Opinion: Italy is set to ban lab-grown meat—here's why it should think again

April 17 2023, by Silvia Malagoli

Credit: AI-generated image (disclaimer)

Scientists recently created a meatball with the flesh of the long-extinct wooly mammoth. The meatball was the product of one of this century's most promising technological advancements—cellular agriculture.

Sometimes called "lab-grown meat," the process involves growing

animal products from animal cells in a controlled laboratory environment. The process eliminates many of the environmental, animal welfare and human health concerns that are associated with industrial livestock systems today.

But laboratory-grown animal products are yet to really take off. Singapore and the US are so far the only two countries in which lab-grown food products can be sold legally to consumers. The European Food Safety Authority is still assessing the potential risks associated with cultured animal products.

And on March 28, Italy's minister of agriculture, Francesco Lollobrigida, announced that the country would become the first to ban lab-grown foods. The reason for the proposed ban is mainly to protect Italian farmers. But the government has also voiced concerns about the quality of synthetic foods and their threat to Italy's proud culinary heritage.

However, lab-grown meat has the potential to offer a much more sustainable food source than traditional animal farming that could also help reduce the spread of disease.

How are meat products grown?

Scientists can grow muscle tissue synthetically by reproducing the process of cellular regeneration that occurs naturally in an animal's muscles. This task is carried out by stem cells, which are specialized in cellular division. Stem cells are collected by obtaining a tissue sample from a living animal before being isolated and cultivated in conditions that resemble the animal's body.

It currently takes around four weeks to produce a burger. A range of other animal products can be cultivated in a lab, including seafood and milk.

Fewer resources

There are growing concerns around the climate impact of meat production.

At present, livestock production alone consumes 70% of the world's arable land and uses vast amounts of water. This may increase further in the future. Meat consumption is expected to double by 2050 as the middle class grows in China, Brazil, India and across Africa.

But, if scaled up, lab-grown meat would use substantially less land and water. Research finds that around 99% less land is required to produce 1kg of lab-grown meat than would have to be used by European farms to produce the same amount.

Producing 1kg of meat in a laboratory would also use between 82% and 96% less water than a traditional livestock farm, depending on which product is compared.

Lower health risk

Cultivating meat from cells can also reduce the risk of disease development and prevent unnecessary animal suffering.

There are obvious welfare issues associated with crowding animals together on farms. But these cramped conditions also make diseases like avian flu, mad cow disease and the African swine fever virus more likely to develop and spread.

In the year 2018–2019, around 225 million pigs in China either died or were culled due to the outbreak of African swine fever. This is equivalent to around one quarter of the global pig population.

Animal farmers use antibiotics to prevent the spread of disease. But their overuse is contributing to a rise of antibiotic resistance. The United Nations estimates that, by 2050, antibiotic resistance will lead to more deaths than cancer worldwide.

Lab-grown meat is also safer to eat when it comes to bacteria. The cells used in cultivated meat production are carefully screened to make sure they are not contaminated with infectious pathogens.

Meat products that are grown from cells are also free from contamination by fecal bacteria like E. coli, Salmonella and Listeria. These bacteria live inside an animals' gut and can contaminate the meat when the animal is slaughtered.

An environmentally friendly alternative?

Industrial livestock systems—particularly cattle farms—are responsible for the emission of huge quantities of greenhouse gases like CO_2 and methane. But growing meat from cells can have a similar—and sometimes even worse—environmental footprint.

Cellular food technologies generate more CO_2 (up to 22.1kg of CO_2 per kg of meat) than conventional cattle farms at present (which produce up to 5.4kg CO_2). This is largely because maintaining the right conditions for cell growth in a laboratory consumes a lot of energy.

Lab-grown meat does, however, produce substantially less methane than conventional cattle farming. This will vary depending on the method of culturing and farming used, but on average, 1kg of meat grown in a lab produces up to 0.082kg of methane. In comparison, a kilogram of meat produced on a conventional farm can generate up to 1.2kg of methane.

Methane has a 25-times greater global warming potential than CO_2. But

it remains in the atmosphere for much less time—around 20 years compared with centuries for CO_2. This means that the CO_2 that accumulates in the environment will fuel global warming for a long time after its emission. So upscaling cellular food technology to a mass-market production system before energy systems are decarbonized is risky.

Lab-grown meat has the potential to make our food system more sustainable. As energy systems are decarbonised, this new form of food will only become more attractive.

But upscaling the technology will require a lot of political will. And, as shown by Italy's prospective ban, political will is in short supply.

Provided by The Conversation

Citation: Opinion: Italy is set to ban lab-grown meat—here's why it should think again (2023, April 17) retrieved 25 June 2024 from https://phys.org/news/2023-04-opinion-italy-lab-grown-meathere.html