

DTU



RESEARCH IN SUSTAINABILITY

# FOOD

## Interdisciplinarity must ensure the transformation of food production

Food production currently accounts for about 30 per cent of the world's total CO<sub>2</sub> emissions. At the same time, the UN expects that by 2050 we will be up to 10 billion people on Earth. We must develop new sustainable foods and efficient production methods to feed everyone without depleting our planet's resources.

Food production affects major global crises. This includes the climate crisis with emissions of greenhouse gases from animal production, the biodiversity crisis with the loss of species caused by large agricultural areas, and loss of life in lakes and the world's oceans due to overfishing and environmental pollution.

DTU adopts a holistic approach to food as a research concept allowing us to contribute to making food both healthy and safe with various perspectives and disciplines.

The world is facing a crisis with increasing levels of hunger and malnutrition alongside rising rates of obesity. DTU focuses on finding healthy, safe, and tasty alternatives to meat and dairy products based on plants or with the help of microbes.

At the same time, technology and digital solutions can contribute to better resource utilization in the processing, use, storage, and transport of food. Lower energy consumption, reduced water usage, less food waste, and innovative uses of by-products will help increase sustainability throughout the food chain.

At DTU we are committed to a responsible future

In Europe we must transition towards a more viable society based on more sustainable solutions.

At DTU, we lead cutting-edge research in engineering and natural sciences, supported by one of Europe's most robust innovation ecosystems.

Our strength lies in interdisciplinary collaboration, where we develop advanced technologies and sustainable solutions to benefit society.

Kind regards,



**Christine Nellemann,**  
provost



Creating new technological solutions requires interdisciplinary collaboration and expertise in areas such as nutrition, chemistry, microbiology, toxicology, mathematical modelling, digitalization, and technology.

At DTU, we have the latest knowledge and technologies in areas such as:

- Food based on microorganisms
- Biotechnology and biosolutions
- Nutrition
- Food safety
- Plant-based foods
- New production methods and food system designs

### **Development of novel foods and food systems**

At DTU, we conduct research into the design of food systems in relation to scaling, business models, and production methods, as well as new applications of side streams and by-products. This innovative approach ensures that in the future, we can produce with high quality, safety, nutritional value, flavour, and with minimal climate impact.

DTU has a strong position in:

- Fermentation technologies such as precision fermentation
- Use of microorganisms and biomass to produce healthy, tasty, and safe food
- Development of the future fisheries and aquaculture, and the use of new species
- Reduction of food waste through optimized use of whole raw materials and preservation technologies
- By-products via bioregeneration

### **Quality control, logistics, and storage**

DTU develops new solutions within:

- Autonomous systems, robots, and artificial intelligence (AI)
- Optical technologies, e.g. monitoring of food storage
- Packaging - biodegradable, edible, etc.

### **Consumer behaviour, safety, and climate impact**

DTU is a leader in:

- Consumer behaviour and guidance for the acceptance of novel foods
- Advice and collaboration regarding the implementation of technologies
- Dissemination of systems and methods for food production in vulnerable areas to increase food supply and food security
- Feedback impact - e.g. calculations of how climate change affects food production and public health in the future

## **CONTACT**

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**DTU's Centre for Absolute Sustainability** develops models to calculate the absolute sustainability of products and our behaviour based on our planet's resources and planetary boundaries. The models show whether something is sustainable in an absolute sense and not just less environmentally harmful than the alternatives.