chemical fertilizer usage in sustainable agriculture.

2nd Runner-up: K.A.A.I. Amarasinghe (AG/18/009)

University of Peradeniya
Sri Lanka

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