



The most advanced biorefinery in the world

In the new Centre for Biorefining Technologies at Aarhus University, researchers will create knowledge and technology that can contribute to the exploitation of biomass for high-value products.

The activities at the centre aim to create the knowledge required to strengthen the pre-conditions for producing a range of new green products that are currently either imported or extracted from fossil fuels.

These products include new sources of protein for animal feed and raw materials for many

different industrial purposes – all produced in a refining process based on biomass extracted from crop residue, straw, grasses and other plant matters that do not compete with food production. “We’re working on creating a highly efficient biorefinery and providing leading examples of how to kick-start a bio-based economy with sustainable high-value

products such as proteins, polymers, and new chemical or biological components for industry,” says Associate Professor Ib Johannsen.

He is responsible for the centre’s engineering research and development activities regarding production systems and technologies for refining green biomass.

High-protein animal feed from grass

Sustainable feed produced from grass can eventually provide a replacement for the large amounts of imported soya that European pigs consume every day.

Green juice in a freeze-dried variant. This is what it looks like – the product produced by Aarhus University researchers in some of the most extensive pilot experiments to date in extracting protein from biomass. The juice is a concentrate of selected grass species and contains proteins that can meet the amino acid needs of most large mammals. With this juice, the researchers have solved one of the major challenges in a refining process that has been under way since the Second World War.

They can now optimise the separation of the biomass into various components and remove those parts of the plants that are indigestible and which inhibit the absorption of protein.

“Our aim has been to design a refining process so that we can convert green biomass to highly absorbable protein concentrate for pigs at the same time as utilising the residual components in feed for ruminants. This will enable us to create a locally produced alternative to soya,” says Postdoctoral Fellow Morten Ambye-Jensen.

An attractive alternative to soya

The researchers are now working on more methods to extract protein from different types of crops. They have good experience with both heating and fermenting, and have already completed the first major test production at the university’s pilot plant. Subsequently, they used the resulting green protein in a feed experiment with pigs, aimed at studying amino acid absorbability.

“The major engineering challenge is now to create a production process that is both financially viable and environmentally sus-

tainable, and which provides a product with high protein absorption,” says Morten Ambye-Jensen.

Aarhus University has unique facilities for biomass production as well as world-class research in animal nutrition. The researchers expect that the technology for producing green protein will be ready for commercial use in the course of five years.

EU countries currently import more than 45 million tons of soya per year for animal feed with an enormous impact on the climate from both production and transport. The considerable environmental benefit of using grass for feed is that it can be grown locally with low use of pesticides and minimal leaching of fertilisers.