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We need an informed discussion on cultivated meat

Technical, social, and humanities specialists call for measured discussion on the future of food.

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The photograph shows a burger based on cultivated meat, a product that was first obtained by Dutch scientists in 2013. Credit: Mosa Meat/CC BY.

The Italian government is [moving](#) to ban what critics call ‘synthetic meat’, a negative term to describe what researchers call ‘cultivated meat’, and that can be positively portrayed as ‘sustainable, clean, or ethical meat’. This proposal comes as other governments are acknowledging the strategic importance of cultivated meat towards both food security and global sustainability. As technical, social, and humanities scientists active in the field we wish to provide important clarifications with the hope of spurring a much-needed informed discussion.

From a technical perspective, cultivated meat is obtained from a process analogous to taking a plant sprout to grow it back into a greenhouse. Except that the sprout is a small biopsy or a blood draw from a farm animal, and the greenhouse is a cultivator, a sterile environment with controlled temperature and nutrient supply not much different from fermenters used for beer, wine, cheese and yogurt. The process is therefore often

referred to as 'cellular agriculture'. Contrary to some claims, no animal serum is currently used in the process¹, nor are cells or tissues with tumor-like behavior². On the other hand, cultivated meat can be grown without antibiotics commonly used in conventional animal farming, and is free from other contaminants such as microplastics and toxic heavy metals such as mercury³.

Food safety agencies conduct rigorous safety assessments of novel foods such as cultivated meat. The positive verdict of the European Food Safety Authority (EFSA) would be required to authorise commercialization of cultivated meat in the EU, following an assessment process that is considered one of the most rigorous globally.

Notably, however, cultivated meat does not require clinical trials because it is not a pharmaceutical drug. This is neither a loophole nor an oversight, but rather the very same principle that regulates food supplements, homeopathic products, and cosmetics. The EFSA authorisation procedure has led to the approval of some 125 novel foods in the EU since 2000.

Cultivated meat is processed by the gastrointestinal tract in the same way as any other conventional or novel food, and provided that it lacks contaminants or allergens, both of which can be accurately measured, is expected to be as safe as conventional meat³. It may even turn out to be healthier, as control over the cells and nutrients in the cultivator could lead, for

instance, to lower saturated fats and higher antioxidant levels.

Detractors claim that cultivated meat is not environmentally friendly, but life cycle assessments (LCAs) published in the peer-reviewed literature collectively prove the opposite⁴. A recent LCA suggests that in 2030 cultivated meat will have up to 90% lower environmental footprints compared to conventional meats, even accounting for ambitious targets to make animal farming more sustainable⁵ (Figure 1).

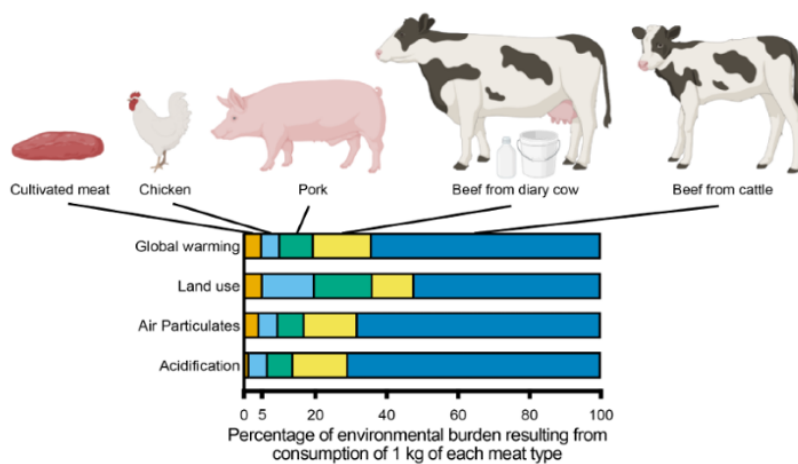


Figure 1. Projected environmental impact of different types of meat in 2030. Data reanalyzed from reference 5.

Cultivated meat is not coming to Italian supermarkets anytime soon, but should that happen, it would be just an additional option for customers and could not, under EU law, be used as replacement for conventional meat without a clear indication on the product label (regulation 2015/2283).

Regarding reaction to cultivated meat, acceptance of novel foods is not unprecedented: sushi was introduced in Italy in the late 1980s and has overcome strong initial resistance. While detractors currently argue that Italians do not want cultivated meat, surveys performed before the current media campaign indicated that at least 54% of Italians would be willing to try it⁶. Several factors influence consumer acceptance: knowledge and attitudes towards agri-food technologies, risk-benefit perceptions (especially of healthiness), ethical and environmental concerns, trust in the food chain, age, education, sensitivity to disgust, food neophobia, personality traits, personal and social values, and political conservatism. The product name and the color of the packaging can also influence the reaction to cultured meat.

Faced with a new food, produced in an apparently inaccessible place and through so-far unknown procedures in the food chain, people tend to reduce the cognitive burden of judgment by simplifying decision-making processes using the 'natural is better' heuristic⁷: the less food is processed, the more it is considered good – i.e. tasty, healthy, fair and sustainable. The expression 'synthetic meat', in this sense, emphasizes an opposition to "natural" food. Such an opposition has been largely used in public debates and media messages in the last decade⁸. However, the so-called 'natural', or 'traditional' meat is itself the product of cultural processes

and transformations such as breeding, farming and slaughtering – all practices whose impact on the environment and the very life of animals has been increasingly questioned. Cultivated meat can be an ethically acceptable way to consume meat for those people who are not necessarily vegan or vegetarian but have qualms about eating meat.

Cultivated meat is a promising field that deserves to be nurtured, not stifled. While doubts remain about the feasibility of scaling up cultivated meat production to substantially impact the global meat market, specific scenarios such as space exploration, where cultivated meat could be an interesting option for astronauts during long-duration flight, are poised to benefit from even minor advances. Moreover, research and development in the arena is likely to deliver advances in related fields, such as regenerative medicine (which also requires cultivating tissues in large scale at affordable costs), much like the race to the Moon led to the development of GPS technology as a byproduct. We hope that the Italian parliament will see the wisdom in trusting the technical, sociological, and humanities scientific process rather than imposing a shortsighted ban.

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