



Sources	World Economic Forum		
Date	July 2021		
Potential scale of impact	Certainty of outcome	Impact horizon	
★★★★	★★☆☆	H1	H2 H3

The NASA space programme - challenged to feed a year-long space mission - asked an unusual question in the 1960s: can you make food from thin air? The answer, it now appears, is 'yes'.

When astronauts exhale, the carbon dioxide in their breath can be captured by a special class of microbes - and potentially turned into nutrients.

Now an American company has taken this technology and converted CO2 into food and bio-based products. California-based [Kiverdi](#) has more than 50 patents granted or pending for carbon transformation technology, which is inspired by the microbes - hydrogenotrophs - that NASA discovered.

These are natural single-cell organisms that act like plants in the way in which they convert carbon dioxide into food. [Air Protein](#), a Kiverdi spin-off company, has created the world's first air-derived meat using this method.

Produced "without the traditional land, water and weather requirements," Air Protein says, the meat can be made "in a matter of days instead of months ... and requires just a tiny fraction of the land used in traditional meat production". The company compares the process to that of making yoghurt or beer and says it addresses the global need for producing more food using less land.

With 36 billion tonnes of CO2 emitted globally every year, the company says it knows its work is just beginning. "It is not just about reducing carbon dioxide emissions," says Lisa Dyson, Chief Executive of Kiverdi, "but also leading a new era of sustainable production on how food and everyday products are made, to support a growing population."

Some of those other applications include [Revive Soil](#), which turns CO2 from the air into organic crop nutrients, and CO2 [Aquafeed](#), which converts CO2 into an alternative, sustainable form of fish feed - avoiding the need to produce fishmeal using 15 million tonnes of wild-caught fish a year. Kiverdi is also developing [Reverse Plastics](#), which uses the technology to turn plastic waste into a range of biodegradable materials.

