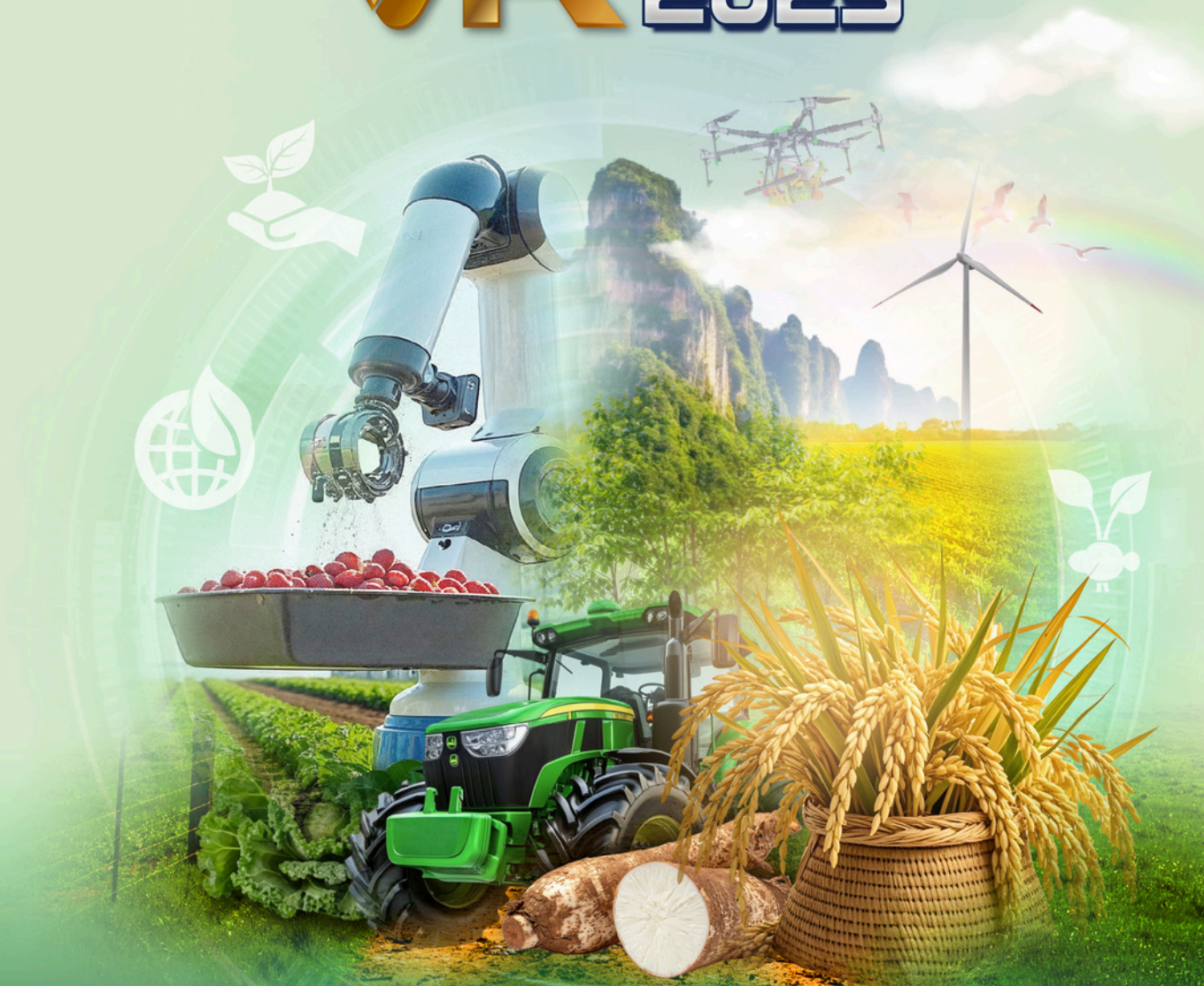
VENTURE RISE THAILAND 2025



INNOVATION CATALOG

AGRICULTURE, FOOD & ENVIRONMENT

Agriculture, Food & Environment

PiLeatha

BIO-LEATHER MADE FROM PINEAPPLE LEAF FIBER AND NATURAL RUBBER

Assoc. Prof. Taweechai Amornsakchai

Faculty of Science, Mahidol University

AGR-001

Highlight

Key features and Strengths

PiLeatha – Thailand's Bio-Leather Innovation for a Sustainable Global Future

PiLeatha is a 100% Thai-developed and manufactured bio-based leather alternative, created from pineapple leaf fibers and natural rubber, both renewable resources of Thailand. Using a proprietary technology, PiLeatha is produced as a single layer (monolayer) material in which the natural fibers are perfectly integrated within the rubber matrix. This unique structure provides exceptional strength, tear resistance, and durability, preventing peeling or cracking, and outperforming common synthetic leathers such as PU and PVC.

In addition to its durability, PiLeatha can be thermo-formed into 3D shapes, allowing designers to create embossed textures and functional patterns without the need for sewing or multi-layer assembly — a feature that highlights its distinctive design versatility.

Beyond innovation in materials, the production of PiLeatha supports agricultural waste reduction and builds a value-driven domestic supply chain—from local farmers and raw material producers to designers and creative manufacturers. This integrated approach forms part of the Thailand Sustainable Material Ecosystem, driving the green economy and positioning Thailand as a leader in next-generation sustainable materials.

PiLeatha is truly "Made in Thailand for the World" — a material that embodies Thai creativity, sustainability, and cultural identity, offering the global design industry a responsible, innovative, and eco-conscious alternative for the future.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Other Standards/Certifications (please specify):
The product is not required to be registered with the FDA, but it has undergone property testing in accordance with industry standards used in the leather industry.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

- The product is commercially available in Thailand (The product is offered in various forms depending on customer requirements and is produced in collaboration with business partners to create premium products for domestic distribution.)
- The product is also commercially available in international markets

(The product is listed on the online platform Etsy.com, with the retail price per unit ranging from approximately 1,400–1,900 THB, depending on the product type.)

ARTO ENZYME

FOR FUNCTIONAL FRUIT-BASED PRODUCTS

Prof. Dr. Supaart Sirikantaramas

Department of Biochemistry, Faculty of Science,
Chulalongkorn University

AGR-002

Highlight

Key features and Strengths

Arto Sucrose-Reduced Technology – Turning Natural Sweetness into Prebiotic Innovation

Arto Sucrose-Reduced Technology is an innovative process that reduces sugar content in fruits using a specialized enzyme system that converts sucrose into fructooligosaccharides (FOS) — a natural prebiotic complex carbohydrate that is not absorbed by the body but promotes the growth of beneficial gut bacteria, supporting digestive health and overall wellness.

This breakthrough technology is designed for use with a wide range of naturally sweet Thai fruits, including mango, banana, durian, and pineapple, while preserving the fruit's natural color, flavor, and nutritional value. The innovation opens new possibilities for developing functional and health-focused products, such as low-sugar beverages, prebiotic ice cream, and nutritious fruit-based snacks. It aligns perfectly with the modern consumer trend toward health, sustainability, and natural ingredients, while also helping increase the value of lower-grade fruits within local communities.

By turning surplus produce into high-value health products, Arto Sucrose-Reduced Technology promotes efficient resource utilization and supports Thailand's Bio-Circular-Green (BCG) Economy Model. This innovation exemplifies the powerful synergy between enzyme technology and health science, driving Thailand's future-ready food innovation toward a more sustainable and wellness-oriented future.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered and approved by the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation

Market Readiness

- The product is at the prototype stage but has not yet undergone market testing (dried fruit).
- The product is currently undergoing market testing (fruit puree).
- The product is already commercially available in Thailand (ice cream).

Retail Price

69–89 THB per unit.

Thai Rice Clay

CRAFT MODELING CLAY MADE FROM RICE FLOUR RUBBER

Asst. Prof. Dr. Jakkrapan Roopngam

Rajamangala University of Technology Krungthep

AGR-003

Highlight

Key features and Strengths

Thai Rice Clay – Affordable, Sustainable, and Perfect for Creative Artisans

Thai Rice Clay is an innovative handmade clay developed from a unique formula that differs from conventional clays on the market. It uses locally produced rice flour as the main ingredient — a readily available and cost-effective raw material compared to other imported starches.

The clay is made from a simple yet effective blend of rice flour, glue, and beeswax, processed through a carefully designed method to create a material that is smooth, soft, flexible, and shape-retentive. It features a natural white matte tone and can be rolled into thin sheets for fine detailing. Once molded, it air-dries and hardens without the need for heat, making it both energy-efficient and easy to use.

With characteristics comparable to high-end Japanese craft clays, this rice flour-based clay offers a more affordable and sustainable alternative for artists, hobbyists, and small manufacturers. It is ideal for flower crafting, doll making, decorative art, and other handmade creations, supporting local creativity while promoting eco-friendly and value-added use of Thai agricultural resources.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Other Standards/Certifications (please specify):
Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation

Market Readiness

The product is commercially available in Thailand (Please specify the retail price per unit: 60 THB)

WaterCube

INNOVATIVE UNDERGROUND RAINWATER STORAGE FOR FLOOD AND DROUGHT RESILIENCE

Asst. Prof. Dr. Polpat Nilubon

Rajamangala University of Technology Thanyaburi

AGR-004

Highlight

Key features and Strengths

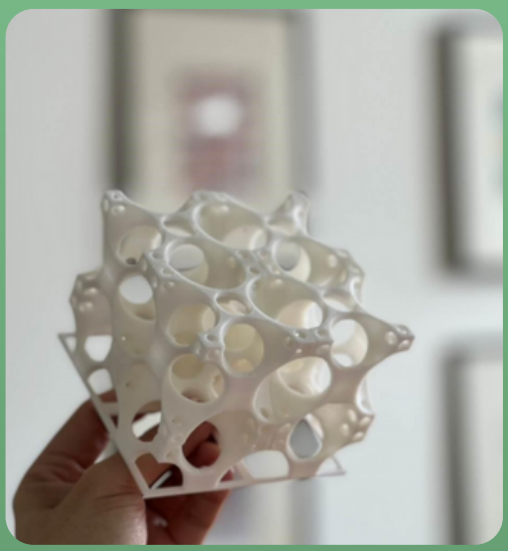
WaterCube – Smart Underground Rainwater Storage for Sustainable Urban Water Management

WaterCube is an innovative underground rainwater storage system designed to provide a sustainable solution for urban water management. It effectively addresses both flooding and drought challenges, ensuring efficient water use and climate resilience for modern cities. The system is easy to install, space-saving, and fast to deploy, making it ideal for dense urban environments where space and time are limited.

At the heart of WaterCube is its parametric modular structure — a lightweight, geometrically optimized design that ensures high drainage capacity and strong ground load resistance. Its flexible modular system allows for easy expansion and customization, supporting installations that range from household and community use to large-scale infrastructure projects.

To further enhance sustainability, WaterCube can be produced using recycled materials or 3D printing technology, minimizing resource use and environmental impact. With a water retention efficiency of up to 95% and requiring only 5% of the unit volume in plastic material, it represents an optimized design for maximum performance and resource efficiency.

By combining engineering innovation, smart technology, and environmental responsibility, WaterCube delivers a durable, scalable, and eco-friendly water management system — a future-ready solution for smart and sustainable cities.



Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has not yet been transferred or commercially utilized.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing .

Triphala Gummy Jelly

Asst. Prof. Dr. Pharmacist Em-on Namhormchan

Rajamangala University of Technology Thanyaburi

AGR-005

Highlight

Key features and Strengths

Triphala Herbal Supplement – A Modern Take on an Ancient Ayurvedic Formula

Triphala is a traditional Ayurvedic herbal remedy made from three fruits — Indian Gooseberry (Phyllanthus emblica), Belleric Myrobalan (Terminalia bellirica), and Chebulic Myrobalan (Terminalia chebula). Known for its powerful antioxidant properties, Triphala has been used in India for centuries to promote overall health and well-being. Extensive scientific studies have confirmed its wide-ranging health benefits.

However, the original formula's naturally astringent taste often limits consumer acceptance. To address this, researchers have developed an innovative Triphala-based dietary supplement that combines Triphala extract with natural fruit juice, improving taste and making it enjoyable for people of all ages.

Using a simple, low-cost production process, the research team successfully created a Triphala gummy jelly that retains high nutritional value while offering a pleasant flavor and convenient consumption form. HPLC analysis revealed a high gallic acid concentration of 500 mcg/ml, highlighting its exceptional antioxidant potency.

Nutritional testing shows that this Triphala gummy provides lower energy content than conventional gummy products on the market, making it a healthier alternative for modern consumers. With its natural ingredients, high antioxidant content, and globally competitive quality and safety standards, this innovation presents a scalable and market-ready solution for the growing health and wellness industry.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has not yet been transferred or commercially utilized.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing .

PROTINOS

HIGH-PROTEIN NOODLE INNOVATION FOR STRONGER MUSCLES

Dr. Peerapong Ngamnikom and Dr. Siriluck Surin

Rajamangala University of Technology Thanyaburi

AGR-006

Highlight

Key features and Strengths

PROTINOS – High-Protein Dried Noodle for Active and Healthy Living

PROTINOS is a high-protein dried noodle product developed from scientific research to meet the needs of consumers seeking a healthy, protein-rich alternative for muscle building and maintenance. Designed for people who want both nutritional and meal variety, PROTINOS offers a modern solution for strength and wellness.

Made from egg white protein and soy protein, the noodles are produced using enzyme technology to achieve a smooth and chewy texture similar to traditional noodles. Each serving provides 20–30 grams of protein — equivalent to 5–8 egg whites — and contains 4,000–10,000 mg of Branched-Chain Amino Acids (BCAAs) that help support muscle growth and prevent muscle loss.

PROTINOS noodles come in two texture types: soft and elastic or firm and springy. They are low in fat, cholesterol-free, and contain fewer carbohydrates, making them a healthy, guilt-free choice. The noodles are easy to prepare — simply boil or soak in hot or cold water — without sticking together or requiring added oil. Their texture remains stable through various cooking methods, resisting sogginess or clumping.

With its simple preparation, balanced nutrition, and high-quality protein, PROTINOS appeals to a wide range of customers — from seniors, recovering patients, fitness enthusiasts, athletes, and weight-conscious individuals, to children with limited meat intake.

For business customers, PROTINOS offers strong potential for use in healthcare centers, elderly care facilities, hospital catering services, clean-food restaurants, vegetarian cafes, fitness centers, and health product stores — a scalable, high-performance innovation ready to serve the growing global demand for healthy and sustainable protein foods.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Non-exclusive technology transfer

Standards and Certification Status

The product has been registered with the FDA. Additional standards and certifications obtained: GHPs, HACCP, HALAL, ISO22000, FSSC22000)

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation

Market Readiness

The product is commercially available in Thailand

Retail Price

79 THB per unit

Thai Herbal Mucoadhesive Film and Mouthwash for Oral Wound Care

Asst. Prof. Dr. Pharmacist Em-on Namhormchan

Rajamangala University of Technology Thanyaburi

AGR-007

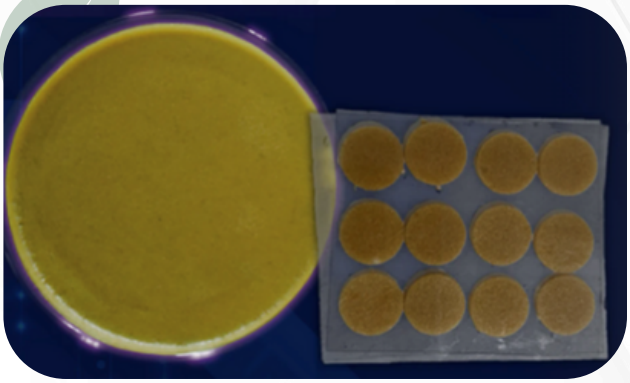
Highlight

Key features and Strengths

Herbal Mucoadhesive Film and Mouthwash for Oral Ulcer Relief

This innovative herbal oral care solution combines the healing properties of Clinacanthus nutans (Phaya Yor), mangosteen, aloe vera, and gotu kola to effectively treat mouth ulcers and oral wounds. The product is available in two user-friendly forms—a mucoadhesive film that adheres directly to the affected area and a herbal mouthwash for gentle, daily care.

Formulated to be safe, steroid-free, and suitable for all ages, this solution promotes faster healing while reducing pain and inflammation. It is cost-effective, easy to use, and designed for both home and clinical applications — a natural, reliable, and accessible alternative for oral health care.



Status and Potential of Research and Innovation

Current Status of Innovation Utilization

No technology transfer or commercial utilization has been implemented yet.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing

Automatic Water-Level Control System

FOR RICE FIELDS SAVING WATER AND REDUCING GREENHOUSE GAS EMISSIONS

Asst. Prof. Dr. Thanasin Bunnam

Rajamangala University of Technology Thanyaburi

AGR-008

Highlight

Key features and Strengths

Smart Water-Level Control System for Sustainable Rice Farming

This automated water-level control system is designed to optimize water use and reduce greenhouse gas emissions in rice cultivation. It supports the Alternate Wetting and Drying (AWD) farming method — a proven technique that can reduce water consumption by up to 63% and cut methane emissions by as much as 79%, while maintaining the same crop yield. The system also helps lower fertilizer and seed costs, ensuring food security amid declining water resources caused by global warming, while simultaneously mitigating climate change impacts.

The system uses non-contact water-level measurement technology, extending sensor lifespan and reducing maintenance needs. It integrates long-range wireless communication between field sensors, pump controllers, and a cloud-based management platform, allowing wide-area coverage with shared signal towers to reduce internet service costs.

Compact, portable, and affordable, this innovation is highly accessible to farmers and offers a scalable, cost-effective, and eco-friendly solution for modernizing rice production toward a smarter and more sustainable agricultural future.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Non-exclusive technology transfer

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is currently undergoing market testing.

BioBlend Plus

THAI PROBIOTICS ENRICHED WITH MULBERRY AND RICEBERRY GERM EXTRACTS

Assoc. Prof. Dr. Doungporn Amornlerdpison

Agri Inno, Maejo University

AGR-009

Highlight

Key features and Strengths

BioBlend Plus – Advanced Synbiotic Innovation for Holistic Gut Health

BioBlend Plus is an innovative synbiotic formulation that combines carefully selected probiotic strains with target-specific prebiotics derived from mulberry fruit and riceberry germ extract. This unique combination promotes the growth and activity of beneficial gut microorganisms, leading to the production of essential bioactive metabolites that help maintain a balanced gut microbiome. By supporting this natural balance, BioBlend Plus enhances digestive function, bowel regularity, immune strength, and helps reduce gastrointestinal infections, contributing to overall health and well-being.

Its effectiveness has been validated through metagenomic studies, confirming an increase in the diversity and population of beneficial gut bacteria, and metabolomic analysis, which identifies and quantifies key bioactive compounds responsible for these positive effects.

BioBlend Plus represents a next-generation health innovation, integrating biotechnology and nutrition science to deliver a safe, natural, and evidence-based solution for better gut health and long-term wellness.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

- The product has been registered with the FDA.
- Additional standards and certifications obtained: HACCP, GHP, and HALAL.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

- The product is commercially available in Thailand (https://shopee.co.th/bioblendprobiotics)
- The product is also commercially available in international markets (Europe: https://delifresheu.com/products/BioBlend+)

Cellogum™

TRANSFORMING BIO-WASTE INTO SMART FOOD ADDITIVES SOLUTIONS

Prof. Dr. Hathaikarn Manuspiya

The Petroleum and Petrochemical College, Chulalongkorn University

AGR-010

Highlight

Key features and Strengths

Cellogum™ – Sustainable Bio-based Additive for the Next Generation of Green Industries

Cellogum™ is an innovative bio-based additive derived from bacterial cellulose (Bio-Cellulose), produced through the advanced fermentation of agricultural and industrial organic residues. Using cutting-edge biotechnological processes, Cellogum™ achieves high purity and superior crystalline structure, making it a high-performance thickener, emulsifier, and stabilizer suitable for diverse applications in the food, cosmetic, and pharmaceutical industries.

Developed through a low-carbon production process, Cellogum™ helps reduce greenhouse gas emissions, minimizes the use of chemical agents, and decreases reliance on forest-based raw materials compared to conventional plant-derived additives. The result is a safe, non-toxic, and eco-friendly product that delivers equal or better performance than traditional additives such as Xanthan Gum, Pectin, and Carbomer, while requiring a smaller dosage—offering both cost efficiency and superior functionality.

Key Benefits of Cellogum™

- Excellent water retention and formulation stability
- High purity and contaminant-free
- High efficiency at low usage levels, reducing production costs
- Environmentally sustainable, supporting waste reduction and resource circularity

By transforming waste into high-value biobased materials, Cellogum™ exemplifies Thailand's commitment to green innovation and the Circular Bioeconomy. It offers a sustainable, scalable, and investment-ready solution for businesses seeking to advance toward eco-conscious and high-performance material innovation on a global scale.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Non-exclusive technology transfer

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is currently undergoing market testing.

Avagan Plant-Based Cheese

Mr. Kuekul Charoenwanwong

National Innovation Agency (Public Organization)

AGR-011

Highlight

Key features and Strengths

Avagan Plant-Based Cheese – Deliciously Healthy, Dairy-Free Innovation

Avagan Plant-Based Cheese is a premium dairy alternative made from cashew nuts, offering a rich source of essential amino acids that the body cannot produce on its own. It is completely lactose-free, gluten-free, and cholesterol-free, making it an ideal choice for health-conscious consumers and those with dietary restrictions.

With its smooth texture and naturally creamy flavor, Avagan delivers the taste and satisfaction of real cheese while supporting sustainable, plant-based living. It's a nutrient-rich, eco-friendly, and future-ready alternative for today's evolving food market.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Exclusive technology transfer

Standards and Certification Status

- The product has been registered with the FDA.
- Other standards/certifications obtained (please specify: US FDA)

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is commercially available in Thailand.

Nano-Liposome Encapsulation for Coffee Extracts in Cosmetic and Cosmeceutical Applications

Assoc. Prof. Dr. Nisakorn Saewan

School of Cosmetic Science, Mae Fah Luang University

AGR-012

Highlight

Key features and Strengths

Nano-Liposome Encapsulation Technology for Coffee Extracts in Cosmetic and Cosmeceutical Applications

This innovative encapsulation process transforms active compounds from coffee extract into nano-liposome form, enhancing their stability, absorption, and long-lasting effectiveness for use in cosmetic and cosmeceutical products. The process involves combining phosphatidylcholine, cholesterol, and coffee extract in ethanol, followed by evaporation, hydration, and high-pressure homogenization to produce stable nano-sized liposomes with superior encapsulation performance. The resulting coffee extract nano-liposomes demonstrate over 70% retention efficiency and over 60% loading capacity, ensuring that active ingredients remain potent and well-preserved. These nano-liposomes possess strong antioxidant and tyrosinase-inhibiting properties, helping to reduce skin aging, brighten complexion, and enhance elasticity. Their small particle size allows for controlled release and deeper skin penetration, delivering prolonged and effective results. In clinical testing with 30 male and female volunteers, the nano-liposome formulation showed greater skin-brightening and elasticity-improving effects than conventional coffee extract.

Key Advantages of the Technology:

- High stability and up to 70% encapsulation efficiency of active coffee compounds.
- Controlled release system for enhanced absorption and longer-lasting efficacy.
- Powerful antioxidant and anti-tyrosinase activity, promoting youthful, radiant skin.
- Ideal for integration into cosmetic and cosmeceutical manufacturing, offering sustainable and high-performance innovation for the beauty industry.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Nano-Liposome Encapsulation of Thai Rice Stem Cell Extract for Cosmetic and Cosmeceutical Applications

Assoc. Prof. Dr. Nisakorn Saewan

School of Cosmetic Science, Mae Fah Luang University

AGR-013

Highlight

Key features and Strengths

Thai Rice Stem Cell Nano-Liposome Technology for Advanced Skincare Applications

Rice stem cells possess powerful skin-rejuvenating and anti-aging properties, helping to brighten skin, stimulate cell regeneration, and restore youthful vitality. By developing these extracts into nano-liposome form, the technology enhances deep and rapid absorption of active ingredients, maximizing visible results and long-lasting performance.

The Thai Rice Stem Cell Nano-Liposome Extract demonstrates over 80% encapsulation efficiency and more than 60% loading capacity, ensuring high stability and effectiveness. Safety and efficacy have been confirmed through fibroblast cell culture tests (in vivo), skin irritation trials with human volunteers, and clinical evaluations of cosmetic formulations containing the extract.

Key Advantages of Technology:

1. Innovative process for producing Thai rice stem cell extract in nano-liposome form.
2. Nano-sized particles enhance stability and bioavailability.
3. Highly suitable for integration into cosmetic and cosmeceutical formulations.
4. Demonstrates strong antioxidant and anti-tyrosinase activities for prolonged action.
5. Reduces signs of aging and promotes brighter, more radiant skin.
6. Stimulates skin cell regeneration with proven safety and long-term effectiveness.

This sustainable and high-performance skincare innovation combines Thai agricultural biotechnology with advanced nanoscience, offering a future-ready solution for the global beauty and wellness industry.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Cordyceps Militaris Extract with Optimized Adenosine and Cordycepin Levels for Cell Regeneration

Asst. Prof. Dr. Sunita Chamyuang

School of Science, Mae Fah Luang University

AGR-014

Highlight

Key features and Strengths

Cordyceps Militaris Extraction Technology for Cell Regeneration and Tissue Repair

This innovation focuses on developing an optimized extraction process for Cordyceps militaris, yielding an extract with balanced levels of adenosine and cordycepin — two essential bioactive compounds that stimulate fibroblast cell proliferation, a key process in new tissue formation.

The extract is non-toxic to cells and effectively enhances cell migration and regeneration in laboratory studies. By precisely controlling the concentration of active ingredients, this process not only enhances the biological activity of the extract but also adds commercial value to Cordyceps militaris, making it suitable for use in pharmaceuticals, cosmeceuticals, nutraceuticals, and regenerative medicine.

Key Advantages of Technology:

1. Stimulates cell proliferation by up to 162%.
2. Non-toxic and safe for cellular applications.
3. Promotes tissue regeneration and wound healing.
4. Enhances cell migration by more than 60% within 12 hours.

This high-performance, biotechnology-driven innovation offers a scalable and future-ready solution for developing advanced health, cosmetic, and medical products that support cell recovery and tissue renewal.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Enriched with GABA and Prebiotic Properties through Mushroom Mycelium Cultivation

Asst. Prof. Dr. Sunita Chamyuang

School of Science, Mae Fah Luang University

AGR-015

Highlight

Key features and Strengths

Innovative Process for Producing GABA-Enriched, Prebiotic Rice Flour through Mushroom Mycelium Cultivation

This innovative rice cultivation process uses mushroom mycelium fermentation to produce GABA-enriched rice flour with natural prebiotic properties. The germinated rice is cultivated with mushroom mycelium, resulting in flour that contains 38.58±0.29 mg of GABA per 100 grams and demonstrates strong prebiotic activity beneficial to probiotic bacteria. Importantly, the rice grains maintain their structure after fermentation, allowing them to be further processed into flour or various rice-based products.

Compared with conventional germinated rice—such as germinated rice berry—this method offers significantly higher prebiotic potential, equivalent to inulin, the prebiotic compound widely used in the food and beverage industry. Moreover, the process enhances the levels of essential amino acids and fatty acids, making the final product more nutritious and functionally superior.

This technology provides a sustainable, high-performance bioprocess that adds value to Thai rice, creating opportunities for the functional food, nutraceutical, and wellness industries seeking next-generation plant-based ingredients.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

High-Protein
Crispy Mushroom Snack Enriched with Dietary Fiber

Asst. Prof. Dr. Phunsiri Suthiluk

School of Agro-Industry, Mae Fah Luang University

AGR-016

Highlight

Key features and Strengths

High-Protein Crispy Mushroom Snack Enriched with Pineapple Fiber

This innovative healthy snack is made from natural mushroom protein and dietary fiber extracted from pineapple residue, turning agricultural waste into high-value food ingredients. Developed through food science and advanced processing, the product offers a light, crispy texture, rich nutrition, and eco-friendly appeal.

Produced using a drum-drying process, the mushroom mixture is shaped into thin, crispy sheets that are easy to store and enjoy. Each serving provides 14.23 grams of protein per 100 grams, along with pineapple fiber, which serves as a natural prebiotic that supports gut health and digestion. The result is a low-calorie, high-protein snack that stands out from typical market products—perfect for health-conscious consumers and those seeking plant-based protein alternatives.

Key Advantages of Technology:

1. Uses locally sourced pineapple residue, adding value to agricultural by-products.
2. Delivers a healthy, fiber-rich snack that aids digestion without adding extra calories.
3. Provides an alternative plant-based protein option for vegans, vegetarians, and health enthusiasts.

This sustainable, high-performance innovation offers a new generation of functional snacks, combining nutrition, flavor, and environmental responsibility for the growing global health food market.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Pectin Hydrolysate from Coffee Cherry Peel

Asst. Prof. Dr. Sunita Chamyuang

School of Science, Mae Fah Luang University

AGR-017

Highlight

Key features and Strengths

Pectin Hydrolysate from Coffee Cherry Peel—A Value-Added Innovation from Chiang Rai's Arabica Industry

Chiang Rai is one of Thailand's largest producers of Arabica coffee. During coffee processing, more than 45% of the total fruit weight becomes by-products such as coffee peel and pulp, which are rich in sugars, pectin, and polysaccharides. The pectin extracted from coffee peel is naturally low in methoxyl content, making it suitable for further value-added development.

This research has successfully developed pectin hydrolysate from coffee cherry peel using pectinase enzymes to break down pectin molecules into smaller, water-soluble forms. The resulting product exhibits prebiotic properties and demonstrates effective inhibition of colon cancer cells. Laboratory studies show that the pectin hydrolysate can stimulate the growth of probiotic strains such as Pediococcus sp. and Lactobacillus casei more effectively than inulin.

The two-step extraction technology—combining acid and alkaline treatment followed by enzymatic hydrolysis—produces small-molecule, water-soluble pectin hydrolysate with proven prebiotic and anti-cancer properties. This innovation supports the food and beverage industry in developing functional ingredients, while also adding value to agricultural waste and promoting sustainable innovation from coffee by-products.

Key Advantages of Technology:

1. Applicable for functional food and beverage product development.
2. Pectin hydrolysate demonstrates a prebiotic index ≥ 1, promoting probiotic growth of Pediococcus sp. and Lactobacillus casei.
3. Shows 38% inhibition of colon cancer cell (SW480) proliferation.
4. Proven non-toxic to normal intestinal cells (CCD481CoN).

This sustainable, high-performance biotechnology not only supports health-focused product innovation but also enhances the value chain of Thailand's coffee industry, turning agricultural waste into a future-ready, eco-friendly ingredient for the global market.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Enzyme-Based Detection for Pesticide Contamination in Agricultural Products

Assoc. Prof. Dr. Kowit Nambunmee

School of Health Science, Mae Fah Luang University

AGR-018

Highlight

Key features and Strengths

Rapid Enzyme-Based Detection Technology for Pesticide Contamination in Agricultural Products

With the growing global demand for organic products, the need for reliable pesticide contamination testing has also risen significantly. This innovation introduces a user-friendly, standardized, and accessible detection system that enables producers, laboratories, and small enterprises to monitor pesticide residues efficiently and accurately.

The technology uses cholinesterase enzymes combined with spectrophotometric analysis to measure contamination levels across three intensity ranges based on concentration and reaction time. Designed with consideration of existing systems' strengths and limitations, this method ensures wide applicability, cost-effectiveness, and ease of use, making it suitable for both on-site testing and small-scale operations. Results are displayed as digital signals, providing fast and clear interpretations.

Key Advantages of the Technology:

1. Reduces testing time from 3–21 days to just one hour per sample.
2. Usable in small facilities without the need for complex equipment.
3. Compact and portable, ideal for fieldwork or remote areas.
4. Easy to operate by trained technicians or business operators.
5. Proven effectiveness in detecting pesticide contamination in agricultural products.

This innovation offers a high-performance, scalable solution for ensuring food safety, organic certification, and consumer trust, supporting the global shift toward sustainable and chemical-free agriculture.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Non-exclusive technology transfer

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Ethyl Cellulose
Based Paper Coating for Water-and Oil-Resistant Packaging

Assoc. Prof. Dr. Nattakan Soykeabkaew

School of Science, Mae Fah Luang University

AGR-019

Highlight

Key features and Strengths

Eco-Friendly Ethyl Cellulose Coating for Water- and Oil-Resistant Paper Packaging

Paper packaging made from plant-based fibers is a renewable and biodegradable material, widely used for making bags, pouches, cups, plates, and boxes. It is lightweight, durable, and impact-resistant, making it ideal for food packaging and transportation. However, conventional paper has poor moisture and oil resistance, limiting its use with liquid- or oil-based foods.

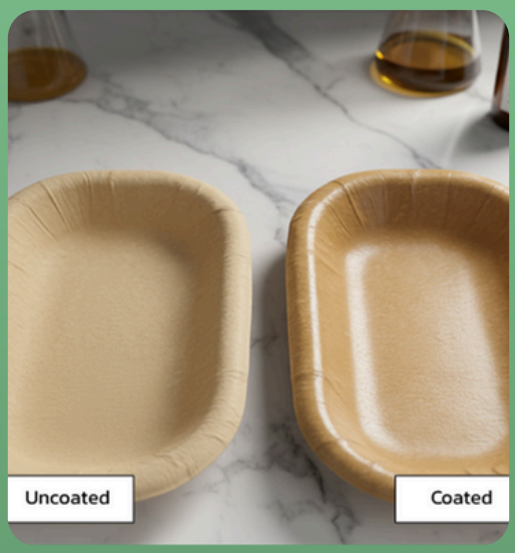
To address this challenge, manufacturers often add PFAS (Perfluoroalkyl Substances) as water-repellent agents. While effective, PFAS chemicals pose serious health and environmental risks. This innovation offers a sustainable alternative by developing a bio-based coating formulation made from ethyl cellulose, organic solvents, and natural additives. When applied to paper packaging with a coating thickness of at least 10 microns, it provides superior water and oil barrier performance.

Tests show that paper coated with this bio-based solution can reduce water absorption by up to 98% compared to untreated paper. It can also withstand hot liquids at 95–100°C for at least 20 minutes without leakage, ensuring durability and safety for food applications.

Key Advantages of Technology:

1. Provides effective water and oil resistance, enhancing paper packaging performance.
2. Safe, non-toxic, and environmentally friendly — fully biodegradable and sustainable.

This innovation delivers a cost-effective, high-performance coating solution that supports the transition away from harmful PFAS chemicals, paving the way for a greener, safer, and future-ready packaging industry.



Status and Potential of Research and Innovation

Current Status of Innovation Utilization

No technology transfer or commercial utilization has been implemented yet.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

BioCoCo

BIODEGRADABLE FILM FROM COCONUT JELLY FOR SUSTAINABLE FOOD SAFETY

Assoc. Prof. Dr. Chiraporn Ananchaipattana

Rajamangala University of Technology Thanyaburi

AGR-020

Highlight

Key features and Strengths

BioCoCo: Biodegradable Film from Coconut Jelly for Sustainable Food Safety

BioCoCo is an innovative bioplastic film developed from nata de coco (coconut jelly), a natural and biodegradable material designed to reduce dependence on petroleum-based plastic packaging. It aligns with the global shift toward green packaging and sustainable consumption in the food industry.

This eco-friendly film is flexible, transparent, and safe for consumers. It can be applied as an edible coating or used in various packaging applications to extend shelf life, prevent moisture loss, and reduce microbial contamination. The dense cellulose structure derived from coconut jelly provides excellent strength and enables rapid biodegradation under natural conditions.

Beyond minimizing plastic waste, BioCoCo adds value to coconut products and by-products from the food processing industry. It supports the Circular Economy model by transforming agricultural residues into high-value materials, while enhancing sustainable food safety standards.

BioCoCo represents a green innovation that combines biotechnology with Thailand's natural resources — driving the food industry toward a cleaner, safer, and more environmentally responsible future.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

No technology transfer or commercial utilization has been implemented yet.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation

Market Readiness

The product is at the prototype stage but has not yet undergone market testing

Bioactive Compounds from Mangosteen Peel and Clinacanthus Nutans Leaves Using Green Technology

Asst. Prof. Dr. Pharmacist Em-on Namhormchan

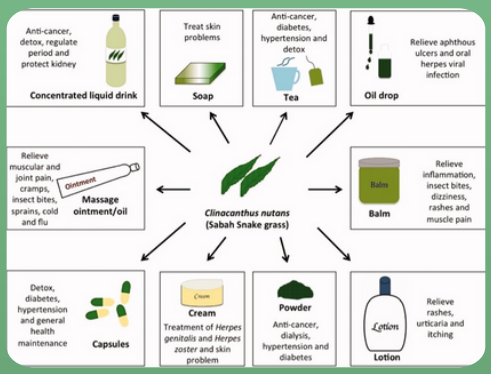
ajamangala University of Technology Thanyaburi

AGR-021

Highlight

Key features and Strengths

Using Microwave-Assisted Extraction (MAE) and Ultrasound-Assisted Extraction (UAE) technologies enhances the efficiency of extracting bioactive compounds from herbs, reduces chemical usage, promotes environmental sustainability, and yields high-purity, premium-quality extracts.



Status and Potential of Research and Innovation

Current Status of Innovation Utilization

No technology transfer or commercial utilization has been implemented yet.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Innovative Technology for Instant and Quick-Cooking Rice Processing

Asst. Prof. Dr. Santi Changjeraja

Agricultural Technology Research Institute, Rajamangala University of Technology Lanna

AGR-022

Highlight

Key features and Strengths

Innovative Quick-Cooking Semi-Instant Rice Processing Technology

This advanced rice processing technology transforms ordinary rice into a semi-instant quick-cooking product through a two-stage hot-air drying process. The rice is partially gelatinized (pre-cooked) by steaming or boiling under conditions optimized for each rice variety, then dried at 60–125°C. This process creates a porous and micro-cracked grain structure, enabling the rice to rehydrate quickly while maintaining its original shape and texture.

The result is a 100% natural, chemical-free semi-instant rice that can be prepared in just a few minutes:

- Simply add hot water and cover for 15–20 minutes, or
- Cook in a microwave or rice cooker for 8–10 minutes, or
- Rehydrate in a hot packaging system for 5–6 minutes.

This method can be applied to both glutinous and non-glutinous rice varieties, preserving their natural flavor, aroma, and nutritional value. The process is simple, scalable, and cost-effective, requiring no processing aids or additives—only a standard hot-air oven with controlled temperature settings.

Key Advantages:

1. User-friendly and versatile process that does not require complex equipment or chemical additives.
2. Reduces cooking time for all rice types while retaining grain quality and integrity.
3. Supports sustainable production of chemical-free, ready-to-cook rice products for modern consumers.
4. Ideal for modern trade and time-conscious customers seeking healthy and convenient meal options.
5. Enables product diversification, allowing producers to develop innovative rice-based foods such as semi-instant sticky rice with mango or durian, expanding opportunities in the premium convenience food market.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

- Currently under FDA registration (Quick-Cooking Semi-Instant Riceberry)
- FDA registration approved (Semi-Instant Sticky Rice with Durian)

Intellectual Property (IP) Rights

No Intellectual Property protection or Invention Disclosure has been filed (as the process is maintained as a trade secret between the research team and local communities. The specific processing techniques vary depending on the characteristics and quality of rice cultivated in each community.)

Market Readiness

The product is already commercially available in Thailand.

- Quick-Cooking Semi-Instant Riceberry – 25 THB per sachet (60 g)
- Semi-Instant Sticky Rice with Durian (Hot Pack) – 175–190 THB per box (100 g)

Innovative Processing Technology for Dried Chiang Da Vegetable Beverages

Asst. Prof. DR. Santi Changjeraja

Agricultural Technology Research Institute, Rajamangala University of Technology Lanna

AGR-023

Highlight

Key features and Strengths

Innovative Drying and Processing Technology for Chiang Da Vegetable Beverages

This technology introduces a hybrid drying process that preserves the color, aroma, and nutritional quality of Chiang Da (Gymnema inodorum)—a traditional Thai medicinal plant known for its natural blood sugar–reducing properties. The process involves blanching the leaves in hot water or brine for an optimal duration, or roasting them to create a pleasant roasted aroma and reduce bitterness. The leaves are then dried in a hot-air oven at 60–65°C until the moisture content is below 8%, ensuring a shelf life of at least one year at room temperature.

The resulting dried Chiang Da is lightweight, easy to store and transport, and can be further developed into various functional beverage products—such as mixed dried Chiang Da teas (roasted and non-roasted blends), herbal tea infusions, green tea blends, vegetable or fruit herbal teas, or powdered instant drinks. It can also serve as an ingredient in functional foods formulated for diabetic or health-conscious consumers.

Key Advantages:

1. Simple and scalable drying process using a standard hot-air oven that is cost-effective and easy to operate.
2. Preserves sensory and nutritional qualities of Chiang Da, maintaining its natural color, aroma, and health benefits.
3. Versatile applications—the process can be adapted to other herbs, vegetables, or plant-based ingredients to produce dried or powdered functional beverages.
4. Supports sustainable local production and adds value to herbal and agricultural products for domestic and export markets.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

- Currently under FDA registration (Chiang Da Mixed Vegetable Beverage)
- FDA registration approved (Chiang Da Beverage with Rose, Mint, and Stevia)

Intellectual Property (IP) Rights

No Intellectual Property protection or Invention Disclosure has been filed (Maintained as a trade secret between the research team and local communities, as the specific processing techniques vary depending on the characteristics and quality of Chiang Da cultivated in each community.)

Market Readiness

The product is already commercially available in Thailand. Chiang Da Beverage with Rose, Mint, and Stevia – 350 THB per box (20 sachets × 1.5 g) Chiang Da Mixed Vegetable Beverage – 120 THB per box (10 sachets × 1.5 g)

Low-Cost Hot-Air Dryer Technology for Soybean Powder Processing

Asst. Prof. Dr. Santi Changjeraja

Agricultural Technology Research Institute, Rajamangala University of Technology Lanna

AGR-024

Highlight

Key features and Strengths

Low-Cost Hot-Air Drying Technology for Soybean Powder Processing

This innovative technology enables the precise processing of soybean powder through a low-cost, energy-efficient hot-air drying system. The process begins with the preparation of soybeans — through cooking, steaming, or fine chopping — before undergoing a two-stage drying process at 60–110°C. The dried beans are then milled and sieved to obtain fine soybean powder (80–90 mesh) with low moisture content, giving it a shelf life of at least one year at room temperature. The resulting powder dissolves easily in hot water, is lightweight for packaging and transportation, and retains the natural color, aroma, and flavor of soybeans.

The product can be further developed into nutrient-rich beverages, high-protein supplements, or other food formulations, depending on market and consumer needs.

Key Advantages

- Cost-effective and user-friendly: The hot-air drying process is simple, scalable, and significantly more affordable than conventional spray drying or freeze drying systems.
- Chemical-free production: No processing aids or food additives are required, allowing the production of 100% pure, organic soybean powder with high plant-based protein content.
- Sustainable and adaptable: The technology supports sustainable food innovation and can be easily adapted for other legumes such as edamame, red beans, and mung beans, offering wide applications in the functional food and beverage industries.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Currently under FDA registration

Intellectual Property (IP) Rights

No Intellectual Property protection or Invention Disclosure has been filed (This innovation is protected as a trade secret jointly held between the research team and the local community. The processing techniques and steps vary depending on the unique characteristics and quality of the raw materials or soybeans produced in each community.)

Market Readiness

The product is already commercially available in Thailand.

Retail Price

- Soybean Powder—THB 100 per box (3 sachets x 25 g)
- Soybean Powder Pack—THB 120 per pack (80 g)

Bamboo Pith Mushroom Extract Soup

SMOOTH TEXTURE, READY-TO-EAT FORMULA

Asst. Prof. Dr. Saifon Phothisuwan

Rajamangala University of Technology Thanyaburi

AGR-025

Highlight

Key features and Strengths

Bamboo Pith Mushroom Extract Soup: Nutritional Therapy for Enhancing Quality of Life in the Silver Economy Era

Thailand is entering a fully aged society, with more than 20% of its population being elderly. Many face nutritional challenges such as loss of appetite, difficulty chewing, and swallowing disorders — conditions that can lead to malnutrition and related complications. To address this, the “Bamboo Pith Mushroom Extract Soup” was developed as a specialized therapeutic food designed to restore physical strength, boost immunity, support collagen production, and sustainably improve quality of life for the elderly.

This innovative product combines a proprietary formula with enzyme-assisted technology to break down proteins into amino acids and collagen that are easily absorbed by the body — ideal for the digestive systems of seniors. It offers high nutritional value, containing 4.11 g protein/100 ml, 18.20 g beta-glucan/100 g (dry weight), and only 0.48 g fat/100 ml, with no cholesterol detected. The soup is also rich in essential amino acids such as Glycine, Alanine, Lysine, and Valine, which help strengthen muscles, repair tissues, and support the nervous system.

Moreover, the soup’s texture is safely modified according to IDDSI Level 3 standards, ensuring smooth swallowing and reducing the risk of aspiration — making it suitable for elderly individuals and patients in recovery.

Beyond its nutritional benefits, this product represents a strategic business opportunity in the rapidly expanding global Silver Economy. It is a future-ready food innovation that harmonizes health science with sustainable and socially responsible economic growth.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has not yet been transferred or commercially utilized.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Development of Instant Rooibos Tea Processing Technology

Dr. Thanawit Kulrattanarak

Suranaree University of Technology

AGR-026

Highlight

Key features and Strengths

This research project developed an innovative ready-to-drink Rooibos tea production process enriched with Aspalathin, a powerful antioxidant that defines the unique health benefits of Rooibos. The team identified the optimal extraction conditions—a 6-minute extraction using a tea-to-water ratio of 1:10 at 95°C—which yielded the highest concentration of Aspalathin.

The research further led to the creation of two product formulations:

1. Honey Lemon Rooibos, which has already been commercialized by local producers; and
2. A new Apple Flavor (Sugar-Free) formula, developed using a pasteurization process at 95°C for 5 minutes — a technique that ensures effective sterilization while preserving the tea's natural aroma and refreshing taste better than conventional sterilization methods.

Additionally, the study examined the stability of Aspalathin, finding that the compound degrades more rapidly under light exposure and high temperatures — insights that are essential for determining proper storage and packaging conditions to maintain product quality.

This project's key strength lies in its science-based, application-oriented innovation, integrating knowledge from extraction and formulation to process optimization. The outcome is a caffeine-free, antioxidant-rich functional beverage that meets the growing demand among health-conscious consumers for natural, high-quality drinks that support wellness and vitality.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand.
The product has been commercially distributed in international markets, including:

- Cambodia, Laos, Myanmar, and Vietnam, where it is sold at THB 17 per can;
- African countries, such as Uganda and Nigeria, with a retail price of THB 40/can
- Middle Eastern countries, including Bahrain and the United Arab Emirates, where it is priced at THB 80/can

This reflects the growing regional and global demand for the product, demonstrating its competitive pricing flexibility and strong market adaptability across diverse economies.

Cocoa Pulp Syrup

Asst. Prof. Dr. Nukool Intakul
Chiang Rai Rajabhat University

AGR-027

Highlight

Key features and Strengths

Cocoa Pulp Syrup: Turning Cocoa By-Products into a Value-Added Health Ingredient

Fresh cocoa juice extracted from the pulp surrounding cocoa beans prior to fermentation has been developed into a prototype cocoa syrup with excellent sensory and nutritional qualities. The syrup has a pH of 3.34 ± 0.16, total acidity of 2.48 ± 0.22 g/100 g, and total soluble solids of 60 °Brix. It contains 67.31 g/100 g total sugars, primarily fructose (31.64 g/100 g), glucose (28.86 g/100 g), and sucrose (6.81 g/100 g) — making it a naturally sweet, high-acid food with low protein and fat content.

Rich in essential minerals such as potassium, calcium, magnesium, and phosphorus, the syrup features a clear golden color, slightly viscous texture, and a pleasantly mild aroma with a sweet-and-tangy flavor. It serves as a natural source of fruit-based sugars, minerals, and antioxidants beneficial to health. Consumer testing shows an overall acceptance rating from “like” to “very much like,” and the product maintains a shelf life of up to 10 months at 25 °C.

By transforming what was once a processing by-product into a value-added, marketable ingredient, this innovation reduces waste, increases the economic value of fresh cocoa production, and supports sustainable cocoa supply chains for future growth.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Currently under FDA registration

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Chiang Rai 8974 Sticky Rice

FARMER NETWORK UNDER THE “ECO RICE” AND GEOGRAPHICAL INDICATION (GI) FRAMEWORK

Assoc. Prof. Dr. Paweena leetrakun

Chiang Rai Rajabhat University

AGR-028

Highlight

Key features and Strengths

Chiang Rai 8974 Glutinous Rice: Advancing Eco-Friendly Cultivation and Sustainable Community Development

Chiang Rai 8974 glutinous rice is a native variety from Chiang Rai province, celebrated for its premium quality and distinctive characteristics. The grains are small, slender, glossy white, and delicately sticky when cooked, with a naturally fragrant aroma. Nutritionally, it is richer than most other sticky rice varieties — containing gamma-oryzanol, vitamin E, and natural antioxidants that help reduce cholesterol, support metabolism, and promote heart health.

Recognized as a Geographical Indication (GI) product of Chiang Rai, this rice represents both the province’s agricultural heritage and its potential as a high-value health product.

The project promotes sustainable cultivation and value-chain development under the “Eco Rice” concept and GI framework, focusing on three key stages:

1. Upstream Development: Strengthening seed production networks to preserve the genetic purity and authenticity of Chiang Rai 8974 glutinous rice as a certified GI product.
2. Midstream Enhancement: Increasing value through GI certification and promoting eco-friendly production standards that align with BCG (Bio-Circular-Green) economy principles.
3. Downstream Expansion: Building marketing capacity under the “Eco Rice” and GI branding to expand distribution channels, improve competitiveness, and generate higher income for farming communities.

Through these integrated efforts, the initiative not only creates value-added agricultural products but also drives grassroots economic growth and preserves natural resources and ecosystems in a sustainable manner.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Other Standards/Certifications (please specify): GI and GAP

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand. Unit Price: 75 THB per kilogram (Chiang Rai 8974 Glutinous Rice certified with GAP and GI standards)

Hom Hua Bon Rice

DEVELOPING LOCAL RICE PRODUCER COMMUNITY ENTERPRISES TO MEET STANDARDS AND INTEGRATE INTO THE BCG ECONOMY

Senior Researcher Rice Department : Kanthanawit Jaisong

Pathum thani Rice Research Center

AGR-029

Highlight

Key features and Strengths

Hom Hua Bon Rice: A Native Heritage Grain of Krabi

Hom Hua Bon Rice is a unique local variety from Krabi province, cultivated by the Khao Rai Pattana Community Enterprise Group and its partner network under Good Agricultural Practices (GAP) standards. The rice is grown in intercropped rubber and oil palm plantations, reflecting the distinctive agroecosystem of southern Thailand.

When cooked, this rice releases a naturally fragrant aroma reminiscent of taro (“bon” in the local dialect). It is rich in gamma-oryzanol and natural antioxidants, which help lower cholesterol, reduce inflammation, and promote heart health.

Production begins with carefully selected pure rice seeds and follows a chemical-free, safe-rice cultivation system aligned with the principles of the Bio-Circular-Green (BCG) Economy.

Hom Hua Bon Rice represents both a living heritage of local wisdom and a premium health product from Krabi, offering a nutritious, aromatic, and sustainable choice for health-conscious consumers who value both taste and wellness.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.
Other Standards/Certifications (please specify): (GAP Standard (Good Agricultural Practices))

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is already commercially available in Thailand

Herbal A-Lua Confectionery

Dr. Sarawut Plaengsorn

Phetchaburi Rajabhat University

AGR-030

Highlight

Key features and Strengths

Herbal A-Lua Confectionery with Low Glycemic Index

A-Lua is a traditional Thai sweet made primarily from sugar. However, its high sugar content can pose health concerns. To address this, the Herbal A-Lua with a Low Glycemic Index was developed as a healthier alternative enriched with four beneficial herbs — green tea, safflower, beetroot, and butterfly pea — providing added nutritional value.

Each 30-gram serving contains approximately 70% carbohydrates, 10% fat, 3% protein, and 1.5% potassium, with a total energy value of 110 kilocalories, making it a lighter and more balanced option compared to conventional A-Lua desserts available in the market.

The confectionery is packaged in food-grade plastic containers with secure lids, ensuring safety, durability, and non-toxicity. The packaging is lightweight, moisture-resistant, air-tight, and grease-proof, effectively preserving the product's shape, color, aroma, and freshness. With proper storage, the Herbal A-Lua maintains its quality and shelf life for up to six months, making it both a delicious and health-conscious choice for modern consumers.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Currently under FDA registration

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand . (Product: 8 0 THB / unit)

Khao Bao Yod Muang Trang Rice

Senior Researcher Rice Department : Kanthanawit Jaisong

Pathum thani Rice Research Center

AGR-031

Highlight

Key features and Strengths

Khao Bao Yod Muang Trang Rice

Khao Bao Yod Muang Trang is a local rice variety from Trang Province, officially registered under Geographical Indication (GI) protection. Cultivated in rain-fed paddy fields by a network of community-based rice producer enterprises, this variety represents the community's commitment to preserving native rice genetics and promoting safe, chemical-free farming practices.

The rice is distinguished by its naturally purplish-red husk, derived from anthocyanin pigments, and is rich in antioxidants such as niacin and gamma-oryzanol, which help reduce blood lipids, enhance immunity, and promote overall well-being. The grains are long, slender, and fragrant, offering a soft texture and mellow flavor when cooked.

Produced through eco-friendly, integrated farming systems and certified under Good Agricultural Practices (GAP), Khao Bao Yod Muang Trang Rice embodies both local wisdom and sustainable community development, making it a premium product that reflects the harmony between tradition, health, and the environment.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Lamduan Cookies with Riceberry Rice Blend

Napapha Homhuan and Dr. Atchariyakool Puangpetch

Faculty of Science and Technology, Phetchaburi Rajabhat University

AGR-032

Highlight

Key features and Strengths

Lamduan Cookies with Riceberry Rice Blend

This innovative snack product is inspired by Kleeb Lamduan, a traditional Thai cookie, reimagined into a modern, bite-sized treat suitable for today's lifestyle. The product combines the charm and delicate flavor of the original Thai dessert with a contemporary design and an industrial-friendly production process, making it both scalable and market-ready while preserving its authentic taste and cultural identity.

To enhance its nutritional value, the cookies are infused with organic Riceberry rice, sourced from the Rai Makham Community Rice Center Enterprise in Ban Lat District, Phetchaburi Province. Riceberry is known for its rich antioxidant content and health benefits. Additionally, select ingredients have been reformulated to increase their functional and nutritional properties.

The result is a modern, health-conscious snack that is easy to consume, shelf-stable, and nutritionally beneficial — offering a perfect balance between Thai tradition and contemporary innovation.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand .

Retail Price

90 THB / unit

Early-Harvest Jasmine Rice

Asst. Prof. Dr. Wassana Panurak

Nakhon Ratchasima Rajabhat University

AGR-033

Highlight

Key features and Strengths

The production process of early-harvest jasmine rice involves harvesting the rice before it fully matures—approximately two weeks after the milky stage—when the grains are in the soft dough stage. At this point, the rice retains high nutritional value, containing folate, beta-carotene, vitamin E, niacin, and various bioactive compounds beneficial to human health.

Research indicates that early-harvest jasmine rice offers greater health benefits than regular brown rice, serving as an effective alternative carbohydrate source for blood sugar control. This makes it particularly suitable for individuals at risk of metabolic disorders, including pregnant women and health-conscious consumers seeking balanced nutrition.

The development of early-harvest jasmine rice not only leads to a premium health-oriented product but also enhances rural farmers' livelihoods and promotes sustainable agricultural practices in line with modern health and wellness trends.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

- The product is currently undergoing market testing
- The product is already commercially available in Thailand.

Retail Price

Retail price of early-harvest jasmine rice: 175 Baht per kilogram

Kale and Fish Flake Rice Seasoning Powder

Asst. Prof. Dr. Oranong Sripawatkul

Phetchaburi Rajabhat University

AGR-034

Highlight

Key features and Strengths

This research focused on developing a drying process for kale and creating an innovative production method for organic kale superfood powder to enhance the value of dried kale products. The resulting kale superfood powder is a dry food with a long shelf life, increasing its market potential and commercial opportunities. The drying technology applied in this process is cost-effective and accessible, allowing community enterprises to implement it independently. Moreover, the method can be scaled up for commercial production, supporting both local value creation and sustainable agricultural development in the future.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Retail Price

79 Baht per box (5 sachets per box)

Dronebox

A CLOUD-BASED PLATFORM FOR PROCESSING AERIAL PHOTOGRAPHS FROM DRONES

Mr.Chingchai Hoomhong

MAPEDIA COMPANY LIMITED, MAPEDIA COMPANY LIMITED

AGR-035

Highlight

Key features and Strengths

Dronebox is an all-in-one cloud-based platform for processing aerial photographs from drones, developed by Mappedia Co., Ltd. It enables users to quickly transform drone images into topographic maps, orthophotos, digital surface and terrain models (DSM/DT

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Technology transferred under a non-exclusive license, allowing multiple partners to adopt and apply the innovation freely.

Standards and Certification Status

Not yet submitted for FDA registration.

Intellectual Property (IP) Rights

In the process of filing for IP protection or preparing an Invention Disclosure.

Market Readiness

Commercially available in the domestic market

Retail Price

Dronebox Pro for professionals is available at 3,200 THB per month, or 32,400 THB per year for an annual subscription.

Solar Panel Cleaning Robot

Asst. Prof. Dr.Eakkachai Pengwang

Institute of Field Robotics (FIBO), King Mongkut's University of Technology Thonburi

AGR-036

Highlight

Key features and Strengths

An autonomous robot for cleaning solar panels in solar farms that runs along the top edge. It is lightweight, works with panels of different lengths, and cleans using water and rotating brushes. It uses an industrial PLC control system that is resistant to dust, heat, and harsh environments. The robot provides vertical adjustment and includes environmental sensors that can be configured to enable autonomous panel cleaning. Development also covers mechanisms for transferring the robot across panels, creating service rails between panels, and a mobile robot that can move freely on panels for rooftop, floating, or solar farm installations. -ready solution for the global beauty and wellness industry.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Technology transferred under a non-exclusive license, allowing multiple partners to adopt and apply the innovation freely.

Standards and Certification Status

Not yet submitted for FDA registration.

Intellectual Property (IP) Rights

In the process of filing for IP protection or preparing an Invention Disclosure.

Market Readiness

Commercially available in the domestic market

Fruii Coconut Gummies

Miss Sarapee Yuadyong

Chiwadi Products Co., Ltd.

AGR-037

Highlight

Key features and Strengths

Fruii Coconut CCV Gummies are health-oriented gummy supplements developed under the concept of functional food innovation. The gummies use fruit-derived pectin instead of animal-based gelatin, making them Halal-certified and suitable for vegetarian and vegan consumers who avoid animal-derived ingredients.

This product is free from glucose syrup and instead uses coconut flower nectar, a natural sweetener with a lower glycemic index. It also incorporates concentrated coconut flower vinegar, containing up to 1,000 milligrams per serving, which provides beneficial metabolites that have been clinically proven to support healthy metabolism.

Fruii Coconut CCV Gummies contain no preservatives and have undergone clinical testing, which demonstrated that three months of continuous consumption can reduce waist, hip, and upper-arm circumference, while enhancing antioxidant production, resulting in healthier skin and reduced appetite.

Additionally, the gummies are delicious, easy to consume, and provide nutritional value from amino acids and natural minerals found in coconut flower nectar, such as potassium, magnesium, and calcium, which play important roles in maintaining body balance.

With a combination of safety, nutritional value, and scientifically proven effectiveness, Fruii Coconut CCV Gummies serve as a next-generation functional supplement, perfectly suited for modern health-conscious and sustainability-minded consumers.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Retail Price

49 THB per 25 g pack, Wholesale price: 32 THB per pack

A continuous-flow system for eliminating weevils and weevil eggs

IN RICE AND ALL TYPES OF GRAINS, WITHOUT THE USE OF CHEMICALS.

Mr. Chanon Srisuma

Tiger Pride Co., Ltd.

AGR-038

Highlight

Key features and Strengths

A continuous-flow, chemical-free disinfestation system for eliminating weevils and weevil eggs in rice and all types of grains. This technology utilizes radio-frequency heating (RFH) — a method that applies heat directly to the material through an electromagnetic field. The process provides rapid, uniform, and precise heating, ensuring that the quality of raw materials is not compromised.

The system employs a proprietary technique known as REC3F, which has been specifically designed to deliver high performance and industrial-grade reliability. It has been successfully implemented in the rice industry for more than five years and is safe for producers, consumers, and the environment.

This innovation delivers tangible value to customers, including:

- Chemical-free operation, ensuring food safety and environmental sustainability;
- Reduced processing time for disinfestation — from ten days to just one operation cycle;
- Cost savings of up to twofold compared to traditional fumigation methods;
- Extended storage life of raw materials for up to one year; and
- Maintained seed germination rate for up to one year.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under an exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is already commercially available in Thailand

Retail Price

350,000–1,450,000 Baht per unit

Chiwadi Vegan Fish Sauce

Miss Sarapee Yuadyong

Chiwadi Products Co., Ltd.

AGR-039

Highlight

Key features and Strengths

Chiwadi Vegan Fish Sauce is a plant-based seasoning product developed from the extraction of natural amino acids and minerals found in coconut flower nectar, using a process that is completely free from enzymatic or acid hydrolysis of proteins.

Unlike conventional fish sauces, which may generate allergenic peptides or undesirable contaminants such as 3-MCPD—a compound associated with potential health risks—this innovative process ensures safety, purity, and nutritional integrity.

A key highlight of this innovation lies in the designed amino acid profile, which enhances the natural umami flavor inherent in coconut nectar. This delivers a well-balanced and savory taste without the use of animal-derived ingredients or synthetic flavor enhancers, while also reflecting the authentic culinary roots of Thai cuisine, which is deeply connected to coconut sugar and other local ingredients.

From a nutritional perspective, Chiwadi Vegan Fish Sauce contains only 190 milligrams of sodium per serving, significantly lower than typical seasoning sauces that contain 400–600 milligrams.

Its mild salinity does not rely solely on sodium chloride, but rather comes from a naturally occurring mineral blend in coconut nectar —including potassium, phosphorus, magnesium, manganese, and calcium—which not only enhances flavor balance but also contributes essential minerals that are often lacking in the daily diet.

Therefore, Chiwadi Vegan Fish Sauce represents a harmonious fusion of traditional Thai taste and modern nutritional science, offering a seasoning that delivers balanced flavor, safety, and comprehensive health value for today's health-conscious consumers.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Retail Price

175 THB per 250 mL bottle, Wholesale price: 112 THB/bottle

Skinov’e Serum formulated from banana peel extract

Dr. Kasinee Ketleka

The Halal Science Center, Chulalongkorn University

AGR-040

Highlight

Key features and Strengths

This innovation introduces a transparent skin-lock film under the Soothing Skin Care category — a skincare product specifically designed to reduce irritation and relieve skin discomfort, while providing long-lasting hydration.

Upon application, it delivers a lightweight, non-greasy texture that absorbs easily into the skin, leaving a transparent protective layer that helps retain moisture, softens the skin, and promotes rapid skin recovery. It can be considered an essential household skincare item.

Importantly, the formula has passed dermatological irritation and allergy tests in human volunteers and has been officially registered for intellectual property protection (patent/petty patent).

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Retail Price

590 baht per unit

Whale Rice
Starch-Free Rice

Mr. Peerapong Jitwiwat

NERAMIT FOODTECH CO., LTD.

AGR-041

Highlight

Key features and Strengths

Whale Rice – Thailand's Innovative Starch-Free Rice for Modern Healthy Living

Whale Rice is a Thai-developed food innovation brand designed for today's health-conscious consumers who want to control carbohydrates and sugar while still enjoying satisfying meals every day.

We have created starch-free rice and noodles made from plant-based ingredients and alternative proteins, specially formulated to fit low-carb, keto, and diabetic-friendly lifestyles. Enriched with seaweed dietary fiber, Whale Rice also supports better gut health and overall well-being.

Our concept goes beyond simple replacement — it's a Healthy Alternative that enhances quality of life through easy, convenient, and enjoyable eating. Whale Rice products are perfect for working professionals, families, seniors, and patients who need dietary management.

In collaboration with health and nutrition partners, we uphold the highest production and safety standards, while maintaining transparent nutritional information to help consumers make informed choices they can trust.

Whale Rice aims to become a leading Thai wellness brand, driving the Wellness Journey forward with products that are delicious, safe, accessible, and scientifically grounded — empowering people to live healthier every day.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product is already commercially available in Thailand

Retail Price

79 Baht per unit

Dragon Blood Tea
from Doi Chang Community

Asst. Prof. Dr.Napaporn Wannaprom

Faculty of Education, Chiang Rai Rajabhat University

AGR-042

Highlight

Key features and Strengths

This research utilizes every part of the Dragon Blood Tea (Magenta plant), cultivated in the Doi Chang community, Wawee Subdistrict, Mae Suai District, Chiang Rai Province, to develop a wide range of innovative products under the BCG (Bio-Circular-Green) Economy Model. The goal is to enhance the value of local resources while supporting digital markets and sustainable tourism. The young leaves are processed into Dragon Blood Tea, a naturally caffeine-free, zero-calorie beverage that contains no sugar, fat, or sodium. Laboratory analysis reveals that it is rich in antioxidants and essential minerals beneficial to health. Extracts from the tea — containing antioxidant compounds, total phenolics, flavonoids, and anthocyanins — are further used as key ingredients in the development of soap, shampoo, and serum products. In addition, the remaining stems and leaves are used to produce natural dyes, which are applied in creating handcrafted textile products such as shawls, bags, keychains, hats, coasters, and traditional Akha-style clothing. This approach ensures zero waste while adding creative and economic value to local craftsmanship. Furthermore, both fresh leaves and processed tea are integrated into local Akha cuisine, featured in a “From Farm to Table” culinary tourism program that showcases traditional dishes made with Dragon Blood Tea. Overall, this innovation highlights the versatility and sustainability of the Dragon Blood Tea plant. It demonstrates how local resources can be efficiently utilized to generate new income streams, strengthen community enterprises, and promote eco-friendly tourism and sustainable livelihoods among tea-growing farmers in Northern Thailand

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Technology transferred under a non-exclusive license, allowing multiple partners to adopt and apply the innovation freely.

Standards and Certification Status

Not yet submitted for FDA registration.

Intellectual Property (IP) Rights

No IP protection filed and no Invention Disclosure submitted.

Market Readiness

Prototype developed but not yet tested in the market.

Blossom Meat

BANANA BLOSSOM PLANT-BASED MEAT

Asst. Prof. Dr. Somruthai Tanma

Chiangrai Rajabhat University

AGR-043

Highlight

Key features and Strengths

"Blossom Meat" High-Utility Banana Blossom Plant-Based Meat is a 100% natural alternative protein product made from locally sourced GI-certified plant ingredients.

Its key components include banana blossoms (Musa ABB), Yamabushitake mushrooms (Hericium erinaceus), and textured vegetable protein, which are rich in essential nutrients and amino acids.

The formulation features six essential amino acids in significant amounts, derived through the use of bromelain enzyme extracted from Phulae pineapple core juice — a byproduct of local agricultural processing in Chiang Rai province.

The product contains no cholesterol and can be used as a versatile meat substitute in a variety of dishes. It offers a pleasant taste and tender, juicy texture, making it suitable for multiple culinary applications.

The product is labeled with Thai Nutrition Facts, GDA labeling, and registered under FDA License No. 5720105960024 as a ready-to-cook and ready-to-eat food product authorized by the Food and Drug Administration (FDA), Ministry of Public Health, Thailand.

From a production standpoint, the product maintains a low manufacturing cost by emphasizing the use of local GI-certified plant raw materials and the bromelain enzyme from Phulae pineapple core juice, helping to modify the protein structure and enhance its nutritional profile with beneficial essential amino acids.

This innovation can be further developed into various value-added products, such as sausages, burger patties, or nuggets, contributing to a sustainable and locally integrated food innovation model.

The private-sector co-investor in this research collaboration is Madee Food Innovation Limited Partnership, based in Chiang Rai Province, Thailand.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Mush Art Tiles

BIO-BASED SURFACE DECORATION MATERIAL MADE FROM MYCELIUM FIBERS

Mr. Charoenpong Songdechakraiwoot

MUSH Composites

AGR-044

Highlight

Key features and Strengths

Mush Art Tiles are innovative bio-based surface decoration materials developed by Mush Composites, embodying the concept of “growing instead of mining”. The tiles are created through biotechnology utilizing mycelium fibers—the natural root structure of mushrooms—which act as an organic binder. These fibers are combined with agricultural by-products such as rice husks, sawdust, and straw, and cultivated under controlled conditions to achieve high-quality materials with unique natural textures, lightweight properties, and excellent durability. The result is a material suitable for use in interior design, wall cladding, furniture production, and various other design applications.

Beyond their aesthetic and functional qualities, Mush Art Tiles significantly reduce the environmental footprint by minimizing dependence on mineral and timber resources, achieving over 80% lower carbon footprint compared to conventional decorative materials. At the end of their lifecycle, they are fully biodegradable, returning harmlessly to nature.

Blending natural beauty with the philosophy of “Nature Technology – Design that Grows,” Mush Art Tiles represent not only a breakthrough in sustainable materials for the construction and design industries but also a symbol of low-carbon, sustainable living for a greener future.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Other Standards/Certifications (please specify): (TIS 966-2003: Standard for Medium Density Fiberboard)

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation.

Market Readiness

The product has undergone market testing for commercial distribution abroad. (Please specify the unit price: varies depending on the model and custom design.)

SimpleSense

HIGH-PROTEIN, LOW-GI READY-TO-EAT PURÉE FOR SPECIAL CARE GROUPS

Asst. Prof. Dr. Phimnipa Hiransorn

Department of Food Technology, Faculty of Technology, Khon Kaen University

AGR-045

Highlight

Key features and Strengths

SimpleSense — Innovative Alternative Nutrition for Patients and the Elderly

SimpleSense is a ready-to-eat high-protein liquid meal specially designed for patients, the elderly, and individuals with swallowing difficulties (dysphagia). It offers a smooth, refreshing, and easy-to-swallow texture with high protein, low glycemic index (GI), and low sodium and phosphorus, and contains no cow's milk or dairy ingredients.

Developed by food technologists and rehabilitation medicine specialists from Khon Kaen University, the product provides complete and balanced nutrition, ensuring high energy and nutrient density even with small portions. Its safe-swallow texture meets the International Dysphagia Diet Standardisation Initiative (IDDSI) Level 4 standards and has been clinically tested for swallowing safety. Designed with sensory appeal in mind, the product's refreshing flavors help enhance appetite and enjoyment, as confirmed by sensory evaluation results showing significantly higher palatability scores compared to reference foods.

Available in multiple flavors: Mixed Berry Yogurt, Honey Milk, Pineapple, and Banana.

Product Specifications (per 200 g pouch)

- Plant-based protein: 15 g (Honey Milk) / 14 g (Mixed Berry Yogurt, Pineapple, Banana) — equivalent to 3.5–4 egg whites
- Energy: 240–270 kcal/200 g (energy-dense food)
- Vitamins & minerals: Contains Vitamin A, Vitamin B1, Vitamin B2, and Calcium
- Dietary fiber: 3,000 mg
- Sugar content: 3 g (Honey Milk) / 4 g (Mixed Berry Yogurt, Pineapple, Banana
- Low glycemic index (GI): Helps slow the rise of blood sugar levels (based on GI test results)
- Low sodium and potassiu
- No cow's milk or milk powder, cholesterol-free
- Viscosity: IDDSI Level 4 (smooth purée texture proven to reduce aspiration — clinical research reference)
- Convenient & ready to eat
- Shelf life: 12 months at room temperature (no refrigeration required)**

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Retail Price

98 THB per pouch.

FreshGuard

COLD PLASMA SYSTEM FOR AGRICULTURAL PRODUCE

Assoc. Prof. Dr. Porramain Porjai

Rajamangala University of Technology Thanyaburi

AGR-046

Highlight

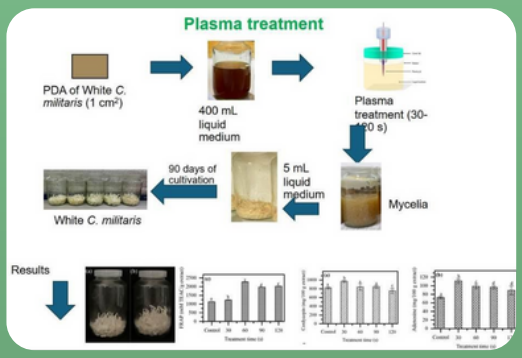
Key features and Strengths

FreshGuard Technology is an innovative cold plasma system designed to preserve the freshness, safety, and quality of agricultural produce such as seeds, flowers, vegetables, and fruits. The system ionizes air into plasma—a unique state of matter composed of charged particles, ions, radicals, and excited electrons—which effectively inhibits microbial growth. This process can extend the shelf life of agricultural products by up to 14 days (approximately twice their normal lifespan) depending on the crop type. Moreover, FreshGuard has been shown to stimulate bioactive compound production and enhance growth in crops such as Cordyceps mushrooms and flower seeds.

Developed as a clean, energy-efficient, and chemical-free technology, FreshGuard operates without heat, leaves no harmful residues, and ensures user safety, offering a sustainable solution for modern postharvest and food preservation systems.

Non-Plasma Treatment

Plasma Treatment



Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is currently undergoing market testing.

Plasma AquaReactor

AN INNOVATIVE PLASMA-BASED SYSTEM FOR PRODUCING NITROGEN-ENRICHED FERTILIZER WATER

Dr. Patcharee Kongphak

Applied Physics Faculty of Science, Maejo University

AGR-047

Highlight

Key features and Strengths

Plasma AquaReactor: An Innovative Plasma-Based Nitrogen Fertilizer Water Production System

The Plasma AquaReactor is an innovative system that utilizes plasma technology to induce chemical reactions between air and water, resulting in the formation of nitrogen compounds that plants can readily absorb—such as nitrate (NO_3^-) and nitrite (NO_2^-). These compounds play a crucial role in promoting root development, chlorophyll synthesis, and enhancing the nutrient uptake efficiency of plants.

The prototype system employs a Plasma Arc Discharge mechanism equipped with 20 plasma emission pins, operating under a continuous water-flow system. It produces nitrogen-enriched fertilizer water at a flow rate of 1.5 liters per minute, with a nitrate concentration of approximately 50 ppm, an optimal level for direct plant application. The plasma discharge generates high-energy yet low-temperature plasma, creating reactive radicals such as OH•, O•, NO•, and N_2^+, which serve as essential intermediates in the synthesis of nitrogen oxides in water.

A distinctive feature of this system lies in its use of only air and water as raw materials, completely eliminating the need for chemical inputs. As a result, the Plasma AquaReactor represents a green, safe, and environmentally friendly technology that can be effectively integrated into Smart Farming, Hydroponic, and Aeroponic systems. This eco-efficient technology is particularly suitable for farmers, community enterprises, and modern agricultural research centers, offering a sustainable and cost-effective alternative to conventional chemical fertilizers. By promoting cleaner and smarter farming practices, the Plasma AquaReactor contributes to advancing Thailand's agricultural sector toward long-term sustainability under the Bio-Circular-Green (BCG) Economy Model.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted .

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Innovation in Cold-Pressed Kale Juice

Asst. Prof. Dr. Chamroonsri Phumthian and Asst. Prof. Dr. Sureeporn Homwisetwongsa
Huachiew Chalermprakiet University

AGR-048

Highlight

Key features and Strengths

This innovation focuses on developing a community-level cold-pressed kale juice production process that complies with Thai FDA food safety standards (GMP). The project enhances local production capacity by redesigning and upgrading existing community facilities to meet safety and hygiene requirements—without requiring high investment. It utilizes locally available tools and equipment, integrated with food technology principles for temperature control, pasteurization, and quality assurance in accordance with the Ministry of Public Health Notification No. 356 (B.E. 2556). Laboratory analysis of the cold-pressed kale juice confirmed a pH level of 3.7, no presence of major pathogens, and full compliance with food safety standards, achieving an impressive GMP evaluation score of 93.27%. A key strength of this innovation lies in its practical, community-based production model, which maximizes the use of local resources, minimizes investment costs, and builds community innovators' knowledge through hands-on training in FDA compliance. The process has reached Technology Readiness Level 6 (TRL 6), enabling technology transfer to other regions seeking to improve their functional food and health drink production. This project exemplifies the integration of research, local innovation, and economic application, adding value to kale, strengthening the local economy, and serving as a provincial model for safe and sustainable food innovation in Samut Prakan Province.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Technology transferred under an exclusive license, granting full commercialization rights to a single partner or enterprise.

Standards and Certification Status

Fully registered and approved by the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is already commercially available in Thailand

Retail Price

Pilot-Scale Production System and Prototype Technology Set for Community Use
Approximately 80,000 THB per set
(Excluding costs for microbial analysis prior to FDA evaluation, nutrition testing, and consulting or facility design services.)

Driving Premium Mangosteen Juice

as a High-Value Thai Processed Fruit

Assist. Prof. Dr.Kewalin Angkananon

Food Innovation and Nutrition Program, Faculty of Science and Technology, Suratthani Rajabhat University

AGR-049

Highlight

Key features and Strengths

Mang cha is a premium mangosteen juice brand that combines mangosteen juice, red tea, and mangosteen extract. It is produced using a special technique to reduce sweetness and viscosity, is free from preservatives, and has a shelf life of up to two years. The product is certified by the Thai FDA and Halal, and is categorized as a functional food suitable for health-conscious consumers. It is priced at 75 THB per 180 ml glass bottle.

Under the research project titled “Driving Premium Mangosteen Juice as a High-Value Thai Processed Fruit for Export to International Markets,” a new formula of mangosteen juice was developed featuring reduced sourness, enhanced mangosteen flavor intensity, and a brighter, more appealing natural color. The formulation includes mangosteen juice enriched with one full daily dose of vitamin C, contains no added sugar (natural sweetness only), and remains preservative-free while maintaining a two-year shelf life.

The product meets comprehensive quality standards including FDA, GHPs, HACCP, ISO 9001:2015, Halal, and UAE standards, and is in the process of SFDA registration for export to Saudi Arabia. It is packaged in 180 ml glass bottles and formally registered under its trademark.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA. Additional standards and certifications obtained: HALAL.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is commercially available in the domestic market

Retail Price

79 THB.

Development of Low-Sodium Shrimp Paste and Seasoned Shrimp Paste Sauce

Dr. Supannikar Sribuathong

Food Innovation and Nutrition Program, Faculty of Science and Technology, Suratthani Rajabhat University

AGR-050

Highlight

Key features and Strengths

Two prototype products were developed: Reduced Sodium Shrimp Paste Powder and Reduced Sodium Seasoned Shrimp Paste Sauce.

During the fermentation process, a salt ratio of NaCl:KCl at 50:50 was used in combination with taurine (1%) and ascorbic acid (0.1%) over a period of six months.

Both the shrimp paste powder and the seasoned shrimp paste sauce achieved a reduction in sodium content of more than 40% compared to reference products (Tha Khe Shrimp Paste and Seasoned Shrimp Paste Sauce).

Comprehensive analyses were conducted on nutritional composition, microbial quality, production cost, break-even point, and optimal pricing. This represents an innovative production process for traditional local shrimp paste and seasoned shrimp paste sauce, not previously reported in Thai artisanal shrimp paste production.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is currently undergoing market testing .

Solar-Powered Distillation and Essential Oil Extraction Machine for Turmeric (Curcuma longa)

Mr. Komkarit Sripan

Suratthani Rajabhat University

AGR-051

Highlight

Key features and Strengths

This technology is a semi-automatic essential oil distillation and extraction system designed with a focus on solar energy utilization combined with an electric (hybrid) power system to ensure continuous operation and reduce energy costs. It is ideal for community-level applications requiring an efficient and environmentally friendly distillation system.

The innovation emphasizes the use of solar panels as the primary energy source to provide heat and control the extraction process, supplemented by household electricity. This hybrid approach reduces dependence on external energy sources, minimizes long-term expenses, and promotes environmental sustainability.

The prototype machine can process up to 40 kilograms of turmeric (Curcuma longa) per distillation cycle. It features an automatic temperature control mechanism integrated with a real-time monitoring system via an IoT dashboard, allowing users to track key parameters continuously.

The machine structure is made of food-grade stainless steel to ensure the safety and purity of the extracted products, making it suitable for use in food, cosmetic, and herbal industries. The condensation system employs water recirculation through a large cooling coil, enhancing the efficiency of condensation and yielding a higher quantity and purity of essential oil.

A 32-inch LCD display provides operational data, with cloud connectivity via Wi-Fi for systematic data recording and process analysis, supporting continuous improvement of production efficiency.

The production cost of the prototype ranges from 100,000 to 230,000 THB, depending on the selected materials and additional energy systems installed. This makes it a cost-effective and high-performance technology for communities and small-scale entrepreneurs.

This technology is particularly suitable for community enterprises, women farmer groups, and rural herbal product entrepreneurs seeking to upgrade product quality standards, enhance commercialization potential, and generate sustainable income for local communities.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Charcoal Briquette

Crushing and Compacting Machine

Assist. Prof. Dr.Pongsak Nopparat

NERAMIT FOODTECH CO., LTD.

AGR-052

Highlight

Key features and Strengths

The charcoal briquette crushing and compacting machine was developed to enhance the efficiency of briquette production from agricultural residues such as coconut shells, rice husks, corn cobs, wood scraps, and dry branches.

This machine integrates two key processes:

1. Crushing – to reduce the size of charcoal or biomass materials, ensuring uniform particle size.
2. Compacting – to form the processed material into ready-to-use briquettes.

By combining these processes in a single system, the machine reduces production steps, improves processing speed, and saves energy. The resulting charcoal briquettes are high in density, long-burning, and produce minimal smoke, thereby increasing both production efficiency and product quality.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Discarded Durian Tying Ropes into Fuel Oil through Microwave-Assisted Pyrolysis Using Renewable Energy Systems

Assist. Prof. Dr.Chainuson Kasetpongsan

Suratthani Rajabhat University

AGR-053

Highlight

Key features and Strengths

Nature of the Innovation:

This innovation utilizes plastic raffia ropes (durian tying ropes), which are waste materials from durian orchards, and processes them through pyrolysis using a simple oil pyrolysis and distillation system developed by the research team. The process converts the plastic waste into fuel oil, specifically diesel and gasoline.

Appropriate Technology:

The pyrolysis process employs locally fabricated equipment designed to handle agricultural plastic waste effectively and sustainably, providing a low-cost and practical solution for waste-to-energy conversion.

Products:

The outputs include diesel oil (suitable for low-speed machinery) and gasoline (usable for vehicles such as cars, motorcycles, and grass cutters).

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Biogas Production Using a 300-Liter Fermentation Tank

Assist. Prof. Dr.Pongsak Nopparat

NERAMIT FOODTECH CO., LTD.

AGR-054

Highlight

Key features and Strengths

A 300-liter continuous anaerobic fermentation tank was developed, in which food waste is fed into the digester at a rate not exceeding 1/30 of the tank's capacity. The amount of material added each day is equivalent to the amount of digestate removed daily. The biogas generated from the system is utilized as a substitute for liquefied petroleum gas (LPG) at the household level, suitable for heating food or cooking meals that require a short preparation time.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Innovation in the Production of Exterior and Interior Components for Electric Vehicles (EVs)

Assist. Prof. Dr.Chainuson Kasetpongsan

Suratthani Rajabhat University

AGR-055

Highlight

Key features and Strengths

Hydrofoil Electric Watercraft (a vessel equipped with underwater wings that lift the hull above the water surface when moving at speed)

Component Innovation:

The innovation focuses on the design and manufacturing of the boat frame and hydrofoil components, engineered to be lightweight yet highly durable against wave impact.

This innovation is part of a large-scale research program aimed at utilizing natural rubber as a substitute for conventional materials and enhancing its value in industrial applications. The key research outcomes referenced in the study include:

1. Epoxidized Natural Rubber–Epoxy Resin Composite Formula:
2. Development of a new material formulation combining natural rubber with epoxy resin to achieve improved specialized properties, enabling replacement of certain polymer or plastic materials in manufacturing applications.
3. Natural Rubber-Based Synthetic Leather Formula:
4. Transformation of natural latex into bio-based or vegan leather, an environmentally friendly alternative to conventional plastic or petrochemical-based synthetic leather, offering both sustainability and material performance advantages.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Compost Production from Oil Palm Residual

Assist. Prof. Dr.Chainuson Kasetpongsan

NERAMIT FOODTECH CO., LTD.

AGR-056

Highlight

Key features and Strengths

The composting process was carried out using a non-turning pile method, combining chopped empty oil palm bunches and cattle manure at a 3:1 ratio by volume. The chopped oil palm bunches were layered thinly (no more than 10 cm thick) on a 2.5-meter-wide base, followed by a layer of animal manure and watering. This layering process was repeated for 15–17 layers, with each layer being moistened to maintain adequate humidity. The pile was formed into a triangular shape approximately 1.5 meters high, with the topmost layer consisting of animal manure.

Palm oil mill ash was added to adjust the pH to the range of 6.8–7.0. Throughout the 60-day fermentation period, the moisture content of the compost pile was maintained at 60–70%, and aeration was provided every five days using an air injection system to ensure optimal microbial activity and effective composting.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

No Intellectual Property (IP) protection has been filed, and no Invention Disclosure has been submitted.

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

Dried Blood Cockle with Herbs

Assist. Prof. Dr. Prawta Chantaro

Suratthani Rajabhat University

AGR-057

Highlight

Key features and Strengths

The Three-Flavored Dried Blood Cockle with Herbs and the Tom Yum Dried Blood Cockle with Herbs products have been processed using advanced drying technology, which effectively reduces the moisture content to a level that inhibits microbial growth. As a result, the products can be safely stored for at least three months at room temperature.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

Not yet commercialized or transferred for use.

Standards and Certification Status

Not yet registered with the FDA.

Intellectual Property (IP) Rights

Currently under Intellectual Property (IP) protection filing or Invention Disclosure preparation

Market Readiness

The product is at the prototype stage but has not yet undergone market testing.

NutriCal

Complete Medical Nutrition Formula

Assist. Prof. Dr. Supat Chaiyakul

Mahidol University

AGR-059

Highlight

Key features and Strengths

This product is a milk-based, sugar-free medical food formulated specifically for individuals with diabetes. It provides approximately 1.06–1.07 kcal/ml and contains 4.67% protein, 3.73% total fat (including 1.42% saturated fat), and 12.09% carbohydrates, all within the recommended nutritional ranges for diabetic patients. The formula also offers an appropriate balance of essential amino acids, omega-3, omega-6, and omega-9 fatty acids, as well as vitamins, minerals, and dietary fiber in accordance with established nutritional guidelines.

Clinical studies confirm the product's effectiveness in supporting blood glucose control, with a Glycemic Index (GI) of 27.86 and a Glycemic Load (GL) of 16. Over a 90-day follow-up period, significant improvements were observed in blood glucose, insulin levels, and triglycerides. Additional benefits included reductions in systolic blood pressure, body weight, body mass index, waist circumference, body fat percentage, and overall adipose tissue mass.

With these attributes, the product represents a suitable and safe nutritional option for individuals with diabetes, those with lactose malabsorption, and individuals who are recovering from illness, older adults, or anyone requiring balanced and reliable nutritional support.

Status and Potential of Research and Innovation

Current Status of Innovation Utilization

The technology has been transferred under a non-exclusive agreement.

Standards and Certification Status

The product has been registered with the FDA.

Intellectual Property (IP) Rights

Intellectual Property (IP) protection or Invention Disclosure has been approved.

Market Readiness

The product is already commercially available in Thailand

Retail Price

49–55 THB per bottle

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