‘It looks like cocoa powder, but is in fact a protein that can help end world hunger’

Unibio has developed a special method for converting methane gas from animal slurry into new protein. The technology may transform the future of feed production and thereby help reach the goal of zero hunger.

Protein. A small word with a huge impact on the ecosystems of the Earth. Proteins are essential building blocks of all living organisms, which explains why humans use an enormous amount of resources to grow them, for example through the production of meat, beans and seeds. But protein can also be extracted from methane gas found in animal slurry. Sounds complicated? Henrik Busch-Larsen, CEO of Unibio, explains:

‘Essentially, the method utilises the so-called methanotrophic bacteria that can be found in soil and freshwater lakes, among other places. When these bacteria ‘eat’ carbon from methane, they grow rich in protein. These proteins can then be harvested by removing the water and drying the product. What is left is a brownish granule that resembles cocoa powder that can be led directly back into the food chain as animal feed.’

The foundation for this advanced technology can be traced back to 1980, when a professor at the Max Planck Institute in Germany decided to explore why there in certain places arose gas bubbles from the bottom of a lake. This became the starting point of an enduring development process led by Henrik Busch Larsen’s father, who collaborated closely with a group of Danish biotech researchers at the Technical University of Denmark. In 2001, Unibio was founded to finalise the technology by using a so-called vertical loop fermentor, and Henrik Busch-Larsen assumed the role of CEO in 2012:

Sustainable Development Goals at play

SDG 2: Zero hunger

Target 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

SDG Accelerator for SMEs is an innovation programme for small and medium-sized industrial enterprises created by the UNDP with support from the Danish Industry Foundation. The programme focusses on developing and accelerating business solutions addressing the Sustainable Development Goals. The programme is implemented in collaboration with Monitor Deloitte.

Monitor Deloitte.

INDUSTRIENS FOND FREMMER DANSK KONKURRENCEEVNE
The Danish Industry Foundation

UNDP

'Unibio's most important task was to make the process both manageable and profitable on an industrial scale. This has required many years of research and substantial investments. We are now ready to reap the rewards. Apart from an American competitor who has bought the rights for an earlier version of the technology from a Norwegian company, we are the only company in the world that is capable of extracting these proteins on a large scale.'

According to Henrik Busch-Larsen, between 6 and 30 percent of animal feed protein can be replaced by industrially produced protein. In the future, this would enable a circular model where protein extracted from methane gas from animal slurry is added directly back into the feed. This is a crucial advantage, especially in places without central gas collection infrastructure:

'Building infrastructure to collect and distribute biogas to consumers is extremely expensive and cumbersome. Our method is far more decentralised and based on local plants. We are in fact able to both produce the proteins and direct them back into

the animal feed at the individual estates. This opens the door to brand new opportunities in developing countries, where infrastructure is fragile.'

In addition to the circularity aspect, Unibio's technology requires only a fraction of the water needed for traditional production of animal and plant protein, Henrik Busch-Larsen explains:

'To produce one kilogram of protein, you only need five litres of water. In comparison, it takes between 1,500 and 3,000 litres of water to produce one kilogram of soybeans – and approximately 15,000 litres of water to produce one kilogram of red meat. This solution therefore saves huge amounts of resources.'

In the coming time, Unibio will conduct additional tests to refine the process before taking it to the large farms. Tests are done in collaboration with the Danish meat producer Goodvalley, who operates pig farms in Poland, Ukraine and Russia. Henrik Busch-Larsen looks forward to making progress:

'In Goodvalley, we have found an ambitious partner that works hard to achieve a carbon-neutral production, which is in perfect line with our own values. We will start with a feeding experiment in Poland, where we will collect data and gather knowledge. Once this is done, we are ready to document our business model and take our solutions to the global market.'

Founded on the principles of sustainability, it was an easy choice for Unibio to participate in the SDG Accelerator programme, says Henrik Busch-Larsen, highlighting the partnership with Goodvalley as a valuable outcome:

'I like the idea of looking to the private sector to solve the major environmental challenges of the world. Yes, we would like to make money from our inventions, but we are also driven by making a difference and relieving the pressure on the planet's food resources. Participating in the SDG Accelerator programme certainly gave us an even better overview of our sustainability impact, while the teams from the UNDP and Deloitte gave us critical advice about building the partnership model that we are now testing. We are excited and optimistic about the next phase – and we expect great results.'

This is how Unibio contributes to the Sustainable Development Goals

- Unibio has developed a solution to convert methane gas from biogas or natural gas into proteins.
- According to estimates, industrially produced protein can replace 6-30 percent of the proteins in animal or fish feed.

Facts about Unibio

- Founded in 2001
- Specialised in the production of industrially produced proteins
- Head office in Roskilde, Denmark
- Pilot and demonstration plant in Kalundborg, Denmark
- First industrial plant under construction in Russia. Other industrial project initiated in the United States
- Approximately 35 employees

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