Overview

In Australia, the food and grocery manufacturing industry accounts for 28% of total manufacturing, has an annual turnover of $100 billion and employs 315,000 people. It is anticipated that the food processing industry will need to advance rapidly in order to meet challenges that include population growth, health challenges including the obesity epidemic and the need for more sustainable production.

Traditionally, the University of Western Sydney (UWS) has demonstrated strong academic and research credentials in food science and technology. Looking to the future, the University aspires to be the training and research provider of choice for leaders in the food and agriculture industries. Pivotal to this strategy is the establishment and building of links to industry to more effectively meet their needs for highly employable graduates, up-skilling of staff through postgraduate training programs, and providing access to improved research outcomes.

Areas of Research Activities

Current research activities are aimed at the development of new technologies for food processing. Examples of research grant and consultancy topics are shown below:

- **Eatright sensor labels** Co-Researchers: Adj Assoc Prof Bob Holland; Dr Minh Nguyen
- **Novasep IEL Lactose project commercialisation** Co-Researchers: Assoc Prof Jim Hourigan; Dr Rosalie Durham; Dr Robert Sleigh (CSIRO). Partners: Dairy Australia, CSIRO-Food Science Australia
- **Innovative Separation Technologies** Co-Researchers: Assoc Prof Jim Hourigan; Dr Linh Vu. Funding Body: Dairy Innovation Australia.

The Novasep IEL Lactose project is essentially a retrieval of value from a waste stream. It involved the development of an innovative process for the purification of lactose from whey, known as the “ion exclusion lactose” (IEL) process. In collaboration with CSIRO and Dairy Australia, the process was successfully up-scaled and licensed.

Teaching, Learning and Training

Recent work has focused on re-developing food and nutrition programs to expand the opportunities for students to study in areas focused on food at the University. Currently, there are 208 students enrolled in these undergraduate programs. Post graduate research projects have included dairy applications, separations science, sustainable food processing, functional ingredients and packaging. Activities of the research centres will be linked with undergraduate teaching thus creating cohesion pipeline between existing undergraduate coursework programs and postgraduate research. Specific examples of postgraduate food research programs (PhD and M.Sc Hons) at the Hawkesbury Centre for Sustainable Agriculture and Food Security include:

- Investigation of methods for increasing efficiency of use of non-renewable resources for food production, processing and distribution;
- Investigation of food quality and safety, processing and distribution;
- Investigation of interactions and health benefits of functional foods and controlled delivery systems.
Resources
The School of Natural Sciences and the Centre for Plants and Environment provide academic and logistics support for research, training and policy development in food science and technology. The University has a pilot plant equipped to process a variety of foods and even a small abattoir as part of its teaching and research capabilities. A molecular laboratory and chromatography facilities are also used for food analysis. Other facilities are designed for research into encapsulation of bacteria and other bioactive molecules for targeted release within living organisms.

Facilities include:
- Food pilot plant - includes a wide range of pilot scale process equipment capable of covering most unit operations in food processing. Includes ancillary services such as walk in chillers and freezers, steam and compressed air;
- New Food Studies Centre and kitchen;
- Undergraduate food testing laboratories;
- Sensory evaluation facility and tasting booths;
- Postgraduate food research laboratories. Includes microbiology, analytical instruments, protein analysis, molecular biology, PC2 and food research.

Previous Clients and Projects
UWS academics are engaged in collaborative research and consulting activities with government and industry partners. Some past projects are listed below.
- **Dairy Permeate Opportunities** Co-Researchers: Assoc Prof Jim Hourigan; Dr Estelle Lifran. Funding: iRIS Consulting
- **Whey ion exchange trials** Funding: Bonlac
- **Spray drying trials** Funding: Protech Research

Publication Activity
UWS also has a number of international research and consulting collaborations in the field of food science and technology. Examples include