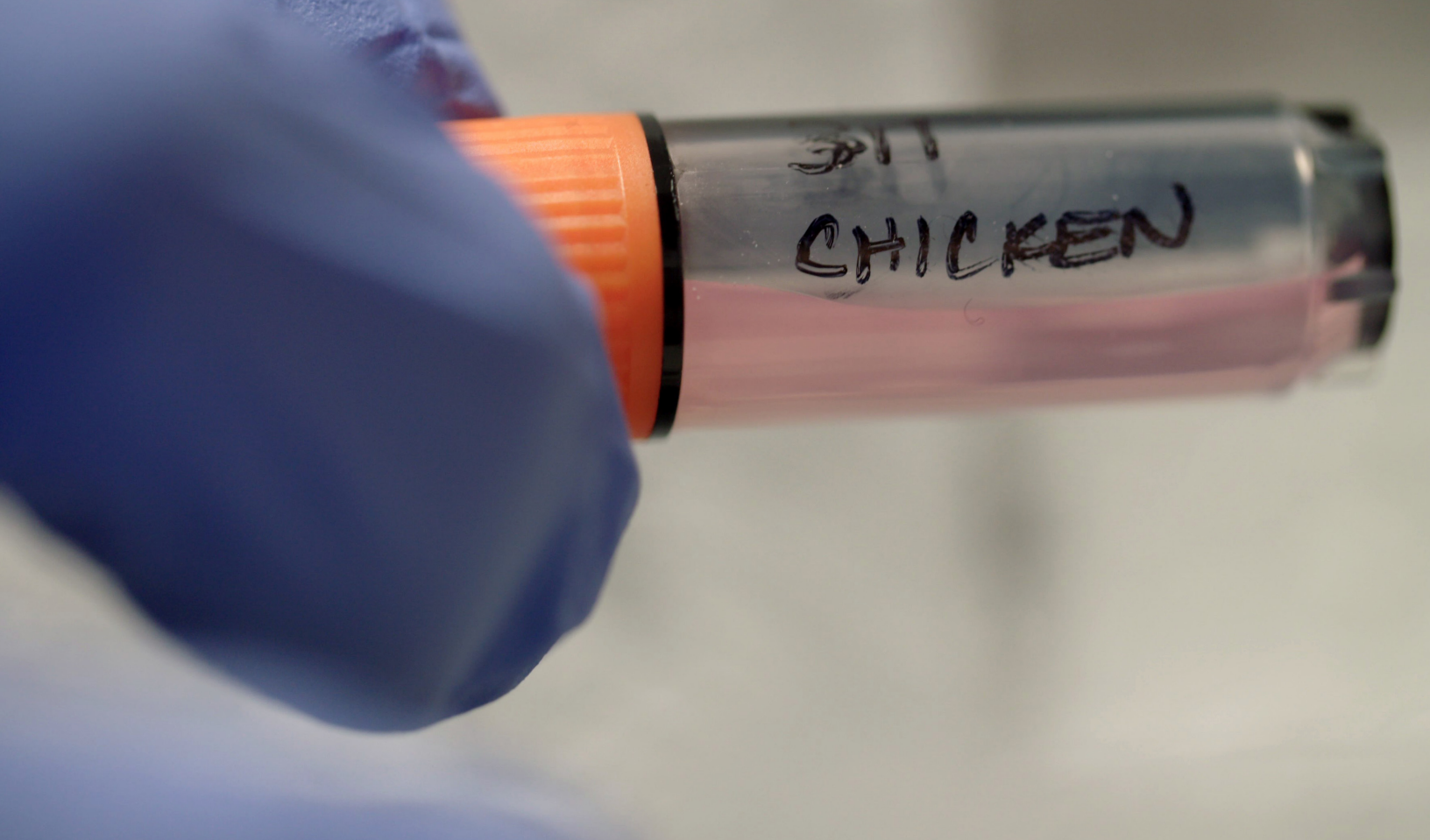


# MEAT THE FUTURE

DISCUSSION GUIDE







# THE NEXT AGRICULTURAL REVOLUTION IS UNDERWAY...

It is a new food science, referred to as “cellular agriculture”, that harvests’ cells from animal tissue to enable the growth of meat, fish, seafood, dairy and eggs as a solution to raising and slaughtering animals.



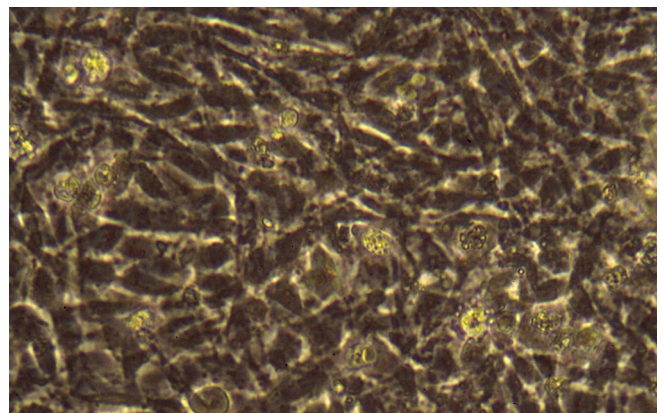
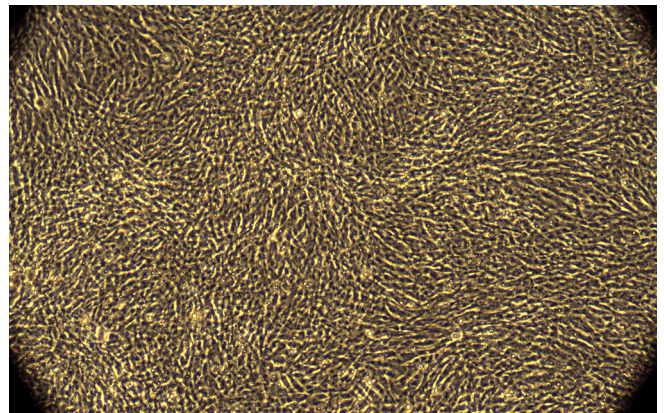
**“ The taste, texture, flavour of meat is a combination of many factors. It’s not just muscle cells, it’s fats, it’s connective tissues...These small tissue samples will produce extremely large amounts of meat. ”**

*– Upside Foods (formerly Memphis Meats)*





**CULTIVATED MEAT** is real animal meat (eg. beef, pork, poultry, fish and seafood). The process begins by acquiring stem cells from an animal. These cells are then grown in bioreactors (also known as cultivators) at high densities and volumes. Similar to what happens inside an animal's body, the cells are fed a nutrient rich medium, that triggers cells to become skeletal muscle, fat, and connective tissues that make up meat. Within 2-8 weeks, these are harvested, prepared, and packaged into final products.<sup>1</sup>



<sup>1</sup> Schwartz, Elliot. Claire Bomkamp. "Introduction to cultivated meat." Good Food Institute, October 13, 2021, <https://gfi.org/science/the-science-of-cultivated-meat/>.



# POST SCREENING DISCUSSION AND QUESTIONS

## ECOSYSTEM:

Currently, nearly half of the world's land surface area is used for animal agriculture. Imagine a future where cultivated meat is part of the food ecosystem, using far less land and resources.

- *What does this future look like?*
- *What are the implications for nature, animals, people?*

## CLIMATE:

Imagine a future where meat production is a climate solution rather than a key contributor to greenhouse gas emissions (GHG).

- *Explain how producing cultivated meat at scale could address the climate emergency.*

## ANIMAL AGRICULTURE, OUR CURRENT FOOD SYSTEMS, AND THE CLIMATE CRISIS

- Agriculture and land-use contribute 25-42 percent of heat-trapping greenhouse gas emissions<sup>2</sup>
- 80 percent of global deforestation<sup>3</sup>
- 50 percent of biodiversity loss in water<sup>4</sup>
- 70 percent of biodiversity loss on land<sup>5</sup>

<sup>2</sup> *Future of food : shaping a climate-smart global food system (English)*. Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/645981468189237140/Future-of-food-shaping-a-climate-smart-global-food-system>. Crippa, M., Solazzo, E., Guizzardi, D. et al. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat Food* 2, 198–209 (2021). <https://doi.org/10.1038/s43016-021-00225-9>. <https://www.grain.org/article/entries/5825-big-meat-and-dairy-s-supersized-climate-footprint>

<sup>3</sup> "Animal Production." *Food and Agriculture Organization of the United Nations*, <http://www.fao.org/animal-production/en/>

<sup>4</sup> "Managing water sustainably is key to the future of food an agriculture." *Organisation for Economic Cooperation and Development*, <http://www.oecd.org/agriculture/topics/water-and-agriculture/>

<sup>5</sup> "UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating.'" <https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/>



## FOOD AND OUR HEALTH:

Many infectious diseases in humans originate from animals—about 75% of emerging infectious diseases are zoonotic—transmittable between humans and animals. COVID-19 is the most recent zoonotic outbreak.<sup>6</sup>

- *What are other health benefits of reducing meat consumption?*

## FOOD SECURITY AND SUSTAINABILITY:

The World Bank estimates that we will need to produce 50 percent more food by 2030.<sup>7</sup> By 2050, global food systems will need to address the dietary needs of more than 10 billion people on our planet.<sup>8</sup> Imagine feeding all people on the planet with climate-smart, affordable food systems.

- *Could cultivated meat address world hunger?*
- *Could cultivated meat address food justice (eg. local, affordable, healthy, and culturally appropriate food)?*

## ANIMAL PROTECTION:

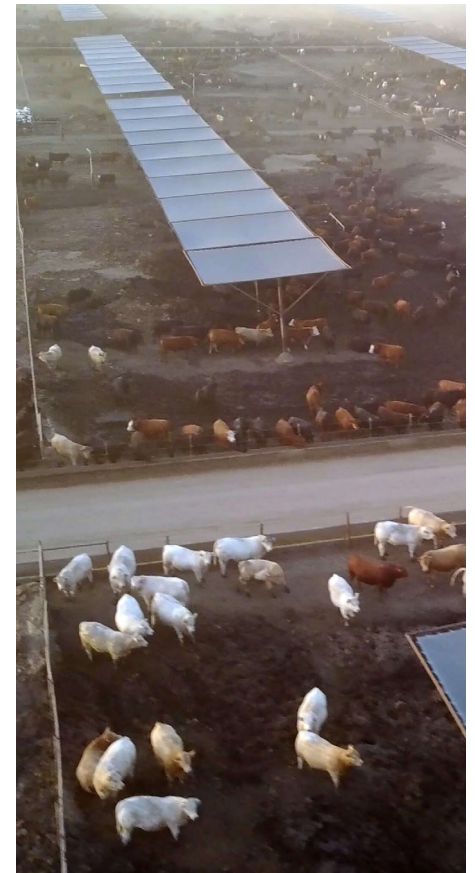
It is estimated that 75 billion land animals annually and globally are slaughtered for food.<sup>10</sup>

- *How else can the world's food systems change to meet the growing demand for protein?*



Foodborne illnesses (eg. Salmonella, E-coli, and Listeria) from bacterial pathogens are also tied to conventional meat production. Antibiotic resistance in humans is a result of the overuse of antibiotics in animals raised for food.

Over the past 50+ years global meat production (in tonnage) has increased over 4.5-fold, nearly twice the rate of population growth.<sup>9</sup> Demand for animal protein is growing as population and incomes increase around the globe.



<sup>6</sup> Espinosa, Romain et al. "Infectious Diseases and Meat Production." *Environmental & resource economics*, 1-26. 4 Aug. 2020, doi:10.1007/s10640-020-00484-3, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7399585/>.

<sup>7</sup> *Future of Food: Shaping a Climate-Smart Global Food System*, p. 23.

<sup>8</sup> Godfray, H. C. J. et al. "Food security: The challenge of feeding 9 billion people". *Science* vol. 327, 2010, pp. 812–818.

<sup>9</sup> Food and Agriculture Organization of the United Nations (FAO), 2020.

<sup>10</sup> <https://www.frontiersin.org/articles/10.3389/fsufs.2020.00134/full>



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