Media Framing of Cultivated Meat

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

Fireflies blinking, the scent of chlorine in the air, my sun-kissed skin radiates heat from spending the entire day in the pool. My perfect childhood summer day at age 10 culminates with biting into a delicious burger lovingly grilled by my dad. Yet soon thereafter at age 11, I made the decision to stop consuming red meat due to its environmental consequences.

Current meat production and consumption systems have tremendous environmental, ethical, and health impacts. Approximately 14.5% of total greenhouse gas emissions are attributed to livestock production, which is also associated with large land and water usage, and subsequent biodiversity reduction. Livestock farming additionally contributes to the prevalence of foodborne diseases, the transmission of pathogenic microorganisms, and the development of antibiotic resistance (Chodkowska et al., 2022; Kirsch et al., 2023).

Cultivated meat is an alternative protein source that was developed to address these issues. Cultivated meat employs tissue-engineering techniques to generate animal fat and tissue cells that are used in food production (Chodkowska et al., 2022). The process begins with the collection of a small sample of animal cells, typically from a biopsy. The cells are then provided with oxygen and nutrients through a bioreactor, which simulates the conditions found in the body. The cells differentiate into various tissues found in meat, such as skeletal muscle, fat, and connective tissues, and are subsequently harvested, processed, and packaged into final products (*The Science of Cultivated Meat*, 2021). It offers the benefits of promoting environmental sustainability, animal welfare, and overall public health (Chodkowska et al., 2022; Kirsch et al., 2023).

Indeed, the possibility of me eating meat again is now a tangible reality.

And yet change is disruptive and never easy; the adoption of new technologies—such as cultivated meat—typically face a battle against traditional techniques and products. Cultivated meat represents a challenge to the status quo of long standing food production practices. The integration of cultivated meat into the market and consumer dietary choices is dependent on public acceptance. The media is a powerful influencer of public opinion, and media framing can shape how consumers receive and respond to cultivated meat. To study these relationships, I will conduct a literature review analyzing the media campaigns of biofuels, electric vehicles, and plant-based food in order to investigate how media framing contributed to public support or opposition of these novel sustainable technologies. In my analysis, I will examine the websites of Upside Foods and GOOD Meat, two prominent companies in the cultivated meat industry. I will assess the media frames being employed to promote cultivated meat and gain popularity in the United States through the lens of sociotechnical imaginaries. I argue that rather than advocating for change on a systemic level, media strategies focus on normalization and the societal benefits of cultivated meat to create a future in which the individual consumer drives the transformation of agricultural practices.

Literature Review

The FDA approved in vitro methods of meat production in 1995, followed by the first filing of a patent for industrial-scale in vitro meat production in 1999 (Kirsch et al., 2023). As of 2023, there are 159 dedicated cultivated meat companies spanning 32 countries (Cultivated Meat Industry Landscape 2023, 2023). The two major players in the United States market are Upside Foods and GOOD Meat. GOOD Meat was the first company to begin selling cultivated meat at hawker stands in Singapore and partnered with José Andrés to serve their cultivated meat in his

restaurant China Chilcano. Upside Foods is the first company to gain FDA approval to sell cultivated meat in the United States and partnered with Dominique Crenn to introduce their product at Bar Crenn (Bomkamp et al., 2022). While cultivated meat is still in its early stages of development and production, securing public approval is important for its future success.

Media holds significant influence over public opinion, leveraging its power through the intentional framing of issues to shape societal understanding, acceptance, and response. Prior research has established the extent to which media can sway public opinion, which can subsequently impact policy decisions and industry practices (Burnstein, 2003; Chong & Druckman, 2007). Millions of Americans engage with news media every day through digital devices, television, radio, and print publications ("News Platform Fact Sheet," 2023). Access to media is further amplified in the digital age through the widespread availability of phones and internet connectivity. The media has become such a prevalent entity throughout society with an expansive reach and strong platform. It is therefore important to investigate the mechanisms through which media exerts control over public perception in order to determine strategies to generate support and adoption. Framing is the "process by which a communication source, such as a news organization, defines and constructs a political issue or public controversy" (Nelson et al., 1997). Framing involves two key elements: selection and salience (Entman, 1993). By carefully curating and presenting articles and stories, the media actively pursues its agenda in shaping the prominence and persuasiveness of information (McCombs & Valenzuela, 2020). Drawing upon the insights learned from media campaigns of other sustainable technologies such as biofuels, electric vehicles, and plant-based food, a purposeful media presence for cultivated meat can be generated to enhance its visibility and popularity. These technologies have all faced

similar challenges to adoption. As a result, cultivated meat can learn from the successes and failures of these innovations that also offer alternatives to conventional practices.

Public opinion of biofuels exhibits notable variation in the United States, driven in large part by the difference in media consumption along political party lines. Media outlets are known to have political biases, and individuals may deliberately choose sources that resonate with their partisan leanings. This contrast in media consumption results in distinct reactions among Democrats and Republicans when exposed to media related to biofuels. For Democrats, increased interactions with political media content tends to enhance their positive views of the technology, but for Republicans, greater attention has a negative effect (Cacciatore et al., 2012). Another study discovered that Democrats are "nearly three times more likely to support various [biofuels] policies, and two times more likely to support biofuels in general or corn ethanol, than Independents and Republicans" (Delshad & Raymond, 2013). When forming opinions regarding science, individuals often turn to their political beliefs as guiding principles (Nisbet & Goidel, 2007). Opinion of biofuels may be a product of political ideology due to the polarized views on climate change and energy resources in the United States. Biofuels have become embedded within the larger societal debate on environmentalism and sustainable development (Dragojlovic & Einsiedel, 2014). Media shapes these perceptions by framing biofuels in ways that align with political agendas. The way in which cultivated meat is framed in the media can be approached differently to avoid this dynamic of the association with political ideologies, aiming to navigate its public reception more effectively.

Public opinion of electric vehicles is improved through media efforts that foster a sense of normalcy and familiarity with the product. In analyzing electric vehicle coverage by the New York Times from 2017 through 2022, Clawson et al. found that 49% of the articles utilized a

Business Frame (Clawson et al., 2022). The Business Frame centers around the economic issues associated with electric vehicles, including market dynamics, competition, and manufacturing. Investing in an electric car is portrayed as "business as usual" and a smart business decision. The switch to electric vehicles represents a major transition in transportation, as vehicles with internal combustion engines have dominated the industry since the 19th century. The Business Frame helps to normalize electric cars, facilitating the integration of electric vehicles into everyday conversations and minimizing resistance to such a dramatic shift. This likely increases positive attitudes towards electric vehicle adoption. Cultivated meat similarly is an attempt to promote wide-scale change in food production and consumption patterns. By focusing on the practical benefits and aligning cultivated meat with existing food industry practices, media framing can help to ease its transition into mainstream diets and culinary cultures.

Public opinion of plant-based foods is impacted by positive rhetoric and a social appeal that emphasizes benefits for animals and the environment. Studies have found that support for measures to increase plant-based eating is higher when they are presented in a gain-frame over a loss-frame (Carvalho et al., 2022). Gain-frames highlight the positive outcomes that result from an action or decision. Loss-frames depict the costs, risks, or negative consequences associated with not engaging in the recommended action. Public perception of plant-based food is enhanced when people are encouraged to add it into their diets, rather than decreasing the consumption of meat. This suggests that loss framing can be seen as intrusive and restrict freedom, choice, and autonomy. Another study additionally determined that presenting the social benefits of plant-based food is more productive than taste and health advantages. Researchers hypothesize that this is because consumers anticipate pleasure when they participate in actions that will contribute to environmental conservation and animal welfare (Ye & Mattila, 2021). Cultivated meat and

plant-based foods have both been created to provide an alternative to meat. In order to gain popularity and support, cultivated meat can be presented as a valuable addition to a diet that will positively impact society.

Across these emerging sustainable technologies, research shows that education is crucial to ensure public awareness and understanding of these innovations. The general American public is mostly uninformed and unaware of biofuels, contributing to reduced public support (Cacciatore et al., 2012). Individuals may be skeptical and hesitant towards embracing electric vehicles due to their limited experience and knowledge with this technology (Schuitema et al., 2013). In a study of the United States, India, and China, researchers found that "lower food neophobia and higher familiarity predicted acceptance of both plant-based and clean meat in every country" (Bryant et al., 2019). People tend to be apprehensive of what they do not understand. This is especially important to consider with dietary choices such as cultivated meat. The media can be used as a tool to educate the public on cultivated meat and its societal benefits, decreasing food neophobia and promoting its implementation.

The attempt to gain public acceptance and adoption of cultivated meat lends itself well to the framework of sociotechnical imaginaries. Sociotechnical imaginaries "encode not only visions of what is attainable through science and technology but also of how life ought, or ought not, to be lived" (Jasanoff & Kim, 2015, p.4). Cultivated meat was created to promote environmental sustainability, animal welfare, public health, and reduce the consumption of traditionally grown meat. Cultivated meat can help to define a new future of food production and consumption. Thompson details four sociotechnical imaginaries for future food systems: "technological modernization (a continuation of food system innovations that began in the 20th century); sustainable intensification (a model emphasizing more efficient use of ecosystem

services; ‘extensification’ (a return to less intensive land use) and urban agriculture (a model that is driven by traditions of urban activism, planning and information technology)” (Thompson, 2018). This framework can be utilized to investigate how media framing integrates cultivated meat into the envisioned future of food systems.

Research Question and Methods

The research question central to this paper is: how are media strategies being employed to enhance the popularity and acceptance of cultivated meat in the United States? To investigate this topic, I will gather primary sources, consisting of company websites and a governmental bill. My analysis will involve examining various media strategies employed by companies promoting cultivated meat, including the presentation of information on company websites, industry reports detailing trends and consumer perceptions, as well as the response from governmental entities and opposing advertising campaigns. My objective is to determine what narratives, messaging tactics, and persuasive techniques are being utilized to facilitate the adoption of cultivated meat.

Analysis

By placing a strong emphasis on taste and deliciousness, the Upside Foods website aims to present their cultivated chicken products as familiar and appetizing, reducing potential consumer fears surrounding the unconventional production process. The website is decorated with bright, vibrant colors to evoke feelings of excitement. This creates a visually engaging and stimulating environment, and can convey a sense of positivity and optimism. This can encourage the consumer to engage with the media content, and promotes cultivated meat as an inviting and

appealing product. The website features photos of the cultivated chicken in a wide variety of well-known dishes, ranging from salads and pizzas to sandwiches and potstickers. This demonstrates that it can be utilized in the same ways as conventional chicken. It highlights the versatility of cultivated chicken, a product that can be used in any context at any time. This mimicking helps to establish a connection to the familiar and integrate cultivated meat into the mainstream culinary landscape. In addition, displaying meals from multiple cultures encourages inclusivity and caters to diverse consumer preferences. The first benefit promoted by the Upside Foods website is that their cultivated chicken is "delicious," "flavorful," "mouthwatering," and "tempting." This makes cultivated meat appear as an enticing and irresistible food choice that will bring pleasure and satisfaction. This positions cultivated meat as a product worth trying for its amazing taste, not just as a replacement for conventional meat. This can encourage consumers to purchase their cultivated chicken products as they are an indulgent and enjoyable experience. Furthermore, the website emphasizes that cultivated meat is "science (but not rocket science)" next to an image of a chicken. This reassures consumers that while it is a new innovation, it is not as complicated and scary as it may seem. This seeks to make cultivated meat more approachable and less intimidating to the average consumer. The image of the chicken further reinforces that cultivated meat is a natural extension of traditional meat sources.

The Upside Foods website additionally attempts to enhance the acceptance of cultivated meat by persuading consumers that their individual actions can contribute to a desirable future for the planet. The social advantages that the website underscores are human health, animal welfare, water protection, reduced land usage, and improvements to climate change and air quality. This aligns with the technological modernization, sustainable intensification, and 'extensification' food futures proposed by Thompson (Thompson, 2018). Technology is

advancing by building upon existing food systems to create a future with improved resource and land utilization and environmental sustainability. The website emphasizes that cultivated meat generates progress that makes this future attainable. The website states that "cultivated meat lets us eat more of what we love—and bite by bite, make progress toward a better future." This message highlights the significance of individual consumer choices in collectively advancing towards a better world. This suggests that everyone has a responsibility to support the adoption of cultivated meat in order to create a healthy planet for humans, animals, and the environment, and that individual choices have the power to drive a thriving and flourishing future for the planet. This frame places the consumer at the center of addressing socio-economic challenges, rather than pushing for systemic change. Targeting individuals is both easier than navigating policy and collective reform, and generates profit. This reflects a culture of consumerism where companies influence individual spending and choices. Some argue that while this can be successful in spreading awareness and promoting the adoption of cultivated meat, it does not fully address the underlying issues that contribute to socio-economic and environmental problems. Effective widespread change requires individual and collective action. The website also uses "what if" phrases with various social appeals, for example "What if we could grow beef with only half the water and protect our oceans from the pollution of manure and fertilizer?" This prompts consumers to consider the potential of what the planet could achieve through the widespread implementation of cultivated meat. The future that Upside Foods envisions is not only plausible but possible. This motivates consumers to be proactive and take action through consuming cultivated meat. The use of "we" fosters a sense of unity and teamwork where every person can contribute positively to the planet. However, critics argue against a universal "we" as this perspective attributes blame to all humans equally, despite the fact that various groups

contribute differently to global problems. For example, a small number of corporations are responsible for around 75% of emissions, which results in a lack of accountability for their actions (Liboiron, 2020). These media strategies can benefit Upside Foods by persuading the consumer to buy cultivated meat to play their part in combating global challenges.

The GOOD Meat website takes a similar approach, leveraging social appeals to foster a vision of a healthier and more sustainable future, positioning cultivated meat as a solution to global challenges. The website asserts that "we will always eat meat. To share the planet together, we have to do it differently." This acknowledges that meat is a staple in many diets and cultures. The act of meat consumption can remain exactly the same, the method of production can simply be adapted to benefit humans, animals, and the planet. Cultivated meat is advertised as the solution that conserves the environment and propels the world forward into a united and harmonious future. With a growing population and resources becoming increasingly scarce, the consumption of cultivated meat is depicted as a proactive remedy to these challenges. This also appeals to the individual by creating a sense of shared experience and responsibility among consumers. The website focuses on prioritizing health as a reason to consume their cultivated meat. The website argues that current meat that is being consumed is unnatural, but people are unaware as "across the globe, we're all just trying our best to feed our families," but that "GOOD Meat offers a new way forward" as it removes slaughter and significantly reduces the risk of food-borne illness. This shows compassion towards the consumer and empathizes with the responsibility of care. This suggests that cultivated meat can be the path towards a healthier life for individuals and those they love. The website additionally frames cultivated meat as a sustainable choice, as "it emits 92% fewer carbon emissions and uses 95% less land. And the best part? We still have meat." This raises awareness about the environmental impact of

traditional meat production but also fosters a sense of empowerment among consumers, who can contribute to environmental preservation by choosing cultivated meat. This reassures consumers that they do not need to sacrifice their culinary preferences to make environmentally conscious choices. While it encourages people to make choices that benefit the planet, it places the burden on the consumer by implying that the responsibility for change rests with individuals. This approach allows companies to promote their offerings as part of a solution while deflecting attention away from any internal issues or areas for improvement within their own operations.

Upside Foods and GOOD Meat further promote their products by serving them in restaurants curated by celebrity chefs known for advocating sustainable and humanitarian practices, thereby reaching more consumers who associate their brands with positive values and culinary expertise. Upside Foods sold their cultivated chicken at Bar Crenn, owned by chef Dominique Crenn. The restaurant is committed to the environment and is a certified Plastic Free establishment. Bar Crenn stopped selling meat in 2018 due to the environmental impact of meat production. The restaurant introduced the Upside Foods cultivated chicken in 2023 (Latham, 2023). GOOD Meat sold their cultivated chicken at China Chilcano, owned by chef José Andrés. He is known for his philanthropic and humanitarian actions. He is the founder of Word Central Kitchen, which is known for "providing meals in response to humanitarian, climate, and community crises." Selling cultivated meat products in these restaurants is yet another strategy targeting the consumer as the driver of change and capitalizes on the trust and influence that these chefs have. They are respected for their food and their ethical principles, lending credibility to cultivated meat. It gives consumers the opportunity to experience cultivated meat in a familiar dining setting, showcasing its quality, taste, and versatility. This targeted consumer-centric approach recognizes the importance of individual preferences and behaviors in driving market

demand and acceptance of innovative food products. While systemic changes are necessary for long-term sustainability, appealing to consumers directly through influential figures and upscale dining experiences can accelerate the adoption of new food technologies like cultivated meat, and portrays it as a product aligned with values that benefit the world.

Although media strategies are attempting to increase acceptance of cultivated meat, backlash may hinder adoption. The Alabama Senate recently passed a bill 32-0 to "prohibit the manufacture, sale, or distribution of meat made from cultured animal cells" (Food Products, Manufacture and Distribution of Meat from Cultured Animal Cells Prohibited, 2024, p.1). Failing to follow this bill results in a class C misdemeanor. Food sales establishments that engage in the sale or distribution of cultivated meat products may lose their food safety permits. The bill was proposed by Senator Jack Williams, who raised concerns about the effects on health and competition with the farming industry (Myskow & Hedgepeth, 2024, Wise, 2024). Senators play an important role in representing the voice of their constituents. The passage of this legislation highlights the potential for public opinion to be swayed by limited understanding or misinformation surrounding cultivated meat. The unanimous vote may cause public opinion to be persuaded by legislative decisions rather than informed discourse. Individuals who are unfamiliar with cultivated meat may be more susceptible to negative perceptions perpetuated by laws. This law reflects a resistance to the adoption of cultivated meat in certain regions, illustrating that there will be obstacles in gaining widespread acceptance despite media framing measures. Additionally, the Center for the Environment & Welfare (CEW) is running a national advertisement on Fox News to "address consumer concerns" about cultivated meat (Shike, 2023). It features a girl presenting cultivated meat as her science fair project. Explaining her invention to her teacher, she says the cells "grow like a tumor, then you bake them with

chemicals" (Center for Environment and Welfare, 2023). This portrays cultivated meat as unappetizing, unsafe, and unnatural. This may contribute to doubts and skepticism about the desirability of cultivated meat. This fear-based messaging may discourage consumers from embracing cultivated meat. For Senator Willaims and the CEW, the desired future is one where cultivated meat is rejected from the culinary landscape. However, these views fail to recognize that cultivated meat is FDA and USDA approved, deemed safe for consumption after an extensive review of all available safety literature. In addition, these opponents claim to desire "un-altered products," yet antibiotic use is extremely prevalent in the agricultural industry. Around 70% of antibiotics sold in the United States are for livestock production, and this percentage continues to increase (Wallinga, 2023). Lastly, there may be an economic bias in the opposition to cultivated meat in Alabama as meat production is one of the largest economic sectors in the state.

Conclusion

The bias inherent in media framing can profoundly impact how people perceive and respond to various issues, especially emerging technologies such as cultivated meat. This research highlights the importance of media literacy among consumers. By being mindful of media frames and critically evaluating information presented, individuals can make more informed decisions about the products they consume. Media strategies employed in promoting cultivated meat often emphasize normalization and societal appeals, seeking to make the product more palatable and familiar to consumers, advocating for a future in which cultivated meat is just as desirable as traditional meat. These findings are important so that future researchers can study public opinion and reaction to these media frames in order to maximize acceptance.

There is still significant resistance and opposition to the uptake of cultivated meat. Basic education may be a more effective approach for increasing the popularity of cultivated meat. The 2022 State of the Industry Report by the Good Food Institute found that 38 to 64 percent of consumers are not at all familiar with cultivated meat (Bomkamp et al., 2022). Public opinion may be low for cultivated meat because a large percentage have no experience with it at all. This lack of awareness can lead to skepticism and apprehension among consumers. The report also argues that explaining aspects of cultivated meat technology to consumers, such as the cultivation process or the social, public, and environmental benefits, promotes support. This provides consumers with essential knowledge so they are better equipped to understand what they are ingesting and appreciate the potential benefits of cultivated meat.

These strategies all target the consumer. However, sustainable innovations such as cultivated meat may also need help from systemic action to affect widespread change. Implementing policies and encouraging collaboration between various stakeholders is necessary to help solve the environmental, health, and ethical challenges that these technologies address. This will also help to distribute the responsibility of creating a better world and future more equitably throughout society, involving individuals, corporations, and institutions.

Sources

Bomkamp, C., Carter, M., Cohen, M., Gertner, D., Ignaszewski, E., Murray, S., O'Donnell, M., Pierce, B., Swartz, E., & Voss, S. (2022). *2022 State of the Industry Report Cultivated Meat and Seafood.* https://gfi.org/resource/cultivated-meat-eggs-and-dairy-state-of-the-industry-report/

Bryant, C., Szejda, K., Parekh, N., Deshpande, V., & Tse, B. (2019). A Survey of Consumer Perceptions of Plant-Based and Clean Meat in the USA, India, and China. *Frontiers in Sustainable Food Systems*, *3*. https://www.frontiersin.org/articles/10.3389/fsufs.2019.00011

Burstein, P. (2003). The Impact of Public Opinion on Public Policy: A Review and an Agenda. *Political Research Quarterly*, *56*(1), 29–40. https://doi.org/10.1177/106591290305600103

Cacciatore, M. A., Scheufele, D. A., & Shaw, B. R. (2012). Labeling renewable energies: How the language surrounding biofuels can influence its public acceptance. *Energy Policy*, *51*, 673–682. https://doi.org/10.1016/j.enpol.2012.09.005

Carvalho, A. S. M., Godinho, C. I. A., & Graça, J. (2022). Gain framing increases support for measures promoting plant-based eating in university settings. *Food Quality and Preference*, *97*, 104500. https://doi.org/10.1016/j.foodqual.2021.104500

Center for Environment and Welfare. (2023, December 18). *Lab Meat: Experiment on Your Plate.* [Video]. YouTube. https://www.youtube.com/watch?v=QJTcy2192rg

Chodkowska, K. A., Wódz, K., & Wojciechowski, J. (2022). Sustainable Future Protein Foods: The Challenges and the Future of Cultivated Meat. *Foods*, *11*(24), Article 24. https://doi.org/10.3390/foods11244008

Chong, D., & Druckman, J. N. (2007). Framing Theory. *Annual Review of Political Science*, *10*(1), 103–126. https://doi.org/10.1146/annurev.polisci.10.072805.103054

Clawson, R. A., Lee, A., & Tyler, W. (2022). *MEDIA FRAMING OF ELECTRIC VEHICLES IN U.S. NEWSPAPERS*.

Cultivated meat industry landscape 2023. (2023). Good Food Institute. https://gfi.org/wp-content/uploads/2023/08/Cultivated-meat-industry-landscape-2023.pdf

Delshad, A., & Raymond, L. (2013). Media Framing and Public Attitudes Toward Biofuels. *Review of Policy Research*, *30*(2), 190–210. https://doi.org/10.1111/ropr.12009

Dragojlovic, N., & Einsiedel, E. (2014). The polarization of public opinion on biofuels in North America: Key drivers and future trends. *Biofuels*, *5*(3), 233–247. https://doi.org/10.1080/17597269.2014.913901

Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of communication*, *43*(4), 51-58.

Food Products, Manufacture and Distribution of Meat from Cultured Animal Cells Prohibited, SB23, Senate 2024 Regular Session (2024). https://www.legislature.state.al.us/pdf/SearchableInstruments/2024RS/SB23-eng.pdf

Jasanoff, S., & Kim, S. (2015). *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. University of Chicago Press.

Kirsch, M., Morales-Dalmau, J., & Lavrentieva, A. (2023). Cultivated meat manufacturing: Technology, trends, and challenges. *Engineering in Life Sciences*, *23*(12), e2300227. https://doi.org/10.1002/elsc.202300227

Latham, T. (2023, July 6). San Fransisco's Bar Crenn Just Became the First U.S. Restaurant to Serve Lab-Grown Chicken. *Robb Report*. https://robbreport.com/food-drink/dining/bar-crenn-lab-grown-chicken-1234865283/

Liboiron, M. (2020, October 12). *There's no such thing as "We."* Discard Studies. https://discardstudies.com/2020/10/12/theres-no-such-thing-as-we/

McCombs, M., & Valenzuela, S. (2020). *Setting the Agenda: Mass Media and Public Opinion*. John Wiley & Sons.

Myskow, W., & Hedgepeth, L. (2024, March 17). Inside the movement to ban lab-grown meat. *Mother Jones*. https://www.motherjones.com/politics/2024/03/inside-the-movement-to-ban-lab-grown-meat/

Nelson, T. E., Clawson, R. A., & Oxley, Z. M. (1997). Media Framing of a Civil Liberties Conflict and Its Effect on Tolerance. *The American Political Science Review*, *91*(3), 567–583. https://doi.org/10.2307/2952075

"News Platform Fact Sheet." *Pew Research Center*, Washington, D.C. (2023) https://www.pewresearch.org/journalism/fact-sheet/news-platform-fact-sheet/.

Nisbet, M. C., & Goidel, R. K. (2007). Understanding citizen perceptions of science controversy: Bridging the ethnographic—survey research divide. *Public Understanding of Science*, *16*(4), 421–440. https://doi.org/10.1177/0963662506065558

Schuitema, G., Anable, J., Skippon, S., & Kinnear, N. (2013). The role of instrumental, hedonic and symbolic attributes in the intention to adopt electric vehicles. *Transportation Research Part A: Policy and Practice*, *48*, 39–49. https://doi.org/10.1016/j.tra.2012.10.004

Shike, J. (2023, December 12). New National Television Ad "Exposes the Realities" of Lab-Grown Meat. *Pork Business.* https://www.porkbusiness.com/news/industry/new-national-television-ad-exposes-realities-lab-grown-meat

The science of cultivated meat. Good Food Institute (2021, January 27). https://gfi.org/science/the-science-of-cultivated-meat/

Thompson, P. B. (2018). 28. Four sociotechnical imaginaries for future food systems. *Professionals in Food Chains*, 187–191. https://doi.org/10.3920/978-90-8686-869-8_28

Wallinga, D. (2023, September 11). *Antibiotic Use Remains Far Too Intensive in U.S. Livestock*. https://www.nrdc.org/bio/david-wallinga-md/antibiotic-use-remains-far-too-intensive-us-livestock

Wise, E. (2024, February 19). State senate passes bill banning lab-grown meat. *NBC 15 News*. https://mynbc15.com/news/local/state-senate-passes-bill-banning-lab-grown-meat-cattle-poultry-alabama-legislature-montgomery-jefferson-county

Ye, T., & Mattila, A. S. (2021). The effect of ad appeals and message framing on consumer responses to plant-based menu items. *International Journal of Hospitality Management*, *95*, 102917. https://doi.org/10.1016/j.ijhm.2021.102917