

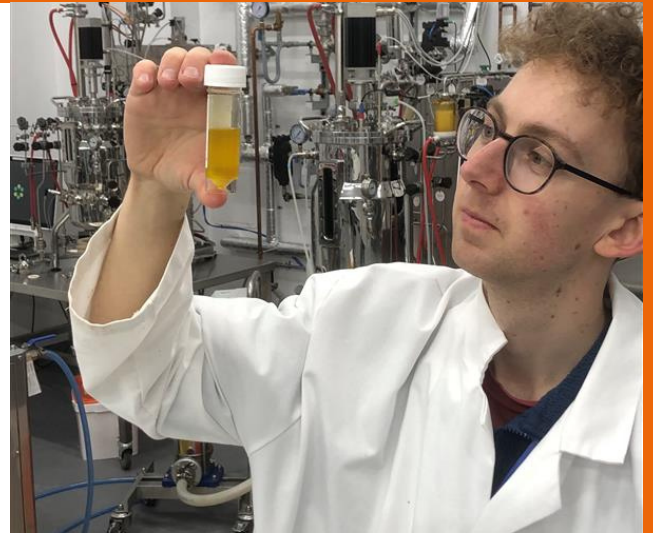


SUN BEAR BIOFUTURE

What is Sun Bear Biofuture's product or solution?

Sun Bear Biofuture works on an alternative yeast-derived product to alleviate demand for palm oil by applying research which combines cutting-edge fermentation and molecular biology.

Sun Bear Biofuture is utilising these technologies to produce everyday essentials which have the potential to divert manufacturing processes away from a reliance on palm oil, thereby protecting wildlife such as company's namesake - sun bears.



Ben Williams, CTO Sun Bear Biofuture

Sun Bear Biofuture received funding and support through the Solutions Catalyst, a programme from AberInnovation, designed to develop innovative products and solutions that will help improve access to nutritious food and build resilience in food systems.



RESEARCH IMPORTANCE

Sun Bear's product has the potential to replace palm oil widely used in cosmetics, food, baked goods and biofuels. Palm oil is an amazingly versatile substance that has a unique composition and a high productivity per hectare. But the major drawback of growing palm oil globally is the crop is responsible for 500m tonnes of CO2 released annually. This is due to the destruction of rainforests, which often displaces rare rainforest habitats and species, a crisis that many are aware of around the world.

With demand for palm oil set to increase by 40% in the next decade, the goal of Sun Bear Biofuture's research is to reduce deforestation and carbon emissions from this market growth and, in doing so, save the sun bear and other rare rainforest fauna and flora. Sun Bear's alternative to palm oil has a lower carbon footprint and a reduced reliance on land. Sun Bear is currently trialling different fermentation processes to perfect product development.

ALTHOUGH PALM OIL HAS UNIQUE FUNCTIONAL ADVANTAGES AND PRODUCTIVITY, IT HAS A REPUTATION FOR BEING GROWN AT THE EXPENSE OF TROPICAL RAINFORESTS IN SOME PARTS OF THE WORLD, DAMAGING CARBON SINKS AND PLACING RARE HABITATS AT RISK.

**SOLUTIONS
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SUN BEAR
BIOFUTURE

Cutting edge research aims to find
replacement for Palm oil

OBJECTIVES

How is Sun Bear Biofuture researching this area?

One example of Sun Bear's research trials is investigating the potential of a strain of yeast fed by alternative by-product-based feedstocks to create a palm oil replacement product. Using this feedstock is an example of upcycling a product that would otherwise be wasted. It also shows how they're developing an economically viable palm oil alternative that's got a far lower environmental impact.

To do this, Sun Bear is using synthetic biology to produce an oil which is similar in fatty acid composition to refined palm oil, which will save 80% of emissions and land use compared to palm oil. Their alternative acts as a drop-in substitute, providing the functional ingredient benefits without the environmental or consumer concerns. Also, by enabling localised production from existing side-streams, they are ensuring robustness against supply chain shocks and improving food security.

Is that research part of a bigger initiative?

The Roundtable on Sustainable Palm Oil (RSPO) is doing some amazing work to certify palm oil as coming from sustainable sources. However, they differ in producing their oil from a completely alternative source, yeast, not an oil palm.

Sun Bear Biofuture wants to work with organisations like RSPO to meet the expected increase in demand of 30m tonnes of palm oil by 2030, without displacing valuable tropical rainforest.

BENEFITS FROM SOLUTIONS CATALYST

Sun Bear Biofuture have met other innovative companies facing similar challenges and had the chance to collaborate with them and share their approaches. This chance to be part of a like-minded community and have the camaraderie, as well as having access to grant funding for early-stage, proof of concept research has been so important.

The strategic link between AberInnovation and Aberystwyth University has meant that Sun Bear have also been able to connect with biopolymer biotechnologist David Warren-Walker from Aberystwyth University. David and the team at AberInnovation, including Biorefining Technologist Andrew Rowbottom, helped them make the most of the facilities at Aberystwyth particularly by mapping out the capabilities of key pieces of equipment and working with them directly to run Sun Bear's fermentations.



AT A GLANCE

Challenges

- Biological research and the processes involved are detailed and complex
- Limited capacity for fermentation process trials in the UK. AberInnovation in Aberystwyth is one of only a few facilities offering different scale bioreactors in their integrated agri-food and circular economy facility.

Benefits

- The ability to test different components of Sun Bear's palm oil alternative using the fermentation suite at AberInnovation, which are usually out of reach cost-wise for a start-up, along with its facilities and expertise that allowed to scale up Sun Bear's testing.
- The equipment at AberInnovation is much sought after, especially for a company wanting to go from lab scale to industrial scale – the R&D environment at AberInnovation allowed to upskill quickly with regards to Sun Bear's product development.
- Access to AberInnovation's Biorefining Centre and using AberInnovation's site fermentation bioreactors improved Sun Bear's abilities which will help them reach their goal much faster.



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