

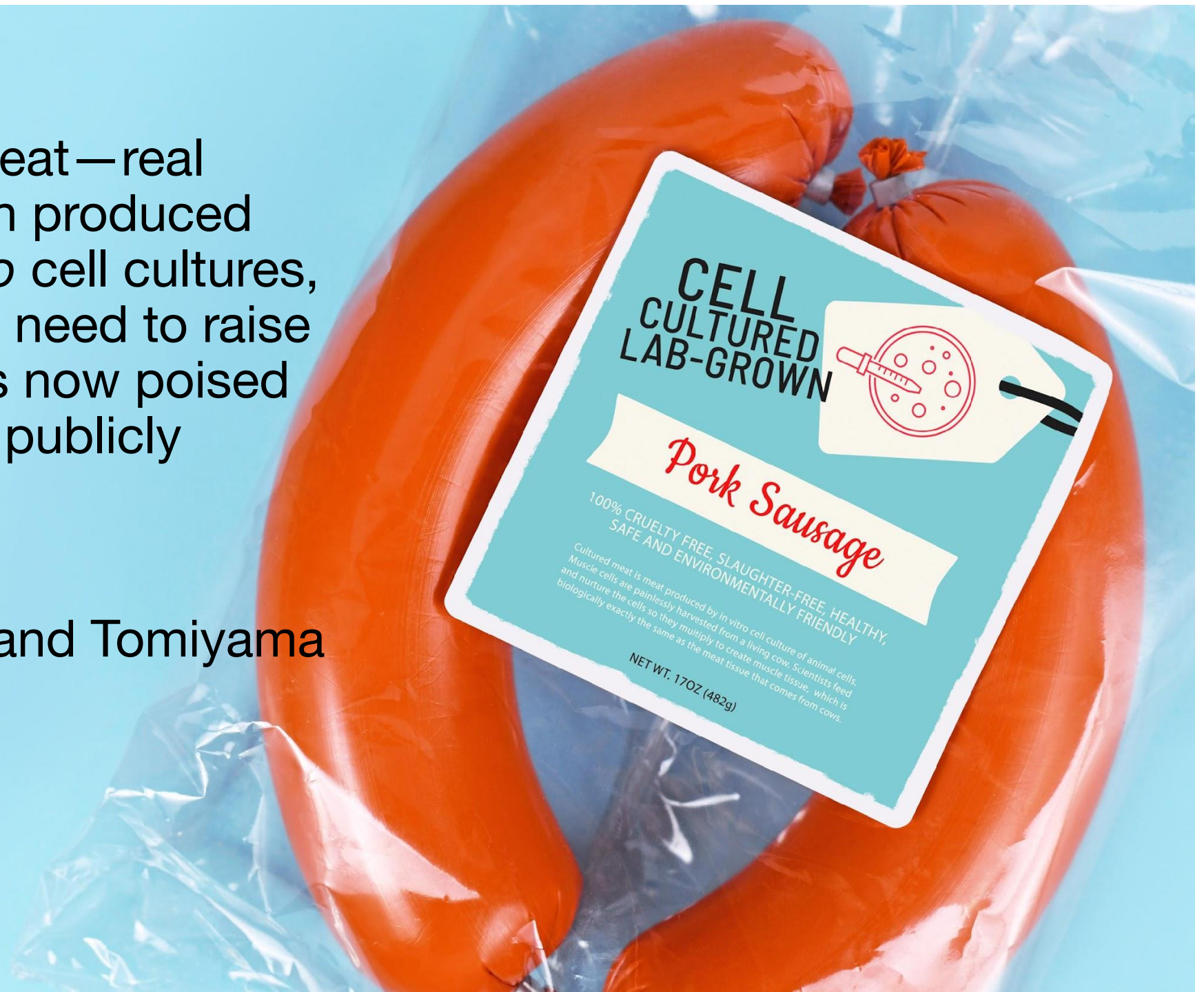
# Would you eat a burger made in a petri dish?



*Why people feel disgusted by cultured meat.*

Cultured meat—real animal flesh produced from *in vitro* cell cultures, without the need to raise animals—is now poised to become publicly available.

Rosenfeld and Tomiyama  
(2022)



Class Survey - Would you eat a burger made in a petri dish?

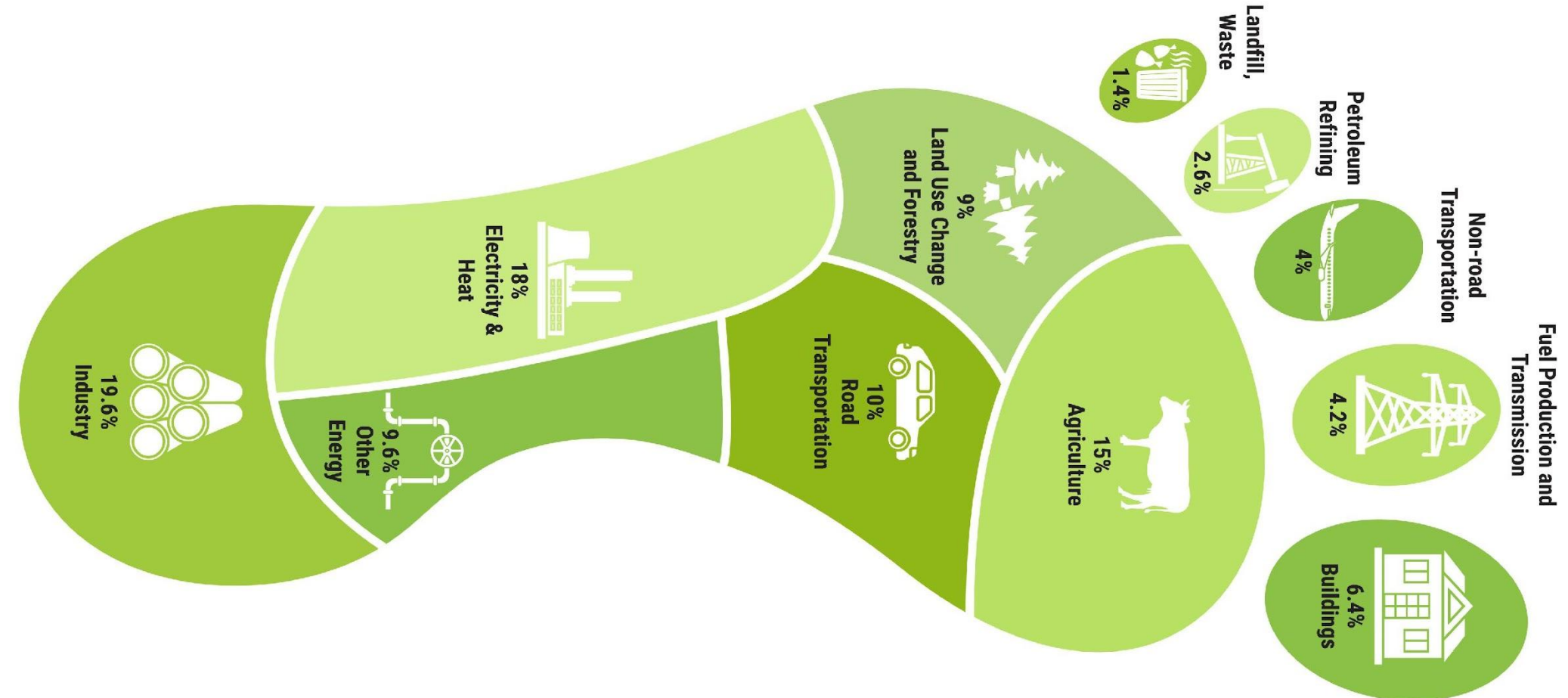


<https://www.surveymonkey.com/r/KRD9ZVF>

Rosenfeld and Tomiyama (2022) in their study suggest cultured meat offers **environmental benefits** in its production:

- using less water
- yielding fewer greenhouse gas emissions

(compared to conventional meat)

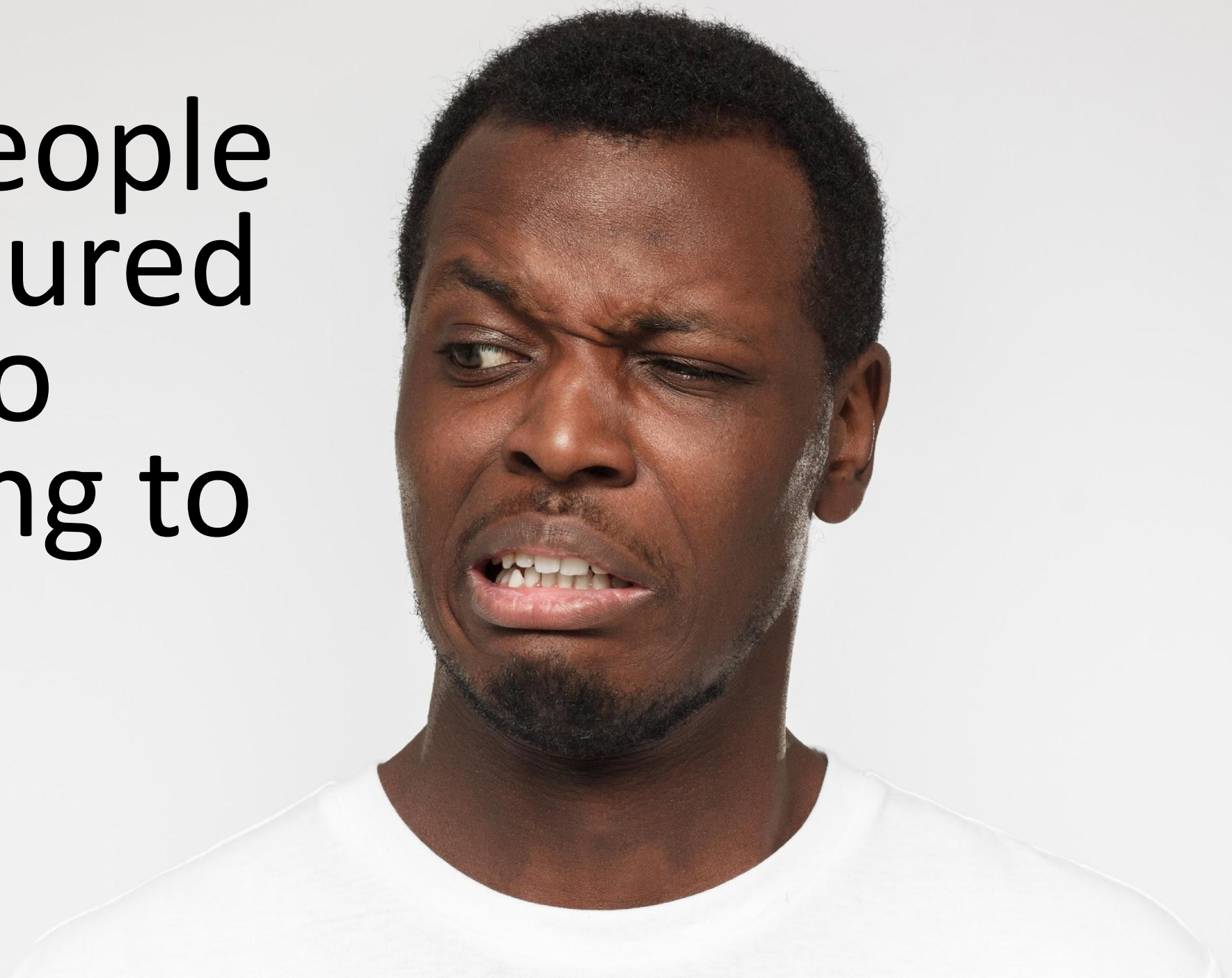


# CARBON FOOTPRINT

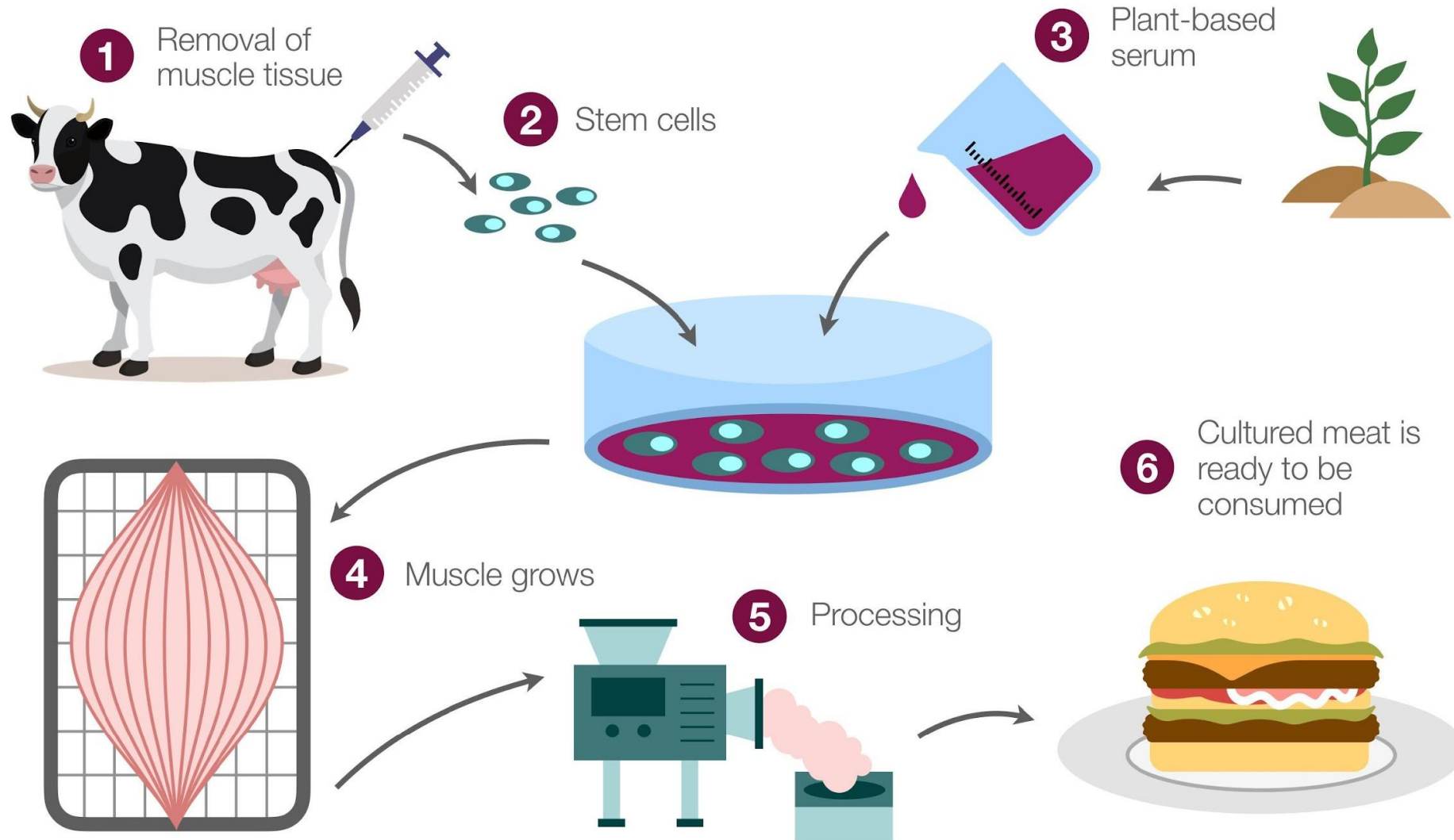
Many social, psychological, economic, and technological factors could fuel consumer resistance to cultured meat, such as:

- perceived norms about eating conventional meat
- distrust of food scientists
- product pricing of cultured meat
- taste expectations
- disbelief in benefits of eating cultured meat

Many people  
find cultured  
meat too  
disgusting to  
eat



# How cultured meat is made





To reap the **benefits** of cultured meat, consumers who currently eat meat have to replace their conventional meat with cultured alternatives



# Discussion

While both meat-eaters and vegetarians are inclined to view cultured meat as disgusting, **distinct** appraisals might underlie each group's feeling of disgust.

Why might meat-eaters view cultured meat as disgusting?

Why might vegetarians view cultured meat as disgusting?

# Rosenfeld and Tomiyama (2022) study posits

## Meat-eaters

- may experience disgust predominantly from **perceiving cultured meat as unnatural**

## Vegetarians

-may feel particularly disgusted by the fact that **cultured meat comes originally from the body of a living animal.**

# Perceptions of cultured meat as

*too unnaturally different from  
conventional meat and,  
ironically, too similar to it*

may both underlie disgust toward cultured meat,  
albeit for different groups of consumers.



## Kahoot Challenge Quiz

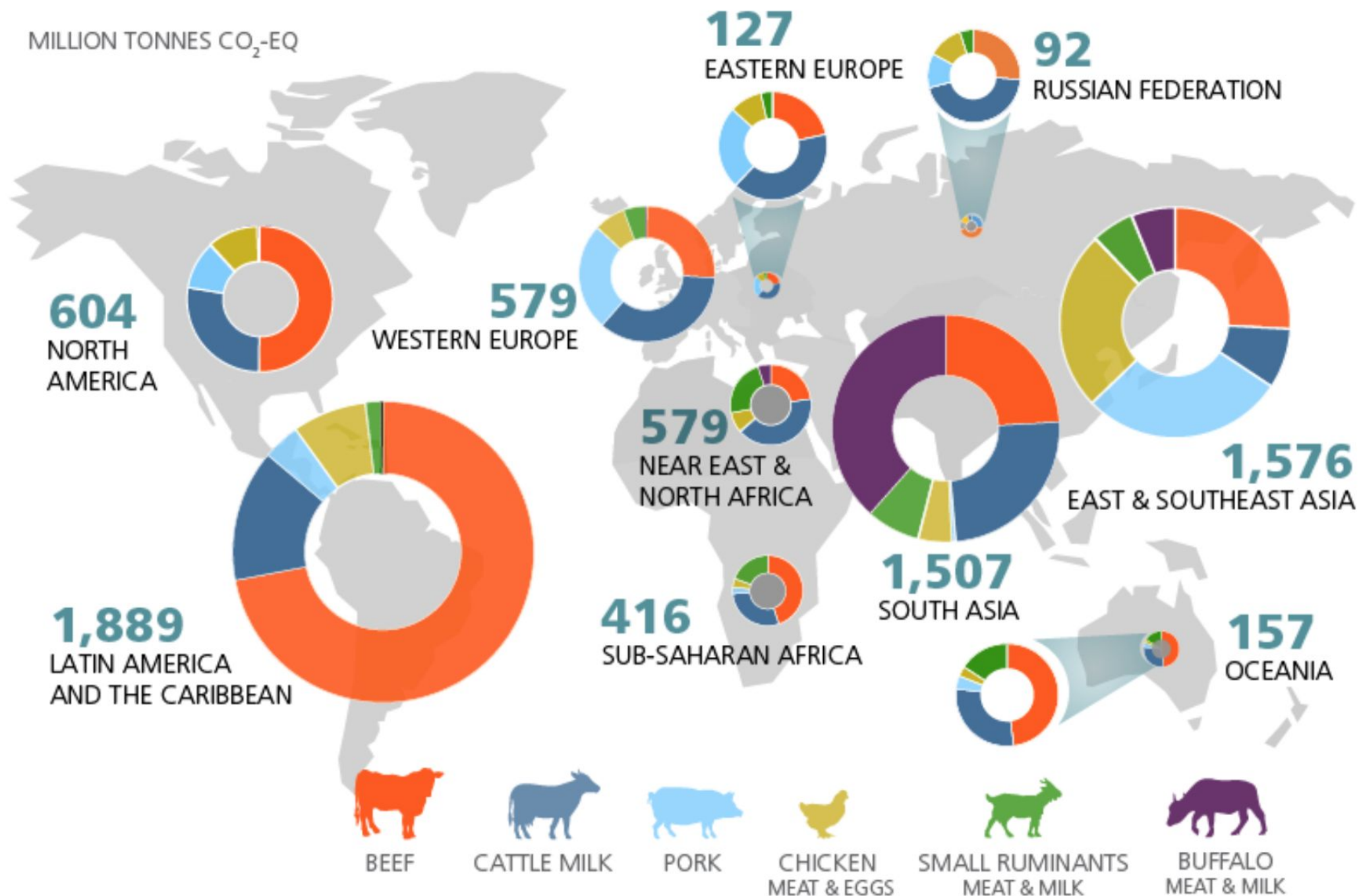
test your knowledge  
about cultured meat

[https://kahoot.it/challenge/01638569?challenge-id=42a8192c-be13-48f4-99c1-aefb04e03bcd\\_1673760714223](https://kahoot.it/challenge/01638569?challenge-id=42a8192c-be13-48f4-99c1-aefb04e03bcd_1673760714223)

Game

PIN: **01638569**

MILLION TONNES CO<sub>2</sub>-EQ



**604**  
NORTH AMERICA

**579**  
WESTERN EUROPE

**127**  
EASTERN EUROPE

**92**  
RUSSIAN FEDERATION

**579**  
NEAR EAST & NORTH AFRICA

**416**  
SUB-SAHARAN AFRICA

**1,507**  
SOUTH ASIA

**1,576**  
EAST & SOUTHEAST ASIA

**157**  
OCEANIA

**1,889**  
LATIN AMERICA AND THE CARIBBEAN



BEEF



CATTLE MILK



PORK



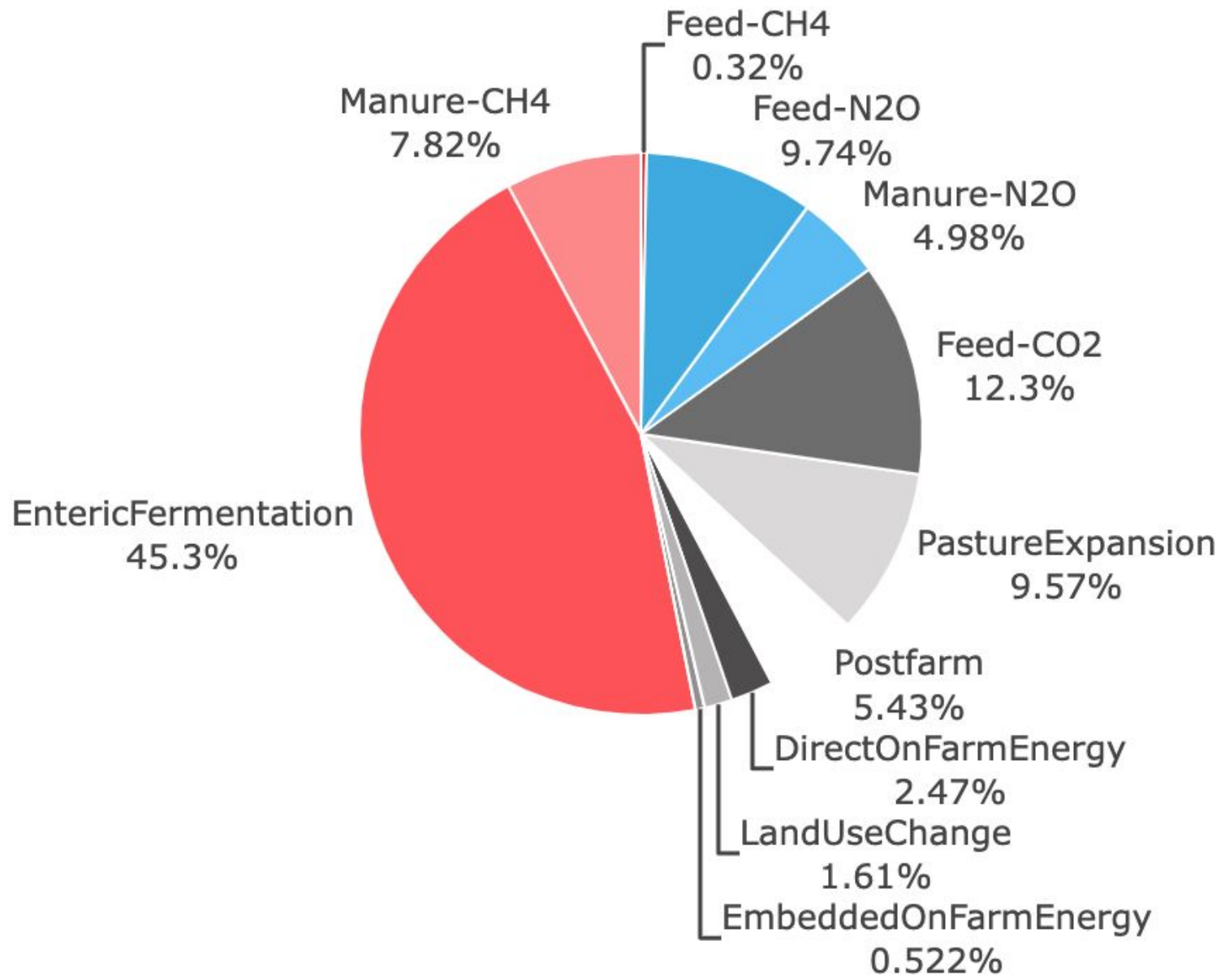
CHICKEN MEAT & EGGS



SMALL RUMINANTS MEAT & MILK



BUFFALO MEAT & MILK



Diane Jeon, Future Fields, Marketing Lead

Matt Anderson-Baron, co-founder and CEO of Future Fields.



(From left) Future Fields co-founders Lejji Gafour, Matt Anderson-Baron and Jalene Anderson-Baron are developing an innovative growth factor for



“Future Fields wants to facilitate growth of this field in Canada and beyond, and we are also striving to educate the public on cellular agriculture, as greater understanding will lead to greater acceptance. Canada has the opportunity to become a leader in cellular agriculture, but we need more involvement all across the country.

We believe students, entrepreneurs, investors, and the public across Canada can make an impact on the future of food through cellular agriculture.”

Matt Anderson-Baron, co-founder and CEO of Future Fields.

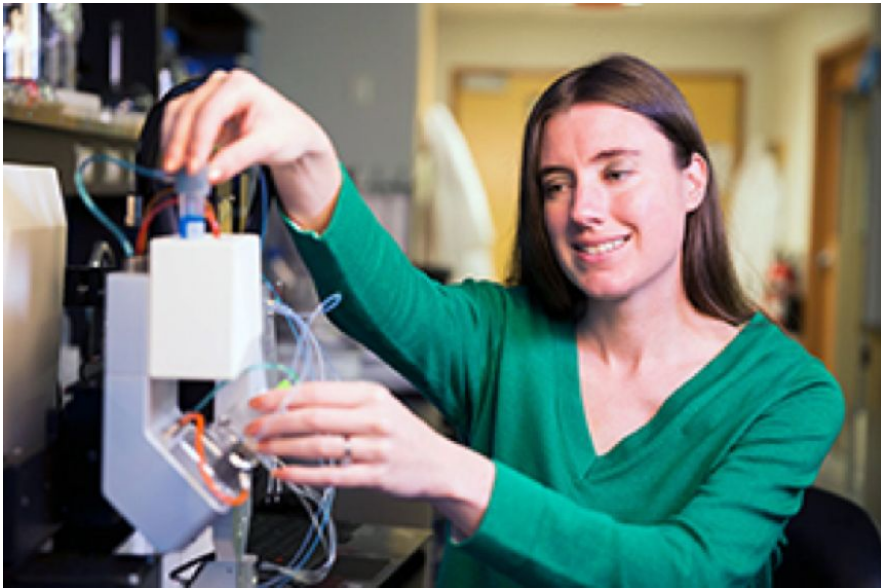
# Critical Thinking Questions:

What is the environmental impact of insect-derived growth factors?

- A: "Cultivated meat and other cellular agricultural products require growth factors. Most growth factors are produced using bacteria, yeast, or hamster ovary cells. These are not the most efficient systems, as they rely on expensive, energy-intensive, stainless steel tanks called bioreactors. In order to produce cultivated foods at scale, growth factors also need to be produced at scale, and they are constrained by these systems. Future Fields, however, replaces the bioreactor with a fruit fly. Producing complex growth factors at a rate that is 30 times faster than steel tanks, our fruit fly-based production platform requires less water, energy, land, and waste treatment than alternative systems."

Diane Jeon, Future Fields, Marketing Lead

Dr. Stephanie Willerth, University of Victoria, Microbiology



# Critical Thinking Questions:

What is the cost of culturing meat?

“It depends on the cell culture methods being used. Some use animal derived products like fetal bovine serum and other groups use chemically defined media that avoids animal derived products. Usually the processes that use non-animal derived products are more expensive. In theory, UVic could, but it would be expensive to get the resources to make enough cells and get them in the proper structure to generate such cultured meat.”

- Dr. Stephanie Willerth, University of Victoria, Microbiology

# Critical Thinking Questions:

Do you believe that cultured meat is a safe bet for net zero consumption ?

“It really depends on how the cells are cultured and there is a wide variety of different cell culture medias that are required to produce the final type of meat. I assume the lower GHG is because you don't need the whole animal (and lots of animals) to make meat. Cell culture in general is still really expensive and especially when working with stem cells and differentiating them. The cost would really depend on how much meat you wanted to make and what type.”

- Dr. Stephanie Willerth, University of Victoria, Microbiology

Tamara Loiselle, CEO and founder at Synergraze Sustainable Agriculture, has developed a seaweed-based cattle feed additive that will significantly lower methane emissions from cattle



# Critical Thinking Questions:

How can a seaweed-based cattle feed additive significantly lower methane emissions from cattle?

“A Calgary-based environmental scientist has developed a process to turn seaweed into an additive for cattle feed that will reduce the animals’ methane production by up to 90 per cent”

Synergraze partnered with T’Sou-ke First Nation on the southern tip of Vancouver Island for the study and a production facility, armed with \$5 million in funding from Alberta’s food, farming and forestry challenge by Emissions Reduction Alberta.

# Critical Thinking Questions:

Are seaweed-based cattle feed additives new?

“The concept is not new. It was originally developed in the early 2000s by scientist Robert Kinley, who was working out of the Dalhousie Faculty of Agriculture. A P.E.I. dairy farmer noticed his cattle produced more milk and were in better health when they fed on seaweed. Kinley also found the cattle emitted 15 to 20 per cent less methane while munching on seaweed.”



Dr Rob Kinley is the pioneer of the use of Asparagopsis as a feed ingredient for livestock. He oversees all FutureFeed's research and development activities.

<https://www.future-feed.com/our-team>



Tony Heesterman – Executive Chef of University Food Services Victoria



# Critical Thinking Questions

Do you serve cultured meat on campus?

“Cultured meats is very new at this time and I see no Canadian company that are selling this product, I see that there was a start up lab in Edmonton but nothing from a food supplier such as Maple Leaf meats.”

-Tony Heesterman – Executive Chef of University Food Services Victoria

# Critical Thinking Questions

“I have no problem with investigating this further, as I feel this will be a more sustainable and more humane but we are many years before this will hit the market for food services. The first step for us would be testing and tasting them in our recipes, the other part to this would be the cost of the product. As you are well aware of our increasing cost of animal proteins around North America. the pricing will need to be close and possibly less cost as this would have to be stated in our menus and may be a deterrent to our customers.”

Tony Heesterman – Executive Chef of University Food Services Victoria

Dr Tom MacMillan, Rural Policy and Strategy at the Royal Agricultural University (RAU), UK



Dr John Dooley, Rural Policy and Strategy at the Royal Agricultural University (RAU), UK



# Critical Thinking Questions

Cultured meat - also known as lab-grown meat - is assumed to pose a threat to farmers, does it?

“While eating less meat overall is a crucial step in tackling climate change, how we go about it makes a huge difference to the impact on farmers. Whether cultured meat goes mainstream is one of many factors at play. This research is about working with farmers to investigate the threats and opportunities that the technology poses to them, as well as the environmental and health impacts. It is still at a stage where the findings can shape investment and policy and how this turns out.”

Dr Tom MacMillan, Rural Policy and Strategy at the Royal Agricultural University (RAU), UK

# Critical Thinking Questions

Could cultured meat - also known as lab-grown meat - have any benefits for farmers?

“In practice, the different ways that cultured meat might develop could bring diverse risks and opportunities for farmers. The technology may create demands for new agricultural products, such as:

cells (donor herds for cell harvesting) feedstock for growth media (arable, forage, sugar beet) feedstock for edible scaffolds (cellulose, pea, bean, soya) and current waste streams (glucose, cellulose) In some scenarios, cultured meat might even be produced on farms, in facilities owned and operated by farmers, or could complement campaigns for ‘less and better’ meat.”

Dr Tom MacMillan, Rural Policy and Strategy at the Royal Agricultural University (RAU), UK



# Critical Thinking Questions

What is a Living Lab?

“According to The Alliance for Sustainability Leadership in Education (EAUC): “A Living Lab initiative hosts projects where participants from different backgrounds partner to collectively address real-world sustainability challenges and opportunities.” At Sheffield, we believe this is an important way of bringing research with global implications to the local; directly benefiting staff, students and local people.”

# Critical Thinking Questions

Are there any living labs happening right now?

“The University is currently exploring various living lab opportunities. These include a sustainable food proposal investigating how we can improve the sustainability of the food consumed in Sheffield Students’ Union. We know that dietary choices have an impact on a variety of environmental factors. Our Institute for Sustainable Food, the SU and its outlets are working together to investigate what we can do as a catering provider to improve the environmental sustainability of food sold and impact consumer behaviour.”

Dr. Cameron J Semper, University of Calgary, Cellular Agriculture

<https://www.cbc.ca/news/canada/calgary/u-of-c-researchers-growing-fish-cells-in-lab-1.5805985>

# Critical Thinking Question

What other food products can be grown in a lab?

“His research applies protein biochemistry to advance the development of serum-free growth medium tailored for fish cell culture. He is passionate about cellular agriculture and excited to see the field develop and expand within Canada.”

Dr. Cameron J Semper, University of Calgary, Cellular Agriculture

Dr Robert Gifford, Environmental Psychology, University of Victoria



# Critical Thinking Questions

In Living Lab studies, beef burger consumption has been found to decrease in proximity to climate action events on campus. Why does that occur?

“

Dr Robert Gifford, Environmental Psychology, University of Victoria

Dr Ron Porter, Consumer Psychology, University of Victoria



# Critical Thinking Questions

What is a consumption journal?

“A consumption journal describes individual consumption activities for 2 weeks. At least 3 entries per day and includes both products and services. Additionally, try to make the product and services choices come from multiple categories. Specific entries for each purchase: When purchased? What purchased? Where purchased? Reasons for purchase? Feelings associated with purchase. Post-purchase evaluation.”

Dr Ron Porter, Consumer Psychology, University of Victoria



# Critical Thinking Questions

What is a consumer profile?

“A one paragraph summary consumer profile for yourself. How would you define yourself if you were a specific market segment?”

Consider Psychographic (variables related to lifestyle) Attitudes, beliefs, and personalities and AIO model (activities, interests, and opinions)

Dr Ron Porter, Consumer Psychology, University of Victoria

# Critical Thinking Questions

What factors influence how each individual reacts to cultured meat?

“In the chain that is evident for the basic consumption process (need -> want -> exchange -> costs and benefits -> reaction -> value) multiple psychological processes including thoughts, feelings and behaviours culminate to represent what each consumer values the most when it comes to cultured meat.”

Dr John Park, United Nations Pillar Foundation



# Critical Thinking Questions

Are there countries that are facing greater challenges than we are?

“Additionally, the need for rural farmers, often labelled as marginalized, to comply with global standards and compete with large importers from around the world the role of agriculture policy is paramount to the growth of these rural economies most notably Ghana”

(Banson et al., 2016)

# Critical Thinking Questions

What projects are occurring in Ghana right now?

Dr John Park, United Nations Pillar Foundation

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