

# Health and Food Sciences Precinct

Delivering clean, safe and high quality  
food and animal products



Queensland  
Government



## New world-class facilities for Queensland

The Health and Food Sciences Precinct brings together Queensland's top scientists and state-of-the-art facilities.

Queenslanders and industry will now benefit from having scientists in one central location: fostering ideas, encouraging collaboration between Queensland's scientific minds and building new research partnerships.

As a result, the state's research and diagnostic capabilities will be enhanced.

## Collaboration and research

The Health and Food Sciences Precinct at Coopers Plains in Brisbane sees Queensland Government scientists working alongside scientists from CSIRO (Commonwealth Scientific and Industrial Research Organisation) to create a dynamic hub of scientific research.

The \$100 million precinct provides a collaborative environment for scientists to advance biosecurity, healthcare, food and nutrition research. Their work will assist Queenslanders to lead healthier, more active lifestyles, and strengthen the state's agricultural and food industries.

## Linking with industry and business

Industry and agribusinesses now have the opportunity to access skills and technology in one location.

The precinct offers a pathway to access a wide range of researchers and diagnosticians from national and international universities and government agencies. This enables more effective collaborations in developing new and emerging technologies and will maximise rapid response capabilities to disease outbreaks.



## Queensland's food industry

Queensland is a global supplier of high-quality, safe, 'clean and green' food at competitive prices.

Queensland's food industry:

- employs more than 43 000 people in the processed foods sector
- contributes more than A\$15 billion annually to the state's economy (both domestic and international sales)
- includes more than 1400 processing companies
- is the largest manufacturing sector in Queensland and the largest exporter of Queensland manufactured goods.

The industry is characterised by two distinct categories:

- food processing and manufacturing (including fruit and vegetables, value-added products such as dairy foods, ingredients, desserts and confectionaries, and ready-to-eat meals)
- meat and meat product manufacturing (including fresh seafood).

## Queensland science precincts

1. Health and Food Sciences Precinct (Coopers Plains)
2. Queensland Bioscience Precinct (the University of Queensland)
3. Ecosciences Precinct (Boggo Road)
4. Eskitis Institute for Cell and Molecular Therapies (Griffith University)
5. Queensland Crop Development Facilities (Redlands)
6. The Centre of Advanced Animal Science (Gatton)
7. UQ School of Veterinary Science (Gatton)
8. The Centre for Marine Microbiology and Molecular Genetics Research (Australian Institute of Marine Science, Townsville)
9. Australian Tropical Science and Innovation Precinct (James Cook University, Townsville)
10. Australian Tropical Forest Institute (James Cook University, Cairns)

## Features of the Health and Food Sciences Precinct

The precinct hosts 190 scientists from the Department of Agriculture, Fisheries and Forestry (DAFF), CSIRO and The University of Queensland through the Queensland Alliance for Agriculture and Food Innovation (QAAFI). Another 550 people are located on the Queensland Health Forensic and Scientific Services (QHSS) campus. Co-locating these researchers makes better use of resources and expertise and will help to foster new ideas and techniques.

The key facilities of the precinct are:

- state-of-the-art pilot plant facility with an extensive range of food-grade processing equipment for handling seafood, meat, dairy and horticulture products. This facility will be available to other public and private research organisations through collaborative research projects.
- workspaces and laboratories for food science, animal nutrition, biochemical analysis and consumer and sensory research.
- facilities for animal biosecurity research and diagnostic testing.



**Above:** Scientists Dr Louise Jackson and Ms Christine McCarthy examine Asian honeybee brood comb for the presence of the exotic Varroa mite.

## Research focus

### One Health

*Collaborating to improve research outcomes*

The Health and Food Sciences Precinct is located on the existing Queensland Health Forensic and Scientific (QHFSS) campus which is home to Australia's most extensive hub of public health and health-related environmental laboratories.

The synergy between the existing capabilities and innovative new science facilities will transform the hub into Australia's foremost health and food sciences research precinct. It will co-locate expert animal, human, environmental and food science practitioners.

This combined capability positions the precinct as one of the nation's leading initiatives working towards a 'One Health' approach to health and disease research. This holistic approach promotes collaboration between disciplines, including animal, human, environmental health and food science practitioners.

### Tackling bat-borne viruses through a One Health approach

Australian bat lyssavirus (ABLV) and Hendra virus have been detected in Australian bats and are capable of crossing species barriers. This rarely occurs, however consequent infection can be fatal.

Scientists from Queensland Health and Biosecurity Queensland (DAFF) will undertake complementary work in testing for exposure to both viruses. While Queensland Health will test for ABLV and for Hendra virus in humans, Biosecurity Queensland will test for ABLV in bats and companion animals, and for Hendra virus in horses.

Biosecurity Queensland will regularly screen populations of bats to identify any new strains of Hendra virus and ensure effective detection capabilities across the One Health continuum. This research aims to improve our understanding of the epidemiology of these viruses in bat populations and the factors that cause viruses to cross species.

Biosecurity Queensland and Queensland Health have worked collaboratively over many years to enhance their diagnostic and research capability. This continued collaboration will be enhanced by both organisations being located at the precinct.

### Protecting animal health

*Keeping our primary industries safe from emerging and exotic diseases*

Biosecurity Queensland researchers and scientists are working at the precinct to develop new rapid response capabilities for disease outbreaks and methods for tracking the spread of new and emerging diseases.

### Protecting Australia's honeybees

Honeybees contribute an estimated \$4–6 billion to the Australian agricultural and horticultural industries each year. Honeybees not only produce honey but also play a vital role in pollinating crops.

Biosecurity Queensland parasitologist Dr Louise Jackson and scientific assistant Ms Christine McCarthy are working to protect Australia's bees from the devastating *Varroa* mites. Australia is one of the few *Varroa*-free countries, allowing Australian honeybees to be exported to other countries where endemic bee populations have collapsed.

These mites could enter the country via their host, the Asian honeybee (*Apis cerana*), which is exotic to Australia but common in South East Asia and Papua New Guinea.

Queensland's shipping ports are a key point of entry for Asian bees, with populations recently detected in Far North Queensland. The *Varroa* mites harmlessly co-exist with the Asian bee but attack adult and developing European bees (*Apis mellifera*), Australia's commercially-kept species. Mite infestation results in weak, deformed bees and causes the rapid demise of the colony.

To date, all Asian bees found have been mite-free. Biosecurity Queensland continues to work closely with the Australian Quarantine and Inspection Service, beekeepers and the general public to capture, identify and inspect Asian bees. This is to ensure any future incursions of the *Varroa* mites can be rapidly detected and eradicated.



## Maintaining market access

*Ensuring product integrity and market access through surveillance and research*

Locating scientific experts in the precinct's world-class chemical science laboratories will help to ensure Queensland's animal and plant products are free from toxins, pathogens and contaminants.

Expertise includes managing chemical control of invasive pests, clinical biochemistry, food safety and nutritional assessment of animal feedstuffs—providing opportunities to link with other research programs onsite.

## Maintaining market access for Australian beef

Australian meat processors export chilled and frozen meat to over 100 countries worldwide. With annual earnings of over \$7 billion, maintaining access to these markets and adapting to changing import and export regulations is critical.

CSIRO researcher Dr Robert Barlow and his colleagues recently responded to changes for point-of-entry testing of beef trim into the US. The researchers developed a mathematical model to estimate the effect of altered sampling strategies on the detection rates of *E. coli* O157 in frozen beef exported to the US.

The model assists informed discussions between Meat and Livestock Australia, US authorities and the Australian Quarantine and Inspection Service. US confidence in the safety of the imported Australian beef is now maintained without the need for excessive import restrictions and testing.

Collaboration between CSIRO, the Queensland Government and university researchers at the precinct will strengthen research to enhance Australia's reputation for safe and secure food exports.

## New testing method saves Queensland pork industry

At the precinct, Biosecurity Queensland scientists continue to protect Queensland's priority trade relationships.

Residues of a banned, and potentially fatal, antibiotic called chloramphenicol were recently found in Australian pork exported to Singapore, sounding alarm bells with Biosecurity Queensland scientists.

Trace-back analysis detected residues in pork originating from several piggeries, but scientists could find no evidence of illegal use of the antibiotic.

The next step included investigating the possible contamination of feed components. To achieve this, scientists developed a new chemical testing method.

Using this new testing method, scientists confirmed the antibiotic was being used as a feed additive and was imported from an offshore location. The investigation led to the development of new procedures provided to Singaporean authorities, who reinstated market access for Queensland producers.

*Right: Dr Heather Smyth identifies chemicals and odorants that constitute the flavours we experience in foods.*



## Food science

Food scientists at the precinct are working with the food industry to improve the quality, safety and health benefits of food products.

The Queensland food industry will benefit from research being undertaken at the precinct by Queensland Government, CSIRO and university scientists into changing consumer food trends, food safety standards, competitiveness and security.

## Food quality testing

*Adding value to existing and new food products through expertise in food safety, consumer science and flavour research*

## Revealing the science of flavour

Dr Smyth is a PhD-qualified organic chemist for DAFF. Her research aims to improve the flavour, sensory qualities and consumer appeal of food.

Her flavour perception work identifies the chemicals and odorants that constitute the flavours we experience in foods. Dr Smyth also works in sensory science, running tasting panels that articulate and rate food quality.

Dr Smyth and her colleagues use custom-designed sensory booths for blind tastings of food samples in the precinct's state-of-the-art laboratories. These sensory booths are an important tool in making sensory measurements of food.

Data from the tastings provides a quality index that is important for food industry clients.

The data also assists with consumer mapping, which helps target a product market to particular consumer groups, or develop the flavours and products to match the taste preferences of a wider group of consumers.

*Below: Taste testing is one way scientists work to understand flavours and people's food preferences. Pictured are (from left) Kathryn Montafia, Peter Scheelings and Jessica Sanderson.*

## Food technology

*Producing tastier, healthier and safer foods for a more sustainable food industry*

## Tailored advice for industry

Food Technologist Ms Jessica Sanderson works closely with food industry bodies and processors to help them apply innovative solutions to create highly nutritious and safe food products.

Focussing on tropical and sub-tropical fruit, vegetables, grains and seafood, Ms Sanderson assists processors to optimise the design, formulation, processing and handling of their food products. Her role also involves interpreting the regulatory requirements placed on food manufacturers to ensure compliance when developing new products.

The facilities used for food technology include a custom-designed product development laboratory and accelerated storage room. In addition, a state-of-the-art pilot plant facility with an extensive range of food-grade processing equipment will be available to other government agencies, CSIRO and private sector clients through consultative project collaborations.

Ms Sanderson's work provides practical guidelines and tailored advice, ensuring continued profitability, sustainability and safety for Queensland's food industry.





*Left: Dr Michael Netzel is investigating the bioactive components of Queensland fruit and what health benefits they might provide.*



## Functional foods

*Food products that improve our health, prevent disease and provide new industry opportunities*

### Bioactives and tropical fruit

Increasing consumer interest in the health benefits of food is driving new markets for Queensland's tropical fruits.

Dr Michael Netzel is investigating the potential health benefits of varieties of Queensland grown fruits such as mango, banana and other tropical exotic produce.

Working for both CSIRO and Queensland Government, Dr Netzel demonstrates the advantages of collaboration for both industry and community.

Dr Netzel is using the combined capability of both organisations to investigate the potential health benefits and processing issues of the Queen Garnet plum, which was specifically bred by the Queensland Government to be high in antioxidants and anthocyanins.

Working at the precinct means he is able to develop new ideas that draw on the expertise and technology of both organisations.

## Measuring folate levels in Asian vegetables

Green leafy vegetables are an excellent source of folates, which occur naturally in many forms (called vitamers).

For the past two years, Dr Pieter Scheelings and staff from Queensland Health's Food Chemistry group have been working collaboratively with DAFF scientists on a study into the folate content of Asian green vegetables.

Folate deficiency has been implicated in a wide variety of disorders. An increase in folate intake for women of child-bearing age is recommended to reduce the risk of spina bifida developing in unborn babies.

The study is intended to provide information on the health attributes of Asian vegetables, in particular total folate content and vitamer composition.

This will enable industry to promote and market the health benefits of Asian vegetables through folate content labelling.

The study draws on the precinct's diverse range of scientific skills and collaborative environment to produce outcomes of both public health significance and agricultural value.





## Contact

For more information about the Health and Food Sciences Precinct

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