

CULTURED MEAT

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KEY MESSAGES AND RECOMMENDATIONS

Strategic objectives: 3.3 More reports and peer-reviewed papers on veganism and related topics.

Problem/gap in knowledge: Cultured meat technology has advanced rapidly over the past 10 years. With the advancement of this technology comes questions over the practicalities and ethics of cultured meat, particularly in comparison to conventional meat. For vegans, this technology may represent a welcome challenge to conventional animal agriculture and lead to mass reductions in the use and death of animals globally. However, it can also be seen as just another way that animals are used and abused, and fails to challenge speciesism. Consensus on cultured meat within the vegan movement is far from clear. We hope that this research briefing can be used by vegans and others as a key resource to better understand what cultured meat is, how it works and what the key considerations are for vegans.

Principal findings:

- Cultured meat technology is being refined at a rapid rate, with some of the most significant developments having been achieved within the past decade.
- Cultured meat is real, non-human animal meat developed without slaughter. However, the cells needed for this meat are often taken from live farmed animals.

- Cultured meat for human consumption could soon be entering the UK market, following the lead from Singapore, the US and Israel.
- Cultured meat is arguably more environmentally friendly and better for public health, than conventional meat.

Recommendation 1: Vegan organisations should continue to monitor the progress of cultured meat regulations globally to stay informed of which markets this technology is entering.

Recommendation 2: The impact of cultured meat technology on farmed animals is paramount and efforts should be taken to centre these animals in discussions on cultured meat.

Recommendation 3: Further research should be undertaken to better understand the opinions of vegans on cultured meat technology.

Recommendation 4: In light of the emergence of cultured meat technology, vegan campaigns should emphasise that we cannot rely on technological advancements to save us from the climate crisis.

The impact of cultured meat technology on farmed animals is paramount and efforts should be taken to centre these animals in discussions on cultured meat.





We want vegans to be in possession of the key facts regarding cultured meat.

SUMMARY

At The Vegan Society, we strive to keep ahead of emerging issues affecting the vegan community. Cultured meat has been steadily growing in significance and is now available to purchase for human consumption in three countries (Singapore, the US and Israel). Cultured meat has recently been approved for sale in the UK, but only for companion animal food (BBC, 2024). Proponents of cultured meat predict that the technology could one day largely or entirely replace conventional meat. While we're very far away from

that possibility, it's clear that cultured meat is no longer an abstract technological concept and, as with any kind of animal use, it's something that vegans should be fully aware of.

We want vegans to be in possession of the key facts regarding cultured meat. It is our aim therefore that vegans and the wider audience have easy access to a succinct overview of this topic, and we hope this research briefing achieves this goal.

CONTEXT

Cultured meat uses non-human animal cells to produce real meat in a laboratory. It has gone from a fringe idea found only in science fiction, to finding its way onto restaurant menus in the US and Singapore. It would appear that other countries will soon follow suit, potentially including the UK. As such, it is important that vegans are fully aware of this emerging technology and the ethical and practical implications that cultured meat poses.

Cultured meat has already been discussed by The Vegan Society through our blogs and webinars, and addressed in

statements to the media. While we have discussed cultured meat in the past, we have not conducted any research into the topic. This briefing is therefore designed to fill this knowledge gap.

Cultured meat has implications for animal agriculture, the environment and public health. As such, it is a topic which directly relates to the work of The Vegan Society and the vegan movement more broadly. We hope that this briefing serves as an informative resource for vegans, and indeed anyone seeking to understand cultured meat.

METHODOLOGY

Cultured meat technology has received significant attention from researchers, and there is a rich and growing body of scholarly literature on this topic. Many of The Vegan Society's affiliated academic researchers have undertaken research on cultured meat and their work has largely informed this publication.

This research briefing was informed by a non-systematic literature review of the existing academic literature, as well as other sources of interest. The research for this publication began with a close reading of the literature on the technical details of cultured meat to understand how the

technology works. This was followed by investigating the global regulations of cultured meat to understand where the technology is being developed, where investment is strongest and which markets are currently open to cultured meat. The final stage of the research was a close reading of a range of sources related to the ethical, environmental and public health issues of this technology.

The final recommendations of this research briefing are informed by this research process. This briefing has been through a peer review process with members of The Vegan Society's Research Advisory Committee (RAC).

WHAT IS CULTURED MEAT?

Cultured meat is known by many names including lab-grown, in vitro and cultivated meat. For the purpose of this research briefing, we will be using the word 'cultured'. Cultured meat is real, non-human, animal-derived meat that is grown (or cultivated) in a laboratory using the cells of a non-human animal. Proponents of cultured meat praise the technology for being able to produce meat using far less land and water, and because it produces far less greenhouse gas emissions. We will take a closer look into these claims later in this briefing.

The first cultured meat burger was made by Mosa Meat, who demonstrated it to the world in 2013, and was estimated to have cost €250,000 to produce (González and Koltowitz, 2019). In 2013, the technology was still in its infancy, but that was over 10 years ago – today, the same cultured meat patty would cost a tiny fraction of this.

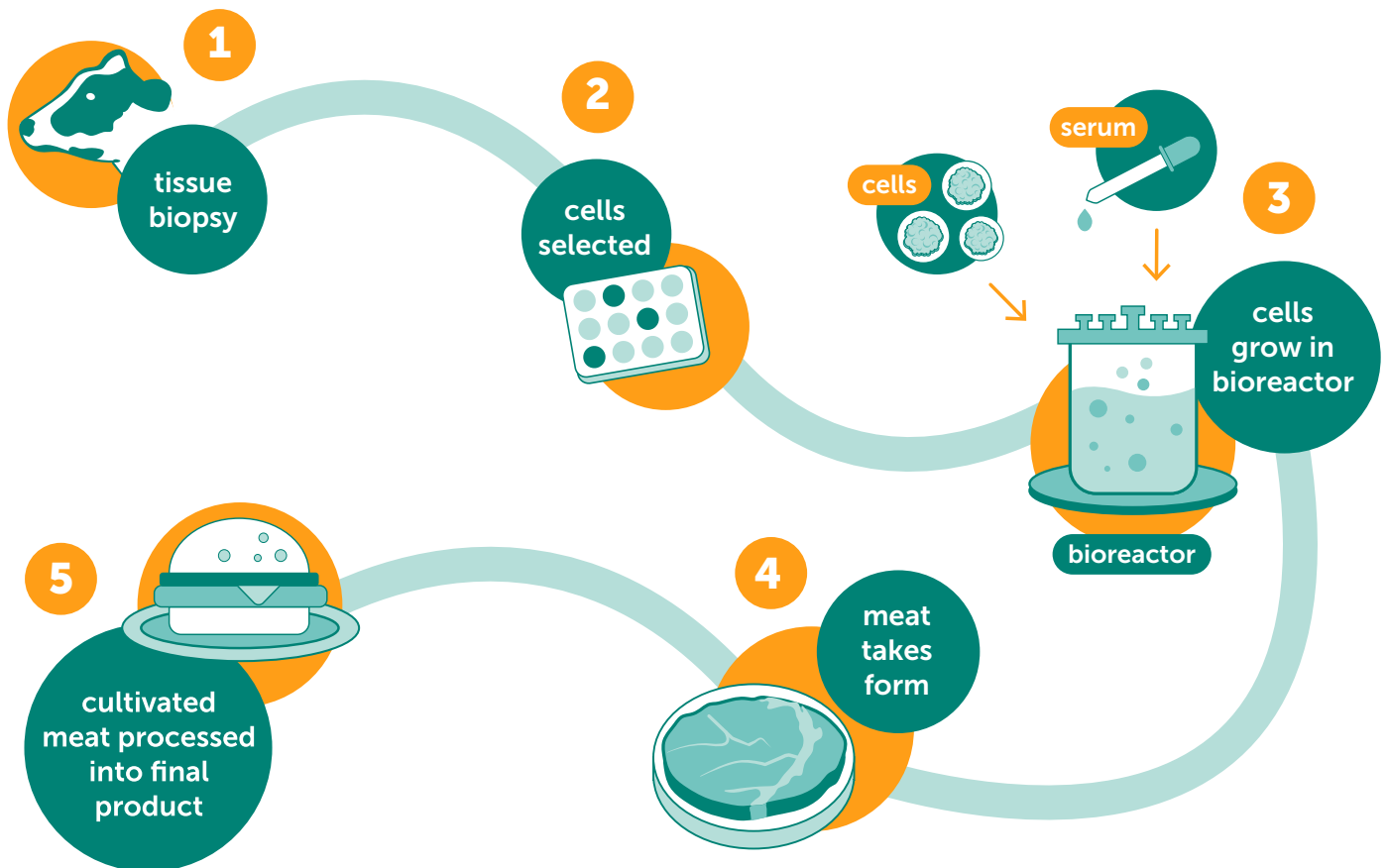
Cultured meat technology is always being developed and refined. As such, there is no single, standard way that cultured meat is produced. However, most follow a general process of extracting cells from a live or dead non-human animal using a tissue biopsy, isolating cells of interest and placing the cells in a bioreactor. They are then expanded to create a larger yield of cells, and are then placed into a 'scaffold' which allows the cells to mature into a specific form

(Reiss, Robertson and Suzuki, 2021; Chriki, Ellies-Oury and Hocquette, 2022). To expand the cells in the bioreactor, they are fed a cell culture medium in the form of a nutrient-rich solution sometimes containing foetal bovine serum (FBS), which is made from blood drawn from a dead cow foetus. However, the cultured meat industry is transitioning away from FBS to plant-based serums due to economic and ethical reasons (The Good Food Institute, 2024). In 2023, Singapore-based cultured meat company, GOOD Meat, received approval from the Singapore Food Agency to use a serum-free media in its production of cultured chicken (GOOD Meat, 2023).

According to cultured meat company UPSIDE Foods, the entire process of making one of its cultured chicken products takes about two to three weeks (UPSIDE Foods, 2024). The result of this process is a real meat product that has the same look, taste and texture as conventional meat.

Cultured meat comes in many forms, with cells taken from cows, chickens, pigs and sheep. But some companies are using the technology to also develop cultivated seafood (BLUU, 2023) and dairy products (Remilk, 2022). Technically speaking, it's possible to grow cultured meat from any animal, even humans.

How is cultured meat made?





CULTURED MEAT AROUND THE WORLD

Companies of interest

Whilst not an exhaustive list of cultured meat companies, the following provides an overview of some of the biggest names in the industry right now:

- **Aleph Farms** (established in 2017 in Israel)

At the beginning of 2024, Aleph Farms gained approval to sell its product in Israel and submitted an application to the UK Food Standards Agency (FSA) for pre-market approval. It describes itself as a "...cellular agriculture company. We design new ways to grow quality animal products that improve sustainability, food security, and animal welfare in our food systems." The company has raised about \$140 million since 2017 (Rabinovitch, 2024).

- **Believer Meats** (established in Israel originally as Future Meat Technologies in 2018)

Believer Meats describes its products as "cruelty and slaughter free". In 2022, it announced plans to open a 200,000-square-foot cultured meat facility in North Carolina, expected to be the largest in the world. The plant is expected to open at some point in 2024.

- **GOOD Meat** (established in 2011 in California)

GOOD Meat is a cultured meat company owned by Eat Just, which is best known for JUST Egg, a vegan egg alternative made from mung beans. It was the first company to sell cultured meat – currently it sells its product in the US and Singapore.

- **Mosa Meat** (established in 2016 in the Netherlands)
Mosa Meat was the first to create a cultured meat burger patty, launched at a press conference in 2013. In 2021, actor Leonardo DiCaprio joined Mosa Meat as an advisor after investing in the company.

- **Multus Biotechnology** (established in 2019 in the UK)

Multus Biotechnology is a cultured meat company specialising in the development of key ingredients and formulas essential to the production of cultured meat, including serum-free growth media. In 2022, Multus Biotechnology secured a large investment from Innovate UK.

- **SuperMeat** (established in 2015 in Israel)

SuperMeat made headlines back in September 2023 for receiving kosher certification from OU Kosher, the world's leading kosher certification agency (Vegconomist, 2023). It specialises in cultured chicken products.

- **UPSIDE Foods** (established in California originally as Memphis Meats in 2015, changed its name in 2021)

UPSIDE Foods made headlines for being the first cultivated meat brand to receive US Food and Drug Administration (FDA) approval in 2022, allowing it to sell its lab-grown meat in stores and restaurants in the US (Toeniskoetter, 2022).

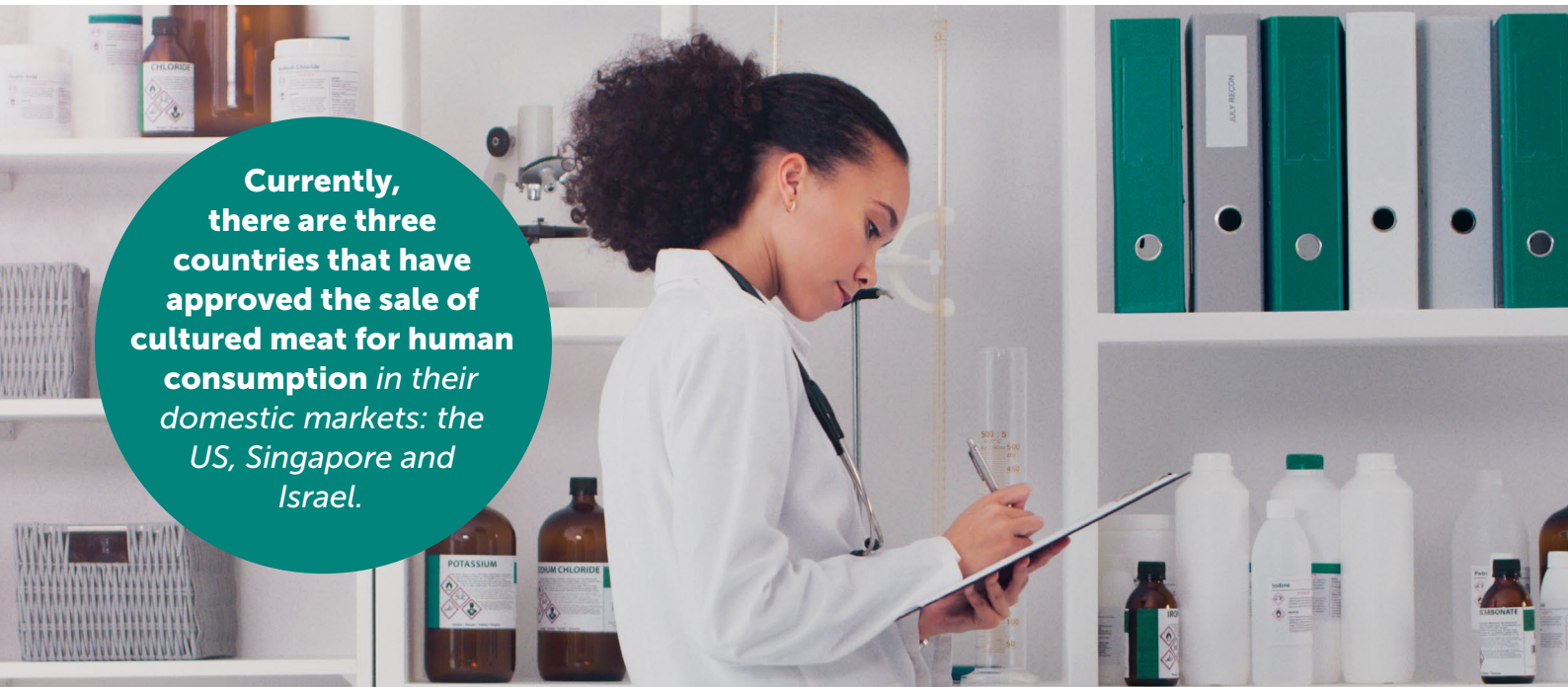
Cultured meat in the UK

In the UK, cultured meat technology has attracted a lot of investment. In 2022, Innovate UK, which is part of UK Research and Innovation (a public body which supports business innovation and technological advancement), invested £2.15 million in UK-based cultured meat company Multus Biotechnology (The Good Food Institute, 2022). This investment was part of a larger round of series A funding in which Multus Biotechnology secured a total of £7.9 million from a range of investors (Cornall, 2023). UK-based cultured meat technology has benefitted massively from public and private investment and could stand to benefit even further in the future.

At the time of writing, cultured meat is not commercially available in the UK for human consumption. However, in July 2024, the FSA approved the sale of cultured chicken

meat in food for companion animals, making the UK the first European country to do so (BBC, 2024). In 2023, the FSA received its first application for pre-market approval for a cultured meat product. When Aleph Farms first submitted it, it was expected to take around 18 months to complete the regulatory process. However, in January 2024, it was revealed that the FSA plans to unveil a fast-track approval process for novel foods, which will include cultured meat (Quinn, 2024). Cultured meat for human consumption, therefore, may enter the UK market far sooner than previously thought.

According to Szejda, Bryant and Urbanovich (2021), cultured meat companies can expect a big appetite from UK consumers, with an estimated 70% of the population willing to buy cultured meat. According to this study, the prospect of purchasing cultured meat was most popular amongst Gen Z.



Currently, there are three countries that have approved the sale of cultured meat for human consumption in their domestic markets: the US, Singapore and Israel.

Cultured meat around the world

Currently, there are three countries that have approved the sale of cultured meat for human consumption in their domestic markets: the US, Singapore and Israel. In 2020, Singapore became the first nation to approve the sale of cultured meat. At the time, cultured meat could only be found at a restaurant called 1880 which offered dishes that used GOOD Meat's cultured chicken product. The government of Singapore has been more supportive of cultured meat than most governments, having invested heavily in its research and development over the past several years (The Good Food Institute, 2022).

Following Singapore's history-making decision to approve the sale of cultured meat in 2020, the United States followed suit not long after. In 2022, the FDA gave approval for GOOD Meat and UPSIDE Foods to sell their products in the US, which was a major step towards cultured meat entering the US market (The Good Food Institute, 2022). The latest

development came in June 2023, when the US Department of Agriculture officially granted permission for these two companies to sell to US consumers (Milman, 2023).

The latest country to open its market to cultured meat is Israel, which approved the sale of cultured cow meat products in January 2024. This marks another milestone in the cultured meat world as it is the first time that cultured cow's meat has been approved for sale anywhere in the world – all previous approvals were specifically for cultured chicken (Aleccia, 2024). Cultured meat development is notably large in Israel, attracting 24% of all global investment in cultured meat (The Good Food Institute, 2022).

Not all countries, however, have taken to cultured meat with quite the same enthusiasm as Singapore, the US and Israel: in November 2023, Italy banned cultured meat outright, preventing it from being developed or sold in Italy (Kirby, 2023).

VEGANISM AND ETHICS

Why cultured meat?

Much has been written into the virtues of cultured meat, including its potential to radically reduce the number of animals made to suffer and die in conventional farming (Milburn, 2019; Chriki and Hocquette, 2020); the environmental benefits associated with reduced land and water use, and the reduction in greenhouse emissions (Chriki, Ellies-Oury and Hocquette, 2022; Gursel et al, 2022). Less widely researched but still important is the potential of cultured meat to reduce the likelihood of zoonotic diseases (Anomaly, 2023) and antibiotic resistance (Bomkamp and McNamara, 2022). The impact of cultured meat on the environment and health will be discussed in

The continued use of animals

Veganism as a philosophy is concerned with ending the exploitation of, and cruelty to, non-human animals. As such, it's understandable that some vegans may be drawn to the possibilities of this technology. However, as our policy position makes clear, cultured meat is not vegan or a panacea for the horrors of animal use and exploitation.

Challenging speciesism is at the heart of the vegan philosophy. Speciesism has been defined in different ways, but it essentially refers to the systemic oppression and ill-treatment of non-human animal species based upon the belief of human superiority (Horta, 2010). Speciesism is structural, meaning that it is woven into the fabric of our society, institutions, beliefs and practices. Speciesism, in short, is the belief that the non-human animal world exists to meet the needs of humanity; and that the use, exploitation and killing of non-human animals is justified because of our cognitive and spiritual superiority (Singer, 2009).

The nature of being vegan is to recognise our society as speciesist. We see it every day. We see it in the way cow skin is widely accepted as a material in clothing. We see it in the way that animals are tested on for our cosmetics. But, arguably, in its most egregious form, we see speciesism in how billions of animals are killed each year globally for food.

Promoters of cultured meat claim that the technology will spare millions of animals from being slaughtered for their meat. While this may be true to an extent, it is only

further detail later in this briefing.

It would perhaps be naive to believe that cultured meat companies and their investors are driven solely, or even mostly, by ethical and environmental concerns. The industry is huge and has the potential to grow massively, representing a major profit-making opportunity. Large-scale conventional meat companies such as Cargill and Tyson have invested heavily in cultured meat (Starostinetskaya, 2021). Cultured meat is often framed as a challenge to conventional meat giants like Tyson and Cargill, and yet they arguably stand to make a lot of money from its success.

true of those animals who are raised for their meat. Animals raised for dairy, eggs, wool or leather production, or for experimentation or entertainment, will continue to be killed once they are no longer economically productive (Wrenn, 2016). Animals are still very much connected to the cultured meat process through the biopsy process – indeed, the cells must come from somewhere (Chriki and Hocquette, 2020).

Within current popular discourse on cultured meat, there is a near total absence of the animal that had their cells extracted. In most existing literature on the topic, whether it's academic publications or cultured meat company websites, the animal is mentioned briefly and then seemingly forgotten about. What happens to the animal after their biopsy is left unclear. Presumably, they meet the same fate as most other farmed animals.

Cultured meat is not vegan. Furthermore, it may never be considered vegan. Although it is theoretically possible that lab-grown meat could be made with no animal involvement whatsoever once cell lines are more advanced, this is still only theory. What is arguably important is the experience of the animals. Cultured meat may one day scale up to such a degree that conventional meat is largely replaced and far fewer animals would be used in the food system. A huge decrease in the overall number of animals in the food system would be beneficial for those animals, and for the environment and public health. However, it is currently far from certain that this scenario will actually be reality.

The Vegan Society's definition of veganism

Veganism is a philosophy and way of living which seeks to exclude – as far as is possible and practicable – all forms of exploitation of, and cruelty to, animals for food, clothing or any other purpose; and by extension, promotes the development and use of animal-free alternatives for the benefit of animals, humans and the environment. In dietary terms it denotes the practice of dispensing with all products derived wholly or partly from animals.

The Vegan Society's policy on lab-grown meat

"We acknowledge that lab-grown meat has the potential to reduce animal suffering and we understand that it has benefits to animal welfare, but we fight for an end to all exploitation. As it currently stands, the process of cultivated meat is not enough for us to support it. There is already a myriad of vegan meat alternatives that don't derive from cultivated or lab-grown meats – essentially there are kinder alternatives out there. Whilst these products include starter cells derived from animals, they aren't vegan. We understand that this is a fast-moving sector, and we will keep this under review." – The Vegan Society, 2024

THE ENVIRONMENT AND HEALTH

Climate Crisis

According to recent data from the Food and Agriculture Organization of the United Nations, 900,000 cows, 1.4 million goats, 1.7 million sheep, 3.8 million pigs, 12 million ducks, 202 million chickens, and hundreds of millions of fish are slaughtered globally each day (Roser, 2023). Not only is this an ethical catastrophe, but it's also having a highly destructive impact on our planet. Conventional animal agriculture is an enormous misuse of land, with an estimated 77% of global farmland used to graze farmed animals or to grow crops to feed these animals (de Ruiter, 2017). Furthermore, the greenhouse gas emissions from animal agriculture are making a devastating contribution to the climate crisis. About 26% of all greenhouse gas emissions come from agriculture, and most of this comes from animal agriculture specifically (Ritchie, Rosado and Roser, 2022).

In light of this reality, it's clear that a radical rethinking of our food system is needed if we're to avoid ecological collapse. Cultured meat, in comparison to conventional

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meat, could be viewed as a preferable alternative since cultured meat facilities require far less land and water and are responsible for less greenhouse gas emissions (Swartz, 2021; Sinke et al, 2023). According to Swartz (2021), cultured meat production requires "64 to 90 percent less land" and causes "20 to 94 percent less air pollution". In addition, it is argued that the land freed up from replacing conventional animal agriculture could be repurposed for other, more environmentally friendly means, like growing more food or restoring ecosystems (ibid).

It is worth underlining when considering environmental assessments of cultured meat that the technology is still in its infancy. Most assessments of environmental impact are either based on the technology as it exists today, or on modelling of what the technology could be like at some point in the future. As such, it is important to note that such assessments are not necessarily a reliable indicator of how lab-grown meat will be thought of in the future with regards to the environment.


Public health

Concerns over the suitability of cultured meat for our health has been an obstacle for its progress for some time, with many people concerned about the long-term impact of its consumption and its association with being 'unnatural' (Bryant and Barnett, 2020). It is arguably perfectly reasonable for people to be concerned about the health implications of novel foods like cultured meat, especially considering that for most people, cultured meat is something that they have only heard about and never actually encountered. However, the literature suggests that the production of cultured meat is safer than conventional meat: as highlighted by Chriki and Hocquette (2020), researchers at cultured meat facilities have a high degree of control over the environment, and the chances of contamination with pathogens such as salmonella and E. coli are limited, although it is possible for cultured meat to be contaminated in other ways.

Proponents of cultured meat have also highlighted the potential for the technology to prevent future zoonotic diseases. The scientific literature strongly suggests that

animal agriculture has been responsible for devastating epidemics and pandemics including, most infamously, COVID-19. Furthermore, it's believed that 75% of all emerging diseases affecting humans come from animals (Centre for Disease Control and Prevention, 2021). As such, the nature of cultured meat, where live animals are not present and hygiene standards are high, could go a long way to reducing the frequency of fatal zoonotic disease outbreaks.

It is also worth noting that one of the most pressing issues facing the world today is antibiotic resistance. The main driver of such resistance is animal agriculture, due to the huge scale of antibiotics routinely given to farmed animals. If unchecked, antibiotic resistance risks taking us back to a time where simple infections are once again fatal. Although cultured meat also uses antibiotics to mitigate the risk of contamination, research suggests that in the future, antibiotics will not be routinely used in cultured meat production (Bomkamp and McNamara, 2022).



Cultured meat is a complicated topic. Vegans have differing opinions on how we should think about cultured meat, especially when thinking about animal ethics. In the next section of this Research Briefing, we've invited two members of The Vegan Society's Research Advisory Committee to share their thoughts on cultured meat. Dr Corey Lee Wrenn is a Lecturer of Sociology at the University of Kent and Dr Chris Bryant is a social scientist and Director of Bryant Research Ltd.

The views expressed by our Research Advisory Committee contributors are not necessarily the views of The Vegan Society.

OPINION PIECE

by Dr Corey Lee Wrenn (Senior Lecturer in Sociology, University of Kent)

The Vegan Society has rightly raised concerns with the continued physical violence that in vitro development entails, including using cultures from non-human animals and other forms of vivisection. Sociologically, however, it is important to recognize the symbolic violence that cultured meat sustains. Here I suggest that the feminist movement has much to offer. Many have suggested that prostitution and realistic sex dolls are 'ethical alternatives' for men who wish to own, control, exploit and abuse women, supposedly reducing their desire to enact violence on others. Aside from dehumanising prostituted women, this logic masks the fact that such an approach effectively normalises the ownership, exploitation and commodification of women. Encouraging products and services that mimic or contain systemic violence only supports a culture in which violence is enjoyable, acceptable and for sale to those in power.

The normalcy of speciesism and sexism, incidentally, is clearly demonstrable in the fact that these debates about capitalist 'solutions' to develop analogous, consumable victims are engaged at all. We would never, for instance, encourage white supremacists to enjoy themselves with AI-generated slavery as an 'ethical alternative' to white supremacy. We would never encourage teens to take pleasure in video game simulations of school shootings as an 'ethical alternative' to real-world mass murder. We intuitively understand that these symbolic acts of violence could have consequences for people of colour and children. Women and other animals in today's culture, however, remain so objectified that non-profits and venture capitalists collaborate to profitably continue this objectification, albeit masked in language of ethics and scientific advancement to resonate in a 'woke' and 'sustainable' 21st century.

While the symbolic ramifications of further commodifying animal flesh create serious misgivings, it also remains the case that in vitro meat completely overlooks the billions of other non-humans raised in the food system who are not directly slaughtered for their flesh. For that matter, in vitro technology also does nothing for the billions of oppressed animals who suffer in non-food-related industries. Dairy cattle, veal calves, wool-producing sheep, layer hens and racehorses, for example, all go to slaughter when their bodies become 'spent' and inefficient. And what of 'leather' and 'fur'? In vitro meat does nothing to reduce the demand for animal flesh used in fashion. What of rodeos, zoos and circuses? In vitro technology is totally unrelated. These animals will not be spared by lab-grown meat. Veganism as an ethic, philosophy and political vision considers humanity's oppression of other animals holistically. In vitro meat development, alternatively, is better suited to creating wealth for shareholders by globally expanding animal protein in the human diet.

Indeed, I argue that the most glaring shortcoming of the in vitro scheme is that it overlooks speciesist attitudes and institutions as problematic in of themselves. In vitro meat

purports to meet the supposedly insatiable public demand for non-human animal flesh, but this is a demand that is artificially controlled by industry. By reducing the cognitive dissonance that consumers experience in grappling with the suffering, death and considerable environmental pollution their food choices cause, in vitro meat may further fuel the normalcy of speciesism and meat consumption. In vitro meat will become the next 'happy meat', allowing consumers to retreat into industry-led myths that the flesh they eat comes from humanely-treated animals. Indeed, it is likely that consumers will be completely unaware of the institutionalised violence that remains in the production of in vitro meat. Producers will employ similar tactics to those they currently employ to block public knowledge of the non-human experience. The consumer awareness and ethical discomfort with speciesist consumption that the vegan movement has been building for more than a century will be necessary for real change. More importantly, this individual-level work must be coupled with challenges to oppressive social institutions.

From a human perspective, in vitro meat is also deeply problematic. There is already a thriving industry of healthy and tasty plant-based products, including those that convincingly mimic the flavour and texture of animal flesh. Because consumers are aware that these analogues are plant-based and not of animal origin, they do not threaten to reinforce speciesism to the same degree that in vitro flesh might. It must be emphasised, furthermore, that animal protein is toxic for humans and the effort to globalise heavy animal-protein diets is rooted in colonialism, racism, and classism.

Normalising in vitro flesh will aggravate serious diet-related public health crises, disproportionately harming vulnerable human communities that lack the resources and infrastructure to cope. Vegans should not be promoting toxic products, especially when healthier, more affordable alternatives are available and have been available before Western capitalism began to privatise land and undermine traditional food production across the globe. The more practical response to ensuring world nutrition would be a governmental investment in plant-based food security, a strategy that vegans can support.

As a sociologist, it is my position that vegans should be sceptical of campaigns that purport to solve the inherent problems of free market capitalism with yet more free market capitalism. In vitro meat may be palatable for venture capitalists, but it is unlikely to create meaningful social change for non-human animals. Capitalism aims to exploit materials and labour for the purpose of reducing input costs, increasing efficiency and creating surplus value; it is not designed to liberate. Instead, it has a well-documented history of objectifying and commodifying everything and everyone in its pursuit of that profit. In vitro meat should remain outside the remit of vegan advocacy.

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OPINION PIECE

by Dr Chris Bryant (Director, Bryant Research)

Here, I make the case that those who prioritise reducing farmed animal suffering should support cultivated meat. In particular, I respond to two common vegan objections to cultivated meat: the speciesism objection, and the capitalism objection.

First, I will caveat that I support cultivated meat to the extent that it reduces animal suffering. But there are some versions of cultivated meat which use foetal bovine serum and actually require more animals to be slaughtered – clearly,

these versions do not reduce animal suffering, and I do not advocate for them. Some versions of cultivated meat require a tiny fraction of the number of animals (but still not zero). Some versions of cultivated meat truly demand zero additional animals to be used or slaughtered. In my view, these versions are far superior to meat from animals, and the latter is, in my opinion, vegan.

The speciesism objection

Some vegans object to cultivated meat on the grounds that it perpetuates speciesism and promotes the idea that animals are appropriate for consumption, even if it reduces animal suffering in practice. I have two objections to this.

First, this puts the moral weight on the attitude rather than the outcome. There is one reason that I care about people having less speciesist attitudes: to reduce animal suffering. Less speciesist attitudes only matter if they lead to actions that reduce animal suffering. Other than this causal chain from speciesist attitudes to reduced animal suffering, I have no concern whatsoever about speciesist attitudes.

To illustrate this, let us consider four types of people: those with/without speciesist attitudes, and those who do/do not eat meat (table below).

When considering these four types of people, vegans can agree that A is better than D – compared to the regular meat-eater, the vegan does not eat meat, and does not have speciesist attitudes. In my view, it is also clear that B is better than C – compared to the self-aware meat-eater, the plant-based person might have more speciesist attitudes, but they are not harming animals for meat.

From the animals’ perspective, would you rather that somebody had a negative attitude towards you but left you alone, or that somebody had a positive attitude towards you but killed you for food?

My second argument against the speciesism objection is that, as a matter of human psychology, it is likely that cultivated meat will decrease speciesism, not increase it. This is because speciesist attitudes both cause and are caused by consumption of animals.

Study participants who were given beef jerky to snack on, as opposed to those who were given nuts, subsequently ascribed lower mental abilities and pain capacity to cows. Eating animals literally caused the participants to be more speciesist. If cultivated meat can facilitate people eating less meat, it is likely that it will also facilitate a shift to less speciesist attitudes.

Defences of eating meat are motivated by a desire to keep eating meat. How many people would try to justify killing a cow if there were no implications for whether or not they could continue to eat cheese burgers?

		Attitudes	
		Non-speciesist attitude	Speciesist attitude
Action	Does not eat meat	A. Vegan Good attitude to animals No animals harmed for meat	B. Plant-based Bad attitude to animals No animals harmed for meat
	Eats meat	C. Self-aware meat-eater Good attitude to animals Animals harmed for meat	D. Regular meat-eater Bad attitude to animals Animals harmed for meat

The capitalism objection

Some vegans object to cultivated meat on the grounds that it is made by big companies that are primarily driven by profit and may not really care about helping animals. I have two objections to this.

First, it is not clear that cultivated meat companies do not care about helping animals. The people who own cultivated meat companies, as well as the people who work at cultivated meat companies, are disproportionately vegetarians or vegans. This includes the investors who put money into impact-driven funds like Stray Dog Capital, Sentient Ventures and New Crop Capital; individual investors such as Jeremy Collier and Jim Mellon who are lifelong vegetarians; and the CEOs of many of the biggest cultivated meat companies – including Uma Valeti at UPSIDE Foods and Josh Tetrick at Eat Just – who are vegans.

Second, the question of whether cultivated meat

companies care about helping animals is largely irrelevant. What is relevant is the impact of their actions on animal suffering. Again, we can consider four scenarios, where a cultivated meat company does/does not care about helping animals, and does/does not displace demand for farmed animals (table below).

Again, we can agree that most ideally, companies would both reduce animal harm for meat and sincerely care about animals (A); and least ideally, companies would be both selfish and ineffective (D). However, if we had a choice between B and C, surely we ought to prefer the selfish but effective company (B), which does not care about animals but reduces animal harm incidentally, over the altruistic but ineffective company (C), which cares about animals but lacks the capacity to do anything about it.

		Attitudes	
		Cares about helping animals	Does not care about helping animals
Action	Displaces demand for animals	A. Altruistic and effective Good attitude to animals Reduces animal harm for meat	B. Selfish but effective Bad attitude to animals Reduces animal harm for meat
	Does not displace demand for animals	C. Altruistic but ineffective Good attitude to animals Fails to reduce animal harm for meat	D. Selfish and ineffective Bad attitude to animals Fails to reduce animal harm for meat

Conclusion

Here, I have responded to two common vegan objections to cultivated meat. Cultivated meat is likely to decrease speciesism, not increase it, and cultivated meat companies care about animal suffering, as demonstrated by the disproportionate number of vegans owning and running them. In any case, the outcome of reducing animal suffering is more important than the attitude of caring about animals – for both the companies, and for the general public.

It is true that some versions of cultivated meat are

absolutely not vegan. Other versions, in my view, absolutely are. Other versions still may not be perfectly vegan, but nevertheless can spare millions of animals from slaughter.

There are some versions of cultivated meat we should not support, but refusing to support any cultivated meat – particularly on the basis of the speciesism objection or the capitalism objection to which I have responded here – is misguided, and is likely to increase animal suffering.



Some vegans object to cultivated meat on the grounds that it is made by big companies that are primarily driven by profit and may not really care about helping animals.



We acknowledge that there is no consensus within the vegan community with regards to cultured meat and that other vegan organisations or individuals may disagree with our current policy position.

LIMITATIONS

The purpose of this research briefing is to provide a succinct overview on the topic of cultured meat, and to specifically highlight the main areas of interest for vegans and indeed a general audience. Cultured meat technology is fast-moving, and new research and findings are published regularly. Given the speed at which new research is published, we acknowledge that this may not be a fully comprehensive

account of how cultured meat works or the possibilities that this technology has for the future of our food system. We also acknowledge that there is no consensus within the vegan community with regards to cultured meat and that other vegan organisations or individuals may disagree with our current policy position.

IMPLICATIONS FOR PROFESSIONAL PRACTICE

The Vegan Society and other vegan organisations should continue to monitor the progress of cultured meat regulations globally to stay informed about which markets the technology is entering.

- As cultured meat enters new markets, The Vegan Society must advocate for clear vegan product labelling so that consumers know what they are buying and the origins of their food.
- The impact of cultured meat technology on farmed animals

is paramount, and efforts should be taken to centre these animals in discussions on cultured meat.

- Further research should be undertaken to better understand the opinions of vegans on cultured meat technology.
- In light of the emergence of cultured meat technology, vegan campaigns may wish to emphasise that we cannot rely on technological advancements to save us from the climate crisis.



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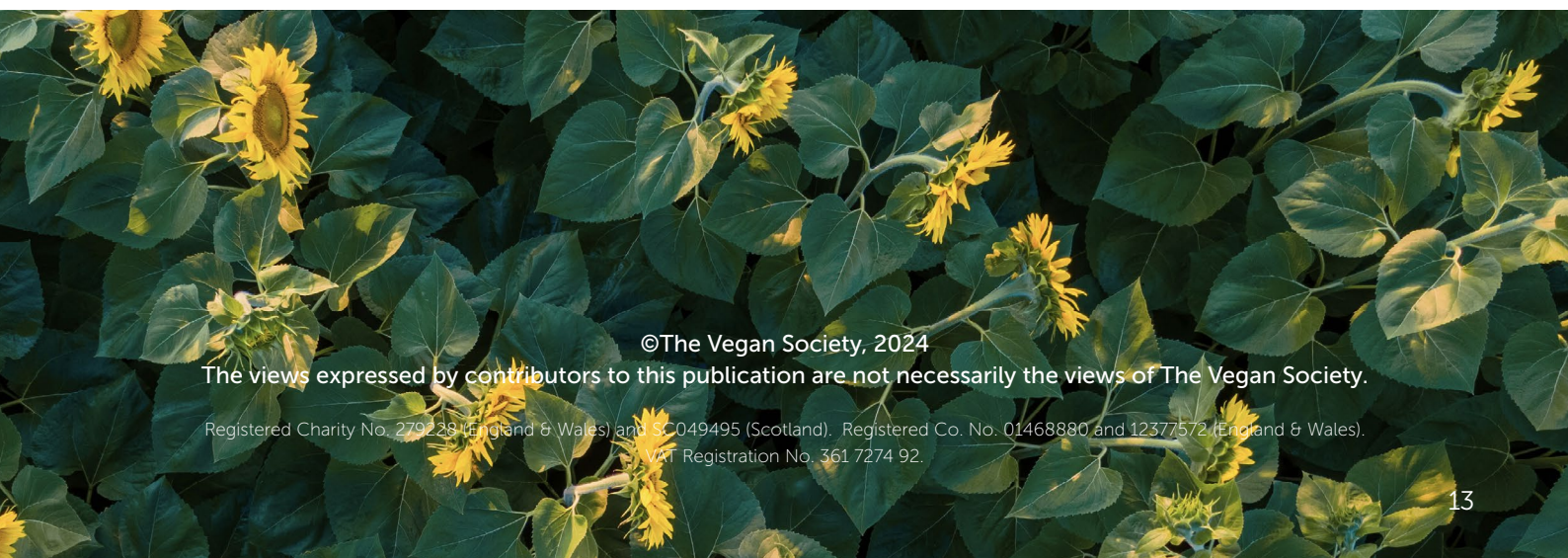
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REFERENCES/FURTHER INFORMATION

- Aleccia J. (2024). Israeli company gets green light to make world's first cultivated beef steaks. Associated Press. (accessed 01 March 2024). Available at: <https://apnews.com/article/cultivated-meat-israel-aleph-farms-beef-7735ab4ca3cb7df1ccb06c60ba0b926a>
- Aleph Farms (2024). About. Available at: <https://aleph-farms.com/about/> (Accessed 29 February 2024).
- Anomaly, J., Browning, H., Fleischman, D., & Veit, W. (2024). Flesh without blood: The public health benefits of lab-grown meat. *Journal of Bioethical Inquiry*, 21(1), 167-175. Available at: <https://doi.org/10.1007/s11673-023-10254-7>
- Believer Meats (2024). Believer Meats CEO Gustavo Burger Meets U.S. Senators Ted Budd and Thom Tillis, Reaffirms Commitment to Investing in North Carolina. Available at: <https://www.believermeats.com/press/believer-meats-ceo-gustavo-burger-meets-u-s-senators-ted-budd-and-thom-tillis-north-carolina> (Accessed 01 March 2024)
- BLUU Seafoods (2023). High Tech Seafood. Available at: <https://www.bluu.bio/technology> (Accessed 29 February 2024).
- Bomkamp C. and McNamara E. (2022). Cultivating a future where antibiotics still work. The Good Food Institute. Available at: <https://gfi.org/blog/cultivating-a-future-where-antibiotics-still-work/> (Accessed 06 March 2024).
- Bryant C. and Barnett J. (2020). Consumer acceptance of cultured meat: an updated review (2018–2020). *Applied Sciences*. Jul 28;10(15):5201ddf. Available at: <https://doi.org/10.3390/app10155201>
- Centre for Disease Control and Prevention (2021). Zoonotic Diseases. Available at: https://www.cdc.gov/one-health/about/about-zoonotic-diseases.html?CDC_AAref_Val=https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html (Accessed 08 March 2024).
- Chriki S., Ellies-Oury M.P. and Hocquette J.F. (2022). Is "cultured meat" a viable alternative to slaughtering animals and a good compromise between animal welfare and human expectations? *Anim Front*. 12(1):35-42. Available at: <https://doi.org/10.1093/af/vfac002>
- Chriki S. and Hocquette J.F. (2020). The myth of cultured meat: a review. *Frontiers in nutrition*. 7:7. Available at: <https://doi.org/10.3389/fnut.2020.00007>
- Cornell J. (2023). Multus Biotechnology closes \$9.5M funding to bring cultivated meat closer to price parity. Labiotech. Available at: <https://www.labiotech.eu/trends-news/multus-biotechnology-funding-cultivated-meat-price-parity/#:~:text=The%20funding%20will%20allow%20Multus,and%20food%2Dgrade%20raw%20materials> (Accessed 29 February 2024).
- de Ruiter H., Macdiarmid J.I., Matthews R.B., Kastner T., Lynd L.R. and Smith P. (2017). Total global agricultural land footprint associated with UK food supply 1986–2011. *Global environmental change*. 43:72–81. Available at: <https://doi.org/10.1016/j.gloenvcha.2017.01.007>
- González A., Koltowitz S. (2019). Corrected: The \$280,000 Lab-Grown Burger Could Be a More Palatable \$10 in Two Years. Reuters. Available at: <https://www.reuters.com/article/us-food-tech-labmeat/the-280000-lab-grown-burger-could-be-a-more-palatable-10-in-two-years-idUSKCN1U41W8/> (Accessed 28 February 2024).
- GOOD Meat (2022). About us. Available at: <https://www.goodmeat.co/about> (Accessed 01 March 2024).
- GOOD Meat (2023). GOOD Meat Receives Approval to Commercialize Serum-Free Media: Technical and regulatory milestone will lead to production efficiencies. Available at: <https://www.goodmeat.co/all-news/good-meat-receives-approval-to-commercialize-serum-free-media> (Accessed 29 February 2024).
- Gursel I.V., Sturme M., Hugenholtz J. and Bruins M. (2022). Review and analysis of studies on sustainability of cultured meat. Wageningen Food & Biobased Research. Available at: <https://doi.org/10.18174/563404>
- Horta O. (2010). What is speciesism? *Journal of agricultural and environmental ethics*. 23:243-66. Available at: <https://doi.org/10.1007/s10806-009-9205-2>
- Jones H. (2024). Lab-grown meat set to be sold in UK pet food. BBC. Available at: <https://www.bbc.co.uk/news/articles/c19k0ky9v4yo#:~:text=The%20UK%20has%20become%20the,planning%20to%20sell%20to%20manufacturers> (Accessed 23 July 2024).

- Kirby P. (2023). Italy bans lab-grown meat in nod to farmers. BBC. Available at: <https://www.bbc.co.uk/news/world-europe-67448116> (Accessed 01 March 2024).
- Milburn J. (2019). The Expert Series (2): How should vegans respond to in vitro meat? The Vegan Society. Available at: <https://www.vegansociety.com/about-us/research/research-news/expert-series-2-how-should-vegans-respond-vitro-meat> (Accessed 05 March 2024).
- Milman O. (2023). USDA allows lab-grown meat to be sold to US consumers. The Guardian. Available at: <https://www.theguardian.com/us-news/2023/jun/21/us-lab-grown-meat-sold-public> (Accessed 01 March 2024).
- Mosa Meats (2021). Leonardo DiCaprio Invests in Mosa Meat and Aleph Farms to Advance Development of Sustainable Cultivated Beef. Available at: <https://mosameat.com/blog/leonardo-dicaprio-invests-in-mosa-meat> (Accessed 01 March 2024).
- Multus Biotechnology (2022). Home. Available at: <https://www.multus.bio/> (accessed 02 March 2024).
- Quinn I. (2024). Lab-grown meat set for green light under FSA plans. The Grocer. Available at: <https://www.thegrocer.co.uk/meat/lab-grown-meat-set-for-green-light-under-fsa-plans/687237.article> (Accessed 29 February 2024).
- Rabinovitch, A. (2024). Aleph Farms gets approval to sell cultivated steaks in Israel. Reuters. (Available at: <https://www.reuters.com/world/middle-east/aleph-farms-gets-approval-sell-cultivated-steaks-israel-2024-01-17/> (Accessed 29 February 2024).
- Reiss J., Robertson S. and Suzuki M. (2021). Cell sources for cultivated meat: applications and considerations throughout the production workflow. International Journal of Molecular Sciences. 22, no. 14, 2-5. Available at: <https://doi.org/10.3390/ijms22147513>
- Remilk. Our Science. 2022 (accessed 29 February 2024). Available at: <https://www.remilk.com/science>
- Ritchie H., Rosado P., Roser M. Environmental Impacts of Food Production. Published online at [OurWorldInData.org](https://ourworldindata.org/environmental-impacts-of-food). 2022. Retrieved from: <https://ourworldindata.org/environmental-impacts-of-food>
- Roser M. How many animals get slaughtered every day? [OurWorldInData.org](https://ourworldindata.org/how-many-animals-get-slaughtered-every-day). 2023 (accessed 07 March 2024). Available at: <https://ourworldindata.org/how-many-animals-get-slaughtered-every-day>
- Singer P. (2009). Speciesism and moral status. *Metaphilosophy*. 40(3-4):567-81. Available at: <https://doi.org/10.1111/j.1467-9973.2009.01608.x>
- Sinke, P., Swartz, E., Sanctorum, H. et al (2023). Ex-ante life cycle assessment of commercial-scale cultivated meat production in 2030. *Int J Life Cycle Assess* 28, 234–254. <https://doi.org/10.1007/s11367-022-02128-8>
- Starostinetskaya A. (2021). This Cultured Meat Startup Just Raised a Record \$347 Million with Help from Tyson. *VegNews*. Available at: <https://vegnews.com/2021/12/future-meat-technologies-347-million-tyson> (Accessed 07 March 2024).
- Swartz E. (2021). New studies show cultivated meat can have massive environmental benefits and be cost-competitive by 2030. The Good Food Institute. Available at: <https://gfi.org/blog/cultivated-meat-lca-tea/> (Accessed 07 March 2024)
- Szejda K., Bryant C.J., Urbanovich T. (2021). US and UK consumer adoption of cultivated meat: a segmentation study. *Foods*. 10(5):1050. Available at: <https://doi.org/10.3390/foods10051050>
- The Good Food Institute (2022). State of Global Policy. Available at: https://gfi.org/wp-content/uploads/2023/01/State-of-Global-Policy-Report_2022.pdf (Accessed 29 February 2024).
- The Good Food Institute (2024). The Science of Cultivated Meat. Available at: <https://gfi.org/science/the-science-of-cultivated-meat/> (Accessed 22 February 2024).
- Toeniskoetter C. (2022). Lab-Grown Meat Receives Clearance From F.D.A. *The New York Times*. Available at: <https://www.nytimes.com/2022/11/17/climate/fda-lab-grown-cultivated-meat.html> (Accessed 01 March 2023).
- UPSIDE Foods (2024). Cultivated meat. It's science (but not rocket science). Available at: <https://upsidefoods.com/innovation> (Accessed 29 February 2024).
- Vegconomist (2023). SuperMeat's Cultivated Chicken Receives Kosher Certification, Making Sustainable Proteins Accessible to Millions. Available at: <https://vegconomist.com/company-news/supermeats-cultivated-chicken-kosher-certification/> (Accessed 01 March 2024).
- Wrenn C.L. (2026). If You Care about Animals, In-Vitro Meat is Not the Answer. Available at: <https://www.coreyleewrenn.com/in-vitro/> (Accessed 05 March 2024).



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