ArloesiAber
AberInnovation

The Development Hub

innovate@aber.ac.uk | 01970 621809 | aberinnovation.com | @AberInnovation

AberInnovation

Aberystwyth University has been at the forefront of meeting the societal and environmental challenges of food and water security, climate change mitigation and renewable energy for decades. AberInnovation allows this vital work to continue at the cutting edge of new technology and with some of the world's most innovative companies.

AberInnovation provides state of the art facilities for a community of ambitious, collaborative companies of all sizes to develop new products and processes in the sustainable and circular economy and to innovate in food and biorefining.

At AberInnovation product development and business growth are frictionless. Our community of world-leading academic experts and innovative businesses share a common purpose in a common location at Aberystwyth University's Gogerddan Campus, famous for crop and livestock science.

Facilities for Collaborative R&D

- Future Food Centre
- Biorefining Centre
- Advanced Analysis Centre
- Seed Biobank
- Innovation Hub
- Office Space

Biorefining Centre

A pilot scale facility for trialling and optimising a range of primary and secondary processing techniques for biomass, applying a wide range of product extraction methods and with access to a broad suite of compositional analysis technologies and food and drink development facilities.

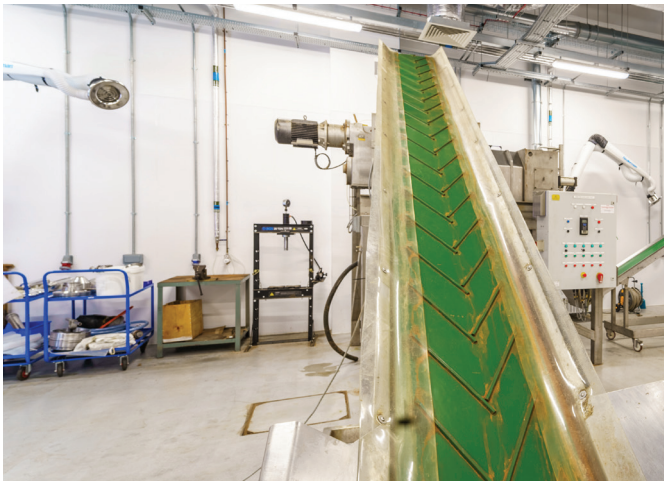
The AberInnovation Biorefining Centre is home to **BEACON Biorefining.**

Pilot plant:

- **Primary Processing Unit:** Juicing fresh feedstocks (100kg to 1 tonne per hour) and producing pressed material for further processing static and continuous drying systems up to 150kg/h. Ambient stirred digestion or maceration of bulk materials in intermediate bulk containers (250-1000 litres). Milling and densification of dried feedstocks for fuel production including production of pellets for trials.
- **Downstream Processing Unit:** Food grade facilities for size fractionation of suspended and dissolved solids using pilot scale micro-/ultra-/nano-filtration and reverse osmosis cross-flow filtration systems fitted with industrial sized spiral-wound, ceramic and tubular membranes. Continuous solid-liquid separation capability using decanter, auto desludging disc-stack and separator centrifuges (50 to 2000 litres per hour). Preparation of food-grade quality extracts and concentrates.
- **Spray Drying:** Finished powder products (approx. 2 litres per hour).
- **Steam Explosion:** Pressurised hydrothermal pre-treatment of a range of different woody biomass feedstocks (batch processing up to 20kg dry biomass per day).
- **Pilot Fermentation Unit:** Food grade facilities for conventional fermentative and novel biotech products at an industrially relevant scale. Fermentation in 1 litre, 30 litre, 70 litre and 340 litre bioreactors. Automated methane potential systems for assessing biogas potential of feedstock. Design of experiment (DoE) guided bioprocesses.
- **Clean Room (Product Finishing Area):** An ISO 7 level (high hygiene) area for crystallisation development (using the *Technobis Crystal16* platform) and product finishing (e.g., bagging small scale products (mg to kg) in a controlled atmosphere environment).

Industrial Biotechnology suites:

- **Biotechnology Acceleration Suite:** High throughput microbial phenotyping and fermentation platforms for both aerobic and anaerobic microbiological applications. Phenotypic microarrays to identify novel microbes and characterise the metabolism of new production strains developed using synthetic biology approaches. Exploration of Synthetic Biology development routes and full analytical support.
- **Bioprospecting Suite:** Extraction of samples at a range of scales (mg to kg). Laboratory scale evaporation and fractionation (mg to kg) of semi-purified natural products and liquors.



Future Food Centre

A food-grade environment for the testing, validation and improvement of existing and novel materials as foods including nutritional content, advanced compositional analysis, shelf life and consumer preferences.

Food Research and Development Areas:

Food-grade processing and laboratories following BRC standards

- **Solids (meat and alternative protein):** Goods reception with delivery yard, proof of concept scale processing facilities (90m^2) and cold storage for meat product raw materials as well as emulsified, fermented, cured and cooked meat products.
- **Liquids (dairy and other liquids):** Reception (130m^2; capacity: 1-500 litre batches), thermal processing and separation of raw milk feedstocks allowing continuous flow pilot scale pasteurisation with option of homogenisation and UHT with filler. Batch pasteurisation from 3-120 litres offering a diverse range of processing options for proof of concept and product development. Liquid processing also offers facilities for multiple batches enabling sample replicates for the research into novel products simultaneously. Production facilities for cultured and fermented liquid products including yogurt and cheese, as well as ice cream making and blast freezing facilities.
- **Grains and pulses:** Processing and formulation of raw goods, on-site baking including preparation of functional food materials for consumer testing.

Demonstration Kitchen and Sensory Booths:

- **Demonstration Kitchen:** Test kitchen to support sensory booths, develop cooking methods, improve recipes and assemble and present products. Includes combi oven, grill, griddle, fryer, blending, preparation, freeze drying and monitoring equipment.
- **Sensory Analysis:** Six sensory testing booths for consumer and trained, specialist panels, served by a dedicated kitchen to allow real-time responses to organoleptic and sensory properties of novel foods (taste, texture, appearance, etc.) to be collated. Individual climate and lighting-controlled booths for the sensory assessment of food products, ingredients and their packaging.

Laboratory Analysis: composition, shelf life and safety

- **Food quality and composition:** Access to excellent facilities in the Advanced Analysis Centre to determine food composition using standard and bespoke tests (e.g. essential fatty acids, nutraceuticals, micronutrients, chemical determinants of bioactivity, flavour and colour development).
- **Food characteristics:** A fully equipped laboratory for measuring the physical characteristics of liquid and solid foods (e.g. meat texture).
- **Food storage:** Replicated thermal environment modulation cabinets to study a range of temperature and humidity effects on food maturation processes.
- **Retail display cabinets:** To study effects of shelf life and types of packaging on food quality (e.g. colour testing, food stability).
- **Food Safety:** A designated microbiology laboratory to test and measure microbial spoilage.

Microbiology

Dedicated Class 2 microbiology laboratory for routine microbiological testing of food products or for use in other areas of research and development.

The laboratory is equipped with a Class II biological safety cabinet and a laminar flow cabinet to control contamination during sample and media preparation.

The laboratory also has its own dedicated micro plate reader with UV-vis spectrometry for measuring absorbance/absorbance spectra, along with other detectors for fluorescence intensity, time-resolved fluorescence, *AlphaScreen*™ and luminescence.

Ideal for the measurement of chemical, biological and physical properties of an analyte or sample. Method examples include DNA quantification, enzyme activity assays, ELISA immunoassays and cell viability assays.

Advanced Analysis Centre

Bespoke modern laboratories with state-of-the-art analytical chemical instrumentation provide a research environment to fulfil collaborators' analytical needs from sample processing and extraction to screening, targeting, and quantifying compounds of interest. Experienced staff can support and assist in further method development as required.

The Advanced Analysis Centre supports a wide range of analytical needs and interacts with the Aberystwyth University Well-being and Health Assessment Research Unit (WARU) for food intervention studies.

At a glance:

Qualitative and quantitative analysis of:

- Lipids, free fatty acids and short-chain fatty acids
- Proteins and free amino acids
- Sugars and starch
- Pigments
- Vitamins
- Sterols and steroids
- Dietary biomarkers

Non-targeted screening and phenotyping using:

- Metabolomics
- Lipidomics

Samples can include:

- Raw and processed foods
- Plant materials
- Fermentation products
- Nutraceuticals
- Cosmetics
- Biofluids
- Clinical samples

Advanced compositional testing in bioprospecting, biorefining and fermentation process support:

- **Chemical content analysis:** Including minerals, sugars, organic acids, alcohols, lipids, lipid oxidation status, pro-oxidative and anti-oxidative capacities.
- **Comprehensive profiling and structural elucidation:** Analysis of metabolites using ultra high performance Liquid Chromatography and Gas Chromatography Mass Spectrometry.
- **Targeted quantification of secondary metabolites** in complex mixtures using **Triple Quadrupole Mass Spectrometry.**

Food quality and composition:

- **Analytical Capability to Determine Food Composition:** Standard and bespoke tests (e.g. vitamins, essential fatty acids, nutraceuticals, micronutrients, chemical determinants of flavour and colour development) for process quality control on dedicated instruments.
- **Food Bioactives Discovery and Validation:** Comprehensive profiling of foods for discovery and validation of (lipidomics and metabolomics) dietary exposure biomarkers and bioactive functional compounds.
- **Comprehensive Lipid and Fatty Acid Profiling:** Dedicated laboratory for analysis of fat-soluble components, lipid fractions, fatty oxidation products and vitamins.

Food functionality and health claims:

- **Dietary Exposure Biomarker Analysis:** Triple Quadrupole analysis area for targeted, quantitative analyses of urine and blood samples to assess compliance in food intervention studies and to measure biomarkers of overall eating behaviour in clinical trials with novel foods.
- **Bioavailability and Metabolism Assessment:** Determining the metabolic fate of food bioactives/ nutraceuticals in clinical trial participants.
- **Nutritional Status Assessment:** Clinical biochemistry analytics supporting nutritional status assessment.

Seed Biobank

A controlled environment facility for the secure storage and cataloguing of plant genetic resources. These facilities support IBERS's world-renowned plant breeding programmes, enabling the development of new plant varieties and maintenance of many commercial plant varieties.

- **The Biobank:** One of the largest ex-situ collections in the world on forage and amenity grasses, clovers, oats, and the bioenergy crop Miscanthus. The state-of-the-art seedbank facility, a £7m investment from Aberystwyth University, BBSRC and the Welsh Government, currently holds over 35,000 accessions for medium (20-50 years) to long-term (100 years) storage for research and breeding. An integral asset for the UK Plant Genetic Resources Group (UKPGR) collections and the European Cooperative Programme for Plant Genetic Resources (ECPGR), the Biobank also possesses one of the few quarantine facilities in the UK that can accommodate imported plants which require phytosanitary observations and control. All collections since 1992 are compliant with the United Nations Convention on Biological Diversity (CBD) and Nagoya Protocol on Access and Benefits Sharing (ABS) for utilisation and commercialisation.
- **Crop seed processing:** Bulk seed store (10°C and 20% relative humidity – capable of holding over 150 pallets of seed) for large pre-commercial seed lots, along with a separate store for dried, pre-cleaned seed. It also includes a laboratory for germination testing and seed analysis and the main seed processing area, where cleaning of lots ranging in size from a few grammes to 10 tonnes is carried out in line with International Seed Testing Association (ISTA) guidelines.

Co-located Projects

AberInnovation is co-located with a variety of other Aberystwyth University innovative projects allowing for seamless interdisciplinary research, development and innovation.

BEACON
From plants to products
O blanhigion i gynhyrchion

BEACON Biorefining Centre of Excellence
www.beaconwales.org

National Plant PHENOMICS Centre

National Plant Phenomics Centre
www.plant-phenomics.ac.uk

Uned Ymchwil Asesiant Lles a Iechyd
Well-being and Health Assessment Research Unit
WARU

Well-being and health Assessment Research Unit
www.waru.org.uk

FutureFoods
Collaborate to Succeed | Cydweithio i Lwyddo

Future Foods Wales
www.futurefoods.wales

BioArloesedd Cymru
BioInnovation Wales

BioInnovation Wales
www.bioinnovationwales.org.uk

CIEL

Small Ruminant Research Platform
www.cielivestock.co.uk

Be part of our community of likeminded innovators

Innovation Hub

Innovation Hub

The front door to all of our technical R&D zones is the Innovation Hub which provides a welcoming social space for meetings, events and breakout discussions. Our first-floor co-working spaces offer bright, adjustable areas to suit your needs, with comprehensive videoconferencing capabilities.

Bookable Meeting Rooms

Spacious and bright spaces perfect for meetings, conferences and training.

We have a variety of bookable meeting rooms to suit your needs. All of our meeting and conferencing spaces are fully accessible and have kitchen facilities close by. All of our Innovation Hub spaces are available free of charge to AberInnovation members.

Office Space

Fully Serviced, Flexible Office Space at the AberInnovation Incubator

Our Incubator lies over the road from the Campus and comprises of 19 offices in sizes varying from 8m^2 to 23m^2. With flexible lease terms, transparent all-inclusive rents and a thriving community of likeminded innovators, there's never been a better time to join.

Associate and Virtual Memberships available to start your company journey with us.

Business Support

We offer a range of business support to entrepreneurs, start-ups, spin-outs and growing companies. The investor-ready and business planning programmes offer tailored mentoring for individuals and enterprises looking to develop or scale up their products or services within the bioscience, healthcare, agri-tech or food and drink sectors.

Office Space
Membership
Packages availaible

Membership Packages at-a-glance

	Resident Tenants (priced m² per month)	Associate Tenants (£90 per month)	Virtual Tenants (£50 per month)
A light spacious and newly renovated, professional private office	●		
A designated desk when working on or visiting campus		●	
Full time presence in a community of businesses and scientists	●		
Cleaning and maintenence services, recycling and refuse facilities	●	●	
Professional work environment amongst likeminded businesses	●	●	
Your company advertised on the AberInnovation website	●	●	●
A trading address	●	●	●
Access to events on campus	●	●	●
A place to host meetings with colleagues and collaborators	●	●	●
Start work immediately	●	●	●

Resident Member

A fully furnished office with telephone landline and 24/7 electronic access to the office building with unlimited working hours. Each Resident Member will have a lockable private offce with heating, electricity, sensored lighting, security and secure high-speed internet and Wi-Fi.

Resident Members will also have free access to high quality meeting room facilities, break-out spaces including a shared kitchen area and on site café, and a dedicated car parking space.

Benefits:

- A light, spacious and newly renovated, professional private office
- Full time presence in a community of businesses and scientists
- Co-location with AberInnovation Team
- Move straight in and start to work immediately
- Access to events on Campus
- Your company advertised on the 'Residents' area of the AberInnovation website
- Cleaning and maintenance included
- Refuse and recycling facilities

Associate Member

A fully furnished, shared office space with 40 hours' electronic access to the office building per month during working hours with heating, electricity, sensored lighting, security and secure high-speed internet and Wi-Fi. Associate members will also have 4 hours of free access to high quality meeting room facilities, break-out spaces including a shared kitchen area and on site café and a dedicated car parking space.

Benefits:

- A designated desk when working on or visiting the Campus
- Co-location with AberInnovation Team
- Move straight in and start to work immediately
- Access to events on Campus
- A trading address and professional work environment
- Your company advertised on the AberInnovation website
- Cleaning and maintenance included
- Refuse and recycling facilities

Virtual Member

Access to AberInnovation's network and online community as well as meeting rooms when visiting campus and a trading address with secure postal storage.

Benefits:

- A trading address and secure postal mail storage
- Your company advertised on the 'Virtual Members' area of the AberInnovation website
- Access to Meeting Rooms – facilities charged at 50% discount on standard rates – bookable, subject to availability

Meet the AberInnovation team

Dr Rhian Hayward MBE
Chief Executive Officer
rih@aber.ac.uk
01970 622837

Dr Rebecca Charnock
Industrial Research Development Manager
rbc1@aber.ac.uk
01970 628788

Teleri Davies
Marketing Communications Manager
had50@aber.ac.uk
01970 628464

Shaun Davies
Equipment and Facilities Manager
shd21@aber.ac.uk
01970 621809

How to find us

Contact us: AberInnovation Offices, Gogerddan, Penrhyncoch, Aberystwyth, Ceredigion, SY23 3EE

innovate@aber.ac.uk | 01970 621809
aberinnovation.com

@AberInnovation

Aberystwyth Innovation and Enterprise Campus Ltd.

- AberInnovation Offices
- Aberystwyth Innovation and Enterprise Campus (AberInnovation)
- Institute of Biological, Environmental & Rural Sciences (IBERS)
- The BEACON Biorefining Centre of Excellence (BEACON)
- The National Plant Phenomics Centre (NPPC)
- Aberystwyth University Penglais campus
- Bow Street train station to Birmingham, Birmingham International and London Euston

PRIFYSGOL ABERYSTWYTH UNIVERSITY 1872

UNDEB EWROPEAIDD EUROPEAN UNION
Llywodraeth Cymru Welsh Government
Cronfa Datblygu Rhanbarthol Ewrop
European Regional Development Fund

UKRI Biotechnology and Biological Sciences Research Council

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Welsh language version available Cymraeg