

Beyond the ‘yuck factor’: Precision fermentation of bacteria could dramatically soften environmental footprint of livestock-linked food production

Precision fermentation is a refined form of brewing, a means of multiplying microbes to create specific products. It has been used for many years to produce drugs and food additives. But now, in several labs and a few factories, scientists are developing what could be a [new generation](#) of staple foods.

The developments I find most interesting use no agricultural feedstocks. The microbes they breed [feed on hydrogen](#) or methanol – which can be made with renewable electricity – combined with water, carbon dioxide and a very small amount of fertiliser. They produce a flour that contains roughly 60% protein, a much higher concentration than any major crop can achieve (soy beans contain 37%, chick peas, 20%). When they are bred to produce specific proteins and fats, they can create much better replacements than plant products for meat, fish, [milk](#) and [eggs](#). And they have the potential to do two astonishing things.

The first is to shrink to a remarkable degree the footprint of food production. [One paper](#) estimates that precision fermentation using methanol needs 1,700 times less land than the most efficient agricultural means of producing protein: soy grown in the US.

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The second astonishing possibility is breaking the extreme dependency of many nations on [food shipped from distant places](#). Nations in the Middle East, north Africa, the Horn of Africa and Central America do not possess sufficient fertile land or water to grow enough [food of their own](#).

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The real sticking point, I believe, is neophobia. I know people who won’t own a microwave oven, as they believe it will damage their health (it doesn’t), but who do own a [woodburning stove](#), which does. We defend the old and revile the new. Much of the time, it should be the other way around.

[This is an excerpt. Read the original post here](#)