

Lab-Grown Meat Policy: A Green Revolution in the Food Industry

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Introduction

The idea of producing meat without using animals directly sounds like something out of a science fiction movie. Even though it seems that the idea of lab-grown meat has developed more than what we would have expected. However, the demand for meat worldwide is still very high, so the question remains: why should we replace the traditional way of producing meat with a new unseen method?

We are all aware of the fact that meat is an important source of nutrition for many people around the world. This explains the growing demand for meat worldwide, with its production tripling over the past 50 years. However, this increase in production comes with significant environmental impacts.¹

Considering the negative externalities that producing meat has, lab-grown meat has become the center of the debate for the past years. Lab-grown meat is created directly from animal cells but it is not produced through traditional live animal breeding and slaughter.² This type of laboratory-grown meat offers an alternative to conventional meat; as it is biologically identical but with a greatly reduced environmental impact. This alternative meat is biologically identical to conventional meat because it is cultivated from animal cells in a controlled environment by replicating muscle tissue,³ without the need for livestock farming, which significantly reduces greenhouse gas emissions, land use, and water consumption. Thus, if this alternative was widely adopted, consuming lab-grown meat could mitigate the environmental impact of traditional meat production, without requiring significant changes to consumer habits.

This greener alternative has not been widely welcomed yet, as the public is extremely divided. In 2023, the U.S. Department of Agriculture approved the production and sale of lab-grown chicken by two companies.⁴ Thus, making the United States the second country, after Singapore, to legalize what proponents call “cultured meat” or “synthetic meat.”⁵ It has been estimated that in the next few years the sector concerning the cultivation

¹ Pablo Martin, Jorge Olivares, Fernando Maass, Elvis Valero, “Analytic approximations for special functions, applied to the modified Bessel functions $I_2(x)$ and $I_{2/3}(x)$,” *Results in Physics*, 11 (2018): 1028-1033, <https://doi.org/10.1016/j.rinp.2018.10.029>.

² Christian Kurrer and Carys Lawrie, “What if all our meat were grown in a lab?”, European Parliament - Scientific Foresight Unit (STOA), January 2018.

³ Garone, Sarah. “FDA Has Approved Lab-Grown Meat-Here's How It's Made.” *Health*, April 22, 2024. <https://www.health.com/lab-grown-meat-fda-6835173#:~:text=How%20Is%20Lab%2DGrown%20Meat,livestock%2C%20poultry%2C%20and%20seafood>.

⁴ Milman, Oliver. “USDA Allows Lab-Grown Meat to Be Sold to US Consumers.” *The Guardian*, June 21, 2023. <https://www.theguardian.com/us-news/2023/jun/21/us-lab-grown-meat-sold-public>.

⁵ Mulvaney, Kieran. “Carne Coltivata in Laboratorio: Tutto Quello Che c'è Da Sapere.” *National Geographic*, August 24, 2023.

of meat in the laboratory could also be expanded to the fishing sector.⁶ The latter has suffered greatly in the past years, due to increased levels of pollution in the seas and excessive fishing practices, which led to a reduction in marine life. The possibility to extend lab-grown production to fish could especially expand to the cultivation of red tuna.⁷

On the other hand, the production of these alternatives in the European Union (EU) could possibly fall under, and be subject to, the 'Novel Food' regulation (EU/2015/2283), or under the genetically modified food and feed regulation No 1829/2003'.⁸ Nonetheless, this has definitely become a divisive topic featuring countries very much in favor of this type of meat cultivation, such as the Netherlands, and the British government; and others very much against, like in the case of Italy and France.⁹

The Topic in Perspective

The concept of lab-grown meat is revolutionary, but its journey has been met with both excitement and resistance. Kaplan (2021) notes that “lab-grown meat could theoretically be produced anywhere, eliminating the need for food imports and transforming global food supply chains.”¹⁰ Different sectors have welcomed this substitute more than others, this was the example of the restaurant industry in recent years.¹¹ It appears that more

<https://www.nationalgeographic.it/carne-coltivata-in-laboratorio-tutto-quello-che-ce-da-sapere#:~:text=%C3%88%20%E2%80%9C%20stessa%20cosa%20della,dal%20processo%20produttivo%20gli%20animali%E2%80%9D.&text=Il%20primo%20hamburger%20al%20mondo,presentato%20a%20Londra%20nel%202013.>

⁶ Elliot, Schwartz. “State of the Industry Report: Cultivated Meat and Seafood: GFI.” The Good Food Institute, May 15, 2024. <https://gfi.org/resource/cultivated-meat-and-seafood-state-of-the-industry-report/>.

⁷ Mulvaney, Kieran. “Carne Coltivata in Laboratorio: Tutto Quello Che c’è Da Sapere.” National Geographic, August 24, 2023.

<https://www.nationalgeographic.it/carne-coltivata-in-laboratorio-tutto-quello-che-ce-da-sapere#:~:text=%C3%88%20%E2%80%9C%20stessa%20cosa%20della,dal%20processo%20produttivo%20gli%20animali%E2%80%9D.&text=Il%20primo%20hamburger%20al%20mondo,presentato%20a%20Londra%20nel%202013.>

⁸ Christian Kurrer and Carys Lawrie, “What if all our meat were grown in a lab?”, European Parliament - Scientific Foresight Unit (STOA), January 2018.

⁹ Boren, Zach. “How a Livestock Industry Lobbying Campaign Is Turning Europe against Lab-Grown Meat.” Unearthed, October 31, 2024.

<https://unearthed.greenpeace.org/2024/07/30/cultivated-backlash-livestock-industry-lobbying-europe-lab-grown-meat.>

¹⁰ Nicholas, Isaac, and Mike Silver. “Tufts Receives \$10 Million Grant to Help Develop Cultivated Meat.” *Tufts Now*, October 15, 2021.

https://now.tufts.edu/2021/10/15/tufts-receives-10-million-grant-help-develop-cultivated-meat?utm_source=chatgpt.com.

¹¹ Gomez, Amanda Michelle. “A José Andrés Restaurant in DC Will Serve Lab-Grown Meat.” *DCist*, June 22, 2023.

<https://dcist.com/story/23/06/22/jose-andres-restaurant-menu-test-lab-grown-chicken-meat-alternative/>.

starred restaurants are introducing this new concept of offering consumers lab-grown meat.¹² Consumers as well, appear very curious and willing to pay a premium to try this type of cuisine.¹³ Despite its potential, some actors have taken a firm stance against it. For instance, Florida and Alabama in the U.S. have banned the development of lab-made meat, arguing that it poses a threat to traditional farming.¹⁴ Similarly, Italy has prohibited the production and sale of lab-grown meat, claiming it undermines the country's rich food culture and agro-food heritage.¹⁵ Critics of these bans see them as premature, especially since lab-grown meat has not yet been approved for consumption in Europe.

In the EU, the discussion goes beyond food culture. Agriculture and food production account for 4.4% of the EU's GDP and 8.3% of total employment, with jobs heavily concentrated in rural areas that rely almost entirely on agriculture.¹⁶ A shift toward lab-grown meat could disrupt these communities and their economies, potentially leaving thousands of farmers and workers vulnerable. Moreover, while lab-grown meat is marketed as a sustainable alternative, concerns about its environmental impact persist. The energy required to produce these alternative lab-grown products can be significant. Estimates suggest that the carbon footprint of cultivated meat could be up to five times higher than that of chicken.¹⁷ This raises questions about whether this new practice is truly eco-friendly or if it simply shifts environmental challenges from one area to another.

Policy Analysis

The Italian reasoning for limiting the possibility of creating “artificial” meat inside a laboratory, is the main argument shared by other countries in the world, who have refused to implement this so-called green

¹² General, Ryan. “Lab-grown Chicken Makes US Debut at Michelin-starred Restaurant in San Francisco.” *NextShark*, July 3, 2023. <https://nextshark.com/lab-grown-chicken-us-debut>

¹³ Leggieri, Antonio. “Ho Mangiato Carne Coltivata in Laboratorio Nell'unico Ristorante Al Mondo Che La Serve.” *GQ Italia*, December 3, 2023. <https://www.gqitalia.it/article/carne-coltivata-laboratorio-assaggio-gusto-prezzo>.

¹⁴ Newkey-Burden, Chase. “The Lab-Made Meat That ‘Could Kill the EU.’” *theweek*, July 26, 2024. <https://theweek.com/culture-life/food-drink/the-lab-made-meat-farmers>.

¹⁵ Monbiot, George. “The Livestock Lobby Is Waging War on ‘Lab-grown Meat’. This Is Why We Can’t Let Them Win.” *The Guardian*, October 9, 2024. <https://www.theguardian.com/commentisfree/article/2024/aug/21/livestock-lobby-lab-grown-meat-new-proteins>

¹⁶ Newkey-Burden, Chase. “The Lab-Made Meat That ‘Could Kill the EU.’” *theweek*, July 26, 2024. <https://theweek.com/culture-life/food-drink/the-lab-made-meat-farmers>.

¹⁷ Mulvaney, Kieran. “Carne Coltivata in Laboratorio: Tutto Quello Che c'è Da Sapere.” *National Geographic*, August 24, 2023. <https://www.nationalgeographic.it/carne-coltivata-in-laboratorio-tutto-quello-che-ce-da-sapere#:~:text=%C3%88%20%E2%80%9C%20stessa%20cosa%20della,dal%20processo%20produttivo%20gli%20animali%E2%80%9D.&text=Il%20primo%20hamburger%20al%20mondo,presentato%20a%20Londra%20nel%202013>.

alternative.¹⁸

According to the law approved on November 16, 2023 by the Italian Parliament, synthetic meat will hinder the protection and health of the Italian agri-food heritage.¹⁹ The law states that this type of meat is not safe for public health and its limitation aims to protect products considered to be of "strategic importance to national interests."²⁰ Moreover, the Italian law has introduced fines between €10,000 and €60,000 for each violation in the production of lab-grown meat within the country.²¹ Similarly, other European countries have also asked the EU to carry out further investigations into cultured meat before the EU Food Safety Authority or other institutions take any decision on the matter.²²

Policy Solution

However, in countries where the production and sale of synthetic meat is restricted, there are worries that it could stop important opportunities for sustainable growth. This might lead to a loss of investments from Europe and scare away potential investors. It also creates a problem for consumer rights, Italians have been deprived of the possibility of consuming cultured meat when it is put on the market.²³

In addition to the aspect of consumer limitations, we also need to address the problem of the loss of the global agricultural sector. An actual scenario where this division is real is in the USA where agriculture, along with related sectors such as the food processing industry, accounts for about 5-6% of U.S. GDP. Furthermore, the agricultural sector, including both primary agriculture and related sectors, employs approximately 19 million

¹⁸ Millstein, Seth. "Which States Are Banning Lab Meat, and Why?" *Sentient*, June 6, 2024. <https://sentientmedia.org/states-banning-lab-meat/>.

¹⁹ Fogli, Serena. "Carne Sintetica Vietata in Italia. Cosa Succede in Europa?" *Wise Society* (blog), December 20, 2023. <https://wisesociety.it/alimentazione/carne-sintetica-vietata-in-italia/>.

²⁰ Bambridge-Sutton, Augustus. "Italian Gov't Bans Cultivated Meat, Restricts Plant-Based Meat Labelling." *FoodNavigator.com*, November 21, 2023. <https://www.foodnavigator.com/Article/2023/11/21/Italy-bans-cultivated-meat-restricts-plant-based-meat-labelling/>.

²¹ Mridul, Anay. "Italy Becomes the First Country to Ban Cultured Meat, in Violation of EU Law." *Green Queen*, November 17, 2023. <https://www.greenqueen.com.hk/italy-cultivated-meat-ban-lab-grown-cell-cultured-plant-based-labelling-eu-giorgia-meloni/>

²² Cappellini, Micaela. "Dodici Paesi contro la carne coltivata: chiesta una moratoria all'Ue." *Il Sole 24 ORE*, 2024.

²³ "il Divieto Alla Carne Coltivata è Un Errore, l'Italia Rimarrà Indietro Ancora Una Volta." *Innovazione Fanpage*, November 17, 2023. <https://www.fanpage.it/innovazione/tecnologia/il-divieto-alla-carne-coltivata-e-un-errore-litalia-rimarra-indietro-ancora-un-a-volta/>.

people, or 10% of the country's total workforce.²⁴

Since cultured meat is a new type of food, it must be approved by food safety authorities before it can be sold to consumers. There are many positive aspects that this new production can bring to the economy and the planet. First, some supporters of cultured meat aim to improve food safety. In fact, in a controlled lab environment, the meat is not exposed to the usual risks of bacterial contamination. Additionally, the fat content of lab-grown meat can be adjusted to recommended levels, replacing unhealthy saturated fats with healthier omega-3 fatty acids.²⁵

Cultured meat could revolutionise our environmental impact. Traditional meat production is estimated to use 70% of global agricultural land and 30% of global water resources. In contrast, cultured meat requires up to 99% less land and 90% less water. However, the energy needed to produce it remains a concern: some estimates suggest its carbon footprint could be up to 5 times higher than chicken. This raises crucial questions about the true sustainability of this innovation.²⁶

Conclusion

These facts highlight the complexity of lab-grown meat as a solution: it's not just about what we eat, but about the cultural, economic, and environmental systems surrounding food production. It would certainly seem that many countries would have adopted this type of sector to deal with climate change, it is no coincidence that referring to the USA.²⁷ We realize that in recent years it would seem that 150 companies are raising billions of dollars to bring products to restaurants and grocery stores.²⁸

²⁴ Steven Zahniser and Kathleen Kassel. "What is agriculture's share of the overall U.S. economy?" *Ag And Food Statistics: Charting the Essentials - Ag and Food Sectors and the Economy* | Economic Research Service, December 19, 2024. <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy>

²⁵ Swartz, Elliot. "The Science of Cultivated Meat | GFI." *The Good Food Institute*, February 7, 2025. <https://gfi.org/science/the-science-of-cultivated-meat/>

²⁶ Escobar, María Ignacia Rodríguez, Erasmo Cadena, Trang T. Nhu, Margot Cooreman-Algoed, Stefaan De Smet, and Jo Dewulf. "Analysis of the Cultured Meat Production System in Function of Its Environmental Footprint: Current Status, Gaps and Recommendations." *Foods* 10, no. 12 (November 30, 2021): 2941. <https://doi.org/10.3390/foods10122941>.

²⁷ Crownhart, Casey. "Here's What We Know About Lab-grown Meat and Climate Change." *MIT Technology Review*, August 31, 2023. <https://www.technologyreview.com/2023/07/03/1075809/lab-grown-meat-climate-change/>.

²⁸ Schramm, Jonathan. "Top 5 Lab-Grown Meat Stocks to Invest in (February 2025)." *Securities.io*, February 1, 2025. <https://www.securities.io/lab-grown-meat-companies/>.

In the case of the United States it would seem one of the steps to reduce carbon dioxide emissions after intensive farming is responsible for 14.5% of total greenhouse gas emissions²⁹. But in the case of Europe it seems that considering lab growing meat as a substitute for intensive farming and climate change is not yet considered as a possibility. The European Commission ³⁰has defined the nascent industry "highly controversial" and has raised concerns about "discontent" if "traditionally prepared food is replaced by synthetic alternatives". For the European Commission this new sector still needs to be well studied to be already considered as an alternative to other agricultural sectors.

It is difficult to predict what will happen to this new sector, whether as in Asia there will continue to be a development or as in Italy there will still be laws that reject this type of meat cultivation. In his article "Cultivating Meat: A Food Revolution?" (2021), Jachmann underlines this type of cultivation is considered a green alternative to the overwhelming intensive farming and the revolution in the agricultural sector has occurred. Now it will be time to see what the different countries will decide in the next decades.³¹

²⁹ Kristiansen, Silje, James Painter, and Meghan Shea. 2020. "Animal Agriculture and Climate Change in the US and UK Elite Media: Volume, Responsibilities, Causes and Solutions." *Environmental Communication* 15 (2): 153–72. doi:10.1080/17524032.2020.1805344.

³⁰ Brzeziński, Bartosz, and Karl Mathiesen. "EU Dumped Lab Meats From Climate Plans on Farm Chief's Demand." *Politico*, February 12, 2024. <https://www.politico.eu/article/eu-lab-meat-climate-plan-agriculture-commissioner-janusz-wojciechowski/>.

³¹ Luis Nicolas Jachmann. "Cultivating Meat: A Food Revolution?", *Green European Journal*, June 14th 2021. <https://www.greeneuropeanjournal.eu/cultivating-meat-a-food-revolution/>

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