WELCOME TO CIRCULAR BIOECONOMY DAYS 2019

AARHUS UNIVERSITY
CAMPUS FOULUM
Circular bioeconomy

“CASE Foulum”: New possibilities for local and safe supply of protein via biorefinery technologies

DCA - Danish Centre for Food and Agriculture
DCA APPROACH: INTEGRATION OF ACTIVITIES

Science based Policy Advice to Ministry of Environment, Food & Agriculture

Current challenges in food and agriculture:
Environment (nitrate leaching, pesticides), climate, productivity, antibiotics animal welfare etc.

Global agenda & international collaboration
› Focus: sustainability/eco-functional intensification, food security, climate change, agroecology
› Food systems

Collaboration with sector/industry
= farmers and companies!
› Focus on innovation and solutions to challenges:
› Smart farming, environmentally friendly growth, bioeconomy, business creation, productivity

Relevance
Excellence
Synergy
THE +10 MILL. TONS PLAN (2013)

Is it possible in 2020 to increase the production of biomass with 10 million tons?

- Increasing bioenergy and
- replacing fossil inputs and imported feed

- Without increasing the agricultural area
- Without reducing food production
- With positive effects on the biodiversity
- With positive effects on eutrophication

Aarhus University and University of Copenhagen
Supported by DONG Energy
PROTEIN FEED FROM GREEN BIOMASS

Combining new crop production with development of green biorefineries, innovative feeding and improved recycling = Circular Bioeconomy

----- And a whole new set of interlinked challenges... !
AU FUNDED PROGRAM: **BIOBASE 2013-2017**
RESEARCH IN GREEN BIOMASS THROUGH FIVE INTEGRATED PLATFORMS

1. New cropping systems
2. Biomass from wetlands
3. Extraction of protein from green biomass for feed and food
4. Hydrothermal conversion of wet biomass to liquid fuel
5. Economic and socio-economic consequences
From field to feed in less than eight years

In less than 8 years researchers at AU Foulum have

- developed a complete production system,
- produced high quality protein from green biomass
- demonstrated the options for replacing concentrates and
- demonstrated the potential environmental benefits and climate change mitigation
- Economic assessments and business models
THE LIMFJORD PROJECT

Integrating agricultural benefits, value chain development and environmental improvements combining agriculture, industry and policy advise for a nitrate sensitive water catchment area and fjord

“Sustainable Intensification” as an alternative to setting aside land
FROM LAB TO PILOT TO DEMONSTRATION SCALE

With support from Arla, Danish Crown, DLG, DLF, GUDP, Central Region Denmark & Aarhus University

Opening today... 😊
CBIO - 8 dept. forming 7 research platforms:

- Production and management of agricultural biomass (AGRO)
- Production of marine biomass (BIOS)
- Biorefining, conversion and recycling (ENG)
- Bio-based materials and bio-oils (CHEM)
- Feeds, by-products and feed ingredients (ANIS)
- Utilization of biomass for food, ingredients and high-value products (FOOD)
- Society, sustainability and economy (ENVS)

Strategy implemented via externally funded projects:

More than 25 projects across the 7 platforms covering:
- Conventional and organic farming systems
- Marine production and recirculation,
- Integration of marine and land based systems
- Environmental assessments and economics
- Science for industry and business development and for policy advise
DANISH PROTEIN INNOVATION - DPI

DPI objective:

To promote and coordinate research and innovation with the aim of increasing a market based and sustainable Danish production of protein for food and feed.
Implementation of a radical new crop production paradigm is conditional to development of green biorefineries

- Harvest
- Pretreatment
- Storage

Bio-refinery

High-value components

- Oil
- C5
- C6
- Lignin
- Residual

- Syngas
- Biogas
- Syngas

Necessary conditions

- Skilled scientists and technical/admin staff committed to
  - Transdisciplinarity and clear coordination,
  - Value chain focus & business collaboration,
  - Explicit objectives for societal benefits

And support from partners in industry, agriculture and ministry
INNOVATION IS HIGHLY NEEDED!

Thank you!
Special thanks to all our collaborators and support from industry, agriculture, ministries and local authorities