The University Of Queensland
AUSTRALIA

QAAFI
Queensland Alliance for Agriculture and Food Innovation

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CENTRE FOR NUTRITION AND FOOD SCIENCES

Queensland Government

Queensland Alliance for Agriculture and Food Innovation

QAAFI is an agricultural and food sciences research institute of The University of Queensland – one of the world's leading research providers in tropical and subtropical agriculture and food production.

At QAAFI, our mission is to harness high tech science for sustainable agriculture and food production. To achieve this, we use game-changing technologies like artificial intelligence (AI), nanotechnology, genomics, gene editing and big data to produce safer, more nutritious food, using less resources.

Not only is UQ number one for agricultural science in Australia and one of the most highly ranked institutions in the world in this field, it is located in tropical and subtropical environments and, therefore, well placed as a hub for digital agriculture and delivering step-change innovations for the growth and production of sustainable and nutritious food.

Through our alliance with the Queensland Government, QAAFI researchers utilise world-class research field station facilities throughout tropical and subtropical environments in Queensland.

QAAFI delivers high-impact science to significantly improve the productivity, competitiveness and sustainability of tropical and subtropical food, fibre and agribusiness industries.

High impact science for sustainable agriculture and food

QAAFI is comprised of four inter-related research centres, with a focus on the challenges facing tropical and sub-tropical food and agribusiness sectors in the tropical and subtropical systems.

- Centre for Animal Science
- Centre for Crop Science
- Centre for Horticultural Science
- Centre for Nutrition and Food Sciences

Centre for Animal Science

Leading tropical livestock research and development

The Centre for Animal Science delivers world-class research to Australia's animal industries. We aim to increase on-farm productivity and sustainability in the northern Australian beef industry and across the livestock industries, including pigs and poultry.

We have major programs and capability in genetics and genomics; breeding and reproductive capability of northern Australian cattle breeds; welfare and ethics; pest and disease control through improved detection; monitoring and vaccine technologies; nutrition; metabolism and growth.

Centre for Crop Science

Integrated research for cereal and legume cropping systems

The Centre for Crop Science conducts world-leading research targeting enhanced profitability and sustainability of cereal and legume cropping systems in tropical and sub-tropical environments.

We pursue excellence in crop science at molecular, whole plant, and production system levels. Our integrated research capabilities include crop genetics, physiology, and modelling, along with soil science and weed biology. We work closely with industry and government, and seek synergies to meet challenges in crop science at a national and international level.

Centre for Horticultural Science

Driving innovation and industry adoption

The Centre for Horticultural Science delivers improvements to productivity, profitability and sustainability of horticulture industries.

Our world-class researchers drive innovation and industry adoption to increase the competitiveness of Australia's horticultural industries globally. Our expertise includes; Horticulture crop breeding and agronomy, Plant protection and Emerging technologies.

Centre for Nutrition and Food Sciences

Consumer 'fork to farm' research focus

The Centre for Nutrition and Food Sciences supports enhanced health outcomes and economic benefits for Australia, by conducting integrated fundamental and applied research to improve the taste, quality, appearance, nutritional value and safety of food.

We aim to understand the fundamental characteristics of food that influence processing, food quality, consumer perception and nutritional value.

Our Rankings

UQ is ranked #4 worldwide and #1 in Australia for agriculture

According to the NTU Performance Ranking of Scientific Papers for World Universities 2023

UQ is ranked #20 worldwide and #1 in Australia for environmental sciences

According to the QS World University Rankings by Subject 2023

UQ is ranked #16 worldwide and #1 in Australia for Agriculture and Forestry

According to the QS World University Rankings by Subject 2023

UQ is ranked #23 worldwide and #1 in Australia for food science and technology

According to the Shanghai Ranking's Global Ranking of Academic Subjects 2023

Our research capabilities in food and nutrition sciences

Uniquely Australian

Identifying and validating opportunities for elite products from foods and ingredients that can only have come from Australia

Our research includes:

- Provenance (region of origin) and regional attributes
- Functional food/feed/nutraceutical ingredients with enhanced nutritional and phytochemical profiles from specialty crops (Australian native plant foods) and industry co/by-products
- Value chain value-addition through processing and preservation
- Sensory properties, linked to consumer marketing and branding
- Innovative packaging solutions and safe use of novel plant foods

Smart selections

How to identify the right combinations of raw materials and processing to deliver consumer-preferred foods

Our research includes:

- Determining the molecular basis for the sensory and nutritional properties of foods, as influenced by raw materials and post-harvest processing
- Analysing the compositional structure of food attributes desired by consumers
- Matching animal genotypes and meat processing for quality meat products
- Post-harvest quality of cereals, in relation to domestic and export market requirements
- High through-put technologies such as near infrared for testing raw material and finished food quality

Naturally nutritious

Maximising the intrinsic nutritional properties of agricultural products in foods and ingredients

Our research includes:

- Biofortification: screening germplasm, bioprospecting and plant breeding for nutrition-enhanced products
- Linking nutritional and sensory properties through chemosensing mechanisms
- Bioaccessibility and bioavailability of phytonutrients to humans; impact of phytonutrient consumption on health markers
- Maintenance of phytonutrients: identification of nutritional value decline in the supply chain, and means of preserving nutritional content to point of consumption
- Phytonutrient analysis, sensory and consumer science
- Enhanced nutrition in pigs and poultry for improved production and as models for humans

Highlights of QAAFI's research into food and nutrition sciences

Value-adding for premium Australian food brands and markets

Australian native plants are packed with unique and complex phytonutrients that allow the plant to survive in some of the world's harshest environments. The ARC Training Centre for Uniquely Australian Foods are working with indigenous industry and communities to research the nutritional characteristics of these foods – and investigate the provenance of foods grown in Australia to transform the native Food and Agribusiness Sector.

uniquelyaustralianfoods.org

Sweetcorn, but not as you know it

Scientists in Queensland are developing purple sweetcorn varieties with the horticulture industry to help growers respond to increasingly health-conscious consumers. Being delivered by the University of Queensland, and jointly funded by the grower-owned research and development company, Hort Innovation, the new varieties are being developed through natural breeding programs.

qaafi.uq.edu.au/purple-sweetcorn

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Queensland Alliance for Agriculture and Food Innovation is a research institute of The University of Queensland supported by the Queensland Department of Agriculture and Fisheries.

Published date: 16/05/2024

CRICOS Provider 00025B
TEQSA PRV12080