The chain of research areas

Environmental Credibility, Economic Feasibility and Social Acceptance
Professor Marianne Thomsen, Department of Environmental Science

This research area takes a systemic approach to identify regulatory, social and economic barriers and enablers of a transition towards an environmentally sustainable circular bioeconomy. We model the ecosystem health and services, e.g. emission capture, nutrient cycling and climate change mitigation, which may be obtained from systems: management systems, upcycled biowaste value chains and high-value biorefinery systems. Monetary and non-monetary valuation of environmental restoration and climate mitigation services are proposed. Business decision support tools and policy instruments to boost a circular regenerative bioeconomy.

Utilization of biomass for food, ingredients and high-value products
Associate Professor Trine Dalsgaard, Department of Food Science

This area will develop and optimize techniques and technologies for the extraction of high-value products for foods and ingredients. Primary focus is development strategies to avoid enzymatic browning and extraction and characterization of white protein, secondary metabolites, active compounds, prebiotics and natural colors. The area also comprises strategic efforts within the optimization of process parameters in relation to protein-chemical changes, functional properties, sensory preferences and bioavailability.

Production and management of agricultural biomass
Senior Researcher Ulla Jørgensen, Department of Agroecology

This research area focuses on the improvement of plants and crops, innovative cultivation systems, and recycling technologies as well as the application of such sustainable biomass production. The aim is an improved utilization of natural production conditions in order to ensure an optimum resource utilization and minimum losses to the environment. Additional focus will be on improving biodiversity in both intensive and in more extensive production systems in partly intensive and partly extensive production systems.

Feeds, by-products and feed ingredients
Senior Researcher Søren Knag Hansen, Department of Animal Science

Research focuses on soluble protein, fiber, fiber associated protein and other products extracted from biomass and how these can be optimally used as feed for monogastrics and ruminants. We will examine how different animal groups utilize the products most optimally, and how protein and other parts may be used as raw materials in the feed. We will further examine how to develop a concept for cooperation between pig and poultry and cattle farmers in order to ensure optimal utilization of green biomasses.

Production of marine biomass
Senior Researcher Annette Bruhn, Department of Bioscience

The primary research areas within marine biomass are 1) Cultivation and harvest of macroalgae (innovative cultivation technology, life cycle control, selective breeding, optimizing biomass yield and quality, nutrient absorption), 2) Environment and climate impact of marine biomass production (macroalgae and mussels) (life cycle analyses, organic modelling, marine area management). Focus will be on the analysis and mapping of biomass production potentials and environmental impacts of large-scale cultivation in marine areas with different oceanography and nutrient loads. This includes impacts on biodiversity and area efficiency of nutrient emissions from agricultural and marine farming.

Biorefining, conversion and recycling
Assistant Professor Mølten Amby-Jensen, Department of Biological and Chemical Engineering

This area carries out research in the development of biorefining technologies with a view to increasing the value of biomass streams. Focus will be on applying the latest research results to new technologies and - at the same time - develop pilot scale refining plants in order to ensure that operation results are readily scalable to an industrial level. The plants developed will be implemented into refinery plans, thus ensuring a maximum value increment in relation to produced biomasses and side streams as well as ensuring concerted planning in entire systems in order to finish the value chain.

Biomaterials and bio-oils
Associate Professor Marianne Glasius, Department of Chemistry

This area carries out research in biomass conversion, a molecular level via hydrothermal and catalytic processes. The purpose is to develop new materials, molecular building blocks for the chemical industry and fuels based on bio-based compounds. The research focuses on the optimization and molecular understanding in relation to conversion of a wide range of biomasses with a view to identifying and evaluating the most suitable ones. An important research area is catalytic upgrading of raw bio-oil to a high-quality fuel.
Facilities
Aarhus University has a series of unique technology platforms and research facilities, and now—within the framework of CBIO—we interconnect these to constitute entire chains and invite other interested parties to participate in research and development. The facilities include cultivation and harvest areas for macroalgae production, a platform for sustainable intensification of biomass production, a protein platform to optimize extraction methods for protein and active compounds as well as analytical platforms and plants for hydrothermal liquefaction of wet biomasses and for biogas research.

Cooperation with the industry
The Centre invites for cooperation with national and international companies and organizations within biobased economy. Our activities should contribute to the establishment of new companies and business areas within bio-based economy, e.g., production and marketing of new Danish protein for both animal feed and food production.

Contact information
Production and management of agricultural biomass
Senior Researcher Uffe Jørgensen, Department of Agroecology
e-mail: uffe.jorgensen@agro.au.dk, tel.: +45 8715 7729

Production of marine biomass
Senior Researcher Annette Bruhn, Department of Bioscience
e-mail: anbr@bios.au.dk, tel.: +45 8715 8797

Biorefining, conversion and recycling
Assistant Professor Morten Amby-Jensen, Department of Biological and Chemical Engineering
e-mail: maj@bce.au.dk; tel.: +45 9350 8009

Biobased materials and bio-oils
Associate Professor Marianne Glasius, Department of Chemistry
e-mail: glasius@chem.au.dk, tel.: +45 8715 5923

Feeds, by-products and feed ingredients
Senior Researcher Søren Krogh Jensen, Department of Animal Science
e-mail: skj@anis.au.dk, tel.: +45 8715 8076

Utilization of biomass for food, ingredients and high-value products
Associate Professor Trine Dalsgaard, Department of Food Science
e-mail: trine.dalsgaard@food.au.dk, tel.: +45 8715 7998

Sustainability, society and economy
Professor Marianne Thomsen, Department of Environmental Science
e-mail: mth@envs.au.dk, tel.: +45 8715 8602

Industrial cooperation
Business- and International Coordinator Margrethe Balling Høstgaard, DCA – Danish Centre for Food and Agriculture
e-mail: Margrethe.hoestgaard@dca.au.dk, tel.: +45 4014 7885.