The University Of Queensland
AUSTRALIA

QAAFI
Queensland Alliance for Agriculture and Food Innovation

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Queensland Government

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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 fewer 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

The Centre for Animal Science delivers world-class research to support and transform Australia's livestock industries. We aim to enhance productivity, profitability, and sustainability across the livestock sector, with particular expertise in northern Australia's beef industry, the feedlot sector and strong programs in poultry and pork.

We combine expertise in genetics and genomics, reproductive performance, animal health and welfare, biosecurity and vaccine development, and nutrition and growth, distinguished by an integrated systems approach that links animal biology, environment, and management to deliver solutions for tropical and subtropical livestock production.

Centre for Crop Science

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

The Centre for Horticultural Science delivers improvements to productivity, profitability and sustainability of horticulture industries. Our researchers drive innovation and industry adoption to increase the competitiveness of Australia's horticultural industries.

Our expertise includes; horticulture crop breeding, agronomy, plant protection, biosecurity and diagnostics, plant propagation, orchard design and productivity improvements in existing orchards.

Centre for Nutrition and Food Sciences

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, and translate insights into added-value ingredients, new products and new opportunities for growers and food manufacturers.

Our Rankings

UQ is ranked #1 in Australia and #6 globally for agriculture

According to the NTU Performance Ranking of Scientific Papers for World Universities 2025.

UQ is ranked #1 in Australia and #15 globally for environmental sciences

According to the QS World University Rankings by Subject 2025.

UQ is ranked #1 in Australia and #15 globally for agriculture and forestry

According to the QS World University Rankings by Subject 2025.

UQ is ranked #1 in Australia and #17 globally for food science and technology

According to the 2024 Shanghai Ranking's Global Ranking of Academic Subjects.

QAAFI's research impact

QAAFI delivers high-impact science to significantly improve the productivity, competitiveness and sustainability of tropical and subtropical food, fibre and agribusiness industries. QAAFI comprises interrelated research centres which conduct research across the supply chain in crops, horticulture, livestock and food, with a focus on delivering high-impact science to address the challenges facing food and agribusiness sectors in the tropical and subtropical systems, both in Queensland and globally.

Sorghum genetics and breeding

QAAFI has a world-leading research group focussed on the genetic improvement of grain sorghum. As a long-standing collaborative program with DPI at Hermitage Research station, the sorghum pre-breeding program has produced genetic material which can be found in almost all current sorghum hybrid cultivars. Our expertise includes biotechnological approaches to improving key traits with CRISPR gene editing, harnessing high-throughput phenotyping for resilience traits such as root architecture, staygreen and yield parameters. We are pioneering the use of predictive breeding techniques to accelerate the rate of genetic gain in sorghum.

Tissue culture propagation and cryogenics

A world-first platform technology is enabling commercial-scale, year-round propagation of horticultural plants. QAAFI is advancing this innovation to accelerate crop improvement through integrated gene editing and in vitro breeding technologies. The team is also developing cryopreservation methods to secure plant genetic resources for the long-term conservation of Australia's crop germplasm and the protection of genetic diversity in threatened tree and vegetable species.

Data-driven decisions for northern beef production

QAAFI delivers research that enhances the productivity, profitability, and resilience of Australia's livestock industries. The Calf Alive project exemplifies this impact, combining nutrition, physiology, genetics, and economic modelling to improve reproductive efficiency and herd performance in northern beef systems. The project is also pioneering the use of nitrogen isotopes in tail hair to identify more efficient breeders, linking cutting-edge science with practical management to help producers build flexible and productive herds under variable northern conditions.

Crop protection and biosecurity

QAAFI researchers have developed state of the art diagnostic technologies to safeguard Queensland's major horticultural industries from the introduction of exotic pests and diseases. Keeping exotic diseases out of Australia reduces production costs, the risk of crop failure, domestic market access, and reduces environmental footprint. For example, exclusion benefits in banana yields significant benefits of $138 million a year for Fusarium wilt TR4, $134 million for Moko and Blood disease, $80 million for Black Sigatoka and $37 million for Banana Bunchy top virus.

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

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