PLENITUDE

First-of-its kind large-scale production of proteins for food applications from alternative, sustainable sources using a zero-waste biorefinery process.

https://www.plenitude-bbi.com/

Type of Action: Innovation Action – Flagship

Value Chain: VC3 – agro-based

Start date: 01 October 2019

End date: 30 September 2024

BBI JU contribution: € 16,937,334.61

Summary

Emissions from livestock are a major contributor to rising CO2 levels causing almost 15 per cent of anthropogenic greenhouse gas emissions. In addition, the amount of land devoted to food production is a major cause of a loss of biodiversity. Without action, the growing population and consequently increasing demand for food – particularly proteins – the situation is likely to deteriorate.

The PLENITUDE project will address this issue by producing food-grade protein sustainably by integrating an aerobic fermentation plant with a conventional first-generation biorefinery. This will help to meet the growing demand for protein without the impact on CO2 emissions or on biodiversity. The process will use sustainable cereal crops as its feedstock. The process will be highly efficient, with zero waste, while producing food-grade protein with a feed conversion ratio superior to current alternatives.

Objectives

As well as establishing methods of manufacturing proteins sustainably, and the contribution this will offer to the challenge of feeding a growing population, the PLENITUDE project will make a number of societal and environmental impacts. It will:

- Safeguard and/or create a number of jobs. At the initial scale of production, this will be in the region of 200 jobs, as many as 4350 if the project achieves its longer-term goals.
- Create employment in rural areas.
- Provide access to a food source that is high in protein and fibre, cholesterol-free, with the potential to contribute to improving cardiovascular health.
- Make proteins more available and affordable, with the potential to reduce the challenge of increasing levels of obesity.
- Develop a sustainable mycoprotein biorefinery process capable of offsetting more than 11 million tonnes of CO2 per annum and reducing water consumption by 13.8 billion cubic metres compared to beef farming, globally.

Expected impacts

The PLENITUDE project seeks to deliver a number of specific impacts. It will:

- Create five new cross-sectoral interconnections, linking biorefineries with business with two consumer food producers, a pet food producer and a business to consumer biopolymer company, as well as linking a mycoprotein company and a B2C pet food producer.
- Establish five new bio-based value chains; one for mycoprotein bio-based packaging, one for mycoprotein-based pet food, one for meat-free consumer products one for meat extender consumer products and one for mycoprotein as a co-product to accelerate the growth of cultured meat.
- Creates five new families of consumer products across meat-free, meat extender, pet food, cultured meat, and biopolymer packaging film categories.
- Develop novel mycoprotein-based biopolymer packaging materials demonstrated at TRL (Technology Readiness Level) 6.

- Reduce the pressure on land caused by growing feed for livestock; this currently uses more than three-quarters of agricultural land yet only produces less than one-fifth of the calorie supply.

Achievements & milestones

The numbers don’t add up for meat-free future
22 July 2019
Our new PLENITUDE flagship project will produce a plant-based protein that is 50% more cost-efficient than meat alternatives. It is based on grains and is called mycoprotein. Read more

Consortium

- 3F BIO Ltd (United Kingdom)
- Bridge 2 Food (Netherlands)
- Life Cycle Engineering Srl (Italy)
- Wageningen Research (Netherlands)
- Lactips (France)
- MosaMeat BV (Netherlands)
- Vivera BV (Netherlands)
- Anglo Beef Processors UK (United Kingdom)
- International Flavors & Fragrances IFF BV (Netherlands)
- Alcogroup (Belgium)

Project coordination

Organisation name: 3F BIO Ltd (United Kingdom)