Routledge
Taylor & Francis Group

Journal of Foodservice Business Research

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/wfbr20

# Cultivated meat in tourism and hospitality: setting the scene and outlining future research agenda

Hien Thu Bui, Viachaslau Filimonau & Vladimir A. Ermolaev

**To cite this article:** Hien Thu Bui, Viachaslau Filimonau & Vladimir A. Ermolaev (15 May 2024): Cultivated meat in tourism and hospitality: setting the scene and outlining future research agenda, Journal of Foodservice Business Research, DOI: 10.1080/15378020.2024.2355373

**To link to this article:** https://doi.org/10.1080/15378020.2024.2355373



Published online: 15 May 2024.

JOURNAL OF FOODSERVICE BUSINESS RESEARCH
https://doi.org/10.1080/15378020.2024.2355373

Routledge
Taylor & Francis Group



# Cultivated meat in tourism and hospitality: setting the scene and outlining future research agenda

Hien Thu Bui[a], Viachaslau Filimonau[b], and Vladimir A. Ermolaev[c]

[a]York Business School, York St John University, York, UK; [b]School of Hospitality and Tourism Management, University of Surrey, Guildford, UK; [c]Faculty of Technological Entrepreneurship, Kuzbass State Agricultural University, Kemerovo, Russia

**ABSTRACT**

The major societal challenges of climate change and animal welfare call for novel solutions to produce food. Cultivated meat may represent one of such solutions and research is emerging to understand its implications for food consumption. However, to date research has excluded the sector of foodservice provision as part of the wider tourism and hospitality industry from analysis. The current conceptual paper addresses this critical gap in knowledge by introducing cultivated meat to the context of food consumption outside the home. The paper elaborates upon the implications of cultivated meat for global foodservice provision and outlines an agenda for future research. This agenda considers the interests of multiple stakeholders, including developers/manufacturers of cultivated meat, foodservice providers, consumers, policymakers, and digital technology providers to highlight research avenues that warrant in-depth empirical investigation.

**KEYWORDS**

Cultured meat; cell-based food; animal welfare; foodservice

## Introduction

The phenomenon of cultivated meat, or the meat produced from animal cells, has recently attracted considerable scientific and press attention due to its potential to contribute to climate change mitigation and enhance animal welfare (Chriki et al., 2020). Surprisingly, however, cultivated meat has not yet been studied from the perspective of foodservice provision in the wider context of tourism and hospitality. This represents a critical knowledge gap because empirical research on cultivated meat remains untapped in tourism and hospitality, which leaves multiple stakeholders within the sector unsupported.

This conceptual paper strives to partially address this knowledge gap. To this end, it discusses the potential impact of cultivated meat in tourism and hospitality and outlines an agenda for future research that can aid in

**CONTACT** Hien Thu Bui h.bui@yorksj.ac.uk York Business School, York St John University, Lord Mayor's Walk, York YO31 7EX, UK

understanding this phenomenon from the multi-stakeholder perspective. The paper applies an interdisciplinary perspective to the analysis of the emerging trend of cultivated meat in the global market of tourism and hospitality to offer theoretical, management, and policy implications for gastronomy and food science.

## Setting the scene

The Conference of the Parties held in Dubai, the United Arab Emirates, in November–December 2023 (known as COP28) marked an important milestone in global pro-environmental decision-making. For the first time in the last three decades, it has explicitly recognized the profound contribution of global food systems (i.e., all the elements and activities related to producing and consuming food, to climate change) (Bauck, 2023). COP28 called for urgent interventions to mitigate the carbon intensity of food systems that account for one-third of anthropogenic greenhouse gas (GHG) emissions (Crippa et al., 2021).

The outcome of COP28 holds important implications for the global sector of tourism and hospitality. Tourism contributes at least 8% to global GHG emissions with the trajectory of anticipated growth (Lenzen et al., 2018). Although, cumulatively, transportation and accommodation account for the largest share of tourism's carbon footprint, the contribution of food service is noticeable as it amounts up to 10% of the sector's total GHG emissions (Gössling et al., 2023). Importantly, this figure does not incorporate the carbon footprint of food production. If these downstream GHG emissions are considered in a climate impact assessment, thus applying a lifecycle perspective to climate impact assessment, the share of food in the carbon footprint of tourism can grow up to 17% (Campos et al., 2022) and even 36% (Whittlesea & Owen, 2012). These figures call for urgent mitigation of the food-related GHG emissions of tourism and hospitality (Miralles et al., 2023). Importantly, as the above figures demonstrate, this mitigation should be concerned not only with the consumption of food, but also with its production.

Dietary change should be prioritized in the design of policymaking and management interventions aimed at climate change mitigation (Geyik et al., 2023). Globally, livestock agrifood systems are responsible for about 12% of all anthropogenic GHG emissions and circa 40% of the total carbon footprint from agrifood systems (FAO, 2023). Thus, transitioning from meat-based to plant-based diets can significantly reduce the carbon intensity of global food systems (Kovacs et al., 2021). Although some consumers are making a conscious effort to substitute meat with non-meat/plant-based alternatives in their diets, the majority prefer to stay omnivores (Milfont et al., 2021). Various factors determine consumer unwillingness to engage with plant-based meat substitutes, including taste preference, visual appearance, perceived

naturalness, cultural/social identity and religious beliefs (Slade, 2018). Consumer behavior and, more specifically, consumer food choices, is therefore a major barrier that needs addressing to facilitate dietary change from meat-based to plant-based diets (Graça et al., 2019).

To make plant-based meat substitutes more attractive to consumers, food manufacturers have made a significant effort to provide (nearly) identical visual, textual, and taste food representations (He et al., 2020). This is to ensure that plant-based dishes resemble, as much as possible, their popular meat-based analogues, such as burgers, sausages, and steaks, thus not alienating prospective consumers (Pingali et al., 2023). Despite these industry efforts, challenges in encouraging a demand-side transition from meat-based to plant-based diets persist (Aschemann-Witzel et al., 2021). More "aggressive" measures, such as phasing meat-based products out of the market, have been called for by climate activists (Saner, 2019). However, these measures should be applied with caution in democratic, neoliberal economies where the freedom of (food) choice is paramount (Filimonau et al., 2017).

Consumers of tourism and hospitality services are largely unwilling to make their food choices more climate benign, which includes their unwillingness to substitute meat with plant-based analogues (Bacon & Krpan, 2018). This is predominantly attributed to the hedonic nature of tourism which implies that food consumption in this context is driven by the sensory attributes of food and pleasure seeking as opposed to environmental sustainability considerations (Dolnicar, 2020). Although recent experimental research demonstrates some promising potential to architect consumer food choice via targeted interventions, the literature recognizes the significant challenge of voluntary behavior shift from meat-based to plant-based substitutes in tourism and hospitality (Greene et al., 2024).

Technology can facilitate the transition of tourism and hospitality toward more climate benign food choices as it enables new methods of food production. Cultivated meat, also known as cultured, lab-grown, cell-based or in-vitro meat, is a recent example of effective technological advancements in food production (Baum et al., 2021). Cultivated meat is a product of cellular agriculture where meat is produced by culturing animal cells in vitro (Gaydhane et al., 2018). Cultivated meat could be beneficial from the perspective of climate change as neither extensive livestock nor the land to host it is required to make it (Sinke et al., 2023). Cultivated meat is also advantageous from the viewpoint of animal ethics as animals do not need to be slaughtered (Bhat et al., 2019). Production of cultivated meat can be economically viable as demonstrated by almost 300 thousandfold reduction in production costs of cultivated meat since 2013 (Cai et al., 2024) which may stimulate the global cultivated meat market to be worth an estimated 788 billion US dollars by 2040 (Statista, 2024). Lastly and most importantly, given that animal cells are used to make cultivated meat, its sensory and physical properties, such as color,

flavor, aroma, texture, and palatability, are comparable to those of conventional meat, thus implying potentially high(er) levels of its acceptance by consumers compared to plant-based substitutes (Kadim et al., 2015). These factors entail that cultivated meat as a potential solution to the GHG emissions associated with the global food systems whereby voluntary transitioning of consumers to more climate benign food choices should not be restricted by sensory factors.

Cultivated meat is not without its shortcomings. Currently, its production remains overly expensive, and it has not yet reached the required economy of scale when it can compete with conventional, heavily subsidized agriculture (Garrison et al., 2022). There are also health and safety concerns given that culturing animal cells in vitro requires strict adherence to specific physical parameters to avoid failure and contamination (Ong et al., 2021). Finally, the market of cultivated meat is largely unregulated, and it is unclear how future policies will promote or, contrarily, inhibit its production (Guan et al., 2021). This notwithstanding, as technology becomes more advanced and as more subsidizes may be allocated to produce climate benign food following COP26, cultivated meat may become competitive and, therefore, more mainstream.

Although cultivated meat has been discussed in the literature concerned with the context of general food production and consumption, to our knowledge, no study has attempted to understand its implications for tourism and hospitality. A review of research on consumer behavior toward cultivated meat between 2014 and 2022 by Siddiqui et al. (2022) has revealed no studies undertaken on this important topic in the context of out-of-home food consumption. This may be partially attributed to the conservative nature of tourism and hospitality businesses that have been slow in adopting novel business practices in response to new consumption trends, especially in the environmental sustainability context (Filimonau, 2021). An exception is the study by Chriki et al. (2021) who examine attitudes to cultivated meat among restaurant visitors in Brazil. Although this study is pioneering, it focuses on a single tourism and hospitality actor i.e., the consumer, concurrently ignoring the perspectives of other stakeholders. Despite the lack of academic research, foodservice outlets have started offering cultivated meat to their customers in, for example, Singapore (Marsh, 2023) which includes restaurants representing the high-end of the market (Crownhart, 2023).

Following COP26, there will be mounting pressure on tourism and hospitality businesses to provide their customers with more climate benign food choices. Cultivated meat may therefore represent a feasible alternative to plant-based dishes, especially for tourism and hospitality consumers who do not want to abandon conventional meat because of its perceived superior sensory and physical qualities compared to plant-based analogues. Further, given that Generation Y and Z consumers consider environmental sustainability and animal welfare the important elements of food choice

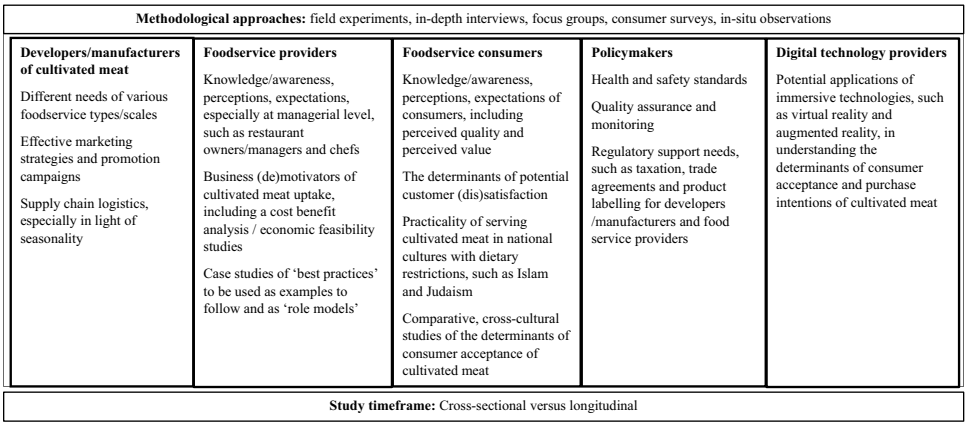


**Figure 1.** Agenda for cultivated meat research in tourism and hospitality.

(Bollani et al., 2019), cultivated meat can be used by tourism and hospitality providers as a means to enhance their business appeal to these customer segments. To this end, research is necessitated to lend theoretical and empirical support to industry practitioners and policymakers to highlight the potential benefits of cultivated meat, but also to better understand the challenges in its uptake. Given the lack of studies on cultivated meat in tourism and hospitality literature, this current paper proposes several analytical perspectives that can inform future research agendas on the subject matter in question (Figure 1).

## Outlining future research agenda

Future research could benefit from approaching cultivated meat in tourism and hospitality from five key perspectives: (1) developers/manufacturers of cultivated meat; (2) foodservice providers; (3) foodservice consumers; (4) policymakers; (5) digital technology providers.

### *Developers/manufacturers of cultivated meat*

Research should inform developers and manufacturers of cultivated meat about the different needs and expectations of the product which they offer among various foodservice business types and categories. For example, fine dining restaurants may require cultivated meat of different animal types, such as beef, pork, and lamb, of the highest quality, yet in smaller quantities. This is as opposed to casual dining restaurants which may need cultivated meat offering "value for money" rather than the top quality, yet in considerable amounts. This raises further research questions about the logistics of supply chain for cultivated meat, especially given that the number of cultivated meat

companies remains geographically limited and because of the seasonality of demand in tourism and hospitality.

Related to this point, research is necessitated to better understand how cultivated meat can be promoted and marketed by its developers/manufacturers to consumers and foodservice providers, particularly because of their inherent business conservatism, as discussed earlier. Research should be set to establish the most effective business-to-business communication channels and marketing strategies, especially in the tourism and hospitality markets where specialized cultivated meat suppliers are currently not present. By such marketing strategies as sponsorship of, for example, culinary events and festivals, developers/manufacturers can showcase cultivated meat to chefs and industry professionals to promote this innovative food. Influencer marketing, involving collaboration with renowned chefs or food influencers, can help developers/manufacturers facilitate wider awareness, acceptance, and adoption of cultivated meat among consumers. In addition, such methods as market research, in-depth stakeholder interviews, and surveys concerned with understanding industry needs and expectations can inform a research stream focusing on developers/manufacturers of cultivated meat.

### *Foodservice providers*

Research should delve into foodservice providers' knowledge, awareness, and perceptions of cultivated meat and its sustainability alongside wider societal benefits. Research should also be concerned with identifying the determinants of cultivated meat uptake, including individual (i.e., personal values of business owners/managers) and organizational (i.e., corporate strategies and business objectives) factors, but also external (i.e., market forces) factors, such as seasonality. Further, expectations of foodservice providers toward quality and quantity of cultivated meat as well as the (de)motivators in shifting menus toward cultivated meat should be carefully explored. This line of research can be underpinned by either qualitative (for instance, in-depth interviews or focus groups of foodservice providers), quantitative (for example, large-scale surveys of foodservice organizations) or mixed methods. Such investigations will enable the developers/manufacturers of cultivated meat to benefit from a better understanding of foodservice business expectations and, consequently, design more effective marketing interventions.

The exploration of foodservice providers' awareness, perceptions, expectations, and (de)motivators should focus on senior leadership given that management-level employees determine the direction of business development. In particular, chefs who are responsible for menu design and meals preparation should be interviewed and/or they can be surveyed to obtain more representative insights into their perceptions of and attitudes toward cultivated meat. Same argument applies to the need to study opinions of foodservice business

owners/managers who oversee the design of business models, including the selection of suppliers, and menu development.

The economic (dis)benefits of cultivated meat to foodservice providers deserve a dedicated research stream to facilitate informed industrial uptake. A cost-benefit analysis of cultivated meat, especially in comparison to other food alternatives, such as plant-based meat analogues or insect food, should be undertaken. This analysis should consider foodservice providers of different size, market category and specialism. Case studies of restaurants that are already offering cultivated meat can be used to better understand the economic feasibility of integrating cultivated meat into a menu. Such "best practices" can encourage foodservice providers to at least consider cultivated meat as part of their product offer.

### *Consumers*

Although the literature examining general consumer awareness and perception of cultivated meat alongside the (de)motivators of its acceptance is gradually emerging (Baum et al., 2021; Fu et al., 2023; Leung et al., 2023; Siddiqui et al., 2022; Silva & Semprebon, 2021), it has mainly been concerned with food consumption at home. The hedonic nature of tourism and hospitality necessitates a dedicated stream of research on awareness and perception of cultivated meat among foodservice customers. Given the unexplored nature of this topic, studies can be underpinned by qualitative research methods, such as in-depth interviews and consumer focus groups. Quantitative or mixed methods can also be applied to obtain a more nuanced view of the issue under scrutiny. On-site tasting sessions of dishes made of cultivated meat can be organized and consumer feedback can be collected after these sessions and analyzed either thematically or statistically.

More consumer-centered knowledge is vital for the design of marketing and promotion interventions by developers/manufacturers of cultivated meat and foodservice providers serving cultivated meat to their customers. Such critical research avenues as the drivers of customer (dis)satisfaction, perceived value, and perceived quality of cultivated meat should be investigated. Foodservice customers who have tasted cultivated meat in the past should be studied with the help of, for example, interviews and focus groups. Prospective customers should also be targeted in future research. In this case, field and/or quasi-experiments in which both conventional meat and cultivated meat are used as stimuli under the menu labeling versus un-labeling conditions for comparison, for instance, can provide interesting results.

Foodservice consumer research may generate particularly valuable insights if designed as comparative and applied cross-culturally. Comparative studies on consumers' antecedents of cultivated meat acceptance in different markets of foodservice provision can aid in understanding the opportunities and

challenges of cultivated meat uptake by foodservice customers in various cultures. Further, the practicality of serving cultivated meat in such cultures with religion-related dietary restrictions as Islam or Judaism should be carefully investigated to support developers/manufacturers of cultivated meat in meeting religious requirements. Research should focus on consumers with religious dietary practices, but also religious leaders, to explore how/if cultivated meat can fit within the culinary requirements of specific religions. This is because there is not yet a consensus among religious authorities on whether in vitro meat should be considered Halal or Kosher (Chriki & Hocquette, 2020). The opportunities and challenges of promoting cultivated meat in communities with religious dietary restrictions should therefore be examined using qualitative research methods, such as interviews and focus groups.

### *Policymakers*

Given the novelty of cultivated meat as a market phenomenon, the design of appropriate policies and regulations is necessitated to enable business engagement and build customer trust. Research is therefore required to facilitate policymaking, especially in such areas as health and safety. Studies delving into consumers' health concerns and quality expectations will support policymakers in designing regulations on quality control measures, but also health and safety standards. The design of empirical, research-grounded quality and safety regulations will also be fundamental for guiding developers/manufacturers of cultivated meat in the setup and organization of their business models and business ecosystems.

Research should assist policymakers in better understanding future regulatory support needs by developers/manufacturers of cultivated meat and foodservice providers via, for example, favorable tax initiatives, international trade agreements, and product labeling requirements. To this end, research can be underpinned by the method of focus groups or expert opinion whereby the stakeholders concerned can be brought together to discuss the opportunities and challenges and outline a future action roadmap. Studies concerned with obtaining industry views and insights into regulatory support needs will be essential for the co-design of effective policies on cultivated meat production and its service to tourism and hospitality consumers.

### *Digital technology providers*

Emerging immersive technologies such as virtual reality (VR) and augmented reality (AR) can aid in understanding consumers perceptions of cultivated meat and, subsequently, help in its promotion by developers/manufacturers and foodservice providers. AR has been increasingly employed for food quality assessment (Liberty et al., 2024) and food experience enhancement (Yuan,

2018). Likewise, VR has been applied to stimulate healthy and environmentally friendly food consumption (Smit et al., 2021) in experimental settings. Therefore, the AR- and VR- relevant research avenues should be explored, especially given that the number of foodservice outlets offering cultivated meat on a regular basis remains small.

Future research should investigate potential applications of AR and VR in motivating foodservice consumers to accept and/or purchase cultivated meat when eating out. AR and VR can also be harnessed to study how cultivated meat can be more effectively promoted and marketed by developers/manufacturers and foodservice providers. The role of VR and AR in stimulating sensory experiences of cultivated meat consumption represents another promising research venue, especially from a cross-cultural perspective.

## Conclusions

Cultivated meat is a growing trend that has potential to disrupt the market of food consumption outside the home. No research has, however, attempted to examine the applications and implications of cultivated meat for tourism and hospitality. This current study has introduced the phenomenon of cultivated meat to tourism and hospitality scholarship explaining the main drivers for its potential uptake by foodservice providers. Though research opportunities outlined by the current research are not exhaustive, our preliminary research agenda can aid in understanding the future of cultivated meat within the market of eating out from the perspective of multiple stakeholders, including developers/manufacturers of cultivated meat, foodservice providers, consumers, policymakers, and digital technology providers.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## ORCID

Hien Thu Bui http://orcid.org/0000-0002-3146-7098

## References

Aschemann-Witzel, J., Gantriis, R. F., Fraga, P., & Perez-Cueto, F. J. (2021). Plant-based food and protein trend from a business perspective: Markets, consumers, and the challenges and opportunities in the future. *Critical Reviews in Food Science and Nutrition*, *61*(18), 3119–3128. https://doi.org/10.1080/10408398.2020.1793730

Bacon, L., & Krpan, D. (2018). (Not) Eating for the environment: The impact of restaurant menu design on vegetarian food choice. *Appetite*, *125*, 190–200. https://doi.org/10.1016/j.appet.2018.02.006

Bauck, W. (2023, December 17). 'Food is finally on the table': Cop28 addressed agriculture in a real way. *The Guardian*.

Baum, C. M., Bröring, S., & Lagerkvist, C. J. (2021). Information, attitudes, and consumer evaluations of cultivated meat. *Food Quality and Preference*, *92*, 104226. https://doi.org/10.1016/j.foodqual.2021.104226

Bhat, Z. F., Morton, J. D., Mason, S. L., Bekhit, A. E. D. A., & Bhat, H. F. (2019). Technological, regulatory, and ethical aspects of in vitro meat: A future slaughter-free harvest. *Comprehensive Reviews in Food Science and Food Safety*, *18*(4), 1192–1208. https://doi.org/10.1111/1541-4337.12473

Bollani, L., Bonadonna, A., & Peira, G. (2019). The millennials' concept of sustainability in the food sector. *Sustainability*, *11*(10), 2984. https://doi.org/10.3390/su11102984

Cai, J., Wang, S., Li, Y., Dong, S., Liang, J., Liu, Y., & Li, S. (2024). Industrialization progress and challenges of cultivated meat. *Journal of Future Foods*, *4*(2), 119–127. https://doi.org/10.1016/j.jfutfo.2023.06.002

Campos, C., Laso, J., Cristóbal, J., Albertí, J., Bala, A., Fullana, M., Fullana-I-Palmer, P., Margallo, M., & Aldaco, R. (2022). Towards more sustainable tourism under a carbon footprint approach: The camino lebaniego case study. *Journal of Cleaner Production*, *369*, 133222. https://doi.org/10.1016/j.jclepro.2022.133222

Chriki, S., Ellies-Oury, M. P., Fournier, D., Liu, J., & Hocquette, J. F. (2020). Analysis of scientific and press articles related to cultured meat for a better understanding of its perception. *Frontiers in Psychology*, *11*(1845). https://doi.org/10.3389/fpsyg.2020.01845

Chriki, S., & Hocquette, J. F. (2020). The myth of cultured meat: A review. *Frontiers in Nutrition*, *7*, 7. https://doi.org/10.3389/fnut.2020.00007

Chriki, S., Payet, V., Pflanzer, S. B., Ellies-Oury, M. P., Liu, J., Hocquette, É., Rezende de-Souza, J. H., & Hocquette, J. F. (2021). Brazilian consumers' attitudes towards so-called "cell-based meat". *Foods*, *10*(11), 2588. https://doi.org/10.3390/foods10112588

Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario, F., Tubiello, F. N., & Leip, A. J. N. F. (2021). Food systems are responsible for a third of global anthropogenic GHG emissions. *Nature Food*, *2*(3), 198–209. https://doi.org/10.1038/s43016-021-00225-9

Crownhart, C. (2023, November 9). I tried lab-grown chicken at a Michelin-starred restaurant. *MIT Technology Review*.

Dolnicar, S. (2020). Designing for more environmentally friendly tourism. *Annals of Tourism Research*, *84*, 102933. https://doi.org/10.1016/j.annals.2020.102933

FAO. (2023). *New FAO report maps pathways towards lower livestock emissions*. Retrieved March 19, 2024, from https://www.fao.org/newsroom/detail/new-fao-report-maps-pathways-towards-lower-livestock-emissions/en

Filimonau, V. (2021). The prospects of waste management in the hospitality sector post COVID-19. *Resources, Conservation and Recycling*, *168*, 105272. https://doi.org/10.1016/j.resconrec.2020.105272

Filimonau, V., Lemmer, C., Marshall, D., & Bejjani, G. (2017). Restaurant menu re-design as a facilitator of more responsible consumer choice: An exploratory and preliminary study. *Journal of Hospitality & Tourism Management*, *33*, 73–81. https://doi.org/10.1016/j.jhtm.2017.09.005

Fu, W., Zhang, H., Whaley, J. E., & Kim, Y. K. (2023). Do consumers perceive cultivated meat as a sustainable substitute to conventional Meat? Assessing the facilitators and inhibitors of cultivated meat acceptance. *Sustainability*, *15*(15), 11722. https://doi.org/10.3390/su151511722

Garrison, G. L., Biermacher, J. T., & Brorsen, B. W. (2022). How much will large-scale production of cell-cultured meat cost? *Journal of Agriculture and Food Research*, *10*, 100358. https://doi.org/10.1016/j.jafr.2022.100358

Gaydhane, M. K., Mahanta, U., Sharma, C. S., Khandelwal, M., & Ramakrishna, S. (2018). Cultured meat: State of the art and future. *Biomanufacturing Reviews*, *3*(1), 1–10. https://doi.org/10.1007/s40898-018-0005-1

Geyik, Ö., Hadjikakou, M., & Bryan, B. A. (2023). Climate-friendly and nutrition-sensitive interventions can close the global dietary nutrient gap while reducing GHG emissions. *Nature Food*, *4*(1), 61–73. https://doi.org/10.1038/s43016-022-00648-y

Gössling, S., Balas, M., Mayer, M., & Sun, Y. Y. (2023). A review of tourism and climate change mitigation: The scales, scopes, stakeholders and strategies of carbon management. *Tourism Management*, *95*, 104681. https://doi.org/10.1016/j.tourman.2022.104681

Graça, J., Godinho, C. A., & Truninger, M. (2019). Reducing meat consumption and following plant-based diets: Current evidence and future directions to inform integrated transitions. *Trends in Food Science & Technology*, *91*, 380–390. https://doi.org/10.1016/j.tifs.2019.07.046

Greene, D., Zhu, O. Y., & Dolnicar, S. (2024). Vegan burger, no thanks! Juicy American burger, yes please! The effect of restaurant meal names on affective appeal. *Food Quality and Preference*, *113*, 105042. https://doi.org/10.1016/j.foodqual.2023.105042

Guan, X., Lei, Q., Yan, Q., Li, X., Zhou, J., Du, G., & Chen, J. (2021). Trends and ideas in technology, regulation and public acceptance of cultured meat. *Future Foods*, *3*, 100032. https://doi.org/10.1016/j.fufo.2021.100032

He, J., Evans, N. M., Liu, H., & Shao, S. (2020). A review of research on plant-based meat alternatives: Driving forces, history, manufacturing, and consumer attitudes. *Comprehensive Reviews in Food Science and Food Safety*, *19*(5), 2639–2656. https://doi.org/10.1111/1541-4337.12610

Kadim, I. T., Mahgoub, O., Baqir, S., Faye, B., & Purchas, R. (2015). Cultured meat from muscle stem cells: A review of challenges and prospects. *Journal of Integrative Agriculture*, *14*(2), 222–233. https://doi.org/10.1016/S2095-3119(14)60881-9

Kovacs, B., Miller, L., Heller, M. C., & Rose, D. (2021). The carbon footprint of dietary guidelines around the world: A seven country modeling study. *Nutrition journal*, *20*(1), 1–10. https://doi.org/10.1186/s12937-021-00669-6

Lenzen, M., Sun, Y. Y., Faturay, F., Ting, Y. P., Geschke, A., & Malik, A. (2018). The carbon footprint of global tourism. *Nature Climate Change*, *8*(6), 522–528. https://doi.org/10.1038/s41558-018-0141-x

Leung, A. K. Y., Chong, M., Fernandez, T. M., & Ng, S. T. (2023). Higher well-being individuals are more receptive to cultivated meat: An investigation of their reasoning for consuming cultivated meat. *Appetite*, *184*, 106496. https://doi.org/10.1016/j.appet.2023.106496

Liberty, J. T., Sun, S., Kucha, C., Adedeji, A. A., Agidi, G., & Ngadi, M. (2024). Augmented reality for food quality assessment: Bridging the physical and digital worlds. *Journal of Food Engineering*, *367*, 111893. https://doi.org/10.1016/j.jfoodeng.2023.111893

Marsh, N. (2023, June 8). Why Singapore is the only place in the world selling lab-grown meat. *BBC News*.

Milfont, T. L., Satherley, N., Osborne, D., Wilson, M. S., & Sibley, C. G. (2021). To meat, or not to meat: A longitudinal investigation of transitioning to and from plant-based diets. *Appetite*, *166*, 105584. https://doi.org/10.1016/j.appet.2021.105584

Miralles, C. C., Barioni, D., Mancini, M. S., Jordà, J. C., Roura, M. B., Salas, S. P., Argelaguet, L. L., & Galli, A. (2023). The footprint of tourism: A review of water, carbon, and ecological footprint applications to the tourism sector. *Journal of Cleaner Production*, *422*, 138568. https://doi.org/10.1016/j.jclepro.2023.138568

Ong, K. J., Johnston, J., Datar, I., Sewalt, V., Holmes, D., & Shatkin, J. A. (2021). Food safety considerations and research priorities for the cultured meat and seafood industry. *Comprehensive Reviews in Food Science and Food Safety*, *20*(6), 5421–5448. https://doi.org/10.1111/1541-4337.12853

Pingali, P., Boiteau, J., Choudhry, A., & Hall, A. (2023). Making meat and milk from plants: A review of plant-based food for human and planetary health. *World Development*, *170*, 106316. https://doi.org/10.1016/j.worlddev.2023.106316

Saner, E. (2019). *Should meat be banned to save the planet? The Guardian*. 23 September 2019.

Siddiqui, S. A., Khan, S., Farooqi, M. Q. U., Singh, P., Fernando, I., & Nagdalian, A. (2022). Consumer behavior towards cultured meat: A review since 2014. *Appetite*, *179*, 106314. https://doi.org/10.1016/j.appet.2022.106314

Silva, C. P. D., & Semprebon, E. (2021). How about cultivated meat? the effect of sustainability appeal, environmental awareness and consumption context on consumers' intention to purchase. *Journal of Food Products Marketing*, *27*(3), 142–156. https://doi.org/10.1080/10454446.2021.1921090

Sinke, P., Swartz, E., Sanctorum, H., van der Giesen, C., & Odegard, I. (2023). Ex-ante life cycle assessment of commercial-scale cultivated meat production in 2030. *The International Journal of Life Cycle Assessment*, *28*(3), 234–254. https://doi.org/10.1007/s11367-022-02128-8

Slade, P. (2018). If you build it, will they eat it? Consumer preferences for plant-based and cultured meat burgers. *Appetite*, *125*, 428–437. https://doi.org/10.1016/j.appet.2018.02.030

Smit, E. S., Meijers, M. H. C., & van der Laan, L. N. (2021). Using virtual reality to stimulate healthy and environmentally friendly food consumption among children: An interview study. *International Journal of Environmental Research and Public Health*, *18*(3), 1088. https://doi.org/10.3390/ijerph18031088

Statista. (2024, March 19). *Cultivated meat – statistics & facts*. https://www.statista.com/topics/8043/cultured-meat/#topicOverview

Whittlesea, E. R., & Owen, A. (2012). Towards a low carbon future–the development and application of REAP tourism, a destination footprint and scenario tool. *Journal of Sustainable Tourism*, *20*(6), 845–865. https://doi.org/10.1080/09669582.2012.680699

Yuan, Y. (2018). Augmenting food experience while traveling abroad by using mobile augmented reality application. In P. L. Rau (Ed.), *Cross-cultural design. methods, tools, and users* (Vol. 10911, pp. 259–268). Springer.