

JULY, 2026

EDITION 02

FOODTECH

MAGAZINE



Exploring the future of Food
Science & Technology.



Division of Food Technology,
College of Technology,
Kandy.



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Preface

It is with great pleasure that I present this edition of Food Cybex, a magazine dedicated to showcasing the creativity, innovation, and technical expertise of our Food Technology students.

Food technology is a dynamic field that plays a crucial role in addressing modern challenges related to food quality, safety, nutrition, and sustainability. Through their dedication and hard work, our students have developed innovative food products and solutions that demonstrate both scientific knowledge and practical skills. This magazine serves as a platform to share these remarkable innovations with the wider community, highlighting the talent and potential of the next generation of food technologists. I am proud of the efforts made by our students, lecturers, and the editorial team in bringing this publication to life.

I hope that FoodTech Magazine inspires readers to appreciate the importance of innovation in the food industry and encourages our students to continue pursuing excellence in their academic and professional journeys.

I extend my sincere congratulations to everyone who contributed to this publication and wish them continued success in all their future endeavors.



Shanaz Begum
Additional Director,
College of Technology - Kandy

Declaration

It is with great pleasure that I extend my greetings on the publication of the second annual publication of the Food Technology Association of the College of Technology - Kandy.

The successful launch of the inaugural publication marked an important milestone for our institution, providing a platform for students to share their knowledge, research findings, innovative ideas, and creative talents. I am delighted to see this valuable initiative continuing through its second annual publication, reflecting the enthusiasm, dedication, and progress of our students and staff.

This publication serves as an excellent medium for promoting learning, creativity, and knowledge sharing while strengthening the relationship between academia and the food industry. It encourages students to explore emerging trends, technological advancements, and innovative solutions that contribute to the development of the food sector.

I am confident that this publication will offer readers a rich collection of research articles, food science insights, product innovations, industry updates, and creative contributions that showcase the skills and potential of our students. It also provides a valuable opportunity for aspiring professionals to develop their writing, analytical, and communication skills while inspiring others within the field.

I sincerely appreciate the commitment and hard work of the editorial board, academic staff, and students who have contributed to the success of this publication. Their efforts have ensured the continuation of a meaningful platform that promotes excellence and innovation in Food Technology. I extend my heartfelt congratulations to everyone involved and wish the Food Technology Association continued success in its future endeavors.



K.D.S.K. Kahatapitigama
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EDITORIAL

2026 | SECOND ISSUE | ISBN 978-624-6768-01-0



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Finance Manager | Anjalika Kumari Chandrasena

Advertising | Dinuka Sandun Jayanath

Printer | Omax printers, City Plaza Building, No.71/10 Colombo St, Kandy.

Publisher | Association of Food Technology, College of Technology, Kandy. Food Tech Magazine - Sri Lanka

Food Tech Magazine © All right reserved.

Development of a String Hopper Flour Using Jackfruit Bulbs as a Base Ingredient



W.M.P.H.B. WIJEKOON

Lead Researcher & Food Technologist



Nutritional Enhancement of Traditional Sri Lankan String Hoppers (Indiappa).

In Sri Lanka, string hoppers (Indi Appa) are far more than just a culinary staple — they are a comforting, deeply integrated part of everyday life. Traditionally prepared from processed rice flour, these delicate nests are beloved for their soft texture and light taste. But what if this familiar dish could become significantly more nutritious?

Utilization of Mature Jackfruit (Kos) in Nutrient-Enriched String Hopper Production.

A recent food technology study investigated the use of mature jackfruit bulbs (Kos) to develop a healthier functional string hopper flour. Rich in fiber, vitamins, antioxidants, and complex carbohydrates, jackfruit offers strong nutritional benefits while also creating opportunities for value-added food processing in Sri Lanka.

1 PROCESSING METHOD

The research focused carefully on transforming mature jackfruit bulbs into premium flour through systematic cleaning, blanching, dehydration, milling, and fine blending. Multiple composite flour ratios were tested to establish the best balance between structural integrity and health metrics.



Innovation Final Product.

2 GOLDEN RATIO

Sensory trials revealed that the combination consisting of **80% jackfruit flour and 20% rice flour** recorded the absolute best sensory profile. It offered an excellent delicate flavor, enhanced elasticity, and high overall panel acceptability.

"This approach shows how traditional foods can be vastly optimized using regional agricultural assets, effectively reducing post-harvest loss while improving community nutritional profiles."

3

RESEARCH SPOTLIGHT

Jackfruit Seed & Cashew

VEGAN CHEESE



A Sustainable, Dairy-Free Innovation from Sri Lanka

Y. G. A. Iddamalgoda | College of Technology – Kandy | HND Food Technology | 2023–2025

7.32/9

Acceptability Score

46%

Moisture Content

60 Days

Shelf Life

pH 5.79

Optimal Acidity

The Challenge We Tackled

As the world moves toward plant-based diets, the demand for dairy-free cheese alternatives is soaring. Traditional vegan cheeses often rely on imported, expensive ingredients — but what if the answer was already growing in our backyards?

This research developed a 100% plant-based vegan cheese using two locally abundant Sri Lankan ingredients: starch extracted from jackfruit seeds (typically discarded as waste) and creamy cashew nut paste — creating a product that is nutritious, sustainable, and commercially viable.



*The finished product displayed at
College of Technology, Kandy*

💡 Why Jackfruit Seeds?

Jackfruit seeds represent 8–15% of the fruit weight and are usually thrown away. Rich in starch (22–25%) and protein, they are a perfect, zero-cost structuring agent for plant-based cheese.

Key Ingredients



Jackfruit Seeds

Starch extracted by wet milling (1:3 ratio) — provides gel structure & firmness



Cashew Paste

Air-dried & blended — delivers creaminess, fat, and mild flavor depth



Final Product

Flavoured with yeast extract — umami-rich, sliceable, spreadable vegan cheese

Key Findings

- ✦ **Optimal Formula:** 70:30 jackfruit starch-to-cashew ratio — best texture, firmness, and mouthfeel
- ✦ **Top-Rated Flavour:** Yeast extract sample scored 7.32/9 overall — strong commercial potential
- ✦ **Safe & Stable:** pH 5.79, 60-day refrigerated shelf life with no mold or spoilage detected
- ✦ **Science Backed:** Flavor drives acceptance: $r = 0.91$ (very strong correlation with acceptability)

Why It Matters

- ♻️ **Zero Waste** Transforms discarded jackfruit seeds into premium food
- 🚫 **Lactose-Free** Suitable for ~65% of Sri Lankans with lactose intolerance
- 💰 **Affordable** Local ingredients cut costs vs. imported vegan cheeses
- 🌱 **Sustainable** Lower carbon footprint than conventional dairy cheese

"Taste the Future of Cheese — Creamy. Nutritious. Sustainable."

Supervised by Miss. M. A. M. N. Marasinghe | Division of Food Technology, College of Technology, Kandy



D.M.H.B. Dissanayake
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Red Lentil Milk Ice Cream

A New Healthy Choice

Today, many people are looking for healthier and more natural food products. Ice cream is one of the most popular desserts in the world, but normal ice cream usually contains high fat and sugar. Because of this, I am trying to create new ice cream products with better nutritional value. One successful idea is using red lentil milk in dairy ice cream.

Red lentils are highly nutritious and affordable. They are rich in protein, dietary fiber, iron, potassium, and vitamins. Red lentils also help improve digestion and provide energy to the body. In addition, lentils are environmentally friendly crops because they need less water and help improve soil fertility. Therefore, using lentils in food products can support both health and sustainability.

Red lentil milk can be prepared by soaking, boiling, and blending lentils with water until a smooth liquid is formed. This milk can then be mixed with dairy milk to produce a special ice cream. The combination gives a creamy texture while increasing the protein and fiber content compared to normal ice cream.

Several product trials showed that moderate amounts of red lentil milk give the best results. Ice cream made with lower levels of lentil milk had better flavor, smoother texture, and higher customer acceptance. However, very high amounts of lentil milk reduced the taste quality and created a slight beany flavor.

This new ice cream product can be introduced as a functional frozen dessert for health-conscious consumers. It is suitable for people who want a nutritious snack while still enjoying the taste of ice cream. It also creates new market opportunities for dairy producers and lentil farmers.



What If Spinach Could Be Spread on Toast?

Jam is a popular food product made by cooking fruit pulp with sugar, pectin, and acid until it reaches a thick, spreadable consistency. It is commonly enjoyed on bread, toast, and pastries, making it a staple in many households. The high sugar content in jam helps preserve it by reducing water activity, allowing it to have a long shelf life without the need for artificial preservatives. According to standards, jam should contain at least 68.5% total soluble solids (TSS) to ensure proper texture and stability.

This research was conducted to develop a functional spinach-based jam. The study explored the development of an innovative jam formulation using spinach *Spinacia oleracea* a leafy vegetable, instead of traditional fruits



It Looks like a

The physical profile of Spinach Jam features a smooth, gel-like texture with appealing green color achieved through optimal processing methods. It spreads easily on bread, toast, or crackers without being runny. The jam has a balanced sweet taste with a mild, pleasant vegetable undertone, making it an acceptable and enjoyable product. Proper pectin balance ensures a good consistency with minimal liquid separation, preserving its quality and appeal throughout its shelf life.



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Why Spinach..?

- Spinach is known for its rich nutrient profile, but it is often disliked by children and some adults
- Jam is a widely accepted food product across all age groups and is commonly consumed as part of daily meals.
- Incorporating spinach in jam form aimed to enhance its acceptability, particularly among children, and promote healthier dietary habits
- This innovation contributed to the creation of a desirable product suitable for regular consumption.

Nutritional profile

It is a nutrient-rich leafy green containing various vitamins, such as A, C, E, and K. Minerals such as iron and calcium, dietary fiber, and antioxidants. However, raw spinach contains oxalic acid, which can bind with these minerals and block their absorption in the body. Interestingly, cooking spinach breaks down oxalic acid, thereby enhancing the bioavailability of calcium and iron. According to a study by Roberts & Moreau (2016), spinach contains various bioactive compounds, including lutein, zeaxanthin, flavonoids, and phenolic acids, which contribute to its antioxidant, anti-inflammatory, and anticancer properties (Roberts, J.L., & Moreau, R. (2016). Functional properties of spinach (*Spinacia oleracea* L.) phytochemicals and bioactive. Food & Function, 7(8), 3337–3353).

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Designing the Biotic Blueprint: The Intersection of Probiotics, Prebiotics, and Advanced Food Systems

The modern grocery aisle is no longer just a source of basic nutrition; it has evolved into a delivery vehicle for proactive health. At the heart of this transformation is **probiotism** — the systematic incorporation of beneficial live microorganisms into food matrices to modulate the consumer's internal ecosystem. As the global probiotics market shifts into a highly sophisticated, science-driven era, food technologists face a critical dual challenge proving clinical efficacy while ensuring microbial survival across complex industrial



Deciphering the Micro-Engineers: Common Industrial Probiotic Species

The Gold Standard: What Makes a Bacterium a "Proper" Probiotic?

Not every friendly microbe found in fermented foods qualifies as a true probiotic. To act as a proper probiotic in a commercial food system, a candidate strain must demonstrate the following critical properties:

- A true probiotic must exhibit extreme resilience, surviving the highly acidic environment of the stomach as well as the antimicrobial bile salts released in the upper intestine.
- **Mucosal Adherence:** Once the bacteria reach the colon, they must be able to anchor themselves or adhere to the human intestinal epithelial cells or the protective mucus layer, preventing them from simply being flushed out of the gastrointestinal tract.
- **Absolute Safety Profiles:** The strain must be non-pathogenic and non-toxic.
- **Pathogen Antagonism:** It must be capable of competitive exclusion—outcompeting harmful bacteria for nutrients and space.
- **Technological Robustness.** The strain must be genetically stable and capable of surviving in industrial processing techniques
- **Clinically Validated Efficacy:** Finally, they should demonstrate a measurable, statistically significant health benefit in human clinical trials.

Probiotic Microorganisms Utilized in Food Formulation.

Lactobacillus acidophilus, *Lactobacillus rhamnosus*, *Lactobacillus casei*, *Bifidobacterium animalis ssp*, *Bifidobacterium longum*, *Bacillus coagulans*.

Documented Health Benefits: Beyond the Gut

- **Gastrointestinal Homeostasis:** Probiotics competitively exclude pathogens by occupying binding sites along the intestinal wall and secreting antimicrobial compounds called **bacteriocins**.
- **Immune System Modulation:** Beneficial strains are responsible for the production of secretory IgA antibodies and enhance immunity.
- **The Gut-Brain Axis (Psychobiotics):** Targeted strains help in stress resilience, mood regulation, and cognitive focus.
- **Metabolic Regulation:** Newer translational science links strains like *Lactobacillus gasseri* to lipid metabolism pathways, blocking excessive sugar absorption and offering a biological tool to manage metabolic health parameters.

The Industrial Reality: Efficacy and Survival Metrics

The Industry Standard: A functional food must deliver between 10^6 and 10^9 live colony-forming units (CFUs) per gram or serving to survive the stomach's gastric juices and successfully colonize in the colon in order to exert the probiotism. This is challenging to preserve an active significant population within processing methods and storage.

Fueling Probiotics – “Prebiotics.”

“Prebiotics”- These are non-digestible carbohydrates that slip past human digestive enzymes entirely, arriving intact in the lower gut to serve as exclusive fuel or food for probiotics.



Future Trends Shaping The Market

1. **Synthetic Biology & Engineered Strains:** Researchers are moving from wild strain isolation to synthetic engineering. Future food systems will utilize customized probiotics optimized to survive in specific gastric environments.
2. **Integrating wearable health data with functional food production,** will allow brands to manufacture hyper-personalized symbiotic blends adapted to an individual's unique gut microbiome profile.

Suggestions For the Future Food Industry

- **Adopt Microencapsulation:** Protect Fragile vegetative strains by wrapping them in micro-matrices of alginate, lipid coatings, or protein shells. This shields the bacteria from heat, shear forces, and moisture during processing while ensuring a controlled release in the small intestine
- **Design Active Food Matrices:** Prioritize matrices with natural protective structures. High-fat systems like chocolates or specialized plant-milk emulsions can encapsulate bacteria protecting them from environmental oxygen and stomach acids.
- **Encapsulate bacteria,** physically buffering them against both environmental oxygen and stomach acids.



M.A.M.N. Marasinghe
Lecturer (Food Technology)

KIRALA ICE CREAM

HOW KIRALA BECAME THE NEXT BIG DESSERT ”



Mangrove apple (*Sonneratia caseolaris*), locally known as Kirala, into ice cream formulations. This underutilized tropical fruit is rich in vitamin C, antioxidants, dietary fiber, and natural organic acids, making it a promising ingredient for functional food products. Researchers prepared several formulations containing different levels of Kirala pulp and tested their physicochemical properties and sensory qualities. The results showed that adding the fruit pulp improved nutritional value while also giving the product a unique fruity flavor and natural color.



The findings revealed that moderate levels of mangrove apple pulp, especially around 10–20%, produced the most acceptable ice cream in terms of taste, texture, mouthfeel, and overall consumer preference. As the pulp level increased, the acidity and viscosity of the mixture also increased, while overrun (air incorporation) decreased, creating a denser texture. Samples with excessive pulp levels, such as 30%, were considered less desirable due to their fibrous texture and higher sourness. However, moderate pulp concentrations offered a refreshing balance between creamy sweetness and tangy fruit flavor, making the product appealing to consumers.

WHAT IS KIRALA FRUIT?

Sri Lanka is home to many underutilized fruits with great nutritional and commercial value. One such fruit is Kirala (*Sonneratia caseolaris*), also known as Mangrove Apple. This unique fruit grows in mangrove ecosystems, especially in coastal regions. Although traditionally used in local foods and beverages, Kirala remains less popular in modern food markets. Recent research has explored its use in value-added products such as ice cream, opening new opportunities for nutrition, agriculture, and industry.

FUTURE POTENTIAL

This research demonstrates the commercial potential of using local fruits like Kirala in value-added dairy products. Mangrove apple ice cream not only enhances the nutritional quality of traditional ice cream but also supports sustainable food innovation by encouraging the use of underexploited natural resources. In Sri Lanka and other tropical countries, such products could create new market opportunities for coastal communities while promoting healthier dessert alternatives. With further development and marketing, mangrove apple ice cream could become a distinctive product for both local and export markets.



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DEVELOPMENT AND QUALITY EVALUATION OF CREAM FILLED BISCUIT INCORPORATING POMELO PULP AND PEEL POWDER



BENEFITS OF POMELO CREAM FILLED BISCUIT

- ✓ Provides improved nutritional value compared to normal biscuits
- ✓ Potential for commercial bakery production
- ✓ Natural fruit ingredient improves product quality
- ✓ Can be developed as a functional snack product
- ✓ Increases consumer acceptability and product appeal.

In today's food industry, consumers are looking for snacks that are not only delicious but also nutritious. To meet this growing demand, a unique cream filled biscuit incorporating pomelo pulp and peel powder was developed as an innovative bakery product with improved flavor, texture, and nutritional benefits.

Pomelo (*Citrus maxima*), a citrus fruit rich in vitamin C, antioxidants, and dietary fiber, was selected as the key functional ingredient for this product development study. The refreshing citrus flavor and natural health benefits of pomelo make it an excellent ingredient for value-added bakery products.

The product was prepared by incorporating different concentrations of pomelo pulp into a smooth cream filling placed between crispy baked biscuits. Several formulations were tested to determine the most acceptable combination based on sensory and quality characteristics.

During the development process, physical, chemical, microbiological, and sensory evaluations were carried out. Parameters such as texture, moisture content, aroma, taste, and overall acceptability were carefully analyzed to ensure product quality and consumer satisfaction. In addition, further analyses, including extended shelf-life and other relevant quality tests, are planned for future studies to further validate the product's stability, safety, and overall performance.

INGREDIENTS

- Pomelo pulp
- Pomelo peel powder
- flour
- Icing sugar
- Unsalted butter
- food additives
- food emulsifier





• Does it possible?

Yes, it is absolutely possible! As part of my Higher National Diploma (HND) research study, I have successfully developed a novel ice cream product using cassava as a key base ingredient. This innovation explores cassava (*Manihot esculenta*) as a functional ingredient in frozen dessert formulation. Traditionally known as a staple carbohydrate source, cassava has been transformed into a value-added component that contributes to the texture, stability, and creaminess of ice cream systems.

• What is the requirement of cassava-based ice cream?

The demand for alternative ice cream in Sri Lanka is increasing due to lactose intolerance, health awareness, and the need for affordable products using local ingredients. Cassava-based ice cream requires quality cassava, proper processing, stabilizers for texture, good sensory acceptance, and cost-effective production methods.

• How is it made?

Cassava ice cream is produced using cassava in the form of puree & flour as the main base ingredients. It is combined with milk, sugar, cream, stabilizers, and flavoring agents such as vanilla. The mixture is prepared by boiling or gelatinizing the cassava, then blending all ingredients into a uniform mix. This blend is pasteurized for safety, homogenized for smooth texture, and aged to improve flavor and structure. Finally, it is frozen and churned to incorporate air, resulting in a smooth, creamy, and stable frozen dessert.

• Nutritional Profile

Cassava-based ice cream offers a unique nutritional profile compared to conventional dairy ice cream. Cassava mainly provides carbohydrates in the form of starch, serving as a good energy source. When milk or coconut milk is added, it contributes fats that enhance creaminess and texture. Sugar provides quick energy, but its level should be controlled to maintain a healthy balance. The inclusion of fruit flavors or natural additives can further improve the vitamin and antioxidant content. Although cassava is low in protein, it is a valuable functional carbohydrate base for developing low-cost, energy-rich dessert products.

• Quality Characteristics

The developed cassava ice cream showed good physicochemical and sensory qualities with commercial potential. It had a smooth, creamy texture due to gelatinized cassava starch and moderate melting resistance for better stability. The product exhibited acceptable overrun, giving a light mouthfeel. Its neutral flavor allowed easy blending with added flavors, and the appearance was uniform and glossy. Sensory evaluation showed positive consumer acceptance, highlighting cassava as a valuable ingredient for improving body and stability.





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Banana Stem chips



K. Konuja
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I have successfully developed banana stem chips, a healthy and nutritious snack. Banana stem is rich in fiber, vitamins, minerals, and antioxidants. With added spices for taste, these chips provide a tasty and functional food option. Being high in phenolic compounds and other nutrients, banana stem chips are a valuable, health-promoting product for consumers

Nutritional Profile

Banana pseudo stem is an underutilized by-product of banana cultivation and is rich in dietary fiber. High fiber content helps improve digestion, promotes satiety, and supports weight management. It also contains essential nutrients such as potassium and vitamin B6. Potassium plays an important role in muscle function, fluid balance, and blood pressure regulation, while vitamin B6 supports hemoglobin formation and insulin synthesis. In addition, banana pseudo stem contains bioactive compounds with antioxidant properties, making pseudo stem-based chips a healthier snack option compared to conventional chips.

Purpose of developing chips out of banana stem?

The demand for nutritious, sustainable, and plant-based snack foods is increasing worldwide. Banana pseudo stem is available throughout the year and is usually discarded as agricultural waste after harvesting the fruit. Utilizing banana pseudo stem for chip production helps reduce waste and environmental pollution while providing a low-cost raw material for the food industry. Therefore, banana pseudo stem-based chips meet both nutritional and sustainability requirements.

How is it made?

Fresh banana pseudo stems are collected, and the outer fibrous layers are removed to obtain the tender inner core. The cores are sliced uniformly and washed thoroughly with potable water. The slices are then boiled for about 30 minutes to soften the material, and citric acid is added to prevent enzymatic browning. After cooling, the slices are blended into a smooth pulp. The pulp is then shaped and processed by frying or baking to produce crispy banana pseudo stem chips.

Benefits for Consumers and the Industry

For consumers, banana pseudo stem-based chips provide a high-fiber, nutrient-rich, and healthier alternative to traditional snack products. Regular consumption can support digestive health and overall well-being. From an industrial perspective, the utilization of banana pseudo stem adds value to agricultural waste, reduces environmental impact, and creates opportunities for sustainable food production and income generation. Thus, banana pseudo stem-based chips benefit both consumers and the food industry.

Drying Through the Drought: Climate-Resilient Preservation Technology for Sri Lankan Harvest

Sri Lanka is a tropical island strategically situated in the Indian Ocean. Historically, this unique geographic location has blessed the island with a relatively balanced climate and two distinct rainy periods: The Southwest Monsoon and the Northeast Monsoon.

Traditionally, agricultural cycles and field crop cultivation revolved around these monsoons, defining the two main cultivation seasons known as "Yala" and "Maha". Paddy cultivation, in particular, has been fundamentally dependent on these predictable weather patterns. Beyond agriculture, the nation's energy grid has also relied heavily on these monsoons to sustain hydropower generation.

However, in recent years, these once-steady rainfall patterns have experienced severe disruptions driven by global environmental shifts, such as global warming and the greenhouse effect.

Consequently, Sri Lanka now faces extreme climate volatility, fluctuating unpredictably between prolonged arid droughts and sudden flash floods—such as those triggered by Cyclone Ditwa. This critical situation is further aggravated by the periodic declaration of El Niño phenomena by the National Oceanic and Atmospheric Administration (NOAA) and the World Meteorological Organization (WMO).

These prolonged drought conditions have led to a substantial decrease in both annual crop production and hydropower generation. Consequently, the scarcity of agricultural yields has driven up raw material prices, while the drop in hydropower capacity has increased electricity tariffs. These unexpected price surges directly escalate the cost of food and agricultural products within the local Sri Lankan market. Furthermore, they lead to a significant loss in export earnings due to the price volatility of plant-based exports.

Strategic Approaches to Overcoming the Crisis

To mitigate these interconnected challenges, the local food industry must adopt a two-pronged approach:

1. **Reducing Post-Harvest Losses:** Addressing systemic inefficiencies, such as improper transportation and inadequate storage facilities across the country, which cause significant food waste before the harvest even reaches processing hubs.
2. **Accelerating Value Addition:** Transitioning from fresh, highly perishable raw produce to processed, high-value food products. Introducing these processed alternatives to the local market helps stabilize prices, while exporting premium, value-added products secures high-margin returns in global niche markets.

Turning Climate Adversity into Processing Efficiency

While shifting focus to the second approach—value-added processing—a critical question arises: *How can food processors reduce production costs when national electricity tariffs are soaring?*

The solution lies in leveraging the climate crisis itself. The intense solar radiation characteristic of these prolonged arid conditions can be directly harnessed as a cost-effective utility. By integrating advanced solar drying technologies to dehydrate harvested agricultural materials, processors can drastically bypass high industrial energy costs. This transforms a climate threat into an eco-friendly, economically viable preservation asset for Sri Lanka's food security.

Engineering an Efficient Solar Dryer: System Classifications

When designing solar dehydration systems, configurations are fundamentally categorized into two types: **passive** and **active** solar dryers.

Passive vs. Active Solar Dryers

- **Passive Solar Dryers:** These rely purely on natural convection currents. However, they are inherently inefficient and highly vulnerable to fluctuating daily weather conditions.
- **Active Solar Dryers:** To achieve independence from unpredictable weather shifts, active systems can be engineered as either **hybrid dryers** or integrated with **thermal energy storage (TES) systems**. Active dryers utilize forced convection currents driven by fans or blowers, powered sustainably by coupled solar photovoltaic (PV) panels. Moisture-laden air is then efficiently evacuated from the drying chamber via an exhaust ventilator.

Modes of Heating

Depending on how thermal energy is transferred to the product, systems can be designed for either direct or indirect exposure:

- **Direct Dryers:** The food matrix inside the drying chamber is heated directly by solar radiation passing through glass or transparent glazing materials.
- **Indirect Dryers:** The air is preheated in a separate, dedicated solar thermal collector before entering the drying chamber, protecting heat-sensitive compounds from direct UV exposure.

Advanced Modifications for Industrial Scale

- **Hybrid Systems:** To ensure continuous, 24/7 operation during the night or periods of heavy cloud cover, active solar dryers can be coupled with secondary energy sources, such as fuel wood or biomass burners.
- **Thermal Storage Integration:** System reliability can be bolstered by incorporating thermal mass storage devices, such as an insulated solar-heated water tank positioned beneath the drying chamber, to release stored heat when ambient solar irradiance drops.
- **Solar Tunnel Dryers:** If the objective is to scale up processing throughput while shortening the drying cycle, solar tunnel dryers offer an optimal high-capacity solution for commercial operations.

Optimizing Retained Product Quality in Dehydration

During conventional thermal solar drying, critical physicochemical and organoleptic properties of the food matrix—such as color, flavor, texture, and nutritional value—often undergo degradation due to prolonged heat and oxygen exposure. Such quality losses are highly unfavorable when attempting to launch competitive products in demanding local and international markets.

Therefore, food technologists must identify innovative engineering solutions to match or exceed the premium quality standards achieved by sophisticated, energy-intensive industrial drying methods.



Viraj Duminda Jonikkuhewa
(Lecturer – Food Technology)

Is Solar Vacuum Drying a Viable Solution?

Solar Vacuum Drying presents an exceptional opportunity to eliminate quality defects at a minimal operational cost. By operating under a vacuum, the boiling point of water within the food matrix is lowered, allowing rapid evaporation to occur at significantly reduced temperatures. Furthermore, the anaerobic (oxygen-free) environment prevents oxidative browning and nutrient degradation.

Transitioning toward these industrial-scale drying and storage infrastructures, powered entirely by renewable energy sources like solar power, is imperative. Implementing these climate-resilient engineering frameworks will be vital to safeguarding food security and revitalizing the Sri Lankan agricultural economy in the years ahead.



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Innovating Dairy – Free Ice Cream: A Tropical Twist with Potato Milk, Coconut Milk, and Pineapple Pulp

A creamy delight without dairy

The Dairy-free Ice Cream developed in this study offers a delicious, nutritious, and lactose-free alternative to traditional ice cream, made with potato milk, coconut milk, and pineapple pulp, it combines smooth texture.



Vijayakumar Harshani
Department of Food
Technology
College of Technology,
Kandy.

A HEALTHY SCOOP OF INNOVATION

Potato milk serves as the starchy, nutrient- rich base that contributes to body and creaminess. Coconut milk enhances mouthfeel with its natural fats, while pineapple pulp delivers a refreshing flavor.



IT LOOKS LIKE.....

SMOOTHY, CREAMY, AND LIGHT GOLDEN IN COLOR, THIS DAIRY FREE ICE CREAM MIRRORS THE APPEARANCE AND MOUTHFELL OF CONVENTIONAL ICE CREAM.

Processing method

1. Raw material selection
2. Raw material preparation
3. Mixing (potato milk + coconut milk + sugar + salt) Blending (5 – 10 min)
4. Pasteurization 80 °C for 10 – 15 min, add cremadon with continues stirring)
5. Homogenization
6. Cooling (Rapidly cool to 4 °C.)
7. Aging (for 4 to 6 Hours)
8. Flavoring
9. Freezing (Ice cream machine, 30 – 40 min)
10. Filling and packaging
11. Hardening
12. Storage (18 °C)



Healthy and sustainable indulgence

- 🌱 No dairy allergens.
- 🌱 Plant based protein.
- 🌱 Locally sourced ingredients.

A NEW TWIST ON TRADITION

A unique jam with natural sweetness, smooth creamy texture, and a hint of cardamom flavor



Mahalingam Thinisha
Department of Food
Technology
College of Technology, Kandy



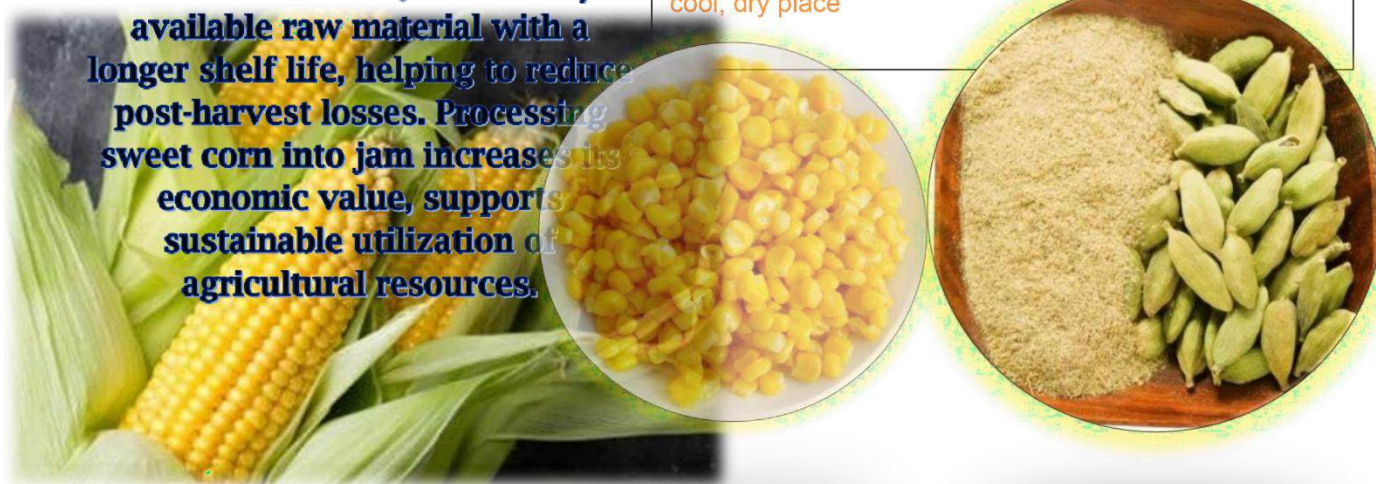
Benefits for Consumers and the Industry

The development of sweet corn jam offers significant benefits to both consumers and the food industry. For consumers, the product provides a nutritious and unique alternative to conventional fruit jams, with potentially reduced added sugar due to the natural sweetness of sweet corn. Its pleasant flavor and smooth texture enhance consumer acceptance while expanding food choices. For the industry, sweet corn is a low-cost, abundantly available raw material with a longer shelf life, helping to reduce post-harvest losses. Processing sweet corn into jam increases its economic value, supports sustainable utilization of agricultural resources.

The formulation of jam using sweet corn represents a novel approach to traditional jam processing. Unlike conventional fruit jams, sweet corn jam utilizes a cereal-based raw material with natural sweetness and a creamy texture. The addition of mild flavor enhancers such as cardamom further improves sensory appeal, creating a unique product that differs from common fruit jams available in the market. This innovation introduces diversity into the jam sector while maintaining familiar processing techniques such as heating, pectin addition, and hot filling.

Preparation Method

Fresh sweet corn kernels were selected, thoroughly washed, and boiled until soft. The cooked kernels were blended into a smooth paste. Sugar, citric acid, pectin, and cardamom flavor were added to the corn paste, and the mixture was cooked with continuous stirring until the desired jam consistency was achieved. The hot corn jam was then filled into sterilized glass jars, sealed immediately, allowed to cool, labeled, and stored in a cool, dry place.



Beyond Sweetness

A New Era of Vegetable-Based Gel



M. A. Amna Thahani

Department of Technology
College of Technology – Kandy

What if a jam could help you enjoy vegetables without even realizing it?

This research introduces a unique idea—a vegetable-based jam made using Gotukola and Winter Melon. It moves away from the usual fruit jams and brings a fresh perspective to everyday food, combining taste, simplicity, and thoughtful ingredient choices.

What makes this jam different?

Most jams are made entirely from fruits. But this one takes a different path:

- ✓ Uses winter melon as the main base, instead of fruits
- ✓ Incorporates Gotukola, a well-known herbal ingredient
- ✓ Uses raw lime juice as a natural way to balance flavor and freshness
- ✓ Reduces reliance on highly acidic fruit bases
- ➔ A small change in ingredients—yet a big change in concept.

What's special about the ingredients?



- ✓ **Gotukola**
Traditionally valued for its natural compounds and refreshing qualities



- ✓ **Winter Melon**
Light, mild, and naturally low in acidity—creating a smooth base



- ✓ **Raw Lime Juice**
Adds a touch of freshness while helping maintain balance without synthetic additives

? Why create a jam like this?

Have you ever thought:

"I don't really like eating vegetables..."
or

"Some jams feel too acidic or heavy..."

This research was designed with those everyday thoughts in mind.

- ✓ Turns vegetables and herbs into a more enjoyable form
- ✓ Offers a milder alternative to strongly acidic fruit jams
- ✓ Makes it easier to include different ingredients in daily meals

😊 What does it feel like to taste it?

- ✓ Smooth and easy to use
- ✓ Gently sweet with a subtle herbal note
- ✓ Light and pleasant, without strong acidity
- ➔ Carefully developed so that taste and comfort go hand in hand.

🌐 Why does this idea matter?

This jam shows how simple, familiar ingredients can be used in new ways.

It encourages:

- ✓ Trying vegetables in a different form
- ✓ Reducing dependence on traditional fruit-only products
- ✓ Making everyday food a little more thoughtful and balanced

✨ Final Thought

Sometimes, innovation isn't about something completely new—it's about seeing familiar ingredients differently. This Gotukola–Winter Melon jam is a gentle reminder that even a simple jar of jam can carry a new idea—one that blends tradition, creativity, and everyday enjoyment.

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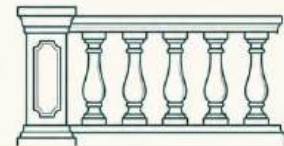
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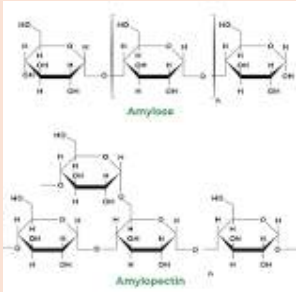
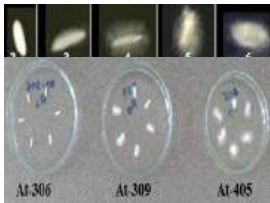


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Sustainable Improvement of the Rice Processing Industry in Sri Lanka

Sri Lanka produces approximately 4.5 million metric tons of rough rice annually. However, the domestic processing sector remains bottlenecked in primary milling for low-margin table consumption. This article outlines the critical physicochemical constraints of domestic rice grains and presents actionable, high-impact industrial recommendations to capture the rapidly growing global value-added, gluten-free, and functional food market.

Physiochemical Blueprint of Sri Lankan rice

Property	Sri Lankan Rice Profile	Industrial Matrix & Processing Implications
Amylose Content 	Over 90% of local varieties are classified as high-amylose. Only a few select varieties (such as At 405) possess low-amylose properties.	High-amylose rice undergoes rapid retrogradation, making it excellent for traditional, distinct-strand products (e.g. string hoppers). However, advanced products like chewy noodles or puffed/expanded crispy snacks strictly require low-amylose matrices to achieve optimum expansion ratios and elasticity.
Gelatinization Temperature (GT) 	Predominantly intermediate to high GT profiles across major local crop lines.	Extrusion and thermal processing lines (e.g., baby food purees or instant cereals) must maintain sustained, elevated temperatures. Failure to hit the specific pasting threshold results in an unpalatable, gritty product texture and compromised infant digestibility.
Gel Consistency (GC) 	Exhibits a distinct medium to soft gel consistency.	The unique combination of high amylose paired with soft/medium GC is a major commercial asset. It yields individual, non-sticky structural strands during extrusion while safely retaining a tender eating quality that prevents rapid staling.
Bioactive Pigmentation 	Abundance of traditional red rice varieties rich in polyphenols, antioxidants, and Zinc.	Provides an immediate clean-label marketing advantage. The natural pinkish-brown pericarp can be utilized to satisfy international consumer demand for rustic, functional breakfast flakes and healthy biscuits without requiring synthetic colorants.

Strategic Industrial Recommendation

The modernization of the industry requires shifting from basic volume handling to highly automated, precision-engineered product diversification. The strategy is structured into three pillars:

I: Technological Upgrades & Precision Automation Advanced Extrusion Technology:

Mandate the deployment of twin-screw extruders to engineer micronutrient-fortified rice kernels and high-expansion crispy snacks. Optical Color Sorting: Integrate industrial optical sorters to achieve the uniform purity standards required by strict export markets. Micro-Milling & Controlled Dehydration: Implement specialized milling lines to produce ultra-fine rice flour with an extended shelf-life that resists clumping naturally.

II: Supply Chain Synchronization & Target Breeding Industrial Agronomy Focus:

Pivot agricultural research toward scaling crop varieties engineered specifically for downstream food processing. A priority must be placed on scaling the low-amylose varieties such as At 405. Direct Out



Asela Bandara
(Lecturer – Food Technology)

grower Contracts: Establish formalized buyback links between large/medium scale processors and farming clusters to guarantee raw material traceability and uniform chemical composition.

III: Aggressive Portfolio Diversification Processors must move beyond basic flour mixes and capture niche global sectors: Pediatric & Geriatric Nutrition:

Formulate low-glycemic index (GI) baby foods and nutrient-dense, clean-label infant cereals using traditional heirloom grains. Functional Beverages: Develop ready-to-drink (RTD) allergen-free rice milks and gut-friendly, probiotic-fermented rice beverages. By-Product Valorization: Deploy stabilization units directly at the milling site to halt enzymatic rancidity in rice bran, unlocking the extraction of premium Rice Bran Oil and high-fiber dietary supplements. Industrial Ingredients & Circular Economy: Manufacture high-grade isolated rice starch, liquid rice glucose, and clean snack binders, while recycling secondary husk waste into eco-friendly bio-packaging.



A leaf of nature, a scoop of happiness.

Banana Leaf Ice Cream



Is it possible to create Banana Leaf Ice Cream?

Yes, it is possible. Banana leaf pulp was successfully used to develop a unique functional ice cream. This product combines herbal value with modern food innovation and offers nutritional and sensory benefits.

What is the requirement?

Demand is increasing for natural and functional foods. Banana leaf ice cream provides a healthy, eco-friendly alternative. Key requirements include proper formulation, quality ingredients, and maintaining nutritional value.

How is it made?

Ingredients used: Banana leaf pulp, milk, sugar, cremoadan, cashew, vanilla. The process includes washing, blanching, extraction, mixing, pasteurization, freezing, and packaging. Quality is controlled using pH, Brix, and acidity measurements.

Processing Method

Fresh banana leaf extract is blended with milk, sugar, vanilla, cashew, and stabilizer. The mixture is pasteurized, cooled, aged, frozen, and hygienically packed to create a smooth, creamy ice cream with a unique natural aroma.



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M.M.I.C. Wijesinghe

Higher National Diploma in Food Technology

College of Technology – Kandy

Development of Layered Fruit Jelly Using Watermelon Flesh & Rind with Seeds

Introduction

Watermelon is a highly consumed fruit due to its refreshing taste and high water content. In most cases, only the flesh is eaten while the rind and seeds are discarded as waste. This mini research project was conducted to develop a layered jelly product using watermelon flesh and rind with seeds and gelatin as a gelling agent. The study focused on creating a value-added, nutritious and attractive dessert while reducing food waste.

Preparation Process

Fresh watermelons were selected and washed properly. The flesh was blended to obtain juice, while the rind was cleaned, peeled and processed into small pieces or extract. The seeds were separated, washed, dried and lightly processed. Gelatin was dissolved in warm water and mixed with sugar and fruit extracts to prepare the jelly mixtures. Different colored layers were prepared separately and poured carefully into molds. The jelly was set under refrigeration until full gel formation.



Aim of the product development

The main aim of this research was to utilize different parts of watermelon (flesh, rind and seeds) efficiently and develop an attractive layered jelly with good nutritional and sensory qualities. Another objective was to introduce an affordable fruit-based dessert product that can be accepted by consumers of different age groups.

This layered jelly provides several functional benefits. Watermelon flesh is rich in vitamins, minerals and antioxidants which help in hydration and overall health. Watermelon rind contains dietary fiber and beneficial phytonutrients. The seeds are a good source of protein, healthy fats, magnesium, iron and antioxidants. Gelatin contributes to the texture and stability of the product, making it a tasty and nutritious dessert option.



Rich in
antioxidants
& vitamins



Good source
of protein &
healthy fats



Contains
fiber & essential
minerals

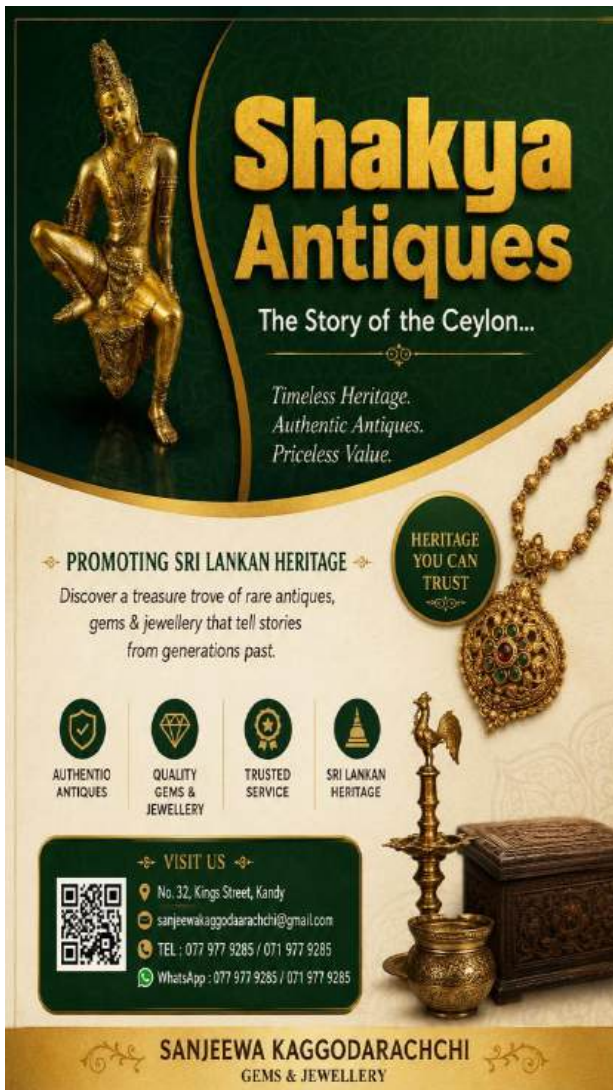


Easy to digest
& refreshing
dessert

Consumer Acceptance

Sensory evaluation of the developed jelly showed good acceptance in terms of appearance, color, taste, texture, aroma and overall preference. The attractive layered look, pleasant watermelon flavor and unique texture from seeds contributed to high consumer liking. The product has potential as a healthy and innovative dessert for the market.





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One Pathway to Career Success



Food Technology is a rapidly expanding field that combines science, technology, quality assurance, and innovation to ensure the production of safe, nutritious, and high-quality food products. In Sri Lanka, students can enter this profession through two main routes. The traditional pathway is through the G.C.E. Advanced Level examination, leading to degree programmes in Food Science and related disciplines offered by universities. However, the other equally and progressive pathway is the Technical and Vocational Education and Training (TVET) route, which provides opportunities to progress from skilled-level training to postgraduate qualifications while gaining valuable industry experience. This article mainly focused the second path of above which is the vocational path.

The DTET Pathway and Other Options

The Department of Technical Education and Training (DTET), through its network of Colleges of Technology and Technical Colleges, plays a vital role in developing skilled personnel for Sri Lanka's food industry. Students can begin their journey through NVQ Level 3 and 4 programmes. Those interested in food processing may enroll in the **Fruit and Vegetable Processor (NVQ Level 4)** programme conducted at the **College of Technology, Kandy** and **Technical College, Kuliyaipitiya**. Students interested in bakery production can follow **Baker (Pastry and Bakery)** programmes offered at institutions including **Maradana, Kandy, Anuradhapura, Badulla, Galle, Ratnapura, Kurunegala, Ampara, Kuliyaipitiya, Balapitiya, Matara, Kalutara, Dambulla, Nuwara Eliya, Homagama, and Anamaduwa**. Those interested in culinary operations may pursue the **Professional Cookery (NVQ Level 4)** programme conducted at **Kurunegala College of Technology** and **Technical Colleges such as Kuliyaipitiya, Wariyapola, Anamaduwa, Nuwara Eliya, Matara, and Gampaha**. These programmes provide practical skills in food processing, preservation, bakery technology, food hygiene, and production operations while creating a foundation for higher studies.

Students with relevant NVQ qualifications or suitable A/L results can progress to the **National Diploma in**

Food Technology (NVQ Level 5) conducted by DTET at the **College of Technology, Kandy** and the **Technical College, Kuliyaipitiya**. This programme combines technical knowledge with industrial training and prepares students for careers in food manufacturing, quality assurance, and food safety.

Further progression is available through the **Higher National Diploma in Food Technology (NVQ Levels 5 and 6 Combined)** conducted at the **College of Technology, Kandy**. This qualification develops advanced technical and supervisory competencies required by modern food industries.

Other options are available through the **Open University of Sri Lanka (OUSL)** and **University Colleges** offering food-related programmes, including the **Diploma in Food Science/ Technology**, allowing students with appropriate qualifications to continue their education while remaining employed. Graduates of these programmes find employment as Food Technologists, Quality Assurance and Quality Control Officers, Production Supervisors, Food Safety Officers, Laboratory Technologists and Product Development Assistants in food manufacturing companies, dairy plants, beverage industries, bakeries, seafood processing facilities, testing laboratories, and government institutions.

From Diplomas to Degrees

One of the greatest strengths of the DTET pathway is that it provides access to higher education beyond diploma level. A key progression route is the **Bachelor of Technology in Food Process Technology** offered by the **University of Vocational Technology (UNIVOTEC)**, which recognizes relevant NVQ and Higher National Diploma qualifications.

Students may also pursue fee-levying and flexible-learning degree programmes while employed. A notable example is the **Bachelor of Food Quality Management (External)** conducted by **Wayamba University of Sri Lanka**, which was designed to support professionals already working in the food sector.

Professional Development and Higher Studies

Food technology professionals are encouraged to continuously upgrade their knowledge through training programmes in HACCP, ISO 22000 Food Safety Management Systems, Good Manufacturing Practices (GMP), Good Hygiene Practices (GHP), quality management, laboratory quality systems, and occupational health and safety. Such programmes are conducted by institutions including the **Sri Lanka Standards Institution (SLSI)**, **Industrial Technology Institute (ITI)**, **Sri Lanka Association for the Advancement of Quality and Productivity (SLAAQP)**, **National Institute of Business Management (NIBM)**, and **National Institute of Occupational Safety and Health (NIOSH)**.

After obtaining a degree, professionals may continue to postgraduate diplomas, master's degrees, M.Phil., and PhD programmes offered by institutions such as the **Postgraduate Institute of Agriculture (PGIA)**, **Postgraduate Institute of Science (PGIS)**, and several Sri Lankan universities.



G. R. P. K. Perera.
Deputy Director
(Industry liaison and Marketing)

Career Opportunities

Food technology professionals are employed throughout the food manufacturing, dairy, beverage, bakery, seafood processing, quality assurance, research, and regulatory sectors. In addition to salaried employment, the field offers excellent opportunities for self-employment through a relevant venture. International opportunities are also available in countries such as Australia, Canada, and the United Kingdom, where expertise in food processing, food safety, and quality management is highly valued.

The DTET pathway clearly demonstrates that vocational education is not a dead end but a progressive route leading from NVQ qualifications to diplomas, degrees, postgraduate studies, entrepreneurship, and rewarding careers both in Sri Lanka and abroad. For young people interested in food innovation, quality, and technology, it remains one of the most practical and promising career pathways available today.

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DEVELOPMENT OF BISCUITS BY INCORPORATING KOHILA FLOUR AND SPROUTED COWPEA FLOUR.

Biscuits remain one of the world's most popular snacks due to their affordability, convenience, and long shelf life. However, many traditional wheat-based biscuits are low in dietary fiber, micronutrients, and offer limited glycemic control. Today's market is moving toward functional snacks that deliver health benefits alongside taste.

This has led to the development of a new biscuit that incorporates Sri Lanka's native Kohila and nutrient-rich sprouted cowpea.

The new Kohila and sprouted cowpea biscuit is a reimagined version of the classic biscuit. It replaces part of the wheat flour with Kohila flour, Kohila starch, and sprouted cowpea flour. The result is a crisp, golden biscuit with flavor and improved nutritional value. Using Kohila "tubes" that are often discarded during harvest also reduces agricultural waste.

Objectives:

- To introduce value added product by utilizing the surplus of "Kohila".
- To familiarize and practice the process of new food product development.
- To evaluate the sensory properties of biscuits made from kohila flour and sprouted cowpea flour.



Consumer & Industry Benefits

Consumers benefit from added fiber and antioxidants. For the industry, it opens a path to functional food innovation, reduces waste, and offers marketing appeal for eco-friendly and health-focused products.

Conclusion

The Kohila and sprouted cowpea biscuit shows how traditional ingredients can be transformed into a modern, healthier snack. It offers improved nutrition, supports sustainability, and proves that innovation in baking can start with local roots.



Ingredients:

Kohila (starch and flour), Sprouted cowpea flour, Wheat flour, Sugar, Salt, Milk powder, Margarine, Baking powder

Methods:

Sprouted cowpea flour is made by soaking clean cowpea overnight, sprouting for 2-3 days, drying, grinding, and sieving.

Kohila flour is prepared by cleaning, chopping, blending, filtering, drying at room temperature, and sieving Kohila.

For the biscuits, dry ingredients are mixed together while wet ingredients are creamed separately. The mixtures are combined to form dough, which is shaped and baked at 180°C/350°F for 15-20 minutes until golden brown.

The biscuits are then cooled, packaged, and stored.



- A.K.K.J. Athukorala
- Higher National Diploma In Food Technology
- College of Technology - Kandy

READY-TO-USE VEGETABLE SMOOTHIE CUBES

AS A CONVENIENT FUNCTIONAL BEVERAGE



D.K.G.A.P. Wijesingha

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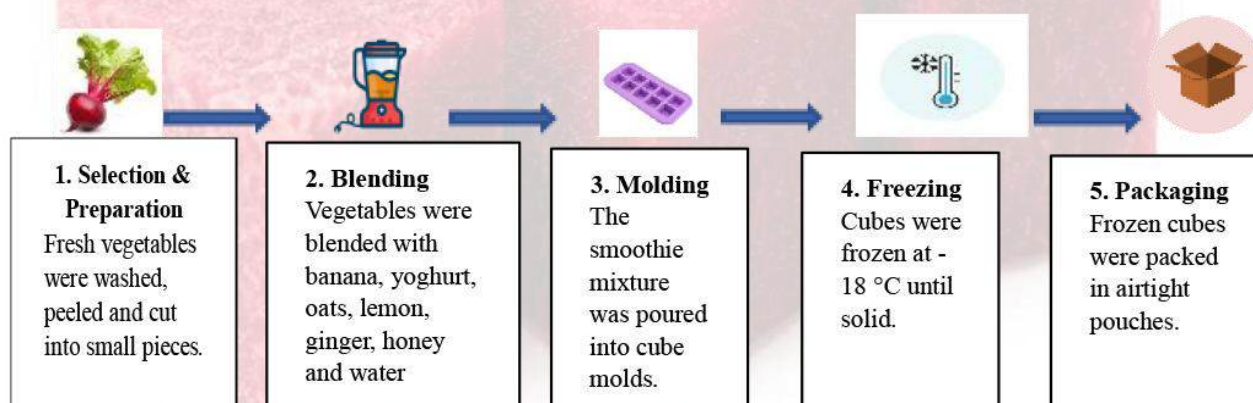
College of Technology, Kandy

Sri Lanka

In modern society, there is an increasing awareness of the importance of a healthy diet and the consumption of nutrient-rich foods. Vegetables are essential sources of vitamins, minerals, dietary fibre, and antioxidants, which play a vital role in maintaining health and preventing chronic diseases. Despite these benefits, the daily intake of vegetables among many individuals remains below recommended levels due to busy lifestyles, lack of time for preparation, and limited availability of fresh produce.

Ready-to-use vegetable smoothie cubes provide a practical solution to these challenges by offering pre-portioned, frozen blends that can be easily added to smoothies, soups, or other beverages. Freezing preserves the nutritional quality, colour, and flavour of vegetables while extending shelf life, making it convenient for consumers to maintain healthy dietary habits.

The development of these cubes is justified because they save time, preserve essential nutrients, promote overall wellness, and meet the growing demand for quick, convenient, and health-promoting food products. By encouraging daily vegetable consumption through an easy-to-use format, these cubes support healthier lifestyles and address modern consumer needs for practical and nutrient-rich dietary options.



Cassava Production, Utilization and Value Added Products



Senarath Ekanayake

Former Head Food Research Unit, Deputy Director (Research) Department of Agriculture, Visiting lecturer, Food Processing Consultant

Cassava is believed to have originated in South America. It is known by the name "Yuca" in those regions and is a widely cultivated crop in all tropical countries. Expected for cold climatic regions it has spread everywhere in Sri Lanka. Cassava is cultivated in this country as a home garden crop as well as a farmer field level crop. Although there are many cassava varieties, the Department of Agriculture has recommended only a few. Among these varieties MU 51, CARI 555 and kirikawadi are the most popular and widely spread varieties among farmers. The harvesting of these varieties can be done within a time frame of 6- 12 months. The yield of these varieties has a harvest potential between 35-75 metric tons per hectare. In terms of cooking qualities, these varieties are endowed with high quality attributes.

When harvesting cassava the harvest should be gathered in a way that does not damage the cassava tuber. The main factor for this is that on increase in the production of toxins is seen damage tubers. Cassava tuber contains two types of cyanogenic glucosides. They are two glucosides, linamarin and lotaustralin. When cassava tubers are damaged the enzyme called linamerase containing those tubers acts upon the aforementioned cyanogenic glucosides and produces the toxin called hydrogen cyanide. Ingestion of this causes harmful conditions to the body. Researchers have found that if the cyanide toxin contained in cassava varieties is less than 50 milligrams of Cyanide per kilogram of cassava tuber that cassava is not toxic to the human body, if it is between 50 and 100 milligrams of Cyanide it has moderate toxicity and if it is more than 100 milligrams of cyanide it is highly toxic. It has been

formed that the amount of Cyanide contained in the tubers of all the varieties recommended by the Department of Agriculture cultivated in Sri Lanka is less than 50 mg per kilo of tuber. Therefore it should be maintained that consuming their tubers does not cause a harmful condition to the body. When cooking the tubers by boiling them with the lid removed even this minimal toxic can be removed. Cassava tubers contain about 62% water and about 35% carbohydrates. Considering cassava in terms of protein it has an amount between 1 - 2% and the tuber has a very low value in protein nutrition. The fat content is about 0.3% while it contains about 1% minerals. Of the carbohydrate contained in cassava a higher percentage is starch. Of Minerals contained in cassava tubers a higher percentage is phosphorus and iron while there is a low amount of calcium. Cassava is rich in vitamin C while has a very low amount of niacin and vitamin A. Considering the nutritional value when consuming cassava as a meal, it is important to include protein rich foods for that meal as well.

In Sri Lanka the cassava crop has become popular for consumption by boiling as curry. Food product manufacturers using this are seen in our country in very small quantities. Recently cassava chips or snacks have been becoming popular in our country and this is also seen commonly in the market. Cassava roots can be processed into a wide variety of value added products including flour, starch, fermented foods, snack products, industrial raw materials and animal feed ingredients. Consequently cassava has considerable potential for value addition, income generation and rural industrial development.

Cassava Gari

Gari is one of the most widely consumed cassava based foods in West Africa and is produced through a controlled fermentation process. Fresh cassava roots are peeled, washed and grated to obtain a fine pulp. The pulp is subsequently subjected to fermentation during which desirable biochemical and microbiological changes occur. Fermentation serves several important functions including the improvement of flavour, enhancement of keeping quality, reduction of undesirable constituents and development of characteristic sensory properties. Following fermentation the pulp is pressed to remove excess moisture and then sieved to obtain the uniform particle size. The fermented material is roasted to produce the granular product known as Gari. Gari is commonly consumed by mixing it with water, sugar, milk or other ingredients and is also utilized in the preparation of various traditional foods.

Cassava Flour

Cassava roots are washed thoroughly to remove mud and soil. Roots are peeled and cut into thin slices. These slices are dried under sun or mechanical dehydrators. Dried slices are ground into flour to obtain cassava flour. The cassava flour can be used in various food products preparation. Cassava flour can partially replace wheat flour in bakery products and other food products. It can be used in the preparation of extruded products,

rotti and pittu. Proper drying and storage important to maintain the quality and self life of the flour.

Cassava Chips

Cassava chips prepared by peeling, slicing them into the thin pieces. These pieces are washed thoroughly to remove starch. Slices are partially dried under sunlight or by mechanical dryer. Dried slices are deep fat fried until golden brown colour is appeared. Fried slices are mixed with spices and other ingredients to improve



the flavor and taste. Proper packaging is required to extend the shelf life of chips.

Cassava Starch

Cassava starch is obtained from cassava roots and is one of the most important value added products derived from cassava. After extraction and purification, the starch can be used many industries. Cassava starch is valued because of its whiteness, purity and functional properties.

Uses of cassava starch

Cassava starch is used in both food and non-food industries. China, Japan, Thailand and Taiwan are the major cassava starch producing countries in the world. Most of the prepared starch products are exported to other countries by them.

Uses of Cassava starch in food industries.

Cassava starch is used:

- As thickening agent in soups, sauces and similar products
- As a filler in various food products.



- As a binder, helping ingredients hold together in process products, confectionery products, sausages, bakery products and sauce industries
- As a stabilizer, helping maintain the desired texture and consistency of food
- In bakery products at level of about 5 - 15% depending on products and formulation, specially biscuit and cream biscuits.
- In the manufacture of liquid glucose and related sweetener products
- In the production of monosodium glutamate(MSG)
- Manufacture of glucose
- In caramel and confectionery products where starch contributes the colour and texture.

None food in industrial uses of cassava starch

Cassava starch also used for the production of non Food industries

- Adhesives(Glues)
- Wallpaper manufacturing
- Well-drilling operation
- Textile industry
- Wood furniture industry
- Remoistening gum
- Foundry Industry
- Cardboard industry
- Paper industry
- Pharmaceutical products
- Cosmetic industrial application

Cassava starch is therefore a valuable industrial raw material with the wide range of applications.

Production of alcohol from Cassava

Cassava can also be used for the production of alcoholic beverage and industrial alcohol. The starch

present in cassava first converted into fermentable sugars. These sugars are then fermented using yeast. This process is similar to the production of alcohol from other starchy raw materials.

Production of animal feed from Cassava

Cassava roots, leaves and processing by products can be used in animal feed. Cassava provides a good source of energy for livestock. However, because cassava is relatively low in protein, feed formulations are usually supplemented with protein - rich ingredients to produce a balanced animal feed.

The development and promotion of cassava-base value-added products can enhance farmer incomes, reduce post harvest losses, create employment opportunities and contribute to rural economic development. Furthermore, the diverse application of cassava starch in both food and non-food industries demonstrate its considerable commercial potential. Therefore increased research, processing and commercialization of cassava products can make significant contribution of agriculture diversification, food security and economic growth in Sri Lanka and other tropical countries.

DEVELOPMENT OF LEGUME-BASED GLUTEN-FREE VEGAN SAUSAGE



A Nutritious and Sustainable Plant-Based Food Innovation



WHAT IS VEGAN SAUSAGE?

Vegan sausage is a plant-based alternative to traditional meat sausages. This research focused on developing a gluten-free vegan sausage using legumes such as chickpea, green pea, cowpea, and soybean. The product was designed to provide a healthy, high-protein, and sustainable food option for vegetarian and health-conscious consumers.



DOES IT POSSIBLE?

Yes, it is absolutely possible to develop a nutritious and acceptable vegan sausage using locally available legumes. The research successfully produced a gluten-free sausage with good texture, flavor, color, and overall consumer acceptability. Natural ingredients such as beetroot were used to improve color, while spices enhanced the sensory quality of the product.



WHAT ARE THE REQUIREMENTS OF VEGAN SAUSAGE?

The development of vegan sausage requires protein-rich legumes, plant-based binders, natural seasonings, and suitable processing methods. Key raw materials used in this research included chickpea, cowpea, green pea, soybean, corn starch, onion, garlic, cumin, black pepper, chilli powder, chilli flakes, salt, coconut oil, and beetroot as a natural colorant. Vacuum packaging and refrigeration were used to maintain product quality and shelf life.



NUTRITIONAL PROFILE

The developed vegan sausage contains high levels of plant protein, dietary fiber, and essential nutrients from legumes. It is completely gluten-free and contains no animal-derived ingredients, making it suitable for vegans and consumers with gluten intolerance. Compared to traditional meat sausages, this product provides a healthier alternative with lower environmental impact.



FUTURE POTENTIAL

The research demonstrates strong potential for developing value-added plant-based meat alternatives in Sri Lanka. With increasing consumer demand for healthy and sustainable foods, vegan sausages can become popular in supermarkets, restaurants, and hotels. Further improvements in texture, flavor, and commercial-scale production can support future market expansion and innovation in the food industry.

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GREEN PEA



COWPEA



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VEGAN



GLUTEN
FREE



HIGH IN
PROTEIN



SUSTAINABLE
CHOICE



**DELICIOUS
— HEALTHY —
SUSTAINABLE**

KEY BENEFITS

- ✓ High-quality plant protein
- ✓ Rich in dietary fiber and essential nutrients
- ✓ No cholesterol
- ✓ Lower environmental impact
- ✓ Suitable for vegans and health-conscious consumers
- ✓ Gluten-free and lactose-free



R.P.D.M. Randeniya

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Hibiscus Jam Innovation

from flower to functional food



By Krishnan Kogilananthan

Department of Technology
College of Technology, Kandy



Introduction

With increasing demand for natural and functional foods, **hibiscus** (*Hibiscus sabdariffa*) petals were utilized to develop a vibrant, **nutrient-rich jam**. This study transforms **floral resources** into a value-added, marketable product with attractive sensory and health benefits.



Formulation & Processing

- Hibiscus petal extract
- Sugar
- Pectin
- Citric acid

The mixture was heated to the required °Brix, hot-filled into sterilized bottles, and sealed to ensure quality and shelf stability.



Why It Stands Out?

- ✓ Natural plant-based ingredients
- ✓ No artificial color additives
- ✓ Functional & antioxidant-rich
- ✓ Sustainable value-added product



Conclusion

Hibiscus petals can be successfully developed into a high-quality jam with strong commercial potential, promoting **sustainability** and innovative food product development.



Innovation

Fresh hibiscus petals were carefully selected, washed, and heat-processed to extract their **natural red pigment and flavor**. The formulation was optimized to achieve desirable gel consistency, color retention, and taste balance.



Sensory & Nutritional Value

- ✓ Deep red natural color
- ✓ Pleasant floral aroma
- ✓ Sweet-tangy flavor
- ✓ Smooth, spreadable texture

Rich in antioxidants (anthocyanins), Vitamin C, and polyphenols — supporting overall health and wellness.



Artificial Intelligence in Food Development

Introduction

Artificial Intelligence (AI) is transforming the food industry by making food production faster, safer, more efficient, and more sustainable. AI refers to computer systems that can analyze large amounts of data, recognize patterns, make predictions, and assist in decision-making. In food development, AI is used throughout the entire food supply chain from agricultural production and product formulation to manufacturing, quality control, packaging, distribution, and consumer engagement.

AI in Product Development and Recipe Formulation

One of the most important applications of AI in food science is the development of new food products. Traditional product development often requires extensive experimentation, which can be expensive and time-consuming. AI can analyze thousands of ingredient combinations and predict their effects on flavor, texture, aroma, nutritional value, and shelf life.

By analyzing consumer preferences, market trends, and nutritional databases, AI can recommend optimal recipes that satisfy customer demands. This significantly shortens the research and development process and increases the likelihood of commercial success.

For example, AI can help develop:

- Reduced-sugar beverages with the same sweetness perception
- Low-fat dairy products with improved texture
- Plant-based meat alternatives that closely resemble real meat
- Functional foods enriched with vitamins, minerals, or probiotics

AI for Personalized Nutrition

Personalized nutrition is an emerging field where dietary recommendations are tailored to an individual's health status, lifestyle, age, and genetic profile. AI can process complex health data and generate customized meal plans that support specific health goals such as weight management, diabetes control, or cardiovascular health.

Mobile applications and wearable devices collect data on physical activity, calorie intake, blood glucose levels, and sleep patterns. AI analyzes this information to provide personalized dietary advice and suggest healthier food choices. This approach helps consumers make informed decisions while promoting preventive healthcare through nutrition.

AI in Food Quality Control

Maintaining consistent food quality is essential for consumer satisfaction and regulatory compliance. AI-powered computer vision systems equipped with high-resolution cameras can inspect food products much faster and more accurately than manual inspection.

These systems detect:

- Surface defects
- Color variations
- Size inconsistencies
- Foreign materials
- Packaging defects

Machine learning algorithms continuously improve detection accuracy by learning from previous inspection data. This reduces human error and ensures that only products meeting quality standards reach consumers.

- Functional snacks

This data-driven approach enables manufacturers to launch products that better meet market demand.

Challenges of AI in Food Development

Despite its many advantages, implementing AI in the food industry presents several challenges:

- High initial investment costs
- Need for skilled personnel and technical expertise
- Data privacy and cybersecurity concerns
- Dependence on high-quality and accurate data
- Integration with existing manufacturing systems

Small and medium-sized food enterprises may face financial and technical barriers when adopting AI technologies.

Conclusion

Artificial Intelligence is revolutionizing food development by enhancing innovation, improving food safety, reducing waste, and increasing production efficiency. Its ability to analyze vast amounts of data enables faster product development, better quality control, personalized nutrition, and more sustainable manufacturing practices.

As AI technologies continue to evolve, they are expected to play an even greater role in addressing global challenges such as food security, climate change, and growing consumer demand for healthy and sustainable foods. The integration of AI into food science represents a major step toward the future of the global food industry.



A.E Rajakaruna

Bachelor of Technology (B.Tech) in food process Technology
Visiting Lecturer.

Best Wishes From The Author

SENARATH EKANAYAKE

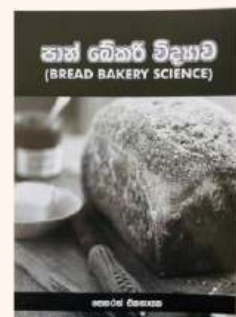
FOOD PROCESSING CONSULTANT



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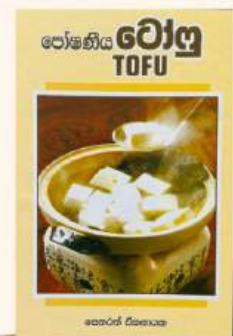
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GLUTEN-FREE PROTEIN CRACKERS

Developed using sweet potato, lentils, and rice flour for a healthier functional snack



1. INTRODUCTION

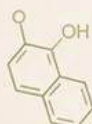
The growing prevalence of gluten intolerance and celiac disease has driven a global shift towards gluten-free and healthier snack alternatives. Consumers are increasingly seeking products that are not only safe but also nutritious, functional, and made from wholesome ingredients.

*Wholesome ingredients.
Better living.*



2. NUTRITIONAL BENEFITS

Sweet potato is rich in dietary fiber and beta-carotene, supporting digestive health and immunity. Lentils provide plant-based protein, essential amino acids, and minerals. Rice flour serves as a naturally gluten-free base, offering good digestibility and energy.



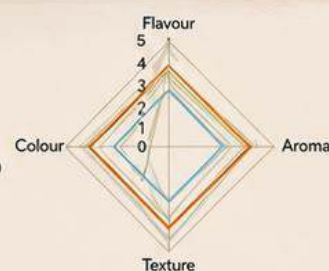
3. PRODUCT DEVELOPMENT

Sweet potato was cooked and mashed, lentils were prepared into a smooth paste, and blended with rice flour and natural seasonings. The dough was rolled, cut, and baked to create crisp, flavorful crackers with enhanced nutritional value.



4. SENSORY EVALUATION

Crackers were evaluated for colour, flavour, texture, and aroma by a panel of semi-trained assessors. Among all formulations, Sample S90 received the highest overall acceptance, excelling in flavour, aroma, and crisp texture, making it the preferred choice.



5. FUTURE FOOD INNOVATION

This study demonstrates the potential of combining locally available ingredients to create gluten-free, protein-rich snacks that align with modern health trends. Such innovations promote better nutrition, support local agriculture, and contribute to a more sustainable and inclusive food future.



**H.M. Tharushi
Pramodya Wijekoon**



Higher National Diploma
In Food Technology



College Of
Technology - Kandy



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A TASTY SOLUTION FOR COOKED RICE WASTE

DEVELOPMENT OF BISCUITS USING SAVING RICE (LEFTOVER COOKED RICE)



I.M.D.C Ilanganthilake
Higher National Diploma in
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In my opinion, food waste has become a serious global problem, especially in Asian countries where rice is the main staple food. Every day, large amounts of cooked rice are discarded from homes, hotels, and restaurants. To reduce this waste, I believe that producing saving rice biscuits using leftover cooked rice is an innovative and practical solution. Biscuits are one of the most popular snack foods because they are tasty, affordable, easy to carry, and have a long shelf life. Most traditional biscuits are made mainly from refined wheat flour, which contains lower amounts of fiber, vitamins, and minerals. Therefore, I think using leftover rice as an alternative ingredient provides both nutritional and environmental benefits.

To prepare saving rice biscuits, leftover cooked rice can be dried and ground into flour. This rice flour can then be mixed with ingredients such as desiccated coconut, eggs, sugar, baking powder, sago seeds, and a small amount of wheat flour to make crispy and delicious biscuits. In my view, one of the biggest advantages of this product is reducing food waste and supporting sustainable food production. Rice is rich in complex carbohydrates



that provide energy and also contains vitamins such as B1 and B3. Desiccated coconut further improves the nutritional value by adding fiber, healthy fats, and

minerals. In addition, rice flour is naturally gluten-free, making these biscuits suitable for people with gluten sensitivity when prepared with minimal wheat flour.

I also believe that saving rice biscuits provide several health benefits. They help reduce unnecessary food wastage while supplying long-lasting energy for children, students, athletes, and working adults. The dietary fiber from rice and coconut supports healthy digestion and may help prevent constipation. Desiccated coconut contains lauric acid, which may help maintain cholesterol balance and support heart health. Furthermore, the combination of rice, coconut, and eggs provides carbohydrates, proteins, healthy fats, vitamins, and minerals in one nutritious snack.

Another important advantage is the good shelf life of these biscuits. Because of their low moisture content, they remain crispy and resistant to spoilage for a longer time. Proper packaging using moisture-proof laminated aluminum pouches helps protect the biscuits from moisture and microbial contamination. Economically, I think this innovation can reduce dependence on imported wheat flour and lower production costs. Small-scale entrepreneurs and bakeries can also use leftover rice to create value-added products with good market potential. As consumers are becoming more interested in healthy and environmentally friendly foods, I believe saving rice biscuits can become a sustainable, nutritious, and affordable snack option for the future.



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College of Technology – Kandy

plant based frozen dessert using coconut milk and ginger with a chocolate coating

A Healthy Dairy-Free Frozen Dessert

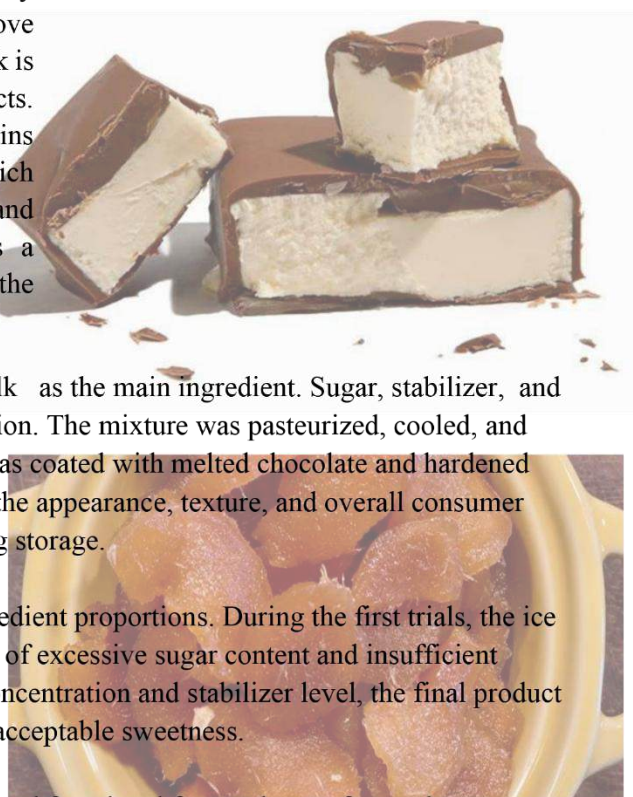
Today, many consumers are searching for healthier and plant-based food products. Ice cream is one of the most popular frozen desserts worldwide, but traditional dairy ice cream may not be suitable for lactose-intolerant or vegan consumers. Therefore, food researchers are developing innovative frozen desserts using natural plant-based ingredients with added nutritional and functional benefits. One successful idea is the development of plant-based ice cream using coconut milk and ginger with a chocolate coating.

Coconut milk is widely used as a dairy alternative because of its rich creamy texture and pleasant flavor. It contains healthy fats, antioxidants, vitamins, and minerals that help improve energy supply and support body metabolism. Coconut milk is also suitable for people who cannot consume dairy products. Ginger is another valuable ingredient because it contains bioactive compounds such as gingerols and shogaols, which are known for their antioxidant, anti-inflammatory, and digestive health benefits. In addition, ginger provides a unique spicy flavor that enhances the sensory quality of the product.

The plant-based ice cream was prepared using coconut milk as the main ingredient. Sugar, stabilizer, and honey ginger pieces were added according to the formulation. The mixture was pasteurized, cooled, and churned in an ice cream machine. Finally, the ice cream was coated with melted chocolate and hardened under frozen conditions. The chocolate coating improved the appearance, texture, and overall consumer acceptance while also helping to protect the product during storage.

Several product trials were carried out using different ingredient proportions. During the first trials, the ice cream showed rapid melting and high Brix values because of excessive sugar content and insufficient structural stability. However, after optimizing the sugar concentration and stabilizer level, the final product achieved better texture, improved melting resistance, and acceptable sweetness.

This plant-based ice cream can be introduced as a healthy and functional frozen dessert for modern consumers. It is especially suitable for lactose-intolerant individuals, vegans, and health-conscious consumers who prefer dairy-free alternatives. In addition, the product creates new market opportunities for plant-based frozen desserts while supporting the growing demand for sustainable and nutritious food products..



Sweetcorn and Chickpea Flour Biscuits with Spicy Flavor



Thanuri Senanayake
Division of Food Technology
College of Technology Kandy

I have successfully created a spicy biscuit using sweetcorn and chickpea seeds flour. Sweetcorn seeds flour is the main ingredient used for this study. Additionally, chili powder was added to get the spicy flavor.

Sweetcorn (*Zea mays*) is a nutrient-rich food that provides various essential vitamins, minerals, and antioxidants. In terms of macronutrients, sweetcorn contains carbohydrates including sugars like glucose and sucrose. It also provides protein with essential amino acids.

Chickpeas (*Cicer arietinum*) are also nutrient-rich food, packed with essential vitamins, minerals. They're an excellent source of plant-based protein and rich in carbohydrates, fiber and healthy fat.



These biscuits were produced using several processing methods to ensure the quality and safety of the product. Firstly, Fresh quality sweetcorn and chickpea seeds were selected and were cleaned thoroughly. Then drying, grinding was done and made sweetcorn and chickpea flour. This sweetcorn and chickpea flour was added in to the other ingredients and mixed, dough prepared and cut in to shape then was baked in the oven according to a specified temperature and biscuits were made. Later, the biscuits were packed well.

After the sensory evaluation was conducted to select the most suitable sample after the process of making product. This product as a ready to eat product. And it is useful product in busy world.

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Brewing Sustainability with Roasted Date Seeds



Minna Ansar
Department of Food Technology
College of Technology-Kandy

Coffee is one of the world's most popular beverages. However, not everyone can consume caffeine regularly. This study introduces an innovative coffee alternative made from roasted date seeds, offering a sustainable, caffeine-free beverage with a familiar coffee-like taste.

From Waste to a Sustainable Beverage

Date seeds, usually discarded as food processing waste, were cleaned, dried, roasted, and ground into a fine powder. Controlled roasting enhanced the color and aroma, resulting in a coffee-like profile. The powder is naturally caffeine-free, low in acidity, and rich in antioxidants and dietary fiber, making it suitable for children, elderly individuals, and pregnant women.

Date seeds were collected from high-quality fruits, washed, soaked, and solar-dried.

The dried seeds were roasted to enhance flavor and aroma similar to coffee. The roasted seeds were finely ground and sieved repeatedly to achieve uniform particle size. The powder was formulated with sugar and milk powder to develop a ready-to-prepare beverage mix. Hot water was added to prepare the drink, which was stored under refrigerated conditions.

The developed product is a ready-to-drink cold beverage that can be consumed chilled without brewing. Sensory evaluation exhibited a pleasant brown color, mild roasted aroma, smooth mouthfeel, and acceptable taste, closely resembling conventional cold coffee. The product showed good consumer acceptability, particularly among individuals seeking caffeine-free beverage.

Roasted date seed powder was successfully used to develop a sustainable, caffeine-free cold coffee alternative. By converting agricultural waste into a value-added product, it promotes sustainability while providing a nutritious beverage rich in health benefits. This innovative formulation has strong potential for the ready-to-drink and functional beverage market.

Ingredients

- Roasted date seed powder
- Milk powder
- Sugar

Why This Beverage Stands Out

- Naturally caffeine-free
- Coffee-like flavor and appearance
- Supports sustainable food production
- Rich in antioxidants and dietary fiber
- Low acidity, gentle on digestion

SWEET INNOVATION IN A JAR

A Delicious Fusion of Potato and Orange



Pakiyanadhan Krishanthani
Department of Food
Technology
College of Technology, Kandy



IT LOOKS LIKE.....

SMOOTH, GLOSSY, AND RICH ORANGE IN COLOR, THIS JAM SPREADS EASILY AND DELIGHTS THE SENSES WITH ITS CITRUS AROMA AND BALANCED SWEETNESS-A PERFECT BLEND OF INNOVATION AND TRADITION IN EVERY SPOONFUL.



A New twist on Tradition
Jam is a beloved preserve known for its sweetness, glossy texture, and fruity aroma. In this innovative study, a unique jam made from potato and orange was developed – combining the smooth, starchy base of potato with the refreshing tang of orange. The result is a jam that's creamy, flavorful, and beautifully golden, offering a fresh take on traditional favorite.

Processing method

- ✚ Selection of raw materials. (Potato, Orange)
- ✚ Washing and cleaning.
- ✚ Preparation of raw materials.
- ✚ Mixing.
- ✚ Cooking to 65-68 Brix.
- ✚ Hot Filling into Sterilized jars.
- ✚ Sealing, Cooling and storage.

Potato pulp was used to enhance body and texture, while orange pulp added brightness, natural acidity, and a burst of vitamin C. This balanced combination produced a jam with excellent spread ability, appealing color, and a pleasant fruity aroma. This product demonstrates how locally available crops like potato and orange can be combined to create nutritious and value-added products. The development of this jam promotes sustainability, affordability, and creative product diversification.



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Suneth Hemantha
Proprietor

PEANUT BASED GARLIC MAYONNAISE



Peanut based garlic mayonnaise is a unique, plant-based spread made by blending roasted peanuts with garlic. It offers a creamy texture, rich nutty flavor and a mild garlic aroma. This innovative mayonnaise provides a healthier alternative to traditional egg-based mayo, being high in protein and natural oils.

This innovative peanut-based garlic mayonnaise is a plant-based alternative to traditional egg mayonnaise, ideal for vegans and lactose-intolerant consumers. Peanuts provide a rich base, delivering protein, healthy fats, and vitamin E, while garlic adds antioxidants and a bold, savory flavor. Two flavor variants low and high garlic are developed to suit different preferences.

To enhance functionality and shelf life, natural ingredients are used and vitamin E acts as an antioxidant to prevent rancidity. Vinegar is included to lower the pH and function as a natural preservative. The product is best stored room temperature.

Ingredients

- Peanuts
- Garlic
- Oil
- Vinegar
- Salt



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About the Product

The Caffeine-Free Functional Milk Beverage is an innovative drink developed using roasted Ceylon almond seeds as a natural coffee substitute. This beverage combines the richness of milk with the roasted flavor of almond seeds to create a healthy, caffeine-free alternative to traditional coffee. It is designed for individuals who want to enjoy a coffee-like experience without the negative effects of caffeine.

Importance of It

With increasing health concerns related to caffeine consumption such as insomnia, anxiety, and heart issues, there is a growing demand for natural alternatives. This beverage provides a solution by using locally available Ceylon almond seeds, promoting both health and sustainability. It also supports the development of functional foods that offer additional nutritional benefits beyond basic nutrition.

A CAFFEINE-FREE FUNCTIONAL MILK BEVERAGE USING CEYLON ALMOND SEEDS

Method

First, Ceylon almond seeds are cleaned and dried properly. Then, the seeds are roasted at a controlled temperature until they develop a dark brown color and coffee-like aroma. After roasting, the seeds are ground into a fine powder.

Fresh milk is heated, and the almond seed powder is added in measured quantities. Sugar is added for taste, and the mixture is thoroughly blended. Finally, the beverage is filtered (if necessary), cooled, and served as a ready-to-drink product.

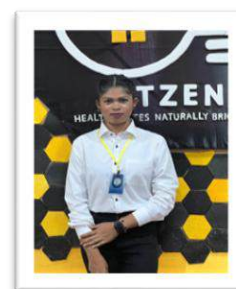
Ingredients

- Ceylon almond seed
- Sugar
- Milk

Advantages for Consumers and Businesses

- Provides a caffeine-free alternative to coffee
- Rich in nutrients such as proteins, healthy fats, and antioxidants
- Suitable for people with caffeine sensitivity
- opportunity to introduce a unique functional beverage
- Utilization of locally available raw materials
- High market demand for healthy and natural drinks

The Ceylon almond seed-based milk beverage is a promising caffeine-free alternative to coffee. With its appealing sensory qualities and health benefits, it has strong potential in the functional beverage market. This product not only meets consumer demand for healthier options but also supports sustainability and local resource utilization.



- K.D.T.C. Athukorala
- Department of Food Technology
- College of Technology Kandy

DELIGHTING YOUR TASTE BUDS WITH MORINGA CHOCOLATE CHIP COCONUT ICE CREAM



Rajendran Sharmila
Department Of Food Technology
College Of Technology Kandy



Moringa Chocolate Chip Coconut Ice Cream – is an innovative fusion dessert that combines the nutritional benefits of moringa leaves powder with the rich flavor of chocolate chips and the creamy texture of coconut milk. This unique ice cream offers delicious and nutritious alternative to conventional frozen desserts, providing essential nutrients, antioxidants, and an enjoyable taste.

A Tasty and Nutritious Moringa Ice Cream Treat

This ice cream mixes moringa (the 'miracle green') with chocolate chips and coconut milk. Moringa gives vitamins and protein for strong bones, better digestion, and glowing skin. Chocolate adds a sweet crunch, and coconut milk makes it creamy and smooth.



Method of Preparation

Fresh Moringa leaves were washed and dried at 50°C for 4-6 hours before being ground into a fine powder. Fresh coconut milk was extracted and mixed with sugar, salt, vanilla extract Cremodan, and moringa powder. The mixture was pasteurized, cooled, and aged to improve texture before being churned with chocolate chips. Finally, the ice cream was hardened at -18 °C and stored for sensory evaluation.



Benefits for Consumers and the Food Industry

Moringa Chocolate Chip Coconut Ice Cream offers a healthy, plant-based dessert for health-conscious and lactose-intolerant consumers. It uses locally sourced moringa and coconut, supporting sustainable farming and local economies. This product meets the demand for natural, eco-friendly, and nutritious frozen treats in today's market.

Nymphaea Seed Yogurt

What Is This Seed?

The water lily seed comes from the Nymphaea flower – yes, the beautiful floating bloom you've seen in ponds and water gardens. gets all the attention, the seed has been quietly centuries in Ayurvedic kitchens.

What it looks like: Tiny. Dark brown to almost black. Smooth surface. Tiny. Dark brown to almost black. Smooth surface. About the size of a peppercorn or smaller

What it tastes like: Slightly earthy. (Gentle of black tea). Not sweet. Not bitter. Just clean.



Opening Hook (Large drop cap) Imagine a yogurt that you blood or weigh down your spirit. That's the promise of Nymphaea – water lily seed yogurt.

While the world raves about Greek and coconut yogurts, an ancient Ayurvedic preparation has remained hidden in quiet ponds and temple kitchens.



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2023-2025 batch college of
technology Kandy.



What it is NOT: It is not a lot us seed (makhana). Lotus seeds are l puffy when roasted, and completely different. Don't confuse them

Ingredients

- Water Lily (Nymphaea)Seeds
- Milk
- Live Yogurt
- Gelatin
- Optional : Kithul Honey

What Is It.?

Water lily seed yogurt isn't a fermented set – set curd in the usual sense. Instead, it's a cooling, drinkable probiotic infusion made by blending ground Nymphaea seed into a plant or dairy milk base, then gently fermenting with traditional lactobacillus. The seeds don't thicken the yogurt alone they transform it, adding a subtle astringent note and potent medicinal qualities

Benefit How it Helps You

Cools body heat Less acidity, fewer rashes, less irritation Calm energy Bette focus, no crash
Happy stomach Gentle on IBS, diarrhea, sensitive gut light immunity Stronger without heaviness
Clear skin Reduces heat-induced breakouts
Better sleep Less restlessness, less irritability
Light feel No Mucus, no sluggishness



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DEVELOPMENT OF BIOCHARCOAL AND CHARCOAL MACHINE USING FOOD WASTE

Green energy from Food waste



Methodology

Bio-charcoal was produced through a controlled pyrolysis process, in which dried food waste materials were heated under limited oxygen conditions (300–600 °C). Prior drying reduced moisture content and improved conversion efficiency. The resulting char was cooled, collected, and prepared for direct use or briquetting.

Introduction

The increasing demand for domestic cooking fuel, rising fuel prices, and deforestation have intensified the need for sustainable, locally available energy alternatives. In Sri Lanka, large quantities of food and agricultural waste—such as banana peels, corn cobs, and household organic residues—are generated daily. Converting these materials into bio-charcoal provides a practical solution for waste management while supplying a cleaner cooking fuel.

This article presents the development of bio-charcoal and a small-scale charcoal production machine designed to utilize food waste as a renewable domestic energy source.

- Banana peels – widely available household waste with good carbonization potential
- Corn cobs – agricultural residue with low moisture after drying and favorable calorific value
- Household food waste – vegetable peels and kitchen residues

Charcoal Machine Development

A small-scale charcoal machine was fabricated using locally available metal components. The system consists of an enclosed carbonization chamber, controlled air inlets, and an exhaust outlet to regulate gaseous emissions. This configuration improves charcoal yield and minimizes smoke compared to traditional open burning.

Celebrate Differences

The bio-charcoal produced exhibited stable combustion, reduced smoke emission, and suitability for domestic cooking. When formed into briquettes, handling and storage characteristics were further improved

- Environmental and Socio-Economic Benefits
- Reduction of household organic waste
- Lower dependency on firewood and fossil fuels
- Reduced indoor air pollution
- Support for circular economy and small-scale entrepreneurship

Conclusion

The development of bio-charcoal and a compact charcoal production machine using banana peels, corn cobs, and household food waste demonstrates a sustainable and practical solution for domestic cooking fuel. The approach is technically feasible and holds strong potential for application in Sri Lanka and similar regions.



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