

**THE SOCIAL IMPLICATIONS OF AGRI-GENOMICS  
CLIMATE-SMART AGRICULTURE AND FOOD SYSTEMS  
INTERDISCIPLINARY CHALLENGE TEAM**

# **ACCEPTANCE AND PERCEPTIONS OF CELLULAR AGRICULTURE IN CANADIAN FOOD SYSTEMS**

## **A SURVEY STUDY**

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# TERRITORIAL ACKNOWLEDGEMENT

Royal Roads University is situated in the traditional, ancestral, and unceded **territory of the Lekwungen-speaking Songhees and Esquimalt Nations**. With gratitude, we live, work and learn here where the past, present and future of Indigenous and non-Indigenous students, faculty and staff come together. In honour of the Songhees and Esquimalt ancestors, Hay'sxw'qa si'em (hy-sh-kwa sea-em)! This means, "Thank you, respected or honourable one."

The University of the Fraser Valley is situated in the traditional, ancestral, and unceded **territory of the Halq'eméylem-speaking Stó:lō peoples (people of the river)**. The Stó:lō have an intrinsic relationship with what they refer to as **S'olh Temexw (Our Sacred Land)**; therefore, we express our gratitude and respect for the honour of living and working in this territory.

The University of Ottawa is situated in the traditional, ancestral, and unceded territory of the **Anishinaabemowin-speaking Omamìwìnini Anishnàbeg (Algonquin) Nation**. We pay respect to the Algonquin people, who are the traditional guardians of this land. We acknowledge their longstanding relationship with this territory, which remains unceded.

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## Legend:

\*\*\* < .001

\*\* < .01

\* < .1

Not sig. Not statistically significant

# SUMMARY

This report summarizes the key results from a large Canadian public survey (n=5166) about cellular agriculture and other novel food technologies.

## Acceptance and perceptions of cellular agriculture

We compared acceptance of three specific examples of cellular agriculture products: ice cream made with cellular agriculture dairy, nuggets made with cellular agriculture chicken, and cellular agriculture salmon fillets. While respondents were likely to feel similarly for all three products, in terms of their interest in consuming the products and seeing cellular agriculture industry grow in Canada ( $\alpha > .9$ ), the differences in some responses were statistically significant (Freidman,  $p < .001$ ). Respondents were least likely to try or buy cellular agriculture salmon and most likely to try or buy cellular agriculture ice cream (Wilcoxon,  $p < .001$ ).

We compared responses for willingness to try cellular agriculture products at least once, buy cellular agriculture products regularly, and buy cellular agriculture products instead of conventional animal-sourced foods. Respondents were most willing to try cellular agriculture products and least willing to buy cellular agriculture products instead of conventional animal-sourced food. When asked if they would buy these cellular agriculture products if they were healthier or cheaper than the conventional option, they tended to be more willing.



We tested the level of agreement or disagreement with common points of contention about cellular agriculture: Will cellular agriculture be sustainable? Will the products be tasty? There was a high degree of internal consistency across the statements of contention ( $\alpha > .9$ ), meaning that respondents who agreed with one statement were more likely to agree to others. Respondents were most optimistic about the benefits of cellular agriculture for food security, animal welfare, and sustainability.

We asked respondents to compare their comfort with cellular agriculture to comfort with other food innovations. Less than 30% of respondents were more comfortable with cellular agriculture than with vertical agriculture, plant-based protein burgers, and genetically modified rice. Over 40% of respondents were more comfortable with cellular agriculture than with genetically modified beef.

## What predicts acceptance and perceptions of cellular agriculture products?

The strongest predictors of acceptance and positive perceptions of cellular agriculture are respondents' perceptions of social and environmental issues: the role of technology in society, trust, corporate criticism, globalization, climate change urgency/ambivalence, and environmental impact of animal agriculture. Multiple linear regressions model that used these perception data as independent variables were all strongly significant ( $R^2 \geq .3$ ,  $p < .001$ ).

There were several significant results for diets. Those who eat fish more frequently are more willing to try cellular agriculture salmon and buy it regularly. Those who eat red meat more frequently have less positive / more negative perceptions of cellular agriculture. Those with special diets related to animal-sourced foods (halal, kosher, organic, paleo, plant-based, vegan, and vegetarian) exhibited somewhat or strongly significant results for being more willing to try or buy some cellular agriculture products on average. Those without special diets were less willing to try or buy cellular agriculture products on average.

Respondents who were already familiar with cellular agriculture were consistently more positive in questions about acceptance and perceptions of cellular agriculture. Similarly, respondents with paid or volunteer work in the food system were more likely to be positive about the acceptance and perceptions of cellular agriculture.

Younger respondents and men had more positive responses for cellular agriculture acceptance and perceptions. Provinces and territories of residence also had significant influences on acceptance and perceptions, with residents of Ontario and Quebec typically being more positive to cellular agriculture than residents in other places in the country. Additionally, respondents who completed postsecondary education, hold liberal political views, and/or have higher household income levels expressed more positive views toward cellular agriculture.



# INTRODUCTION

The global industrial food system is vulnerable to numerous threats. The food system is comprised of centralized production and long supply chains, which create the conditions for world-wide disruptions to supply and distribution from shocks such as climate change events, trade wars, pest outbreaks, and conflicts. Additionally, the global industrial food system is a significant contributor to critical sustainability issues, such as environmental degradation, climate change, habitat loss, and socioeconomic inequities (Rockström et al., 2025; Willett et al., 2019). Accordingly, many countries and communities are exploring ways of reducing reliance on the global food system by developing resilient and sustainable local food systems.

New opportunities for developing local food systems are offered by emerging agricultural technologies and food production methods. One such food production method is cellular agriculture, which involves a suite of technologies that can be used to produce dairy, meat, fish, and other animal products with little to no need for livestock farming or fishing. Cellular agriculture is an indoor food production method; thus, it (theoretically) can be used to develop analogous animal products in a wide variety of environments, such as urban spaces, industrial parks, and remote communities. Due to this geographical flexibility, cellular agriculture technologies can potentially contribute to the development of decentralized, resilient, local food systems (Newman et al., 2023). Additionally, cellular agriculture enables shifts away from conventional livestock farming and the environmental, social, and ethical issues associated with the livestock industry (Kumar et al., 2021; Bowness et al., 2025).

Table 1. Definition of cellular agriculture.

## What is cellular agriculture?

Cellular agriculture is an emerging food production approach that can be used to produce dairy, meat, fish, and other animal products without using live animals.

Here are some examples of cellular agriculture products in development:

- **Ice cream** is made by introducing cow DNA into yeast or other small organisms, so that the organisms can produce milk proteins to replace regular dairy proteins in an ice cream recipe
- **Salmon fillets** are made by taking a sample of salmon cells, and then using these cells to grow muscle fibers in a controlled environment to build a “fillet” or “steak”
- **Chicken nuggets** are made by taking a sample of chicken cells, growing more protein cells, and then adding other ingredients (e.g., vegetable proteins) to make the nuggets

Cellular agriculture can be used to produce protein-based foods and non-food products, including leather. As an industry, cellular agriculture is still in early stages. Few cellular agriculture products are on the market. For example, people in the United States can buy cellular agriculture ice cream at grocery stores and cellular salmon in a select few restaurants.

Several companies are working on cellular agriculture products in Canada, but their products are not yet available to consumers.

As an industry, cellular agriculture is still in early stages, and few cellular agriculture products are on the market. For example, people in the United States can buy cellular agriculture ice cream at grocery stores and cellular salmon at a select few restaurants (see [www.perfectday.com](http://www.perfectday.com) and [www.wildtypefoods.com](http://www.wildtypefoods.com)). In Canada, several companies are working on cellular agriculture products; however, products from these companies are not yet available to consumers. As the industry is still in its nascency, it is difficult to determine whether cellular agriculture will fulfill its “promise” of contributing to resilient and sustainable food systems (Newman et al., 2023). Depending on how the industry develops, cellular agriculture may play a strong role in sustainable food systems, or it may reproduce (and perhaps exacerbate) many of the issues observed with the current global industrial food system (Bowness et al., 2026; Glaros, Newell, Fraser et al., 2023; Newell & Glaros, 2024).

An important consideration for how cellular agriculture may grow and evolve as a component of food systems is the societal interest in, and acceptance, of an emerging cellular agriculture industry. If communities and societies are interested in cellular agriculture playing a role in their food systems, then public support will help the industry grow. Conversely, if communities and societies oppose cellular agriculture, this will create challenges for an emerging cellular agriculture industry in terms of the political will for supporting the industry’s growth and the economic viability of cellular agriculture businesses.

Multiple survey studies have examined consumer interest in, and acceptance of, cellular agriculture products, and these studies has been useful for understanding perspectives and concerns about cellular agriculture as they relate to different people and demographics (Bryant & Dillard, 2019; Powell et al., 2023; Verbeke et al., 2015; Weinrich et al., 2020). However, although such research has produced useful insights, these types of studies typically focus on consumer behaviours and attitudes, meaning they examine whether (and why) individuals may or may not be interested in trying and/or purchasing cellular agriculture products. Such consumer-focused research does not reveal people’s interest in cellular agriculture as an industry. For instance, some people may wish to see cellular agriculture grow as sector that contributes to local economies and food system sustainability, even if they personally are not interested in purchasing and consuming the products. Applying this type of broad research lens to studies on community and societal interest in cellular agriculture is important for comprehensively understanding the support (or lack thereof) for an emerging cellular agriculture industry.

Previously, we (Newell and Ruder) conducted a survey of cellular agriculture perceptions in an earlier UFV-RRU collaboration (Glaros, Newell, Ruder, Mukiri, and Pizzirani, 2023). This was one of the few survey studies that comprehensively examined people’s interest in cellular agriculture as part of their diet, food system, and food economy. However, the Glaros et al. study specifically focused on Lower Mainland region of British Columbia, and the findings were geographically limited with respect to informing Canadian agri-food strategy and policy. Canada is an expansive, culturally diverse, and agriculturally varied country, with agri-food policy making taking place at provincial and federal levels; therefore, a national survey is needed to effectively understand societal interest and potential policy directions for local and domestic cellular agriculture industries. This report presents a country-wide survey study that examines how Canadians feel about cellular agriculture in terms of a food product, a contributor to local and domestic economies, and a component of local and domestic agri-food systems.

# METHODS

The survey study was designed to produce insights into people's perspectives on and attitudes toward an emerging cellular agriculture industry in Canada. The study aims to go beyond the scope of consumer acceptance and attitudes studies, which are common in social science research on cellular agriculture. Along with dietary interests, the survey study also examined people's thoughts and feelings about cellular agriculture becoming a component of food systems and economies. The study focuses on Canada specifically, and the survey was distributed to individuals across the country.

## Recruitment and data collection

The survey was delivered in an online format, with the assistance of the Vancouver-based market research company, Kai Analytics International. Individuals were eligible to participate in the survey if they were 19 years of age or older and lived in Canada. The survey was offered in English, French, Punjabi, and Mandarin to increase participation among eligible individuals, and the recruitment process targeted a demographic composition of no more than 60% participants with European ancestry in effort to collect an ethnically and culturally diverse sample.

Data collection occurred in the months of April and May 2025. The data were cleaned to remove incomplete responses and those who did not correctly answer the attention check question. We also removed surveys that were completed too quickly (under 7 minutes) and seemed unlikely to represent true opinions (e.g., when the first option was selected for all questions). After data cleaning, total of 5,166 were included in the final dataset.

## Survey design

The survey questions were grouped in different themes (see Table 2). The survey was designed to examine what factors influence acceptance and perceptions of an emerging cellular agriculture industry. Accordingly, responses related to people's support or opposition of cellular agriculture formed the dependent variables for the data analysis. We tested the effects of various independent variables, including demographic, behavioural, and conceptual factors. The survey was designed and tested by the research team and collaborators of the Genome Canada/BC ICT Project: "The Social Implications of Agri-Genomics."



Table 2. Survey themes, questions, and structure.

Themes	Sub-topics and questions
<p><b>Diets and eating habits</b></p>	<p>Consumption of animal-sourced foods (e.g., dairy, eggs, red meat, poultry, etc.)</p> <ul style="list-style-type: none"> <li>• Frequency of consuming animal-sourced foods (6-point scale: never, a few times per year, once a month, once a week, a few times per week, every day)</li> <li>• Perceived importance of animal-sourced foods to their diets, by stating the degree to which they agree or disagree with the statement “___ is important to my diet” for each of the categories of animal-sourced foods they consume (7-point scale from strongly agree to strongly disagree).</li> <li>• Where they purchase animal-sourced foods, by selecting all that apply from a list of 8 sources (e.g., supermarket, local butcher, direct from farm, hunt/fish myself, etc.) plus an open field for “other.”</li> <li>• What decisions they make when purchasing these foods, by selecting up to 3 factors from a list of 9 factors (e.g., cost, locally sourced, organic, etc.) plus an open field for “other.”</li> <li>• Whether they align with any diets or cultural practices related to animal-sourced foods, by selecting all that apply from a list of 9 options (e.g., halal, kosher, vegan, vegetarian, etc.) plus an open field for “other.”</li> <li>• How often they eat food that they grew or harvested themselves during the growing season, if at all (7-point scale from “most days” to “never”). <i>Note: This was not limited to animal-sourced foods.</i></li> </ul>
<p><b>Food system priorities</b></p>	<p>Top priorities for food systems, such as reducing the impacts of agriculture to wildlife and increasing people's access to healthy foods (Choose top two priorities from a set list of 10 “initiatives or strategies to improve food systems,” plus “none of the above”)</p> <p><i>Note: We offered an open textbox for respondents to provide top food system priorities that were not in our list.</i></p>
<p><b>Familiarity with cellular agriculture</b></p>	<p>Familiarity with cellular agriculture: “Have you heard of ‘cellular agriculture’ or ‘cultivated meat’ or ‘lab-grown meat’ before?” (3 options: yes, no, and I don't know)</p> <p><i>Note: Short explanation and definition of cellular agriculture provided after this question (featured verbatim from Table 1).</i></p>
<p><b>General support or opposition to cellular agriculture</b></p>	<p>General support or opposition: “Given what you know now, are you likely to support the sale of cellular agriculture products in Canada?” (7-point scale from “strongly support” to “strongly oppose,” plus an option for “I don't know”).</p>

<p><b>Acceptance of example products</b></p>	<p>Acceptance of three specific examples of cellular agriculture products: ice cream made with cellular agriculture dairy, nuggets made with cellular agriculture chicken, and cellular agriculture salmon fillets.</p> <p>Degree to which they agree or disagree with eight statements about cellular agriculture products and the potential impacts on local and global food systems (7-point scale from strongly agree to strongly disagree).</p> <ul style="list-style-type: none"> <li>• “I would like to try _____, at least once”</li> <li>• “I would like to buy _____ regularly (i.e., at least once a month)”</li> <li>• “I would buy _____ instead of the regular animal-based products”</li> <li>• “I would like to see _____ sold in my local grocery store”</li> <li>• “I would like to see _____ be part the local food economy where I live”</li> <li>• “I want to see _____ be part of the Canadian agri-food industry”</li> <li>• “I want to see _____ developed in places across the world”</li> <li>• “I do not think that _____ should exist or be adopted at all.”[reversed]</li> </ul>
<p><b>Compared to regular animal-sourced foods</b></p>	<p>Whether they would be more likely to buy the three cellular agriculture products if they were healthier or cheaper (7-point scale from strongly agree to strongly disagree).</p> <ul style="list-style-type: none"> <li>• “I would buy _____ instead of the regular animal-based products if it were cheaper”</li> <li>• “I would buy _____ instead of the regular animal-based products if it were healthier”</li> </ul>
<p><b>Perceptions of cellular agriculture</b></p>	<p>Degree to which they agree or disagree with 9 common perceptions or characteristics of cellular agriculture, including impacts on sustainability, animal welfare, health, and food affordability (7-point scale from strongly agree to strongly disagree).</p> <p><i>Note: These questions return to cellular agriculture in general.</i></p>
<p><b>Future scenarios</b></p>	<p>Respondents evaluated the likelihood of different future scenarios related to cellular agriculture production in Canada.</p> <p><i>Note: Data from these questions are not included in this report.</i></p>
<p><b>Compared to other novel food innovations</b></p>	<p>Whether they are more or less comfortable with five other novel food innovations (e.g., rice from genetically modified seeds to be more tolerant to drought, plant-based burger with mushroom protein) (7-point scale from “much less concerned” to “much more concerned,” plus an option for “I don’t know”).</p>
<p><b>Technology criticism</b></p>	<p>Critical or negative views about the role of technology in society, four statements (7-point scale from strongly agree to strongly disagree, plus option for “I don’t know”):</p> <ul style="list-style-type: none"> <li>• “Society is worse off than ever, because of the impacts of new technologies.”</li> <li>• “The negative effects of technology outweigh its advantages.”</li> <li>• “Hope for the future lies more in people’s actions than in technology”</li> <li>• “The risks and burdens of technologies disproportionately affect marginalized communities.”</li> </ul> <p>Adapted from Satterfield et al. (2023) and Dunlap and Van Liere (1984).</p>

<b>Technology optimism</b>	<p>Optimistic or positive views about the role of technology in society, two statements (7-point scale from strongly agree to strongly disagree, plus option for “I don’t know”):</p> <ul style="list-style-type: none"> <li>• “Future resource shortages will be solved by technology”</li> <li>• “A country’s progress can be measured by its technological development.”</li> </ul> <p>Adapted from Satterfield et al. (2023) and Dunlap and Van Liere (1984).</p>
<b>Trust in actors to identify risks of technologies</b>	<p>Trust in other actors to identify risks of new food-related technologies, six statements: “I trust ___ to inform me about any risks of new food-related technologies” (7-point scale from strongly agree to strongly disagree, plus option for “I don’t know”).</p> <ul style="list-style-type: none"> <li>• Scientists</li> <li>• Regulators</li> <li>• Agricultural companies</li> <li>• Activists</li> <li>• Celebrities and social media influencers</li> <li>• Family and friends</li> </ul> <p>Adapted from Satterfield et al. (2023).</p>
<b>Corporation and globalization criticism</b>	<p>Criticism of corporations and corporate power, three statements (7-point scale from strongly agree to strongly disagree, plus option for “I don’t know”):</p> <ul style="list-style-type: none"> <li>• “The increasing influence of large corporations is a problem”</li> <li>• “Corporations should NOT limit access to knowledge through patents.”</li> <li>• “Big global tech companies should be broken up.”</li> <li>• “Globalization (i.e., increased connectivity among nation’s economies and cultures) has positive impacts for most people.” [Reversed]</li> </ul> <p>Adapted from Nawaz and Satterfield (2022).</p>
<b>Climate change ambivalence</b>	<p>Ambivalence on climate change, three statements (7-point scale from strongly agree to strongly disagree):</p> <ul style="list-style-type: none"> <li>• “Evidence for human-caused climate change is incomplete at best.”</li> <li>• “Climate change is NOT among the most urgent problems facing humanity and the planet”</li> <li>• “The suggestion that climate change will cause large-scale ecosystem changes is overblown.”</li> </ul> <p>Adapted from Satterfield et al. (2023), Hagerman et al. (2021), and Gregory et al. (2021).</p>
<b>Climate change urgency</b>	<p>Perceived climate change urgency, three statements (7-point scale from strongly agree to strongly disagree):</p> <ul style="list-style-type: none"> <li>• “The human causes of climate change need to be addressed immediately”</li> <li>• “Human impacts are causing changes at a global scale that are destabilizing the functioning of the Earth’s systems.”</li> <li>• “Climate change will affect some ecosystems so quickly and strongly that large-scale changes in nature and biodiversity will follow.”</li> </ul> <p>Adapted from Satterfield et al. (2023), Hagerman et al. (2021), and Gregory et al. (2021).</p>

<b>Animal agriculture as environmentally harmful</b>	Perceived environmental impact of producing 4 types of animal-sourced foods (beef, pork, chicken, and fish): “Most ways of producing ____ products are harmful to the environment and planet” (7-point scale from strongly agree to strongly disagree, plus option for “I don’t know”).
<b>Demographics</b>	Age, gender, ethnicity, household structure, income, education
<b>Political orientation</b>	Political orientation/views on a bi-directional scale (5-point scale from “very conservative” to “very liberal,” plus options for “other” and “I don’t know”).
<b>Location</b>	Province/territory and “forward sorting area” (first three characters of postal code)



# Analysis

The data produced in this study were rich, and numerous analyses were performed. For the purposes of maintaining a reasonable scope for this document, this report presents a selection of the analyses. The outcomes from the analyses involve both descriptive and inferential statistics conducted in IBM SPSS Statistics. The results are presented using both graphs and choropleth maps (when related to geography) created in Excel, PowerPoint, and ArcGIS.

**Dependent variables:** The analysis involved descriptive statistics on the respondents' degrees of support for or opposition toward cellular agriculture, people's willingness to try or buy cellular agriculture products (acceptance), and perceptions of cellular agriculture. The survey also tested how respondents' comfort with cellular agriculture compares to their comfort with other agri-food technologies, such as genetically modified crops, plant-based proteins, and indoor agriculture.

**Independent variables:** The survey's key independent variables were conceptual in nature, labelled "perceptions of social and environmental issues" in the report. These variables related to people's feelings and beliefs about the role of technology in society, corporate criticism, globalization, climate change urgency/ambivalence, trust in others to educate about risks of novel technologies, and the environmental impact of animal agriculture. We measured these variables through multiple statements/questions in the survey (see Appendix for data reduction details). Other independent variables include eating habits and diets, as well as demographic and personal factors that may influence people's perceptions of and attitudes toward cellular agriculture (e.g., age, gender, ethnicity, etc.).

**Descriptive statistics:** The analyses included descriptive statistics related to the characteristics of the survey respondents. These statistics include demographic characteristics, diets and eating habits, their main methods for acquiring foods, and decisions related to the types of animal-sourced foods they purchase/acquire. We also present descriptive statistics on the responses for our main dependent variables. We used Cronbach's alpha tests to measure the internal consistency of multiple-item variables and consequently used means for some variables.

**Multiple linear regressions:** Multiple linear regressions were conducted to examine how perceptions of social and environmental issues affect acceptance (e.g., willingness to try and buy) and perceptions of cellular agriculture (e.g., viable alternative, sustainable). The same sets of dependent variables were used in multiple linear regressions using eating habits as independent variables (e.g., frequency of eating red meat). Finally, age was also tested in a linear regression as a continuous variable.

**Nonparametric statistical analysis:** Much of our data was non-parametric. To compare the same respondents' answers to multiple questions (e.g., willing to try cellular agriculture ice cream, willing to try cellular agriculture salmon, and willing to try cellular agriculture nuggets), we used a Friedman test, which is the non-parametric equivalent to one-way ANOVA with repeated measures. To explore significant Friedman results, we used Wilcoxon sign-rank tests for all possible pairs with the Bonferroni correction. Instead of independent t-tests and one-way ANOVA, we conducted Mann-Whitney U tests and Kruskal-Wallis H tests to compare mean ranks of binary and categorical independent variables. We used these tests to compare responses by diets, familiarity with cellular agriculture, paid or volunteer work in the food system, gender, geography, education, income, and political views. For each significant Kruskal-Wallis H test, we conducted a post-hoc comparisons using Dunn's pairwise tests for all possible pairs and adjusted the significance using the Bonferroni correction.

# RESULTS

## Descriptive statistics

**Age:** The average age of respondents was 50.8. The largest single group of respondents was aged 60 and over, comprising 33% of the total sample. This was followed by adults aged 40-49 (18%), 30-39 (17%), 50-59 (17%), and finally those aged 18-29 (15%).

**Gender:** Men constituted the largest gender group among respondents, representing 56% of the total sample. Women made up 43% of respondents, while non-binary individuals, those who preferred not to say, and those identifying as another gender collectively accounted for 1% of the sample.

**Province or territory of residence:** Nearly half the respondents reside in Ontario (45%). British Columbia (14%), Quebec (14%), and Alberta (13%) were also well represented, while the territories each accounted for less than 0.1% of the sample.

**Ethnicity:** Respondents of European ethnicity formed the majority, representing over half of all respondents (53%). The category “Other” was the second most selected (13%), followed by East Asian (7%) and Indigenous (6%) ethnicities.

**Highest level of education:** Educational attainment was high, with the majority (64%) of respondents having completed post-secondary education at the college level or above. The most common qualifications were a college diploma (25%) or bachelor’s degree (22%).

**Household income:** Most respondents reported a middle-income range. Nearly three-quarters (74%) of the sample had a household income under \$100,000, with the single largest group earning between \$50,000 and \$99,999 (35%). Only 4% reported an income of \$200,000 or more.

**Political orientation:** The sample’s political orientation was distributed across the spectrum, with the largest group identifying as politically neutral (26%). Liberal-leaning respondents (somewhat and very liberal) together constituted a larger portion (37%) than conservative-leaning respondents (somewhat and very conservative, 29%).

**Diet:** More than half of respondents (63.2%) *did not* identify with any specific diet. Among those who did, choosing organic foods (14.1%) was the most common practice, followed by diets that restrict red meat consumption (7.7%) or adhere to religious or cultural guidelines like Halal (7.3%). Plant-focused diets (e.g., vegetarian, vegan, pescatarian) were present but less common, collectively identified by 8.2% of the sample.

**Consumption of animal-sourced foods:** Dairy and eggs were reported to be dietary staples and consumed frequently by most respondents. Over 80% ate dairy at least a few times per week, and nearly two-thirds consumed eggs with similar frequency. Meat consumption was less frequent but regular, with poultry being the most common meat consumed weekly (82.2%) and pork the least (55.8%).

**Importance of animal-sourced foods:** Eggs, dairy, and poultry were considered the most important animal-sourced foods, with a strong majority of respondents agreeing on their dietary importance (85.7%, 80.7%, and 87.9%, respectively). Pork was rated as the least important, with only 40.3% expressing strong or moderate agreement, while a notable 29.4% of respondents held neutral views on fish.

**Involvement in the food system:** Most respondents (82%) reported no direct professional or volunteer involvement in the listed areas of the food system. Among those who were involved, working in food retail was the most common role (6%).

**Top priorities for food systems:** When asked to choose top priorities, respondents most frequently selected initiatives for healthy food access (41.2% of cases) and supporting local food systems (37.4%). Animal welfare (31.7%) was the third-highest priority, ranking above environmental concerns like reducing greenhouse gases (16.5%) and preparing for natural disasters (16.8%).

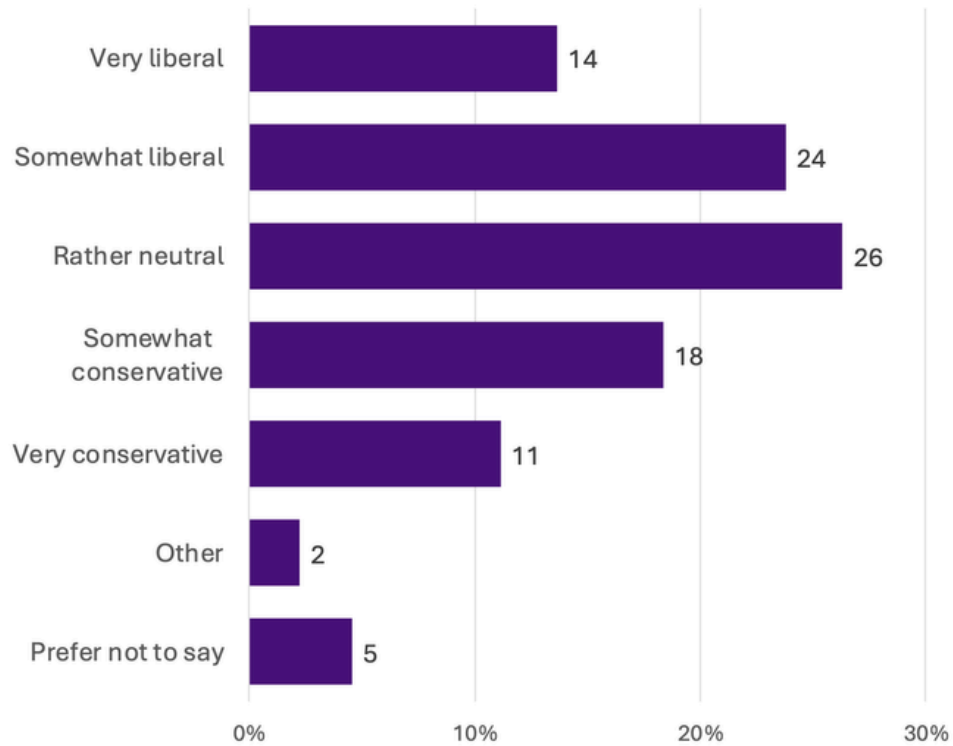


Figure 1. Political views of respondents (n=5166).



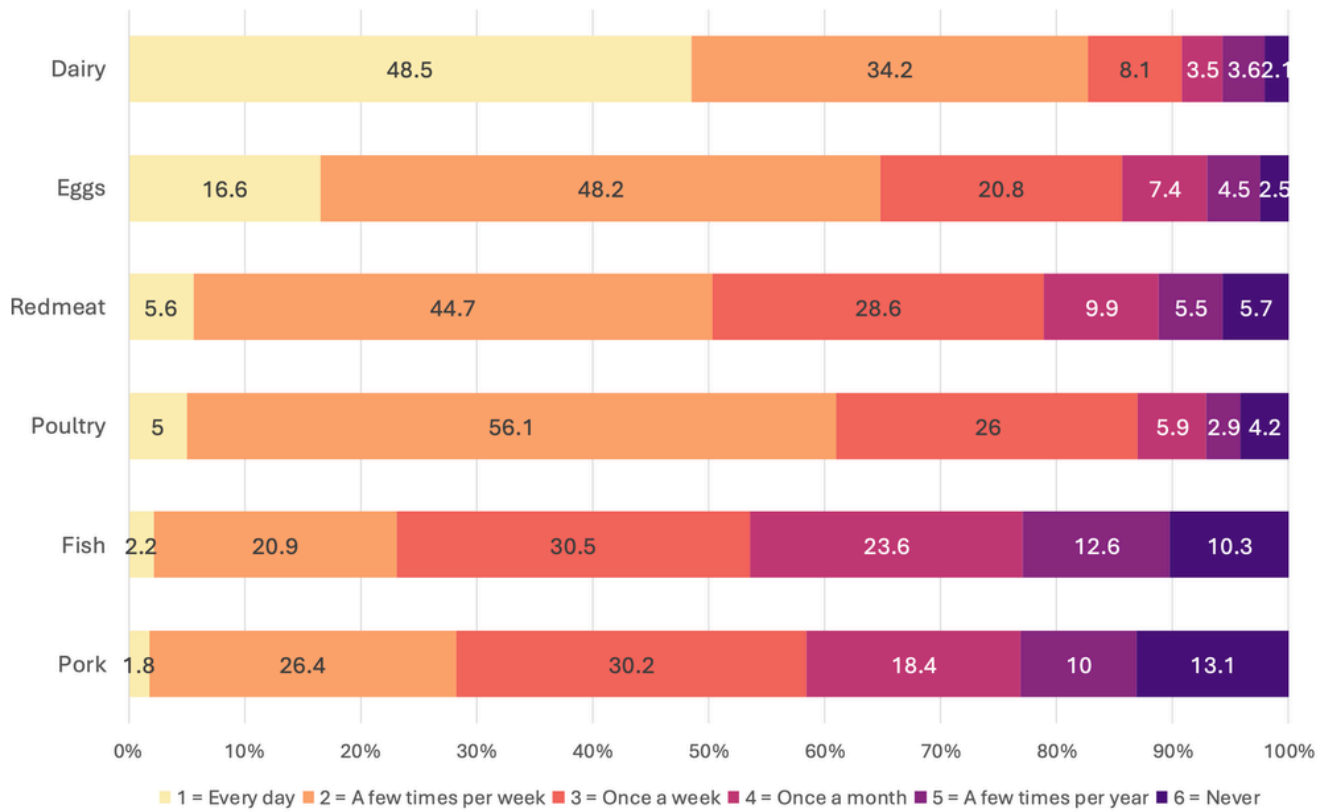


Figure 2: Frequency of eating animal sourced foods (n=5166).

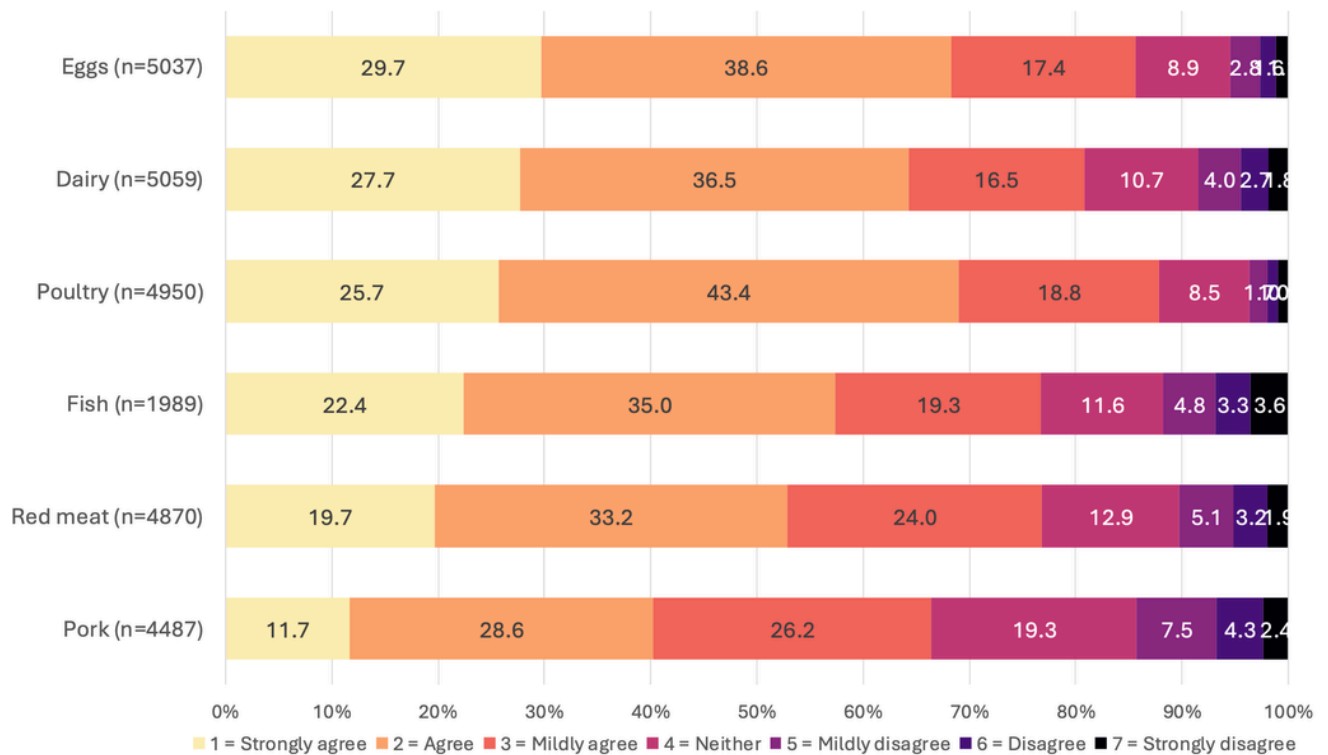


Figure 3: Perceived importance of eating animal sourced foods.

# General feelings of support or opposition

Survey respondents were provided a definition of cellular agriculture (see the “What is cellular agriculture?”), and they were then asked about their support or opposition toward cellular agriculture. A quarter of respondents (25%) said they neither support nor oppose cellular agriculture and 6% said “I don’t know.” Approximately 30% supported to some degree and 39% opposed to some degree.

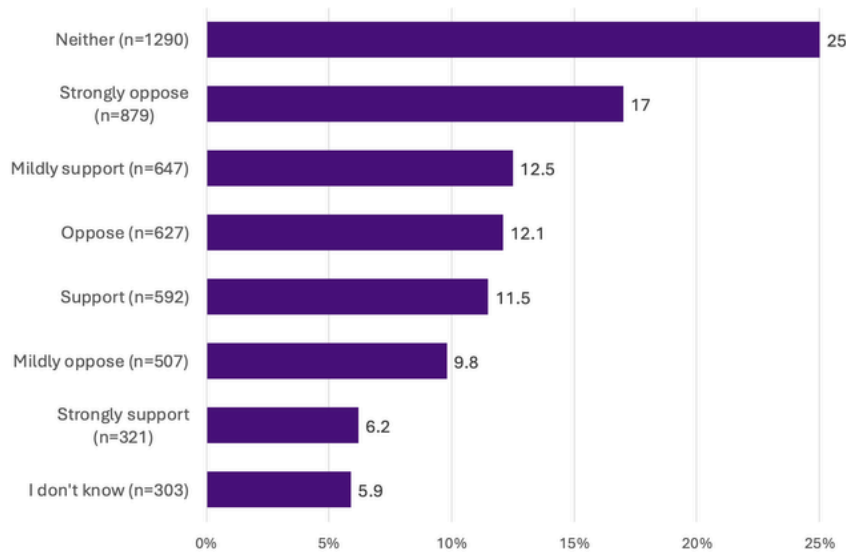


Figure 4: Initial support for or opposition to cellular agriculture (n=5166).

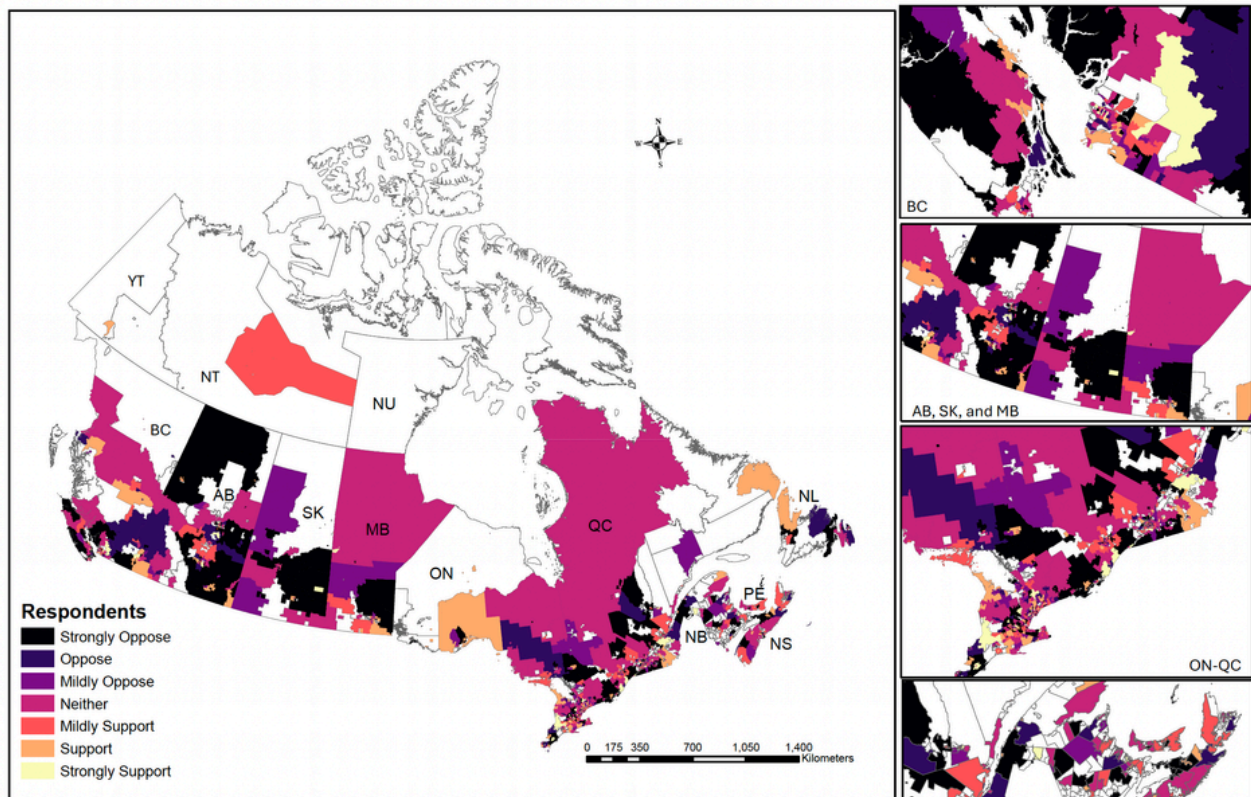


Figure 5: Mean initial support for or opposition to cellular agriculture, mapped by forward sorting area (first three characters of postal codes).

# Three example cellular agriculture products

In the survey, we offered three specific examples of cellular agriculture products:



**Ice cream** made by introducing cow DNA into yeast or other small organisms, so that the organisms can produce milk proteins to replace regular dairy proteins in an ice cream recipe



**Chicken nuggets** made by taking a sample of chicken cells, growing more protein cells, and then adding other ingredients (e.g., vegetable proteins) to make the nuggets



**Salmon fillets** made by taking a sample of salmon cells, and then using these cells to grow muscle fibers in a controlled environment to build a “fillet” or “steak”

## Are Canadians willingness to try or buy different cellular agriculture products?

Each respondent indicated the extent to which they agree or disagree with the following statements:

- “I would like to try \_\_\_\_ *at least once*,”
- “I would like to buy \_\_\_\_ *regularly* (i.e., at least once a month),” and
- “I would buy \_\_\_\_ *instead of the regular animal-based products*.”

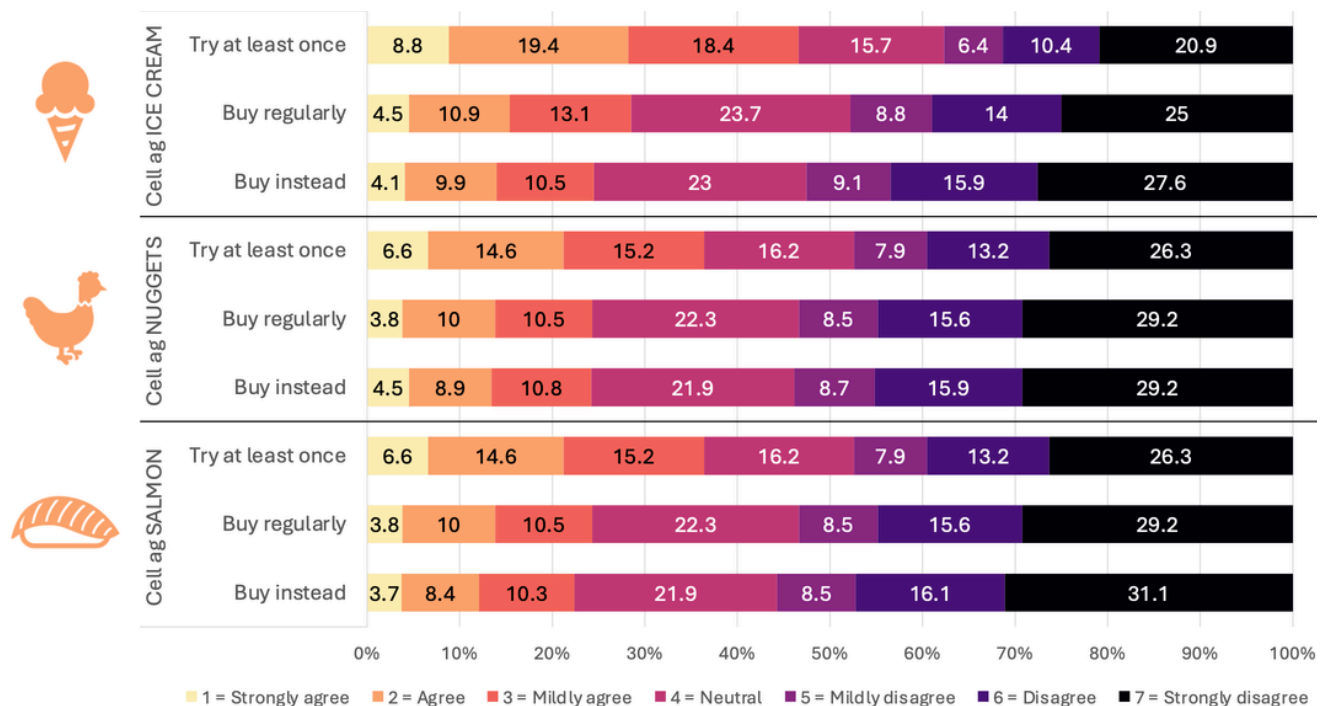


Figure 6: Comparing willingness to try and buy different cellular agriculture products (n=5166).

**Most positive:** Nearly half (47%) of respondents would like to try cellular agriculture ice cream.

**Most negative:** More than half (53-56%) *would not* buy a cellular agriculture product instead of its counterpart animal-based products. More than half (53%) would not buy cellular agriculture chicken nuggets or cell ag salmon regularly.

Using the mean responses for all three products, the most positive response was for willingness “to try at least once” (Mean = 4.29, SD = 1.89), followed by “buy regularly” (Mean = 4.34, SD = 1.76), and then “buy instead” (Mean = 4.88, SD = 1.76). A Friedman test revealed that these differences in means were statistically significant,  $\chi^2(2) = 1894.434, p < .001$ . Wilcoxon sign-rank tests supported the significance of differences with each pair.

- **Buy regularly (All products) < Try (All products)**,  $Z = -32.548, p < .001$
- **Buy instead (All products) < Try (All products)**,  $Z = -35.140, p < .001$
- **Buy instead (All products) < Buy regularly (All products)**,  $Z = -12.793, p < .001$

The order of responses and significance was the same for each product. For example, the most positive response was for cellular agriculture ice cream for willingness “to try at least once” (Mean = 3.56, SD = 1.86), followed by “buy regularly” (Mean = 3.65, SD = 1.69), and then “buy instead” (Mean = 3.58, SD = 1.88). A Friedman test revealed that these differences in means were statistically significant,  $\chi^2(2) = 1894.434, p < .001$ . Wilcoxon sign-rank tests supported the significance of differences with each pair.

- **Buy cellular agriculture ice cream regularly < Try cell ag ice cream**,  $Z = -30.794, p < .001$
- **Buy cellular agriculture ice cream instead < Try ice cream**,  $Z = -34.529, p < .001$
- **Buy cellular agriculture ice cream instead < Buy cell ag ice cream regularly**,  $Z = -11.735, p < .001$



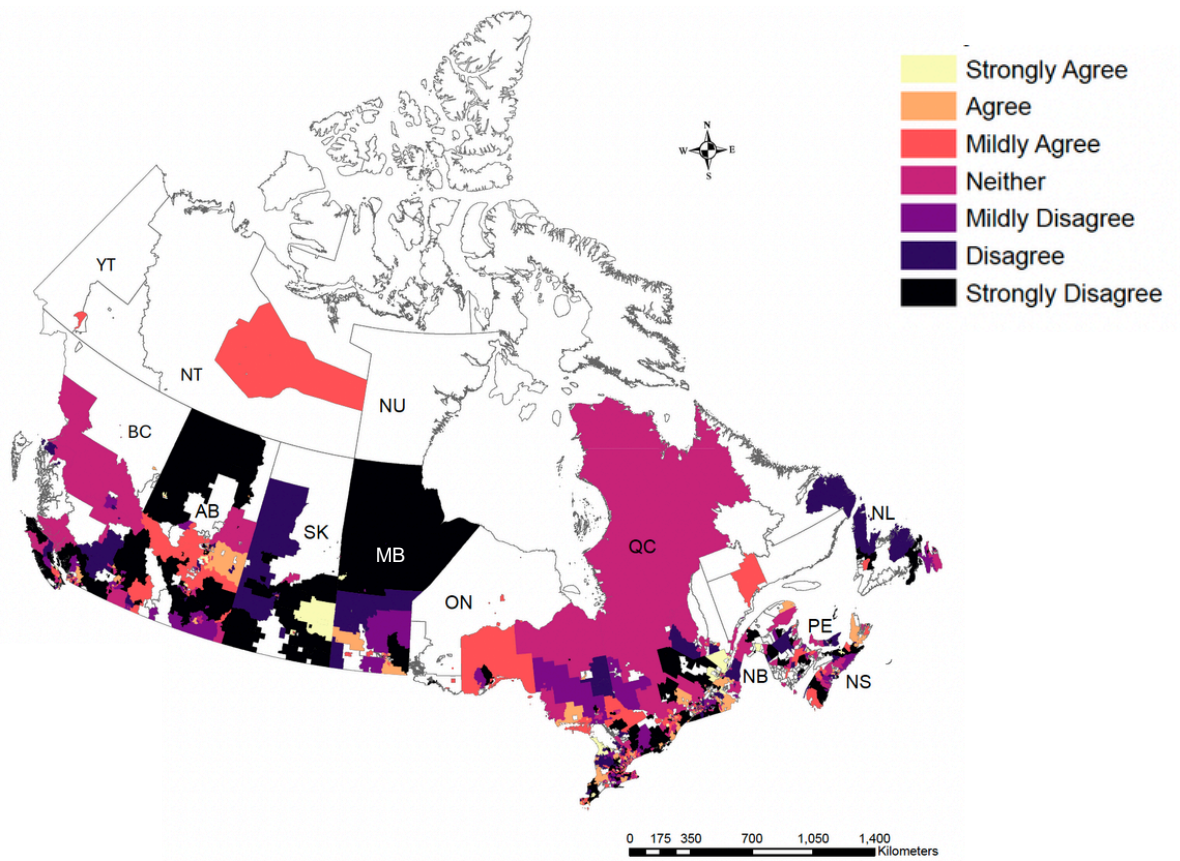
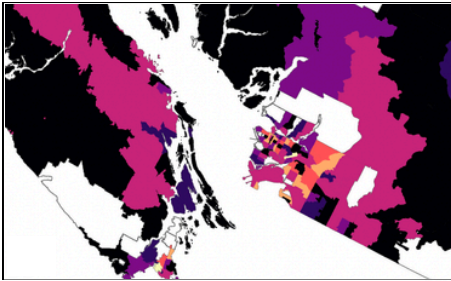
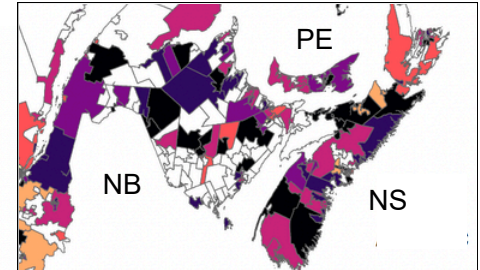


Figure 7: Mean willingness to try cellular agriculture products mapped by forward sorting area (first three characters of postal codes).

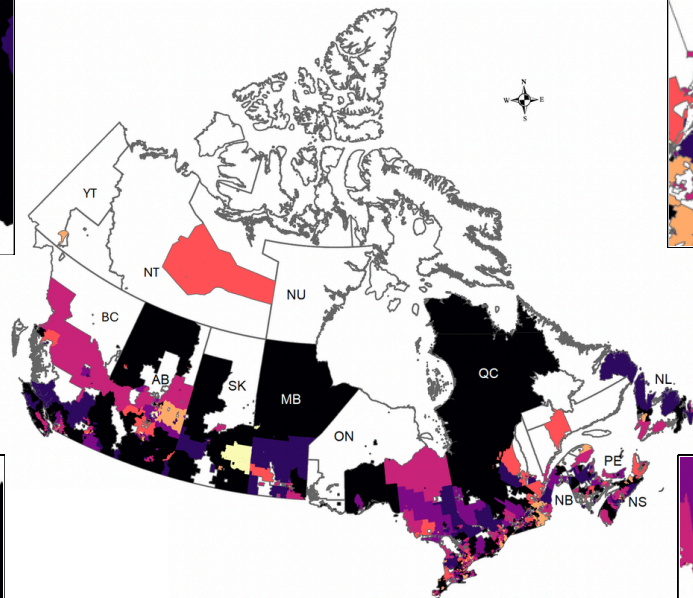
Southwestern British Columbia



Atlantic Provinces



Prairies Provinces



Southern Ontario and Southern Quebec

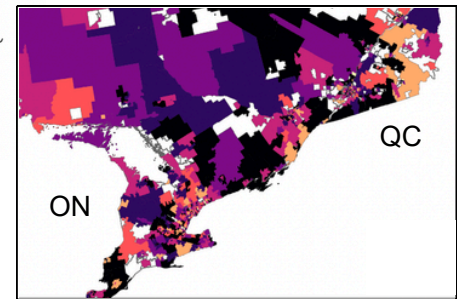


Figure 8: Mean willingness to buy cellular agriculture products regularly, mapped by forward sorting area, with inset maps for British Columbia, the Prairies, Ontario and Quebec, and the Atlantic Provinces

## How do the three products compare?

We tested five more acceptance statements for each of the three products. Altogether, there was a high degree of internal consistency across all 24 statements (Cronbach's alpha = .982), meaning that respondents who agreed with one statement were more likely to agree to others.

Overall, the responses were most favourable for cellular agriculture ice cream, followed by nuggets, then salmon. According to a Freidman test, the different level of willingness to try the three cellular agriculture products was statistically significant,  $\chi^2(2) = 531.819, p < .001$ . Further, the Wilcoxon sign-rank tests supported the significance of differences with each pair.

- Try cellular agriculture nuggets < Try cellular agriculture ice cream,  $Z = -14.686, p < .001$
- Try cellular agriculture salmon < Try cellular agriculture ice cream,  $Z = -21.490, p < .001$
- Try cellular agriculture salmon < Try cellular agriculture nuggets,  $Z = -10.762, p < .001$



### Cellular agriculture salmon:

- Comparing three geographic levels, **more people wanted cellular agriculture salmon to be developed internationally, followed by nationally, and least locally.**
- 36% of respondents **agree that cell ag salmon should not exist at all.**

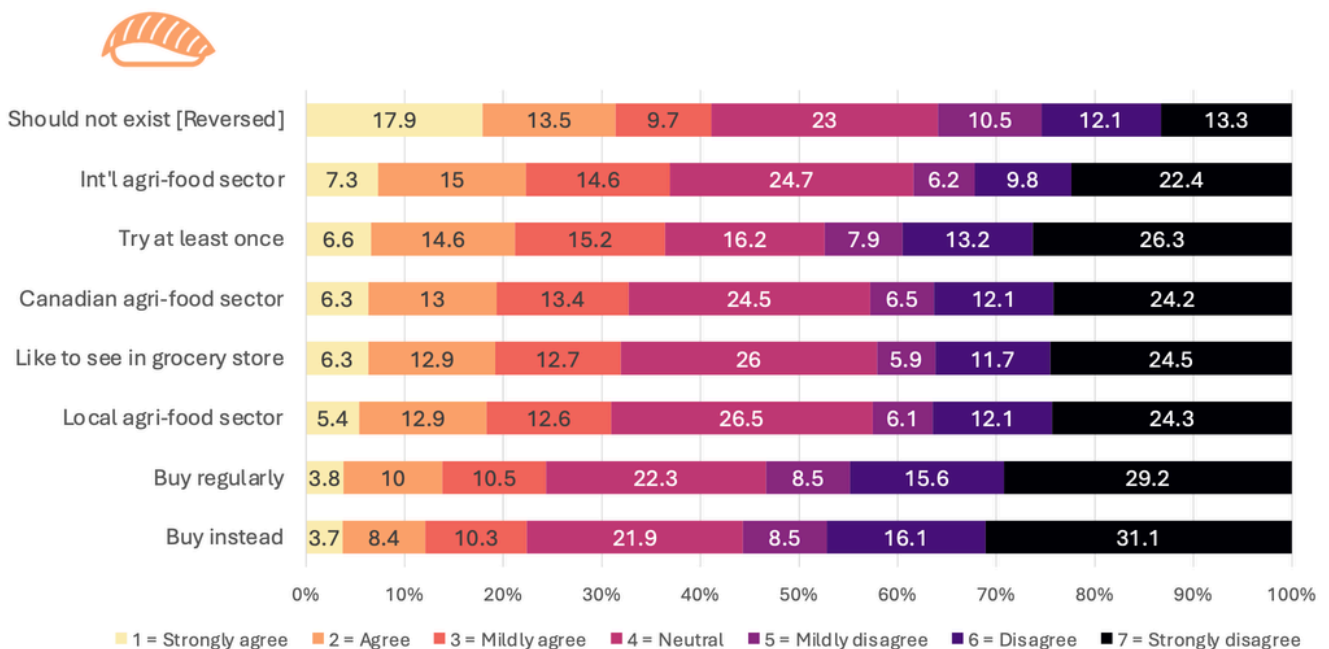





Figure 9: Comparing measures of acceptance for cellular agriculture salmon.

## What if cellular agriculture is cheaper or healthier?

In the acceptance questions above, we asked respondents to assume that the cellular agriculture products were equivalent in price and healthiness. We also tested if either factor impacted willingness to buy cellular agriculture products. The mean values for buy if cheaper or healthier were lower for each product, indicating the respondents were more likely to buy the cellular agriculture products if cheaper and healthier than their conventional animal-sourced counterparts.

**Table 3: Mean responses for willingness to buy cellular agriculture.**  
Yellow cells indicate more positive responses.

Perceptions of cellular agriculture		N	Mean	SD
	Try cellular agriculture ice cream	5166	4.06	(2.03)
	Buy cellular agriculture ice cream <u>regularly</u>	5166	4.64	(1.86)
	Buy cellular agriculture ice cream <u>instead</u>	5166	4.86	(1.87)
	Buy cellular agriculture ice cream <u>if it were cheaper</u>	5166	4.33	(1.98)
	Buy cellular agriculture ice cream <u>if it were healthier</u>	5166	4.15	(2.02)
	Try cellular agriculture salmon	5166	4.49	(2.02)
	Buy cellular agriculture salmon <u>regularly</u>	5166	4.85	(1.86)
	Buy cellular agriculture salmon <u>instead</u>	5166	4.96	(1.84)
	Buy cellular agriculture salmon <u>if it were cheaper</u>	5166	4.50	(1.99)
	Buy cellular agriculture salmon <u>if it were healthier</u>	5166	4.30	(2.02)
	Try cellular agriculture nuggets	5166	4.31	(2.04)
	Buy cellular agriculture nuggets <u>regularly</u>	5166	4.72	(1.89)
	Buy cellular agriculture nuggets <u>instead</u>	5166	4.86	(1.87)
	Buy cellular agriculture nuggets <u>if they were cheaper</u>	5166	4.38	(2.00)
	Buy cellular agriculture nuggets <u>if they were healthier</u>	5166	4.21	(2.03)

A Friedman test revealed that these differences in means were statistically significant,  $\chi^2(2) = 414.617, p < .001$ . Wilcoxon sign-rank tests supported the significance of differences with each pair. The most favourable option was to buy cellular agriculture ice cream if it were healthier than the regular animal sourced ice cream.

- **Buy cellular agriculture ice cream if cheaper < Buy cellular agriculture ice cream regularly,**  
 $Z = -15.467, p < .001$
- **Buy cellular agriculture ice cream if healthier < Buy cellular agriculture ice cream regularly,**  
 $Z = -22.641, p < .001$
- **Buy cellular agriculture ice cream if healthier < Buy cellular agriculture ice cream if cheaper,**  
 $Z = -12.000, p < .001$

The Friedman and Wilcoxon results for comparing cellular agriculture salmon and cellular agriculture nuggets reveal the same order of preferences.



## Opinions about cellular agriculture's ability to produce healthy, accessible, and sustainable food

We tested the level of agreement or disagreement with nine common points of contention about cellular agriculture. There was a high degree of internal consistency across the nine statements ( $\alpha = .906$ ), meaning that respondents who agreed with one statement were more likely to agree to others.

According to the means, respondents most agreed to the statement about food (in)security (Mean = 3.56, SD = 1.67), followed by animal welfare (Mean = 3.58, SD = 1.72), then sustainability (Mean = 3.65, SD = 1.67). For this analysis, the response scales for the two statements phrased negatively were reversed to maintain consistency in the data in terms of sentiment toward cellular agriculture. More than half of the respondents thought that cellular agriculture was "unnatural" (Mean = 4.80, SD = 1.74): 18% somewhat agreed, 19% agreed, and 21% strongly agreed.



Table 4: Mean responses for perceptions of cellular agriculture.

Perceptions of cellular agriculture	N	Mean	SD
<b>"Cellular agriculture will help resolve world hunger and food insecurity"</b>	5166	3.56	(1.86)
<b>"Cellular agriculture will improve <u>animal welfare</u>"</b>	5166	3.58	(1.88)
<b>"Cellular agriculture will make food production more <u>environmentally sustainable</u>"</b>	5166	3.65	(1.69)
<b>"Cellular agriculture will be a <u>viable alternative</u> to conventional animal-sourced foods."</b>	5166	3.76	(1.70)
<b>"Cellular agriculture will make protein products more <u>affordable</u>."</b>	5166	3.81	(1.63)
<b>"Cellular agriculture is <u>disrespectful to nature</u>."</b> [Reversed]	5166	4.02	(1.78)
<b>Cellular agriculture will produce <u>healthy</u> food products."</b>	5166	4.05	(1.64)
<b>"Cellular agriculture will produce <u>tasty</u> food products."</b>	5166	4.12	(1.59)
<b>"Cellular agriculture is <u>unnatural</u>."</b> [Reversed]	5166	4.8	(1.74)

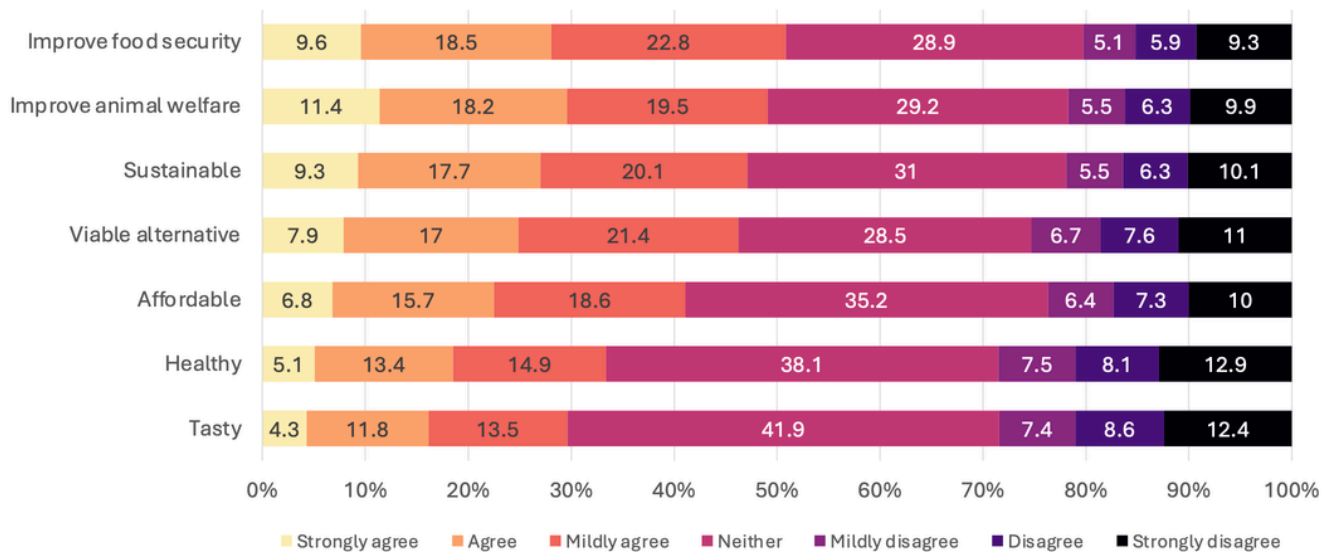


Figure 10: Comparing perceptions of cellular agriculture (n=5166).

## Ambivalence:

For each statement, the most frequent response was “neither agree nor disagree,” indicating a high degree of ambivalence about the future characteristics and impacts of cellular agriculture. More than one third are ambivalent for affordability, health, and tastiness. According to a Friedman test, the difference in responses to the perception statements was statistically significant,  $\chi^2(6) = 2064.524, p < .001$ . Further, the Wilcoxon sign-rank tests supported the significance ( $\leq .002$ ) of differences with all pairs except for Animal welfare – Food security. See Appendix for table with Wilcoxon results for each pair.

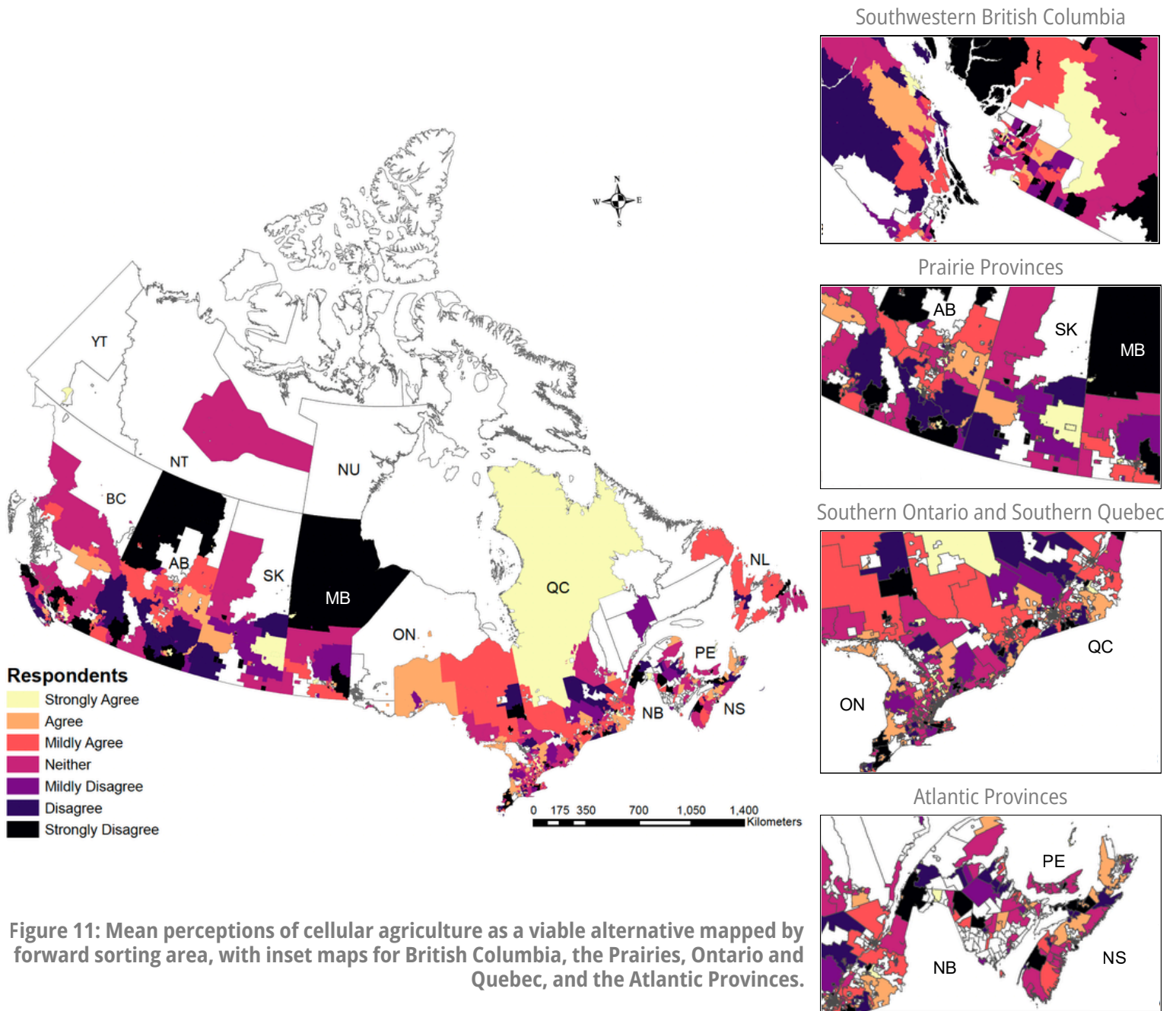


Figure 11: Mean perceptions of cellular agriculture as a viable alternative mapped by forward sorting area, with inset maps for British Columbia, the Prairies, Ontario and Quebec, and the Atlantic Provinces.

# Comfort with emerging food production technologies

We asked respondents to compare their comfort of cellular agriculture with other food innovations: “Compared to cellular agriculture, do you feel more or less comfortable with the following other food products?” Responses were recorded on a bi-polar scale from 1 = “Much less comfortable with \_\_\_ than cellular agriculture” to 7 = “Much more comfortable with \_\_\_ than cellular agriculture.” There was a neutral option as well (3 = Same level of comfort”). Higher mean values signify that more preferred the comparison food innovation to cellular agriculture.

Less than 30% of respondents were more comfortable with cellular agriculture than with vertical agriculture, plant-based protein burgers, and genetically modified rice. Over 40% of respondents were more comfortable with cellular agriculture than with genetically modified beef.

**Table 5: Mean responses for comparing comfort with other food innovations to comfort with cellular agriculture.**

Other food innovations	N	Mean	SD
“Vegetables grown indoors using artificial lights and nutrients, also called vertical agriculture”	5166	4.72	(1.62)
“Plant-based burger with mushroom protein”	5166	4.21	(1.68)
“Rice from genetically modified seeds to be more tolerant to drought”	4725	4.17	(1.58)
“Plant-based burger with soy protein”	4762	4.14	(1.69)
“Beef from genetically modified cows to reduce their greenhouse gas emissions”	4687	3.63	(1.62)



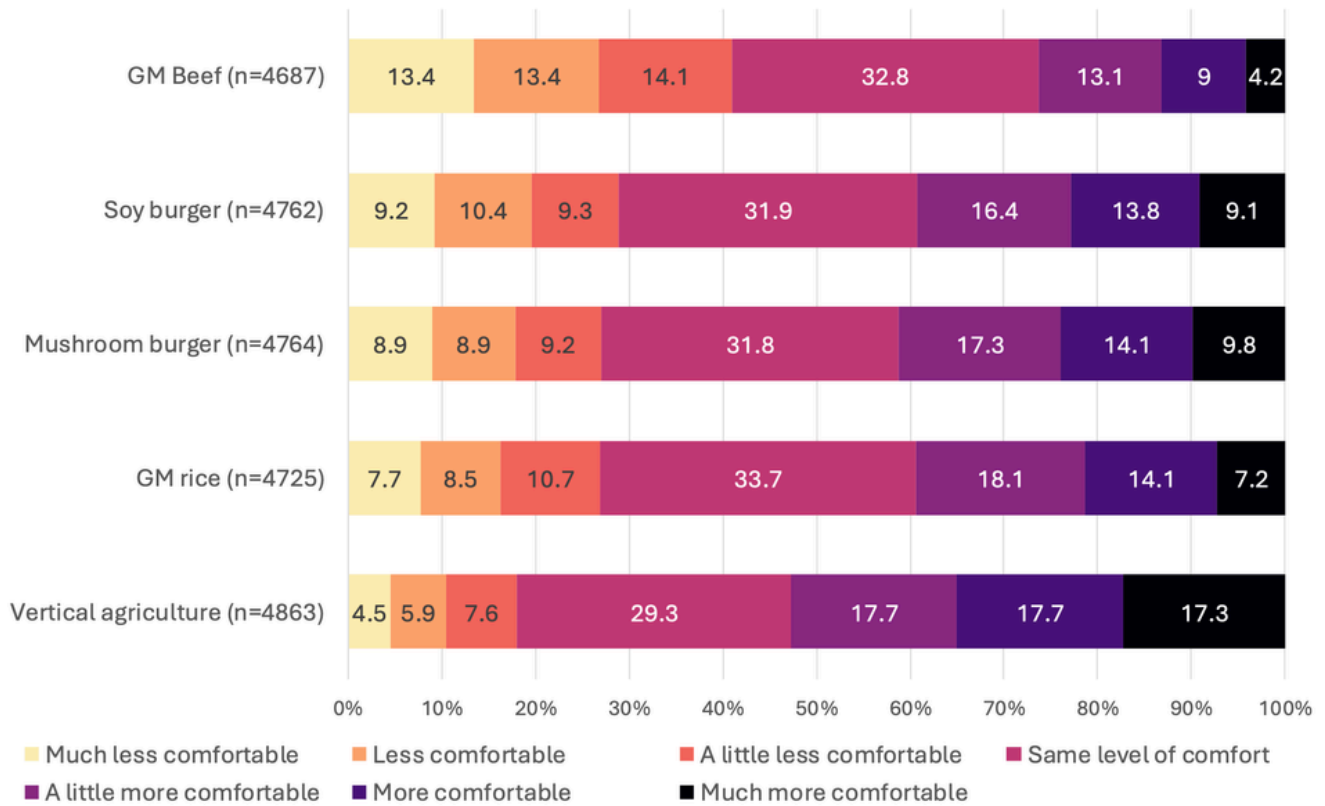


Figure 12: Comparing comfort with cellular agriculture to comfort with other food innovations.

## How do the other food innovations compare?

### Ambivalence:

For each product, the most frequent response was “same level of comfort,” indicating a high degree of ambivalence about the different food innovations. Approximately one third are ambivalent toward genetically modified rice and genetically modified cows.

### Most comfortable:

Over half (53%) of respondents are more comfortable with vertical agriculture compared to cellular agriculture. Between 39 and 41% of respondents were more comfortable with burgers with mushroom or soy protein and genetically modified rice. Over 40% of respondents were less comfortable with genetically modified beef than with cellular agriculture.

Each combination of the five comparisons has a positive Pearson’s Correlation value (2-tailed sig: < .001). The five statements exhibit a high level of internal consistency ( $\alpha = .804$ ). Still the differences in responses for each statement was statistically significant according to a Freidman test,  $\chi^2(4) = 1340.230, p < .001$ . All pairwise comparisons were strongly significant (< .001), other than genetically modified rice with either the soy burger or the mushroom burger. See Appendix for table with Wilcoxon results for each pair.

# What predicts someone's acceptance or perceptions of cellular agriculture?

## Perceptions of social and environmental issues

The strongest predictors of acceptance and positive perceptions of cellular agriculture are respondents' perceptions of social and environmental issues: the role of technology in society, trust actors to identify risks of technologies, corporate criticism, globalization, climate change urgency/ambivalence, and environmental impact of animal agriculture. The questions for these variables in our survey are adapted from other research on perceptions of novel technologies (e.g., Satterfield et al., 2023; Nawaz and Satterfield 2022; Hagerman et al., 2021). The results for each variable demonstrate positive Pearson's Correlation values (2-tailed sig: < .001) and internal consistency Cronbach's alpha tests ( $\alpha > .7$ ). The details of data reduction for these variables are in the Appendix.

### Acceptance of cellular agriculture products

Because the responses for the three different products were similar, mean values for each respondent's rating of the three cellular agriculture products were used in the analysis of social and environmental issues and cellular agriculture.

We ran a multiple regression to predict willingness to try cellular agriculture products from 8 factors about the role of technology in society, trust, corporate criticism, globalization, climate change urgency/ambivalence, and environmental impact of animal agriculture. These variables statistically significantly predicted willingness to try cellular agriculture products (other than corporate criticism). Together the model explained 30% of the variance. We tested the same 8 factors in a multiple linear regression for the willingness to buy cellular agriculture products regularly, which also explained 30% of the variance together. For both models, at least 5 factors are strongly statistically significant ( $p < .001$ ). See Figure 10 below for the effect and significance of each independent variable.

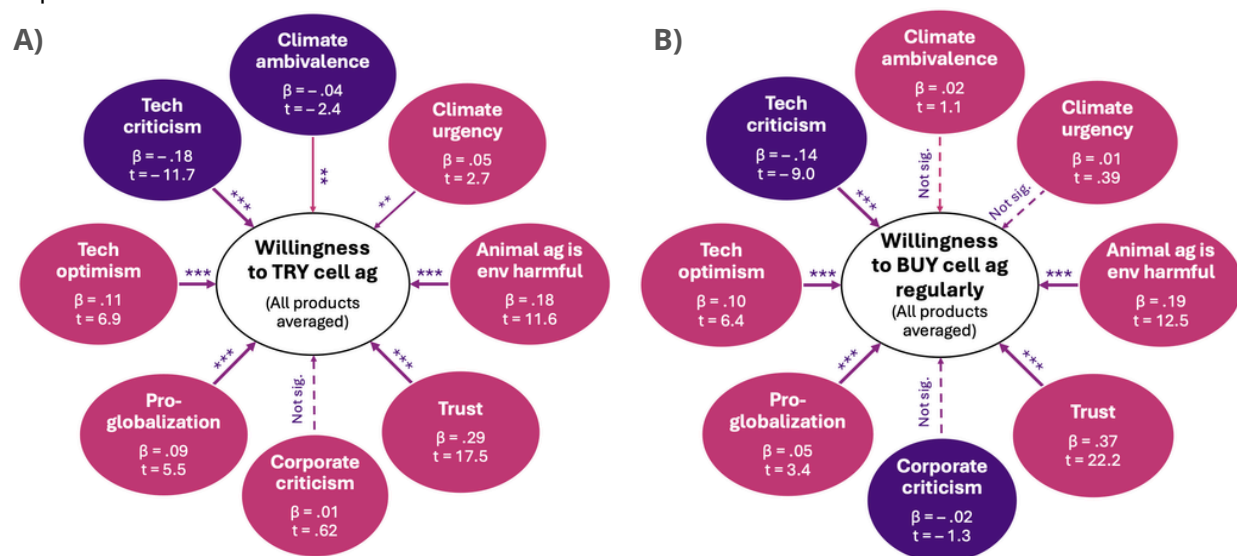


Figure 13: Representation of results from multiple linear regressions for cellular agriculture acceptance by A) willingness to try:  $F(8, 4064) = 219.413, p < .001, R^2 = .302$  and B) willingness to buy regularly:  $F(8, 4064) = 224.100, p < .001, R^2 = .306$ .

We also conducted separate analysis for each product using the mean responses for all acceptance statements. We evaluated the effect of perceptions on social and environmental issues on the acceptance of each cellular agriculture product separately, taking a mean of all 8 acceptance statements above (e.g., willingness to try, would like to see in local grocery store, etc.). These multiple linear regressions are also strongly significant ( $p < .001$ ), with the model explaining 32-34% of the variance. For each of the three models, at least 6 factors are strongly statistically significant ( $p < .001$ ). See Figure 11 below for the effect and significance of each independent variable.



Figure 14: Representation of results from multiple linear regressions for cellular agriculture acceptance by product: A) ice cream:  $F(8, 4064) = 258.20, p < .001, R^2 = .337$ ; B) salmon:  $F(8, 4064) = 238.198, p < .001, R^2 = .319$ ; and C) nuggets:  $F(8, 4064) = 247.155, p < .001, R^2 = .326$ .

## Perceptions of cellular agriculture

We ran multiple regressions to predict perceptions of the common contention that cellular agriculture is environmentally sustainable using the responses on the role of technology in society, trust, corporate criticism, globalization, climate change urgency/ambivalence, and environmental impact of animal agriculture as independent variables. All 8 variables had a statistically significant effect (with only one factor having a significance > .001). The analysis was then repeated for the response data on the other six common contentions. Statistical significance was found with each of the regression models, except for some models that used critical perceptions of corporate criticism and ambivalent or skeptical perceptions of the climate crises as independent variables. The results of all seven multiple regressions for perceptions of cellular agriculture are below.



Figure 15: Representation of results from multiple linear regressions for cellular agriculture perceptions. A) viable alternative:  $F(8, 4072) = 286.974, p < .001, R^2 = .361$ ; B) food security:  $F(8, 4072) = 231.573, p < .001, R^2 = .313$ ; C) sustainable:  $F(8, 4072) = 291.414, p < .001, R^2 = .363$ ; D) animal welfare:  $F(8, 4072) = 260.120, p < .001, R^2 = .339$

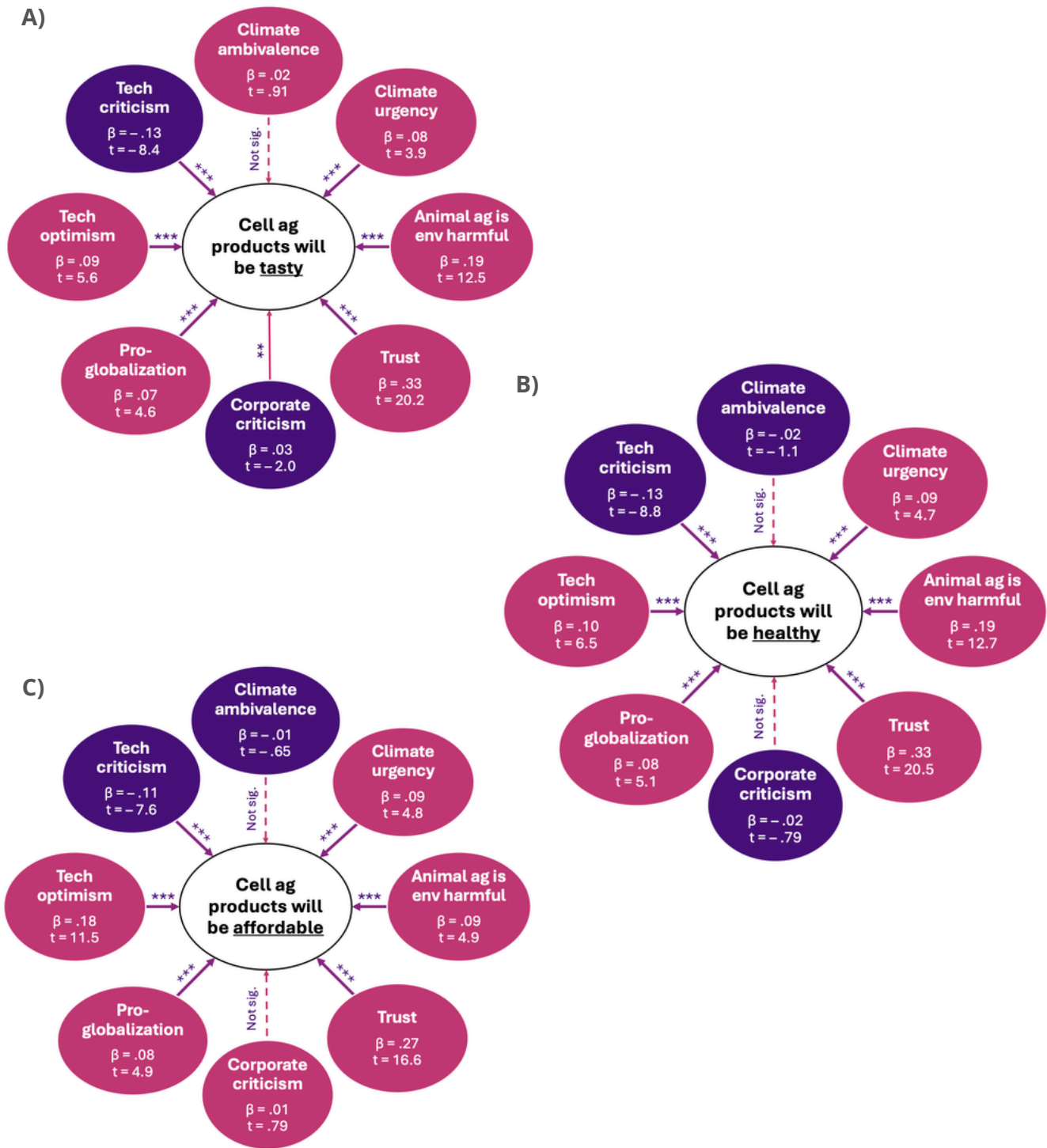


Figure 16: Representation of results from multiple linear regressions for cellular agriculture perceptions (continued). A) tasty:  $F(8, 4072) = 229.108, p < .001, R^2 = .311$ ; B) healthy:  $F(8, 4072) = 261.141, p < .001, R^2 = .340$ ; C) affordable:  $F(8, 4072) = 235.193, p < .001, R^2 = .316$ .

Table 6: Results of multiple linear regressions for the impact of perceptions of social and environmental issues on acceptance of and perceptions of cellular agriculture.

Dependent variable	Predictor variable	$\beta$	$t$	Sig.	$R^2$
<b>ACCEPTANCE</b>					
<b>Willing to try (All products)</b>  <i>F</i> (8, 4064) = 219.413, <i>p</i> < .001	Animal ag is env. harmful	0.18	11.6	< .001	0.302
	Trust	0.29	17.5	< .001	
	Corporate criticism	0.01	0.62		
	Pro-globalization	0.09	5.5	< .001	
	Technology optimism	0.11	6.9	< .001	
	Technology criticism	- 0.18	- 11.7	< .001	
	Climate change ambivalence	- 0.04	- 2.4	< .05	
	Climate change urgency	0.05	2.7	< .05	
<b>Willing to buy regularly (All products)</b>  <i>F</i> (8, 4064) = 224.100, <i>p</i> < .001	Animal ag is env. harmful	0.19	12.5	< .001	0.306
	Trust	0.37	22.2	< .001	
	Corporate criticism	- .02	- 1.3		
	Pro-globalization	0.05	3.4	< .001	
	Technology optimism	0.1	6.4	< .001	
	Technology criticism	- .14	- 9.0	< .001	
	Climate change ambivalence	0.02	1.1		
	Climate change urgency	0.01	0.39		
<b>Acceptance of cellular agriculture ice cream (Mean)</b>  <i>F</i> (8, 4064) = 258.20, <i>p</i> < .001	Animal ag is env. harmful	0.18	12.4	< .001	0.337
	Trust	0.33	20.2	< .001	
	Corporate criticism	- .00	- .20		
	Pro-globalization	0.08	5.2	< .001	
	Technology optimism	0.1	6.6	< .001	

	Technology criticism	– .14	– 9.0	< .001	
	Climate change ambivalence	0.02	1.1		
	Climate change urgency	0.01	0.39		
<b>Acceptance of cellular agriculture nuggets (Mean)</b> <i>F</i> (8, 4064) = 258.20, <i>p</i> < .001	Animal ag is env. harmful	0.18	12.4	< .001	0.337
	Trust	0.33	20.2	< .001	
	Corporate criticism	– .00	– .20		
	Pro-globalization	0.08	5.2	< .001	
	Technology optimism	0.1	6.6	< .001	
	Technology criticism	– .14	– 12.3	< .001	
	Climate change ambivalence	– .06	– 3.5		
	Climate change urgency	0.01	0.39		
<b>Acceptance of cellular agriculture salmon (Mean)</b> <i>F</i> (8, 4064) = 258.20, <i>p</i> < .001	Animal ag is env. harmful	0.18	12.4	< .001	0.337
	Trust	0.33	20.2	< .001	
	Corporate criticism	– .00	– .20		
	Pro-globalization	0.08	5.2	< .001	
	Technology optimism	0.1	6.6	< .001	
	Technology criticism	– .14	– 12.3	< .001	
	Climate change ambivalence	– .06	– 3.5		
	Climate change urgency	0.01	0.39		
<b>PERCEPTIONS</b>					
<b>Cellular agriculture will be a viable alternative</b> <i>F</i> (8, 4072) = 258.20, <i>p</i> < .001	Animal ag is env. harmful	0.17	11.8	< .001	
	Trust	0.28	18.1	< .001	
	Corporate criticism	0.01	0.66		
	Pro-globalization	0.08	5.5	< .001	
	Technology optimism	0.16	10.5	< .001	

	Climate change ambivalence	-.06	-3.5	<.001	
	Climate change urgency	0.11	5.6	<.001	
<b>Cellular agriculture will be environmentally sustainable</b> <i>F(8, 4072) = 291.414, p &lt; .001</i>	Animal ag is env. harmful	0.19	11.1	<.001	0.363
	Trust	0.28	17.8	<.001	
	Corporate criticism	0.03	1.7	<.1	
	Pro-globalization	0.09	6.1	<.001	
	Technology optimism	0.15	10.2	<.001	
	Technology criticism	-.17	-11.3	<.001	
	Climate change ambivalence	-.06	-3.9	<.001	
	Climate change urgency	0.11	5.8	<.001	
<b>Cellular agriculture will improve food security</b> <i>F(8, 4072) = 231.573, p &lt; .001</i>	Animal ag is env. harmful	0.09	5.8	<.001	0.313
	Trust	0.25	15.1	<.001	
	Corporate criticism	-.00	-.01		
	Pro-globalization	0.08	5.3	<.001	
	Technology optimism	0.19	12	<.001	
	Technology criticism	-.11	-7.3	<.001	
	Climate change ambivalence	-.06	-3.6	<.001	
	Climate change urgency	0.14	7	<.001	
<b>Cellular agriculture will improve animal welfare</b> <i>F(8, 4072) = 260.120, p &lt; .001</i>	Animal ag is env. harmful	0.19	12.5	<.001	0.339
	Trust	0.24	14.6	<.001	
	Corporate criticism	-.02	-.79	<.1	
	Pro-globalization	0.08	5.1	<.001	
	Technology optimism	0.18	11.6	<.001	
	Technology criticism	-.13	-8.7	<.001	
	Climate change ambivalence	-.07	-4.0	<.001	

	Climate change urgency	0.11	5.7	< .001	
<b>Cellular agriculture products will be <u>tasty</u></b> <i>F(8, 4072) = 229.108, p &lt; .001</i>	Animal ag is env. harmful	0.19	12.5	< .001	0.311
	Trust	0.33	20.2	< .001	
	Corporate criticism	-.03	-2.0	< .05	
	Pro-globalization	0.07	4.6	< .001	
	Technology optimism	0.09	5.6	< .001	
	Technology criticism	-.13	-8.4	< .001	
	Climate change ambivalence	0.02	0.91		
	Climate change urgency	0.08	3.9	< .001	
<b>Cellular agriculture products will be <u>healthy</u></b> <i>F(8, 4072) = 261.141, p &lt; .001</i>	Animal ag is env. harmful	0.19	12.7	< .001	0.340
	Trust	0.33	20.5	< .001	
	Corporate criticism	-.02	-.79		
	Pro-globalization	0.08	5.1	< .001	
	Technology optimism	0.1	6.5	< .001	
	Technology criticism	-.13	-8.8	< .001	
	Climate change ambivalence	0.02	1.1		
	Climate change urgency	0.09	4.7	< .001	
<b>Cellular agriculture products will be <u>affordable</u></b> <i>F(8, 4072) = 235.193, p &lt; .001</i>	Animal ag is env. harmful	0.09	4.9	< .001	0.316
	Trust	0.27	16.6	< .001	
	Corporate criticism	0.01	0.79		
	Pro-globalization	0.08	4.9	< .001	
	Technology optimism	0.18	11.5	< .001	
	Technology criticism	-.11	-7.6	< .001	
	Climate change ambivalence	-.01	-.65		
	Climate change urgency	0.09	4.8	< .001	

## Eating habits

Responses about the frequencies of eating different types of animal-sourced foods (dairy, eggs, poultry, pork, red meat, and fish) were all strongly positively correlated with one another (Pearson Correlation, 2-tailed:  $< .001$ ) and somewhat internally consistent ( $\alpha = .667$ ). Stated degrees of importance of animal-sourced foods to the respondents' diets were all strongly positively correlated with one another (Pearson Correlation, 2-tailed:  $< .001$ ) and internally consistent ( $\alpha = .804$ ).

### Acceptance of cellular agriculture products

We conducted multiple linear regressions to test the effect of how frequently people eat animal-sourced foods and their perceived importance on product acceptance. We evaluated the effect of eating habits and perceived importance on the acceptance of each cellular agriculture product separately, taking a mean of all 8 acceptance statements above (e.g., willingness to try, would like to see in local grocery store, etc.). We also conducted multiple linear regressions for the willingness to try and willingness to buy regularly for each of the three products.

While these multiple linear regressions were strongly ( $< .001$ ) or somewhat ( $< .05$ ) statically significant, they had small  $R^2$  values, exhibiting weak predictive power. The best predictors of cellular agriculture acceptance based on eating habits and perceived importance of animal-sourced foods were for cellular agriculture salmon. Still, this regression only explained 5-7% of the variance in responses. Positive  $\beta$  values indicate that acceptance increases at the same time as frequency of eating or perceived importance of animal-sourced foods (e.g., people who eat fish more frequently are more likely to have higher levels of acceptance of cellular agriculture salmon).

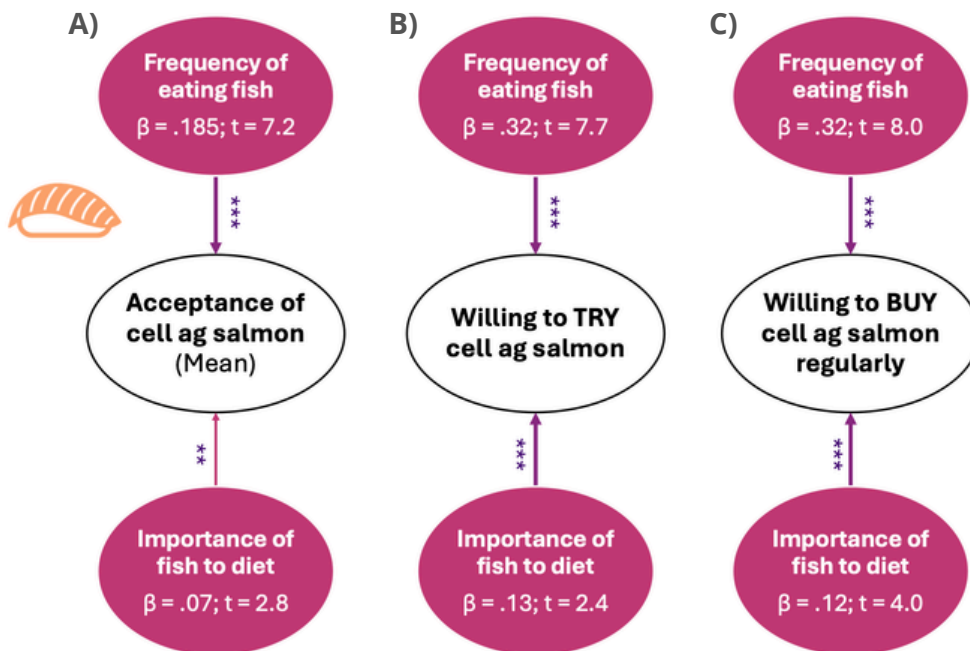


Figure 17: Representation of results from multiple linear regression for acceptance of cellular agriculture salmon products. A) acceptance (mean):  $F(2, 1986) = 55.709, p < .001, R^2 = .053$ ; B) willing to try:  $F(2, 1986) = 73.594, p < .001, R^2 = .069$ ; C) willing to buy regularly:  $F(2, 1986) = 76.917, p < .001, R^2 = .072$ .

## Perceptions of cellular agriculture

We conducted multiple linear regressions to test the effect of how frequently people eat animal-sourced foods on perceptions of the common contentions about cellular agriculture. These variables statistically significantly predicted willingness to try cellular agriculture products and explained 2-3% of the variance. The results of these regressions are in Table 7, and two examples of the regressions are illustrated in Figure 15 (i.e., cellular agriculture will improve food security and cellular agriculture products will be tasty).

Across all regressions, the frequency of eating red meat was a strongly significant ( $< .001$ ) negative predictor of cellular agriculture perceptions. This means that people who eat red meat more frequently are more likely to disagree with the perceptions statements. The frequency of eating other types of animal-sourced foods mostly had a positive effect on the perceptions of common contentions about cellular agriculture, except for dairy products and poultry for perceptions of cellular agriculture products as tasty.

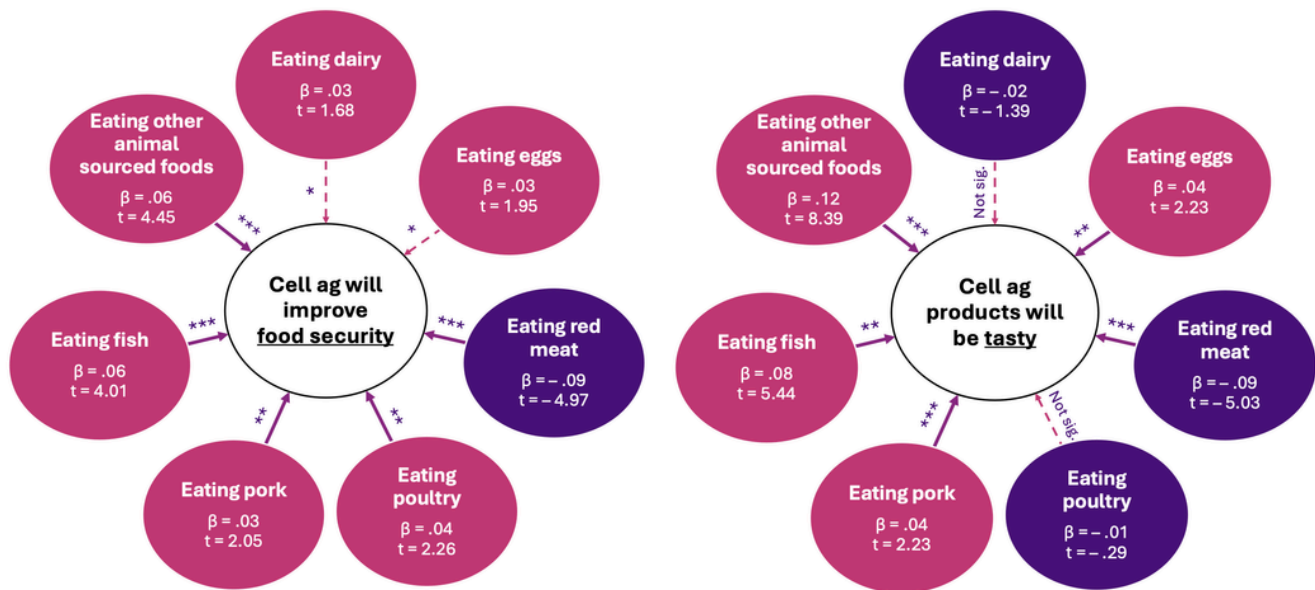


Figure 18: Representation of results from multiple linear regressions for cellular agriculture perceptions and diet. A) food security:  $F(8, 4072) = 231.573, p < .001, R^2 = .017$ ; B) tasty:  $F(7, 5164) = 23.240, p < .001, R^2 = .031$ .



Table 7: Results of multiple linear regressions for the impact of frequencies of eating animal sourced foods on acceptance and perceptions of cellular agriculture. Variance explained for poultry and dairy on respective cellular agriculture products were less than 1%.

Dependent variable	Predictor variables	$\beta$	$t$	Sig.	$R^2$
<b>ACCEPTANCE</b>					
<b>Willing to try (All products)</b> $F(7, 5164) = 37.572, p < .001$	Dairy, <i>frequency of eating</i>	0.01	0.65		0.049
	Eggs, <i>frequency of eating</i>	0.04	2.43	< .05	
	Red meat, <i>frequency of eating</i>	-.09	- 4.93	< .001	
	Poultry, <i>frequency of eating</i>	0.04	2.34	< .05	
	Pork, <i>frequency of eating</i>	0.05	3.39	< .001	
	Fish, <i>frequency of eating</i>	0.13	8.6	< .001	
	Other, <i>frequency of eating</i>	0.12	8.28	< .001	
<b>Willing to buy regularly (All products)</b> $F(7, 5164) = 48.097, p < .001$	Dairy, <i>frequency of eating</i>	-.02	- 1.61		0.061
	Eggs, <i>frequency of eating</i>	0.05	3.5	< .001	
	Red meat, <i>frequency of eating</i>	-.06	- 3.69	< .001	
	Poultry, <i>frequency of eating</i>	0.01	0.47		
	Pork, <i>frequency of eating</i>	0.04	2.56	< .05	
	Fish, <i>frequency of eating</i>	0.14	9.07	< .001	
	Other, <i>frequency of eating</i>	0.16	11.21	< .001	
<b>Acceptance of cell ag salmon (Mean)</b> $F(2, 1986) = 55.709, p < .001$	Fish, <i>frequency of eating</i>	0.19	7.2	< .001	0.053
	Fish, <i>perceived importance to diet</i>	0.07	2.8	< .05	
<b>Willing to try cell ag salmon</b> $F(2, 1986) = 73.594, p < .001$	Fish, <i>frequency of eating</i>	0.32	7.7	< .001	0.069
	Fish, <i>perceived importance to diet</i>	0.13	2.4	< .001	
<b>Willing to buy cell ag salmon regularly</b> $F(2, 1986) = 76.917, p < .001$	Fish, <i>frequency of eating</i>	0.32	8	< .001	0.072
	Fish, <i>perceived importance to diet</i>	0.12	4	< .001	

Dependent variable	Predictor variables	$\beta$	$t$	Sig.	$R^2$
<b>PERCEPTIONS</b>					
<b>Cellular agriculture will be a <u>viable alternative</u></b> <i>F(7, 5164) = 15.430, p &lt; .001</i>	Dairy, <i>frequency of eating</i>	0.02	1.5		0.021
	Eggs, <i>frequency of eating</i>	0.02	1.38		
	Red meat, <i>frequency of eating</i>	-.12	- 6.75	< .001	
	Poultry, <i>frequency of eating</i>	0.05	2.67	< .01	
	Pork, <i>frequency of eating</i>	0.04	2.67	< .01	
	Fish, <i>frequency of eating</i>	0.06	4.21	< .001	
	Other, <i>frequency of eating</i>	0.07	5.11	< .001	
<b>Cellular agriculture will be <u>environmentally sustainable</u></b> <i>F(7, 5164) = 13.254, p &lt; .001</i>	Dairy, <i>frequency of eating</i>	0.04	2.55	< .05	0.018
	Eggs, <i>frequency of eating</i>	0.01	0.36		
	Red meat, <i>frequency of eating</i>	-.10	- 5.81	< .001	
	Poultry, <i>frequency of eating</i>	0.04	2.58	< .01	
	Pork, <i>frequency of eating</i>	0.02	1.24		
	Fish, <i>frequency of eating</i>	0.07	4.3	< .001	
	Other, <i>frequency of eating</i>	0.07	5.08	< .001	
<b>Cellular agriculture will <u>improve food security</u></b> <i>F(8, 4072) = 231.573, p &lt; .001</i>	Dairy, <i>frequency of eating</i>	0.03	1.68	< .1	0.017
	Eggs, <i>frequency of eating</i>	0.03	1.95	< .1	
	Red meat, <i>frequency of eating</i>	-.09	- 4.97	< .001	
	Poultry, <i>frequency of eating</i>	0.04	2.26	< .05	
	Pork, <i>frequency of eating</i>	0.03	2.05	< .05	
<b>Cellular agriculture will <u>improve animal welfare</u></b> <i>F(7, 5164) = 11.617, p &lt; .001</i>	Dairy, <i>frequency of eating</i>	0.02	1.44		0.016
	Eggs, <i>frequency of eating</i>	0.01	0.67		
	Red meat, <i>frequency of eating</i>	-.08	- 4.36	< .001	

	Poultry, <i>frequency of eating</i>	0.02	1.28		
	Pork, <i>frequency of eating</i>	0.01	0.41		
	Fish, <i>frequency of eating</i>	0.06	3.89	< .001	
	Other, <i>frequency of eating</i>	0.09	6.09	< .001	
<b>Cellular agriculture products will be <u>tasty</u>.</b>  $F(7, 5164) = 23.240, p < .001$	Dairy, <i>frequency of eating</i>	-.02	- 1.39		0.031
	Eggs, <i>frequency of eating</i>	0.04	2.32	< .05	
	Red meat, <i>frequency of eating</i>	-.09	- 5.03	< .001	
	Poultry, <i>frequency of eating</i>	-.01	- 0.29		
	Pork, <i>frequency of eating</i>	0.04	2.23	< .05	
	Fish, <i>frequency of eating</i>	0.08	5.44	< .001	
	Other, <i>frequency of eating</i>	0.12	8.39	< .001	
<b>Cellular agriculture products will be <u>healthy</u>.</b>  $F(7, 5164) = 14.321, p < .001$	Dairy, <i>frequency of eating</i>	0	- 0.20		0.019
	Eggs, <i>frequency of eating</i>	0.01	0.91		
	Red meat, <i>frequency of eating</i>	-.08	- 4.52	< .001	
	Poultry, <i>frequency of eating</i>	0.01	0.51		
	Pork, <i>frequency of eating</i>	0.05	3.14	< .01	
	Fish, <i>frequency of eating</i>	0.07	4.36	< .001	
	Other, <i>frequency of eating</i>	0.09	6.19	< .001	
<b>Cellular agriculture products will be <u>affordable</u>.</b>  $F(7, 5164) = 20.418, p < .001$	Dairy, <i>frequency of eating</i>	-.01	- 0.55		0.027
	Eggs, <i>frequency of eating</i>	0.05	2.89	< .01	
	Red meat, <i>frequency of eating</i>	-.08	- 4.56	< .001	
	Poultry, <i>frequency of eating</i>	0.04	2.04	< .05	
	Pork, <i>frequency of eating</i>	0.01	0.41		
	Fish, <i>frequency of eating</i>	0.08	5.09	< .001	
	Other, <i>frequency of eating</i>	0.11	7.58	< .001	

## Diets

### Acceptance of cellular agriculture products

Respondents selected all diets or cultural food practices with which they identified. Diets were recorded and analyzed as binary (yes or no) variables. For each of the diets (i.e., halal, kosher, organic, paleo, plant-based, vegan, and vegetarian), there were somewhat or strongly significant results for being *more willing* to try or buy some cellular agriculture products on average. Those who did not identify with any diets were *less willing* to try or buy cellular agriculture products on average.

**Table 8: Results of Mann-Whitney U tests comparing acceptance of cellular agriculture for those with and without a special diet. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
<b>Willing to try cell ag ice cream</b>	Special diet	1903	3.85	(2.02)	2426.99	- 5.844	< .001
	No special diet	3263	4.18	(2.02)	2674.78		
<b>Willing to try cell ag salmon</b>	Special diet	1903	4.27	(2.01)	2421.98	- 6.042	< .001
	No special diet	3263	4.62	(2.01)	2677.7		
<b>Willing to try cell ag nuggets</b>	Special diet	1903	4.13	(2.01)	2457.37	- 4.710	< .001
	No special diet	3263	4.41	(2.03)	2657.06		
<b>Willing to try (All products)</b>	Special diet	1903	4.08	(1.86)	2427.81	- 5.76	< .001
	No special diet	3263	4.40	(1.90)	2674.3		
<b>Willing to buy regularly (All products)</b>	Special diet	1903	4.40	(1.81)	2309.76	- 10.175	< .001
	No special diet	3263	4.93	(1.70)	2743.15		

In the table below, each statistical test labelled as “more willing” exhibited a lower mean rank from the Mann-Whitney U test, meaning (on average) respondents indicated a value closer to the lower end of the scale (i.e., 1 = strongly agree). For example, respondents who eat a Halal diet were more willing to try cellular agriculture ice cream (Mean rank for Halal: 2249, n=377; Mean rank for not Halal: 2610, n=4789), more willing to try cellular agriculture salmon (Mean rank for Halal: 2249, n=377; Mean rank for not Halal: 2610, n=4789), and more willing to try cellular agriculture chicken nuggets (Mean rank for Halal: 2249, n=377; Mean rank for not Halal: 2610, n=4789).

Table 9: Summary of Mann-Whitney U tests results for cellular agriculture acceptance for respondents with different diets. Note: There were no significant results of these tests for respondents with vegan diets. [Blank cells do not have significant results].

Dependent variables	Halal (n=377)	Kosher (n=135)	Organic (n=729)	Paleo (n=73)	Plant-based (n=228)	Vegetarian (n=224)	No special diet (n=3263)
Willing to try cell ag <u>ice cream</u>	*** More willing	** More willing	*** More willing		*** More willing	** More willing	*** <u>Less</u> willing
Willing to try cell ag <u>salmon</u>	*** More willing	** More willing	*** More willing		*** More willing		*** <u>Less</u> willing
Willing to try cell ag <u>nuggets</u>	*** More willing	** More willing	*** More willing		*** More willing	* <u>Less</u> willing	*** <u>Less</u> willing
Willing to try - all	*** More willing		*** More willing	*** More willing	*** More willing		*** <u>Less</u> willing
Willing to buy reg. - all	*** More willing	*** More willing	*** More willing	*** More willing	*** More willing		*** <u>Less</u> willing



## Perceptions of cellular agriculture

We tested all diets with perceptions of cellular agriculture. Much like acceptance, those who did not identify with any diets had *less* positive views (e.g., more likely to disagree with the statements about cellular agriculture being a viable alternative, sustainable, etc.).

**Table 10: Results of Mann-Whitney U tests comparing perceptions of cellular agriculture for those with and without a special diet. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
<b>Cellular agriculture will be a <u>viable alternative</u></b>	Special diet	1903	3.57	(1.71)	2405.2	- 6.699	< .001
	No special diet	3263	3.87	(1.69)	2687.49		
<b>Cellular agriculture will be <u>env. sustainable</u></b>	Special diet	1903	3.51	(1.71)	2447.9	- 5.109	< .001
	No special diet	3263	3.73	(1.67)	2662.58		
<b>Cellular agriculture will improve <u>food security</u></b>	Special diet	1903	3.45	(1.68)	2476.01	- 4.046	< .001
	No special diet	3263	3.62	(1.65)	2646.19		
<b>Cellular agriculture will improve <u>animal welfare</u></b>	Special diet	1903	3.38	(1.73)	2396.73	- 7.020	< .001
	No special diet	3263	3.94	(1.71)	2692.42		
<b>Cellular agriculture products will be <u>tasty</u></b>	Special diet	1903	3.89	(1.66)	2372.98	- 8.082	< .001
	No special diet	3263	4.25	(1.53)	2706.28		
<b>Cellular agriculture products will be <u>healthy</u></b>	Special diet	1903	3.88	(1.70)	2416.11	- 6.369	< .001
	No special diet	3263	4.16	(1.60)	2681.13		
<b>Cellular agriculture products will be <u>affordable</u></b>	Special diet	1903	3.57	(1.64)	2359.75	- 8.475	< .001
	No special diet	3263	3.94	(1.60)	2713.99		

Table 11: Significance of Mann-Whitney U tests results for cellular agriculture acceptance for respondents with different diets. Note: There were no significant results of these tests for respondents with vegan diets. [Blank cells do not have significant results]

Dependent variables	Halal (n=377)	Kosher (n=135)	Organic (n=729)	Paleo (n=73)	Plant-based (n=228)	Vegetarian (n=224)	No special diet (n=3263)
<b>Viable alternative</b>	** More likely to agree		*** More likely to agree	*** More likely to agree	*** More likely to agree	** More likely to agree	*** Less likely to agree
<b>Env. sustainable</b>			** More likely to agree	*** More likely to agree	*** More likely to agree		*** Less likely to agree
<b>Improve food security</b>			** More likely to agree	*** More likely to agree	*** More likely to agree		*** Less likely to agree
<b>Improve animal welfare</b>			*** More likely to agree	*** More likely to agree	*** More likely to agree	** More likely to agree	*** Less likely to agree
<b>Tasty</b>	*** More likely to agree	** More likely to agree	*** More likely to agree	*** More likely to agree	*** More likely to agree	** More likely to agree	*** Less likely to agree
<b>Healthy</b>	** More likely to agree	** More likely to agree	** More likely to agree	*** More likely to agree	*** More likely to agree		*** Less likely to agree
<b>Affordable</b>	*** More likely to agree	** More likely to agree	*** More likely to agree	*** More likely to agree	*** More likely to agree	* More likely to agree	*** Less likely to agree

## Familiarity with cellular agriculture

Respondents who were already familiar with cellular agriculture were consistently *more positive* in questions about acceptance and perceptions of cellular agriculture. Before presenting our definition of cellular agriculture and specific examples, we asked respondents if they were familiar with “cellular agriculture,” “cultivated meat,” or “lab-grown meat.” The options were “yes,” “no,” and “I don’t know.” For this analysis, we grouped “no” and “I don’t know” to make a binary variable.

**Table 12: Results of Mann-Whitney U tests comparing acceptance and perceptions of cellular agriculture by familiarity with cellular agriculture. “Not familiar” groups “no” and “I don’t know.” Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
<b>ACCEPTANCE</b>							
<b>Willing to try cell ag ice cream</b>	Familiar	2380	3.93	(2.10)	2467.57	- 5.239	< .001
	Not familiar	2786	4.18	(1.95)	2682.53		
<b>Willing to try cell ag salmon</b>	Familiar	2380	4.32	(2.10)	2462.17	- 5.493	< .001
	Not familiar	2786	4.63	(1.93)	2687.15		
<b>Willing to try cell ag nuggets</b>	Familiar	2380	4.18	(2.13)	2484.62	- 4.469	< .001
	Not familiar	2786	4.42	(1.95)	2667.97		
<b>Willing to try (All products)</b>	Familiar	2380	4.14	(1.98)	2471.82	- 4.979	< .001
	Not familiar	2786	4.41	(1.81)	2678.9		
<b>Willing to buy regularly (All products)</b>	Familiar	2380	4.65	(1.83)	2456.56	- 5.660	< .001
	Not familiar	2786	4.81	(1.68)	2691.95		
<b>PERCEPTIONS</b>							
<b>Cellular agriculture will be a viable alternative</b>	Familiar	2380	3.63	(1.78)	2444.01	- 6.343	< .001
	Not familiar	2786	3.87	(1.63)	2702.66		
<b>Cellular agriculture will be env. sustainable</b>	Familiar	2380	3.53	(1.77)	2446.69	- 6.238	< .001
	Not familiar	2786	3.75	(1.60)	2700.37		

<b>Cellular agriculture will improve <u>food security</u></b>	Familiar	2380	3.47	(1.73)	2474.59	- 4.962	< .001
	Not familiar	2786	3.63	(1.60)	2676.54		
<b>Cellular agriculture will improve <u>animal welfare</u></b>	Familiar	2380	3.43	(1.81)	2425.99	- 7.165	< .001
	Not familiar	2786	3.7	(1.64)	2718.05		
<b>Cellular agriculture products will be <u>tasty</u></b>	Familiar	2380	4.01	(1.66)	2446.69	- 5.195	< .001
	Not familiar	2786	4.21	(1.51)	2700.37		
<b>Cellular agriculture products will be <u>healthy</u></b>	Familiar	2380	3.96	(1.73)	2446.69	- 4.397	< .001
	Not familiar	2786	4.13	(1.56)	2700.37		
<b>Cellular agriculture products will be <u>affordable</u></b>	Familiar	2380	3.66	(1.68)	2425.99	- 6.608	< .001
	Not familiar	2786	3.93	(1.57)	2718.05		



## Food related occupations

### Acceptance of cellular agriculture products

We also tested the effect of engaging in paid or volunteer roles in the food system. Across acceptance and perceptions, those with food-related work were more likely to have positive responses. There were the most significant results for respondents involved in food processing, food retail, and food banks.

Table 13: Results of Mann-Whitney U tests comparing acceptance of cellular agriculture for those with and without food-related work. Yellow cells indicate more positive responses.

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
Willing to try cell ag <u>ice cream</u>	Food-related work	939	3.73	(1.92)	2349.8	- 5.37	< .001
	No food related work	4227	4.14	(2.04)	2635.41		
Willing to try cell ag <u>salmon</u>	Food-related work	939	4.08	(1.92)	2285.4	- 6.88	< .001
	No food related work	4227	4.58	(2.03)	2649.72		
Willing to try cell ag <u>nuggets</u>	Food-related work	939	3.86	(1.95)	2268.04	- 7.27	< .001
	No food related work	4227	4.41	(2.05)	2653.58		
Willing to try (All products)	Food-related work	939	3.89	(1.75)	2285.8	- 6.80	< .001
	No food related work	4227	4.37	(1.92)	2649.63		
Willing to buy regularly (All products)	Food-related work	939	4.17	(1.74)	2115.38	- 10.74	< .001
	No food related work	4227	4.86	(1.74)	2687.49		

Table 14: Summary of Mann-Whitney U tests results for cellular agriculture acceptance for with food-related work. [Legend: \*\*\*: <.001, \*\*: <.01; \*: <.1; Blank cells do not have significant results]

Dependent variables	Farmworker (n = 134)	Farmer (n = 188)	Food processing (n = 168)	Food distribution (n=173)	Food retail (n = 286)	Food bank (n = 149)
Willing to try cell ag ice cream			*** More willing		** More willing	** More willing
Willing to try cell ag salmon		* More willing	*** More willing	** More willing	** More willing	** More willing
Willing to try cell ag nuggets	** More willing	** More willing	*** More willing	** More willing	** More willing	*** More willing
Willing to try - all			*** More willing	** More willing	** More willing	** More willing
Willing to buy reg. - all	*** More willing	*** More willing	*** More willing	*** More willing	*** More willing	** More willing

### Perceptions of cellular agriculture

When measuring the perceptions of cellular agriculture, those with food-related work were consistently more positive than those without. The most significant results were seen with respondents involved in food processing and food banks. Those involved in food retail had fewer significant results for perceptions compared to acceptance.

Table 15: Results of Mann-Whitney U tests comparing perceptions of cellular agriculture for those with and without food-related work. Yellow cells indicate more positive responses.

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
Cellular agriculture will be a <u>viable alternative</u>	Food-related work	939	3.62	(1.67)	2455.21	- 2.975	0.003
	No food related work	4227	3.79	(1.71)	2612		

<b>Cellular agriculture will be <u>env. sustainable</u></b>	Food-related work	939	3.5	(1.61)	2460.14	- 2.868	0.004
	No food related work	4227	3.68	(1.70)	2610.9		
<b>Cellular agriculture will improve <u>food security</u></b>	Food-related work	939	3.43	(1.61)	2470.37	- 2.629	0.009
	No food related work	4227	3.59	(1.67)	2608.63		
<b>Cellular agriculture will improve <u>animal welfare</u></b>	Food-related work	939	3.38	(1.64)	2412.81	- 3.959	< .001
	No food related work	4227	3.62	(1.74)	2621.42		
<b>Cellular agriculture products will be <u>tasty</u></b>	Food-related work	939	3.81	(1.60)	2292.41	- 6.897	< .001
	No food related work	4227	4.19	(1.58)	2648.16		
<b>Cellular agriculture products will be <u>healthy</u></b>	Food-related work	939	3.86	(1.67)	2404.55	- 4.202	< .001
	No food related work	4227	4.1	(1.63)	2623.25		
<b>Cellular agriculture products will be <u>affordable</u></b>	Food-related work	939	3.56	(1.58)	2351.03	- 5.435	< .001
	No food related work	4227	3.86	(1.63)	2635.14		

Table 16: Significance of Mann-Whitney U tests results for cellular agriculture perceptions for respondents with food-related work. [Legend: \*\*\*: <.001, \*\*: <.01; \*: <.1; Blank cells do not have significant results]

Dependent variables	Farmworker (n = 134)	Farmer (n = 188)	Food processing (n = 168)	Food distribution (n=173)	Food retail (n = 286)	Food bank (n = 149)
<b>Viable alternative</b>			*** <u>More likely to agree</u>	* <u>More likely to agree</u>		** <u>More likely to agree</u>
<b>Env. sustainable</b>		** <u>More likely to agree</u>	*** <u>More likely to agree</u>	* <u>More likely to agree</u>	** <u>More likely to agree</u>	** <u>More likely to agree</u>
<b>Improve food security</b>		* <u>More likely to agree</u>	*** <u>More likely to agree</u>			** <u>More likely to agree</u>
<b>Improve animal welfare</b>			*** <u>More likely to agree</u>	** <u>More likely to agree</u>		** <u>More likely to agree</u>
<b>Tasty</b>	** <u>More likely to agree</u>	** <u>More likely to agree</u>	*** <u>More likely to agree</u>	*** <u>More likely to agree</u>	** <u>More likely to agree</u>	*** <u>More likely to agree</u>
<b>Healthy</b>			*** <u>More likely to agree</u>	*** <u>More likely to agree</u>		*** <u>More likely to agree</u>
<b>Affordable</b>			*** <u>More likely to agree</u>	*** <u>More likely to agree</u>	** <u>More likely to agree</u>	*** <u>More likely to agree</u>

## Age

Age is a statistically significant predictor of both acceptance and perceptions of cellular agriculture. Younger respondents were more willing to try or buy cellular agriculture products. Younger respondents were more likely to agree with positive perceptions of cellular agriculture, whereas older respondents were more likely to disagree. However, for both regressions, the effect of the independent variable and the variance explained were small.

**Table 17: Results of multiple linear regressions for the impact of age on acceptance of and perceptions of cellular agriculture.**

Dependent variable	Predictor variable	$\beta$	t	Sig.	R2
<b>ACCEPTANCE</b>					
<b>Willing to try (All products)</b> <i>F</i> (1, 5165) = 25.409, <i>p</i> < .001	Age	0.07	5.04	< .001	0.005
<b>Willing to buy (All products)</b> <i>F</i> (1, 5165) = 30.767, <i>p</i> < .001	Age	0.08	5.55	< .001	0.006
<b>PERCEPTIONS</b>					
<b>Cellular agriculture will be a <u>viable alternative</u></b> <i>F</i> (1, 5165) = 7.235, <i>p</i> < .001	Age	0.04	2.69	< .001	0.001
<b>Cellular agriculture will be <u>env. sustainable</u></b> <i>F</i> (1, 5165) = 12.836, <i>p</i> < .001	Age	0.05	3.58	< .001	0.002
<b>Cellular agriculture will improve <u>food security</u></b> <i>F</i> (1, 5165) = 4.55, <i>p</i> < .001	Age	0.03	2.13	< .001	0.001
<b>Cellular agriculture will improve <u>animal welfare</u></b> <i>F</i> (1, 5165) = 15.975, <i>p</i> < .001	Age	0.06	4	< .001	0.003
<b>Cellular agriculture products will be <u>tasty</u></b> <i>F</i> (1, 5165) = 14.791, <i>p</i> < .001	Age	0.05	3.85	< .001	0.003
<b>Cellular agriculture products will be <u>healthy</u></b> <i>F</i> (1, 5165) = 13.065, <i>p</i> < .001	Age	0.05	3.85	< .001	0.003
<b>Cellular agriculture products will be <u>affordable</u></b> <i>F</i> (1, 5165) = 16.056, <i>p</i> < .001	Age	0.06	4.01	< .001	0.003

## Gender

Men were more willing than women to try cellular agriculture products or buy them regularly. Men were also more positive in their perceptions of cellular agriculture (e.g., viable alternative, sustainable, tasty). Our sample included 30 respondents who identified as non-binary, 6 who selected “other,” and 10 who preferred not to share their gender identity. While these respondents are included in the other analysis, we focus only on comparing women (N = 2224) and men (N = 2896) in statistical tests as they significantly outsize the sample of other gender categories. See Appendix for means for all gender categories.

**Table 18: Results of Mann-Whitney U tests comparing acceptance and perceptions of cellular agriculture for women and men. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
<b>ACCEPTANCE</b>							
<b>Willing to try cell ag ice cream</b>	Woman	2224	4.35	(2.04)	2761.98	- 8.672	< .001
	Man	2896	3.85	(1.99)	2405.77		
<b>Willing to try cell ag salmon</b>	Woman	2224	4.88	(1.97)	2840.62	- 12.079	< .001
	Man	2896	4.19	(2.01)	22345.38		
<b>Willing to try cell ag nuggets</b>	Woman	2224	4.67	(2.02)	2818.09	- 11.088	< .001
	Man	2896	4.03	(2.02)	2362.68		
<b>Willing to try (All products)</b>	Woman	2224	4.63	(1.86)	2827.53	- 11.393	< .001
	Man	2896	4.02	(1.88)	2355.44		
<b>Willing to buy regularly (All products)</b>	Woman	2224	5.05	(1.70)	2820.45	- 11.138	< .001
	Man	2896	4.5	(1.76)	2360.87		
<b>PERCEPTIONS</b>							
<b>Cellular agriculture will be a viable alternative</b>	Woman	2224	3.89	(1.70)	2682.59	- 5.29	< .001
	Man	2896	3.65	(1.70)	2466.74		

<b>Cellular agriculture will be <u>env. sustainable</u></b>	Woman	2224	3.78	(1.66)	2684.12	- 5.37	< .001
	Man	2896	3.55	(1.70)	2465.57		
<b>Cellular agriculture will improve <u>food security</u></b>	Woman	2224	3.62	(1.64)	2624.09	- 2.76	< .001
	Man	2896	3.51	(1.68)	2511.66		
<b>Cellular agriculture will improve <u>animal welfare</u></b>	Woman	2224	3.69	(1.71)	2663.39	- 4.46	< .001
	Man	2896	3.49	(1.73)	2481.49		
<b>Cellular agriculture products will be <u>tasty</u></b>	Woman	2224	4.3	(1.57)	2734.73	- 7.71	< .001
	Man	2896	3.98	(1.59)	2426.7		
<b>Cellular agriculture products will be <u>healthy</u></b>	Woman	2224	4.25	(1.61)	2738.15	- 7.79	< .001
	Man	2896	3.91	(1.65)	2424.07		
<b>Cellular agriculture products will be <u>affordable</u></b>	Woman	2224	3.96	(1.61)	2701.04	- 6.135	< .001
	Man	2896	3.69	(1.63)	2452.57		

## Geography

### ***Acceptance of cellular agriculture products***

The acceptance of cellular agriculture products varied significantly depending on the respondent's province or territory of residence. Due to the sample size for the territories, respondents from the Northwest Territories, Nunavut, and Yukon were grouped for the statistical analysis.

A Kruskal-Wallis H test for willingness to try (mean of all three products) reveals statistical significance in the mean ranks by province or territory,  $\chi^2(10) = 32.212$ ,  $p < .001$ . Post-hoc comparisons using Dunn's pairwise tests for all possible pairs revealed significant differences between Quebec and Saskatchewan and Quebec and Alberta ( $p < .05$ , adjusted using the Bonferroni correction). There was also some significance in the difference between Quebec and Nova Scotia ( $p = .063 < .1$ , adjusted using the Bonferroni correction).

Similarly, for willingness to buy regularly (mean of all three products), a Kruskal-Wallis H test for reveals statistical significance in the mean ranks by province or territory,  $\chi^2(10) = 38.538$ ,  $p < .001$ . Post-hoc comparisons using Dunn's pairwise tests for all possible pairs revealed significant differences between Quebec and Saskatchewan ( $p = .002$ , adjusted using the Bonferroni correction) and Quebec and Alberta ( $p = .001$ , adjusted using the Bonferroni correction). The difference between Ontario and Saskatchewan was mildly significant ( $p = .068$ , adjusted using the Bonferroni correction).

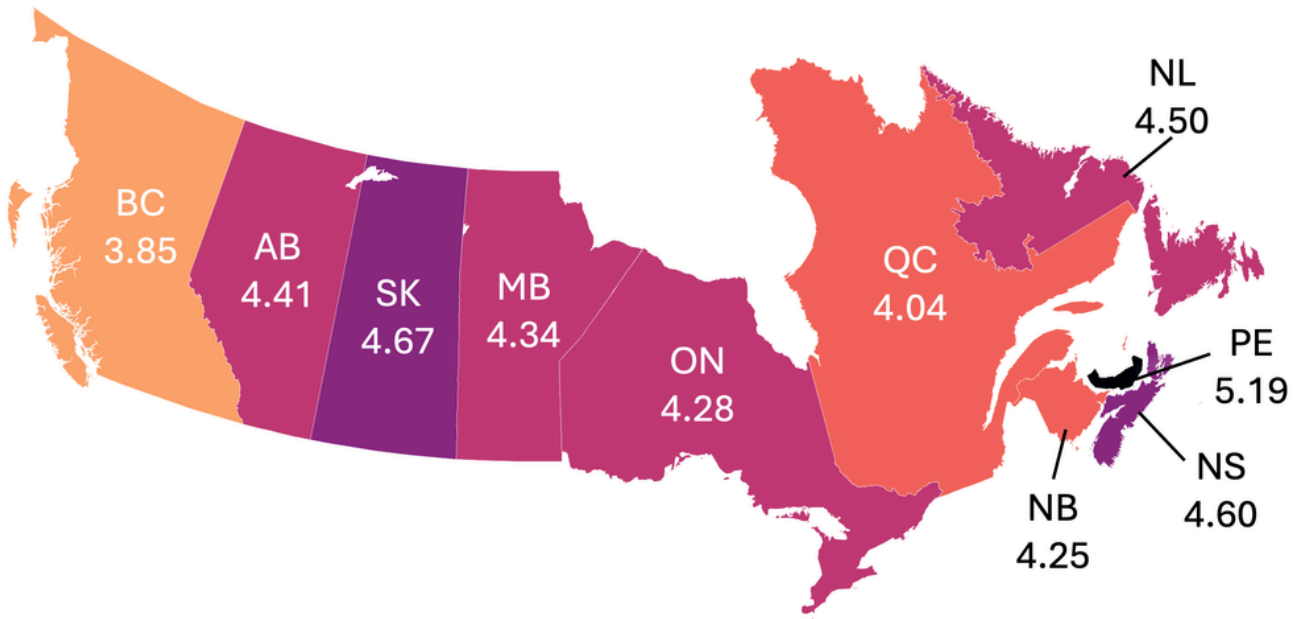


Figure 19: Mean willingness to try cellular agriculture products by province.

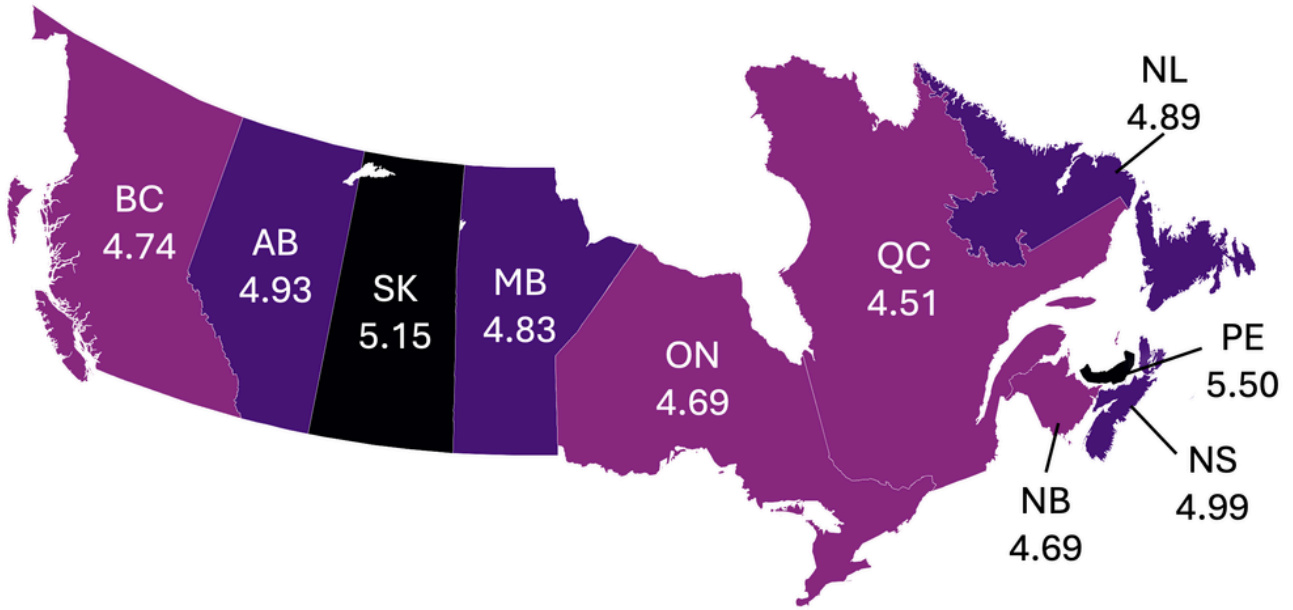


Figure 20: Mean willingness to buy cellular agriculture products regularly by province.

Table 19: Results of Kruskal-Wallis H tests comparing acceptance of cellular agriculture by province or territory of residence, ordered by mean rank. Yellow cells indicate more positive responses.

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	H	Sig. (2-sided)
Willing to try (All products)	QC	729	4.04	(1.88)	2399.12	32.212	< .001
	BC	702	3.85	(1.99)	2537.25		
	NB	127	4.25	(1.98)	2546.2		
	ON	2295	4.28	(1.89)	2576.34		
	Territories	15	4.33	(1.74)	2623.17		
	MB	221	4.34	(1.81)	2633.29		
	AB	650	4.41	(1.89)	2677.18		
	NL	83	4.5	(1.84)	2741.79		
	NS	167	4.6	(1.84)	2812.82		
	SK	151	4.67	(1.96)	2884.38		
PE	26	5.19	(1.62)	3302.79			
Willing to buy regularly (All products)	Territories	15	4.38	(1.82)	2285.47	38.538	< .001
	QC	729	4.51	(1.79)	2401.24		
	ON	2295	4.69	(1.77)	2543.09		
	NB	127	4.69	(1.84)	2554.47		
	BC	702	4.74	(1.73)	2588.68		
	MB	221	4.83	(1.70)	2650.63		
	NL	83	4.89	(1.62)	2693.08		
	AB	650	4.93	(1.70)	2741.59		
	NS	167	4.99	(1.63)	2778.79		
	SK	151	5.15	(1.82)	2943.67		
PE	26	5.5	(1.48)	3216.37			

## Perceptions of cellular agriculture

Provinces and territories have statistically significant differences in perceptions of cellular agriculture. Kruskal-Wallis H tests for each of the measured perceptions were significant ( $\leq .005$ ) for location of residence. Ontario and Quebec were consistently among the top provinces and territories in terms of the most positive responses for all tested perceptions.

We conducted post-hoc comparisons using Dunn's pairwise tests for all possible pairs for each Kruskal-Wallis test with perceptions of cellular agriculture (see results in Appendix). There were several significant comparisons between Quebec and Ontario and other provinces.

**Table 20: Results of Kruskal-Wallis H tests comparing perceptions of cellular agriculture by province or territory of residence, ordered by mean rank. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	H	Sig. (2-sided)
<b>Cellular agriculture will be a <u>viable alternative</u></b>	QC	729	3.54	1.67	2386.86	52.614	< .001
	ON	2295	3.69	1.71	2519.49		
	NB	127	3.76	1.67	2599.59		
	BC	702	3.77	1.68	2607.38		
	MB	221	3.84	1.7	2663.34		
	AB	650	3.93	1.7	2734.72		
	NS	167	4.08	1.78	2864.7		
	NL	83	4.1	1.64	2879.05		
	Territories	15	4.2	2.08	2908.23		
	SK	151	4.22	1.69	3007.15		
PE	26	4.31	1.32	3167.48			
<b>Cellular agriculture will be <u>env. sustainable</u></b>	QC	729	3.48	1.63	2445.31	42.310	< .001
	ON	2295	3.59	1.69	2533.43		
	MB	221	3.62	1.71	2540.61		
	BC	702	3.62	1.71	2548.8		
	NB	127	3.72	1.74	2647.74		
	AB	650	3.82	1.68	2730		

	NS	167	3.92	1.71	2818.59		
	NL	83	3.93	1.54	2849.42		
	SK	151	4.06	1.66	2978.33		
	Territories	15	4.2	1.9	3078.37		
	PE	26	4.35	1.47	3265.37		
<b>Cellular agriculture will improve food security.</b>	QC	729	3.43	1.59	2469.62	25.475	= .005
	MB	221	3.46	1.57	2514.6		
	ON	2295	3.52	1.66	2545.37		
	BC	702	3.59	1.71	2608.86		
	AB	650	3.64	1.67	2657.56		
	NB	127	3.71	1.79	2686.85		
	SK	151	3.7	1.65	2697.43		
	Territories	15	3.67	1.68	2741.23		
	NS	167	3.8	1.78	2794.81		
	NL	83	4.02	1.6	3020.6		
	PE	26	4.23	1.61	3181.42		
<b>Cellular agriculture will improve animal welfare.</b>	QC	729	3.33	1.62	2379.17	54.888	< .001
	ON	2295	3.51	1.71	2526.6		
	NS	167	3.57	1.73	2585.31		
	MB	221	3.61	1.77	2603.66		
	NB	127	3.62	1.72	2622.6		
	BC	702	3.64	1.76	2627.72		
	AB	650	3.81	1.77	2767.72		
	NL	83	3.86	1.65	2846.81		
	Territories	15	4	1.69	2922.93		

	SK	151	4.15	1.73	3094.7		
	PE	26	4.27	1.64	3156.31		
<b>Cellular agriculture products will be <u>tasty</u>.</b>	QC	729	3.94	1.51	2426.14	37.203	< .001
	Territories	15	3.93	2.05	2486.2		
	ON	2295	4.06	1.61	2533.3		
	MB	221	4.08	1.53	2534.57		
	BC	702	4.16	1.6	2622.82		
	NB	127	4.23	1.56	2673.74		
	AB	650	4.25	1.59	2694.05		
	PE	26	4.35	1.65	2797.69		
	NS	167	4.4	1.46	2853.66		
	NL	83	4.41	1.48	2876.15		
	SK	151	4.55	1.62	2956.37		
<b>Cellular agriculture products will be <u>healthy</u>.</b>	Territories	15	3.93	2.12	2433.97	25.834	0.004
	QC	729	3.92	1.58	2469.63		
	ON	2295	4.01	1.66	2538.55		
	MB	221	4.05	1.69	2552.74		
	BC	702	4.07	1.63	2611.28		
	AB	650	4.13	1.67	2644.34		
	NB	127	4.2	1.65	2746.96		
	NL	83	4.24	1.5	2790.03		
	NS	167	4.31	1.62	2808.98		
	SK	151	4.4	1.61	2923.43		
	PE	26	4.5	1.61	2940.65		

<b>Cellular agriculture products will be affordable</b>	Territories	15	3.6	1.68	2304.57	47.388	< .001
	QC	729	3.66	1.54	2458.45		
	ON	2295	3.71	1.63	2495.88		
	MB	221	3.76	1.67	2536.64		
	BC	702	3.87	1.62	2650.91		
	NB	127	3.93	1.75	2675.19		
	AB	650	4.02	1.63	2762.54		
	NS	167	4.05	1.58	2829.74		
	SK	151	4.11	1.64	2854.03		
	NL	83	4.29	1.51	3020.13		
	PE	26	4.35	1.41	3092.5		



## Education

### ***Acceptance of cellular agriculture products***

A Kruskal-Wallis H test for willingness to try (mean of all three products) reveals statistical significance in the mean ranks by education,  $\chi^2(7) = 155.763, p < .001$ . Similarly, for willingness to buy regularly (using the means of all three products), a Kruskal-Wallis H test reveals statistically significant effects related to education,  $\chi^2(7) = 133.422, p < .001$ . For each test, primary school, professional school, and graduate degrees were among the top three most positive responses.

We conducted post-hoc comparisons using Dunn's pairwise tests for all possible pairs for the Kruskal-Wallis tests with willingness to try and willingness to buy regularly (see results in Appendix). There were multiple significant results for the comparisons with undergraduate, graduate, and professional degrees.

**Table 21: Results of Kruskal-Wallis H tests comparing acceptance of cellular agriculture by highest level of educational achievement, ordered by mean rank. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	H	Sig. (2-sided)
<b>Willing to try (All products)</b>	Professional school	140	3.73	(1.96)	2089.17	155.763	< .001
	Graduate degree	652	3.89	(1.84)	2215.68		
	Undergraduate degree	1149	3.98	(1.92)	2309.74		
	Prefer not to say	42	4.26	(1.79)	2425.88		
	Secondary or high school	1333	4.47	(1.87)	2760.29		
	College / other post-secondary	1313	4.56	(1.84)	2764.35		
	Apprenticeship certificate	408	4.63	(1.85)	2838.22		
	Primary or elementary school	129	4.71	(1.74)	2995.51		

<b>Willing to buy regularly (All products)</b>	Primary or elementary school	140	3.69	(1.90)	2137.83	133.422	< .001
	Professional school	652	3.82	(1.79)	2220.67		
	Graduate degree	42	4.1	(1.78)	2280.26		
	Undergraduate degree	1149	3.94	(1.79)	2346.89		
	Prefer not to say	1333	4.51	(1.71)	2754.54		
	Secondary or high school	1313	4.51	(1.69)	2755.94		
	College / other post-secondary	408	4.6	(1.70)	2821.96		
	Apprenticeship certificate	129	4.82	(1.64)	2830.42		

We also compared education in two groups: those with primary or secondary school as their highest level of educational achievement and those who completed post-secondary education. Here, those with post-secondary education were more likely to try and buy regularly.

**Table 22: Results of Mann-Whitney U tests comparing acceptance of cellular agriculture for respondents whose highest level of educational achievement is primary or secondary school compared to those with postsecondary education. Yellow cells indicate more positive responses.**

<b>Dependent variable</b>	<b>Independent variable</b>	<b>N</b>	<b>Mean</b>	<b>(SD)</b>	<b>Mean Rank</b>	<b>Z</b>	<b>Sig. (2-sided)</b>
<b>Willing to try (All products)</b>	Primary or secondary school	1462	4.53	(1.86)	2757.09	- 5.983	< .001
	Postsecondary	3662	4.18	(1.90)	2484.81		
<b>Willing to buy regularly (All products)</b>	Primary or secondary school	1462	4.95	(1.70)	2736.37	- 5.369	< .001
	Postsecondary	3662	4.65	(1.77)	2493.09		

## Perceptions of cellular agriculture

Similarly, when compared as two groups, respondents who completed post-secondary education held more positive perceptions of cellular agriculture.

Table 23: Results of Mann-Whitney U tests comparing perceptions of cellular agriculture for respondents whose highest level of educational achievement is primary or secondary school compared to those with postsecondary education. Yellow cells indicate more positive responses.

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-sided)
<b>Cellular agriculture will be a <u>viable</u> alternative</b>	Primary or secondary	1462	3.9	1.69	2700.29	- 4.301	< .001
	Postsecondary	3662	3.7	1.71	2507.49		
<b>Cellular agriculture will be <u>env. sustainable</u></b>	Primary or secondary	1462	3.79	1.67	2686.48	- 4.424	< .001
	Postsecondary	3662	3.59	1.69	2513		
<b>Cellular agriculture will improve <u>food security</u></b>	Primary or secondary	1462	3.69	1.67	2703.86	- 3.878	< .001
	Postsecondary	3662	3.51	1.66	2506.07		
<b>Cellular agriculture will improve <u>animal welfare</u></b>	Primary or secondary	1462	3.67	1.6	2731.53	- 2.838	0.005
	Postsecondary	3662	3.55	1.73	2495.02		
<b>Cellular agriculture products will be <u>tasty</u></b>	Primary or secondary	1462	4.3	1.54	2693.4	- 5.390	< .001
	Postsecondary	3662	4.05	1.6	2510.24		
<b>Cellular agriculture products will be <u>healthy</u></b>	Primary or secondary	1462	4.19	1.71	2653.39	- 4.137	< .001
	Postsecondary	3662	4	1.66	2526.21		
<b>Cellular agriculture products will be <u>affordable</u></b>	Primary or secondary	1462	4	1.63	2741.14	- 5.620	< .001
	Postsecondary	3662	3.73	1.62	2491.18		

## Income level

The three groups with the most positive willingness to try or buy were “\$250,000 and over,” “200,000 to \$249,999,” and “\$150,000 to \$149,999.”

A Kruskal-Wallis H test for willingness to try reveals statistical significance in the mean ranks by household income level,  $\chi^2(7) = 93.916, p < .001$ . The Kruskal-Wallis H test for willingness to buy regularly is also significant,  $\chi^2(7) = 96.026, p < .001$ .

We conducted post-hoc comparisons using Dunn’s pairwise tests for all possible pairs for the Kruskal-Wallis tests with willingness to try and willingness to buy regularly (see results in Appendix). There were multiple significant comparisons between higher and lower income levels.

**Table 24: Results of Kruskal-Wallis H tests comparing acceptance of cellular agriculture by household income level, ordered by mean rank. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	H	Sig. (2-sided)
Willing to try (All products)	\$250,000 and over	114	3.54	1.86	1995.9	93.916	< .001
	\$150,000 to \$199,999	366	3.84	1.77	2233.94		
	\$200,000 to \$249,999	123	3.87	1.98	2247.18		
	\$100,000 to \$149,999	866	4.12	1.87	2443.99		
	\$50,000 to \$99,999	1784	4.26	1.91	2562.74		
	Under \$20,000	412	4.36	1.78	2651.55		
	\$20,000 to \$49,999	1294	4.58	1.91	2816.48		
	Prefer not to say	206	4.65	1.79	2884.73		

<b>Willing to buy regularly (All products)</b>	\$250,000 and over	114	4	1.84	1991.41	96.026	< .001
	\$200,000 to \$249,999	123	4.25	1.78	2178.83		
	\$150,000 to \$199,999	366	4.3	1.68	2201.55		
	\$100,000 to \$149,999	866	4.61	1.76	2483.21		
	Under \$20,000	412	4.66	1.72	2512.19		
	\$50,000 to \$99,999	1784	4.75	1.77	2591.52		
	\$20,000 to \$49,999	1294	5.02	1.72	2816.49		
	Prefer not to say	206	5.03	1.64	2850.08		



## Political views

We tested the differences in the mean ranks for acceptance and perceptions of cellular agriculture by political views on a 5-point bi-polar scale from “very liberal” to “very conservative.” A Kruskal-Wallis H test had a significant result for both willingness to try and willingness to buy regularly. For willingness to try, post-hoc comparisons using Dunn’s pairwise tests for all possible pairs revealed significant differences for each pair *except for* “somewhat conservative” and “very conservative” as well as “rather neutral” and “very conservative.” All other pairs had adjusted significance of  $\leq .004$  (Bonferroni correction).

For willingness to buy, post-hoc comparisons using Dunn’s pairwise tests for all possible pairs revealed significant differences for each pair *except for* “somewhat conservative” and “very conservative.” The adjusted significance in the difference between “rather neutral” and “very conservative” was  $< .02$  (Bonferroni correction). All other pairs had adjusted significance of  $\leq .008$  (Bonferroni correction).

**Table 25: Results of Kruskal-Wallis H tests comparing acceptance of cellular agriculture by political orientation, ordered by mean rank. Yellow cells indicate more positive responses.**

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	H	Sig. (2-sided)
<b>Willing to try (All products)</b>	Very liberal	705	3.68	(1.92)	1977.95	175.285	< .001
	Somewhat liberal	1228	3.97	(1.86)	2197.42		
	Rather neutral	1359	4.35	(1.80)	2483.03		
	Somewhat conservative	948	4.63	(1.88)	2671.65		
	Very conservative	575	4.78	(1.98)	2773		
<b>Willing to buy regularly (All products)</b>	Very liberal	705	4.14	(1.85)	1978.05	134.782	< .001
	Somewhat liberal	1228	4.54	(1.72)	2274.09		
	Rather neutral	1359	4.8	(1.65)	2468		
	Somewhat conservative	948	5.07	(1.72)	2674.62		
	Very conservative	575	4.99	(1.89)	2639.76		

When tested as a binary variable of “liberal” versus “conservative,” a Man-Whitney U test revealed significant differences in mean ranks for or every item in both acceptance and perceptions variables. We found “liberal” respondents were more positive on average than “conservative” respondents.

Table 26: Results of Mann-Whitney U tests comparing acceptance and perceptions of cellular agriculture for liberal and conservative respondents. Yellow cells indicate more positive responses.

Dependent variable	Independent variable	N	Mean	(SD)	Mean Rank	Z	Sig. (2-tailed)
<b>ACCEPTANCE</b>							
<b>Willing to try cell ag <u>ice cream</u></b>	Liberal	1933	3.61	(1.99)	1540.68	- 12.655	< .001
	Conservative	1523	4.52	(2.06)	1966.88		
<b>Willing to try cell ag <u>salmon</u></b>	Liberal	1933	4.09	(2.04)	1567.98	- 10.833	< .001
	Conservative	1523	4.85	(2.02)	1932.23		
<b>Willing to try cell ag <u>nuggets</u></b>	Liberal	1933	3.88	(2.05)	1559.09	- 11.414	< .001
	Conservative	1523	4.7	(2.05)	1943.52		
<b>Willing to try (All products)</b>	Liberal	1933	3.86	(1.88)	1544.62	- 12.275	< .001
	Conservative	1523	4.69	(1.91)	1961.88		
<b>Willing to buy regularly (All products)</b>	Liberal	1933	4.4	(1.77)	1574.77	- 10.300	< .001
	Conservative	1523	5.04	(1.78)	1923.88		
<b>PERCEPTIONS</b>							
<b>Cellular agriculture will be a <u>viable alternative</u></b>	Liberal	1933	3.39	(1.65)	1555.39	- 11.700	< .001
	Conservative	1523	4.12	(1.81)	1948.21		
<b>Cellular agriculture will be <u>env. sustainable</u></b>	Liberal	1933	3.27	(1.62)	1549.8	- 12.103	< .001
	Conservative	1523	4	(1.79)	1955.31		
<b>Cellular agriculture will improve <u>food security</u></b>	Liberal	1933	3.23	(1.59)	1568.5	- 10.840	< .001
	Conservative	1523	3.89	(1.76)	1931.58		
<b>Cellular agriculture will improve <u>animal welfare</u></b>	Liberal	1933	3.22	(1.66)	1556.38	- 11.637	< .001
	Conservative	1523	3.95	(1.83)	1946.95		

<b>Cellular agriculture products will be <u>tasty</u>.</b>	Liberal	1933	3.81	(1.53)	1579.9	- 10.229	< .001
	Conservative	1523	4.42	(1.70)	1917.1		
<b>Cellular agriculture products will be <u>healthy</u>.</b>	Liberal	1933	3.72	(1.58)	1564.76	- 11.179	< .001
	Conservative	1523	4.39	(1.74)	1936.32		
<b>Cellular agriculture products will be <u>affordable</u>.</b>	Liberal	1933	3.51	(1.57)	1581.2	- 10.020	< .001
	Conservative	1523	4.11	(1.73)	1915.46		

The political views are related to what we measured with the independent variables about perceptions of social and environmental issues (e.g., climate change urgency, corporate criticism). Strongly positive correlations include respondents that are more liberal leaning expressed higher agreement with statements about climate urgency, environmental impact of animal agriculture, trust, corporate criticism, pro-globalization, technological optimism. Strongly negatively correlated include more conservative leaning respondents expressing higher agreement toward statements that indicate climate change ambivalence or skepticism. No significant correlation was found with the statements related to technology criticism.



# CONCLUSION

This study surveyed people across Canada to understand perceptions, interests, and concerns related to the emergence of cellular agriculture. The findings from this study offer useful insights to policymakers, industry stakeholders, and agri-food actors who are interested in understanding the challenges and opportunities for developing a thriving domestic cellular agriculture industry. One such insight relates to how the analysis indicates that opposition to cellular agriculture is more prevalent than support (39% of respondents versus 30% of respondents). The study also reveals that such opposition may stem from how cellular agriculture products are viewed as “unnatural” (i.e., as indicated by over half of participants). Such a perspective potentially extends to other animal-related agri-genomic technologies and innovations. While only under 30% of respondents were more comfortable with cellular agriculture than with other non-animal related agritech innovations (i.e., vertical agriculture, plant-based protein burgers, and genetically modified rice), this number was over 40% when comparing cellular agriculture to genetically modified beef production.

Although this study revealed more opposition than support for cellular agriculture, the findings also suggest that opportunities exist for building support for a growing cellular agriculture industry. Respondents who were more familiar with cellular agriculture and generally had higher levels of education typically expressed higher levels of acceptance and support for cellular agriculture. Additionally, the findings show that (for the most part) perceptions and understanding of the role of technology in society, the urgency of climate change, the environmental impacts and ethical concerns of livestock agriculture, and other social and environmental issues influence people’s acceptance of cellular agriculture and their beliefs about its potential benefits. Taken together, these findings demonstrate how education and evidence-based communication about cellular agriculture could lead to more acceptance of a cellular agriculture industry. However, education and messaging must align with action, meaning that the industry is developed in a way that effectively makes progress toward goals related to sustainable, just, and resilient agri-food systems. Otherwise, the cellular agriculture industry risks experiencing substantial backlash and distrust from consumers and early proponents who may feel that the “promise” of the technology has not be fulfilled (or perhaps even abandoned).

Another important finding from the study is that opposition, concerns, or disinterest toward cellular agriculture are conditional, and not absolute, for many people. In general, respondents indicated that they would be more likely to accept and be interested in cellular agriculture if the products were cheaper or healthier. Such a finding suggests that cellular agriculture may garner more support if start-ups and the emerging industry in Canada were incentivized to develop food production facilities and processes that can meaningfully address food insecurity issues in the country. Additionally, the research produced evidence to suggest that organizations working toward addressing food security issues could be potentially valuable collaborators and partners in the growth of a cellular agriculture industry. Specifically, the findings reveal that people working in food banks have a more favourable opinion toward cellular agriculture than others.



Governments and industry players should engage these organizations to explore ways that cellular agriculture could contribute to charitable and community food programs and systems. Forming partnerships and cellular agriculture coalitions that include food banks could potentially improve public confidence that the industry and technologies have the potential to meaningfully contribute to food security in Canada.

The study produced findings that are useful for industry stakeholders who seek to determine how best to market their cellular agriculture products. Respondents that indicated that animal-sourced foods are important to their diet were found to be more acceptant of cellular agriculture products. Similarly, respondents with particular diets, such as halal and kosher, were found to have more favourable views toward cellular agriculture. Such findings can appear counterintuitive, as one might assume that people who value animal-based foods in their diets (as well as specific preparations of these foods) are also those who would prefer to eat conventional (i.e., “authentic”) animal products. However, the findings of this study suggest that those who think more about their diets and the importance of animal products to these diets are also those who recognize the value of producing viable, sustainable, ethical alternatives to protein products. Cellular agriculture start-ups who aim to understand the best target markets and messaging for their products may be interested in this result. In addition, it is important for industry players to recognize that not all cellular agriculture products were regarded in the same way in this study, with the respondents (on average) indicating higher acceptance of cellular ice cream over cellular chicken nuggets and salmon. This finding suggests that the industry may benefit from first focusing on making “more acceptable” products available to consumers to increase familiarity and comfort with cellular agriculture production systems before introducing “less acceptable” products to Canadians.



This research found that the residents of some Canadian provinces and territories (on average) indicated higher acceptance of cellular agriculture than residents of other provinces. In particular, responses from Ontario and Quebec were consistently higher than responses from other provinces and territories in terms of favourability toward and acceptance of cellular agriculture. Such findings are important, as they suggest that there are certain places in the country where an emerging cellular agriculture industry would be most supported in terms of public opinion and sentiment. In Canada, much of the agri-food policy and regulation is developed and implemented at the provincial level.

A situation where provinces with high support for cellular agriculture introduce policies and regulations for the Canadian industry would be valuable for other provincial governments, as the governments of the “lower acceptance” provinces would benefit from the guidance, lessons, and product normalization generated from the early adopter provinces. This study produced cautionary insights for government, non-governmental organizations, and industry stakeholders who would like to see a domestic cellular agriculture industry developed in Canada. In particular, the study indicates that political orientations influence people’s support or opposition toward cellular

agriculture, with liberal-leaning respondents exhibiting more favourable opinions and perceptions toward the food production method and technologies. The analysis reveals that opinions and perceptions towards cellular agriculture are related to perspectives towards social and environmental issues that also are associated with political leanings and orientations (e.g., the urgency of the climate crisis, the environmental impacts of animal agriculture, etc.). Ultimately, what these findings show is that cellular agriculture has the potential of becoming a politically polarized issue in Canada. Accordingly, governments, industry stakeholders, and cellular agriculture proponents should be careful not to develop coalitions for an emerging industry that exclude and alienate people of a particular political affiliation, as this could firmly divide cellular agriculture support along political lines and turn opposition toward cellular agriculture into political talking point.

Demographics exhibited a relationship with acceptance toward cellular agriculture, and findings from demographic analysis hold important implications for the future of a cellular agriculture industry in Canada. In particular, the study found that younger respondents in general expressed more interest in cellular agriculture in terms of trying and buying the products. This suggests that new generations are more open to new ways of producing food. As cellular agriculture is an emerging agri-food method, it may reach maturity when currently young generations have reached mid-to-late stages of adulthood. Accordingly, cellular agriculture could potentially represent a food system of the future for the people (and decision-makers) of the future.



# REFERENCES

- Bryant, C., & Dillard, C. (2019). The impact of framing on acceptance of cultured meat. *Frontiers in Nutrition*, 6 (July), 1–10. <https://doi.org/10.3389/fnut.2019.00103>
- Bowness, E., Mukiri, J., Ruder, S-L., Hase-Ueta, M., Morais-da-Silva, RL., Newell, R., & Glaros, A. (2025). Editorial: The social implications of cellular agriculture and the future of food. *Frontiers in Sustainable Food Systems*, 9(1597622). <https://doi.org/10.3389/fsufs.2025.1597622>
- Bowness, E., Ruder, S-L., Giles, R., and Skinner, D. (2026). A just transition for cellular dairy? Reflections from the Fraser Valley. *Canadian Food Studies / La Revue Canadienne des études sur l'alimentation*, 13(1), 131–149. <https://doi.org/10.15353/cfs-rcea.v13i1.731>
- Dunlap, R. E., & Van Liere, K. D. (1984). Commitment to the dominant social paradigm and concern for environmental quality. *Social Science Quarterly*, 65(4), 1013.
- Glaros, A., Newell, R., Fraser, E., & Newman, L. (2023). Socio-economic futures for cellular agriculture: The development of a novel framework. *Frontiers in Sustainable Food Systems*, 7, 970369. <https://doi.org/10.3389/fsufs.2023.970369>
- Glaros, A., Newell, R., Ruder, S-L., Mukiri, J., & Pizzirani, S. (2023). *Cellular agriculture futures: A survey of public perceptions in the Lower Mainland, BC*. Food and Agriculture Institute, University of the Fraser Valley. <http://doi.org/10.13140/RG.2.2.31248.58889>
- Gregory, R., Kozak, R., Peterson St-Laurent, G., Nawaz, S., & Hagerman, S. (2021). Under pressure: conservation choices and the threat of species extinction. *Climatic Change*. 166(2). <https://doi.org/10.1007/s10584-021-03102-3>
- Hagerman, S., Satterfield, T., Nawaz, S., St-Laurent, G. P., Kozak, R., & Gregory, R. (2021). Social comfort zones for transformative conservation decisions in a changing climate. *Conservation Biology*, 35(6), 1932–1943. <https://doi.org/https://doi.org/10.1111/cobi.13759>
- Kumar, P., Sharma, N., Sharma, S., Mehta, N., Verma, A. K., Chemmalar, S., & Sazili, A. Q. (2021). In-vitro meat: A promising solution for sustainability of meat sector. *Journal of Animal Science and Technology*, 63(4), 693-724. <https://doi.org/10.5187/jast.2021.e85>
- Nawaz, S., & Satterfield, T. (2022). Climate solution or corporate co-optation? US and Canadian publics' views on agricultural gene editing. *PLoS ONE*, 17(3 March), 1–19. <https://doi.org/10.1371/journal.pone.0265635>
- Newell, R., & Glaros, A. (2024). Sustainable food systems, development paths, and scenarios for cellular agriculture. In E. D. G. Fraser, D. L. Kaplan, L. Newman, & R. Y. Yada (Eds.), *Cellular Agriculture* (pp. 29–45). Academic Press. <https://doi.org/10.1016/B978-0-443-18767-4.00022-6>
- Newman, L., Newell, R., Dring, C., Glaros, A., Fraser, E., Mendly-Zambo, Z., Green, A. G., & KC, K. B. (2023). Agriculture for the Anthropocene: Novel applications of technology and the future of food. *Food Security*, 15, 613–627. <https://doi.org/10.1007/s12571-023-01356-6>

- Powell, L. J., Mendly-Zambo, Z., & Newman, L. L. (2023). Perceptions and acceptance of yeast-derived dairy in British Columbia, Canada. *Frontiers in Sustainable Food Systems*, 7, 1127652. <https://doi.org/10.1007/s12571-023-01356-6>
- Rockström, J., Thilsted, S. H., Willett, W. C., Gordon, L. J., Herrero, M., Hicks, C. C., ... & DeClerck, F. (2025). The EAT–Lancet Commission on healthy, sustainable, and just food systems. *The Lancet*, 406(10512), 1625-1700. [https://doi.org/10.1016/S0140-6736\(25\)01201-2](https://doi.org/10.1016/S0140-6736(25)01201-2)
- Satterfield, T., Nawaz, S. & St-Laurent, G.P. (2023). Exploring public acceptability of direct air carbon capture with storage: climate urgency, moral hazards and perceptions of the ‘whole versus the parts.’ *Climatic Change*, 176(14). <https://doi.org/10.1007/s10584-023-03483-7>
- Verbeke, W., Sans, P., & Van Loo, E. J. (2015). Challenges and prospects for consumer acceptance of cultured meat. *Journal of Integrative Agriculture*, 14(2), 285-294. [https://doi.org/10.1016/S2095-3119\(14\)60884-4](https://doi.org/10.1016/S2095-3119(14)60884-4)
- Weinrich, R., Strack, M., & Neugebauer, F. (2020). Consumer acceptance of cultured meat in Germany. *Meat Science*, 162, 107924. <https://doi.org/10.1016/j.meatsci.2019.107924>
- Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., de Vries, W., Majele Sibanda, L., ... Murray, C. J. L. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447-492. [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)

# APPENDIX

## Data reduction

Table 27: Details of data reduction for conceptual independent variables.

Variable	Questions or statements in survey	Correlation and consistency	Data reduction
<b>Technology criticism</b>	<p>Adapted from Satterfield et al. (2023) and Dunlap and Van Liere (1984).</p> <ul style="list-style-type: none"> <li>• “Society is worse off than ever, because of the impacts of new technologies.”</li> <li>• “The negative effects of technology outweigh its advantages.”</li> <li>• “Hope for the future lies more in people’s actions than in technology”</li> <li>• “The risks and burdens of technologies disproportionately affect marginalized communities.”</li> </ul>	<p>Positive Pearson Correlation, 2-tailed sig: &lt; .001 Cronbach’s Alpha: .688</p>	Mean
<b>Technology optimism</b>	<p>Adapted from Satterfield et al. (2023) and Dunlap and Van Liere (1984).</p> <ul style="list-style-type: none"> <li>• “Future resource shortages will be solved by technology”</li> <li>• “A country’s progress can be measured by its technological development.”</li> </ul>	<p>Positive Pearson Correlation, 2-tailed sig: &lt; .001 Cronbach’s Alpha: .658</p>	Mean
<b>Trust in actors to identify risks of technologies</b>	<p>Adapted from Satterfield et al. (2023).</p> <ul style="list-style-type: none"> <li>• Scientists</li> <li>• Regulators</li> <li>• Agricultural companies</li> <li>• Activists</li> <li>• Celebrities and social media influencers</li> <li>• Family and friends</li> </ul>	<p>Positive Pearson Correlation, 2-tailed sig: &lt; .001 Cronbach’s Alpha: .826</p>	Mean

<p><b>Corporation and globalization criticism</b></p>	<p>Adapted from Nawaz and Satterfield (2022).</p> <ul style="list-style-type: none"> <li>• “The increasing influence of large corporations is a problem”</li> <li>• “Corporations should NOT limit access to knowledge through patents.”</li> <li>• “Big global tech companies should be broken up.”</li> <li>• “Globalization (i.e., increased connectivity among nation’s economies and cultures) has positive impacts for most people.” [Reversed]</li> </ul>	<p>Positive Pearson Correlation, 2-tailed sig: &lt; .001 Cronbach’s Alpha: .717</p>	
<p><b>Climate change ambivalence</b></p>	<p>Adapted from Satterfield et al. (2023), Hagerman et al. (2021), and Gregory et al. (2021).</p> <ul style="list-style-type: none"> <li>• “Evidence for human-caused climate change is incomplete at best.”</li> <li>• “Climate change is NOT among the most urgent problems facing humanity and the planet”</li> <li>• “The suggestion that climate change will cause large-scale ecosystem changes is overblown.”</li> </ul>	<p>Positive Pearson Correlation, 2-tailed sig: &lt; .001 Cronbach’s Alpha: .827</p>	<p>Mean</p>
<p><b>Climate change urgency</b></p>	<p>Adapted from Satterfield et al. (2023), Hagerman et al. (2021), and Gregory et al. (2021).</p> <ul style="list-style-type: none"> <li>• “The human causes of climate change need to be addressed immediately”</li> <li>• “Human impacts are causing changes at a global scale that are destabilizing the functioning of the Earth’s systems.”</li> <li>• “Climate change will affect some ecosystems so quickly and strongly that large-scale changes in nature and biodiversity will follow.”</li> </ul>	<p>Positive Pearson Correlation, 2-tailed sig: &lt; .001 Cronbach’s Alpha: .875</p>	<p>Mean</p>

## Post-hoc tests

Table 28: Wilcoxon Signed Ranks Test results following significant Freidman Test for willingness to buy if cheaper or healthier.

Pairs	Z	Wilcoxon Signed Ranks	Asympt. Sig. (2-tailed)
Buy ice cream if <u>cheaper</u> – Buy ice cream	- 15.467	Based on positive ranks	< .001
Buy ice cream – Buy ice cream if <u>healthier</u>	- 22.641	Based on negative ranks	< .001
Buy ice cream if <u>cheaper</u> < Buy ice cream if <u>healthier</u>	- 12.000	Based on negative ranks	< .001

Table 29: Wilcoxon Signed Ranks Test results following significant Freidman Test for perceptions of cellular agriculture.

Pairs	Z	Wilcoxon Signed Ranks	Asympt. Sig. (2-tailed)
Food security – Viable Alternative	- 11.509	Based on positive ranks	< .001
Sustainable – Viable Alternative	- 7.635	Based on positive ranks	< .001
Tasty – Viable Alternative	- 20.519	Based on negative ranks	< .001
Healthy – Viable Alternative	- 17.781	Based on negative ranks	< .001
Animal welfare – Viable Alternative	- 10.357	Based on positive ranks	< .001
Affordable – Viable Alternative	- 3.074	Based on negative ranks	0.002
Sustainable – Food security	- 5.163	Based on negative ranks	< .001
Tasty – Food security	- 27.134	Based on negative ranks	< .001
Healthy – Food security	- 25.250	Based on negative ranks	< .001
Animal welfare – Food security	- 1.190	Based on negative ranks	0.234
Affordable – Food security	- 14.640	Based on negative ranks	< .001
Tasty – Sustainable	- 25.361	Based on negative ranks	< .001
Healthy – Sustainable	- 24.173	Based on negative ranks	< .001

<b>Animal welfare – Sustainable</b>	- 4.183	Based on positive ranks	< .001
<b>Affordable – Sustainable</b>	- 10.029	Based on negative ranks	< .001
<b>Healthy – Tasty</b>	- 4.937	Based on positive ranks	< .001
<b>Animal welfare – Tasty</b>	- 26.245	Based on positive ranks	< .001
<b>Affordable – Tasty</b>	- 17.484	Based on positive ranks	< .001
<b>Animal welfare – Healthy</b>	- 24.466	Based on positive ranks	< .001
<b>Affordable – Healthy</b>	- 13.918	Based on positive ranks	< .001
<b>Affordable – Animal welfare</b>	- 12.370	Based on negative ranks	< .001

Table 30: Wilcoxon Signed Ranks Test results following significant Freidman Test for comparisons with other food innovations.

<b>Pairs</b>	<b>Z</b>	<b>Wilcoxon Signed Ranks</b>	<b>Asympt. Sig. (2-tailed)</b>
<b>GM beef - GM rice</b>	- 22.022	Based on positive ranks	< .001
<b>Vertical agriculture - GM rice</b>	- 21.308	Based on negative ranks	< .001
<b>Soy burger - GM rice</b>	- 1.116	Based on positive ranks	Not sig.
<b>Mushroom burger - GM rice</b>	- 1.862	Based on negative ranks	< .1
<b>Vertical agriculture - GM beef</b>	- 33.705	Based on negative ranks	< .001
<b>Soy burger - GM beef</b>	- 17.456	Based on negative ranks	< .001
<b>Mushroom burger - GM beef</b>	- 19.758	Based on negative ranks	< .001
<b>Soy burger - Vertical agriculture</b>	- 20.690	Based on positive ranks	< .001
<b>Mushroom burger - Vertical agriculture</b>	- 18.337	Based on positive ranks	< .001
<b>Mushroom burger - Soy burger</b>	- 4.411	Based on negative ranks	< .001

**Table 31: Mean responses for willingness to try and buy cellular agriculture products based on gender categories.**

Gender	N	Wiling to Try (All products)		Willing to Buy Regularly (All products)	
		Mean	SD	Mean	Mean Rank
Woman	2224	4.63	(1.86)	5.05	(1.70)
Man	2896	4.02	(1.88)	4.5	(1.76)
Nonbinary	30	3.82	(1.67)	4.35	(1.31)
Other	6	4.44	(1.82)	4.33	(1.74)
Prefer not to say	10	4.33	(2.16)	4.83	(2.35)

## Geography

We conducted post-hoc comparisons using Dunn’s pairwise tests for all possible pairs. The significance values listed were adjusted using the Bonferroni correction.

- **Viable alternative:** Quebec and Alberta (< .001), Quebec and Saskatchewan (< .001), Quebec and Nova Scotia (.008), Ontario and Saskatchewan (.004)
- **Sustainable:** Quebec and Alberta (< .05), Quebec and Saskatchewan (.002), Ontario and Saskatchewan (< .05)
- **Animal welfare:** Quebec and Alberta (< .001), Quebec and Saskatchewan (< .001), Ontario and Alberta (< .05), Ontario and Saskatchewan (< .001), BC and Saskatchewan (< .05)
- **Tasty:** Quebec and Alberta (< .05), Quebec and Saskatchewan (.002), Quebec and Nova Scotia (< .05), Ontario and Alberta (< .05), Ontario and Saskatchewan (< .05)
- **Healthy:** Quebec and Saskatchewan (< .05)
- **Affordable:** Quebec and Alberta (.006), Quebec and Newfoundland (< .05), Ontario and Alberta (.002)
- There were no significant results in pairwise comparisons for perceptions of food security.

## Education

We conducted post-hoc comparisons using Dunn's pairwise tests for all possible pairs. The significance values listed were adjusted using the Bonferroni correction.

- **Willing to try:**
  - Graduate degree and Primary school (<.001), Graduate degree and Secondary school (<.001), Graduate degree and Apprenticeship certificate (<.001), Graduate degree and College diploma (<.001)
  - Undergraduate degree and Primary school (<.001), Undergraduate degree and Secondary school (<.001), Undergraduate degree and Apprenticeship certificate (<.001), Undergraduate degree and College diploma (<.001)
  - Professional degree and Primary (<.001), Professional degree and Secondary school (<.001), Professional degree and Apprenticeship certificate (<.001), Professional degree and College diploma (<.001)
- **Willing to buy regularly:**
  - Graduate degree and Primary school (<.01), Graduate degree and Secondary school (<.001), Graduate degree and Apprenticeship certificate (<.001), Graduate degree and College diploma (<.001)
  - Undergraduate degree and Primary school (<.05), Undergraduate degree and Secondary school (<.001), Undergraduate degree and Apprenticeship certificate (<.001), Undergraduate degree and College diploma (<.001)
  - Professional degree and Primary (<.01), Professional degree and Secondary school (<.001), Professional degree and Apprenticeship certificate (<.001), Professional degree and College diploma (<.001)

## Income level

Post-hoc comparisons using Dunn's pairwise tests for all possible pairs revealed significant differences. The significance values listed were adjusted using the Bonferroni correction.

- **“\$20,000 to \$49,999” and “\$50,000 to \$99,999”**
- **“\$100,000 to \$149,999” and “\$20,000 to \$49,999” (.000)**
- **“\$100,000 to \$149,999” and “Prefer not to say” (.004)**
- **“\$150,000 to \$199,999” and “Under \$20,000” (.003)**
- **“\$150,000 to \$199,999” and “\$20,000 to \$49,999” (.000)**
- **“\$150,000 to \$199,999” and “\$50,000 to \$99,999” (.002)**
- **“\$150,000 to \$199,999” and “Prefer not to say” (.000)**
- **“\$200,000 to \$249,999” and “\$20,000 to \$49,999” (.001)**
- **“\$200,000 to \$249,999” and “Prefer not to say” (.008)**
- **“\$250,000 and over” and “Under \$20,000” (.001)**
- **“\$250,000 and over” and “\$20,000 to \$49,999” (.000)**
- **“\$250,000 and over” and “\$50,000 to \$99,999” (.002)**
- **“\$250,000 and over” and “Prefer not to say” (.000)**

The willingness to buy regularly results were also significant,  $\chi^2(7) = 96.026$ ,  $p < .001$ . Post-hoc comparisons using Dunn's pairwise tests for all possible pairs revealed significant differences. The significance values listed were adjusted using the Bonferroni correction.

- **"Under \$20,000" and "\$20,000 to \$49,999" (.008)**
- **"\$20,000 to \$49,999" and "\$50,000 to \$99,999" (.001)**
- **"\$100,000 to \$149,999" and "\$20,000 to \$49,999" (.000)**
- **"\$100,000 to \$149,999" and "Prefer not to say" (.038)**
- **"\$150,000 to \$199,999" and "\$20,000 to \$49,999" (.000)**
- **"\$150,000 to \$199,999" and "\$50,000 to \$99,999" (.002)**
- **"\$150,000 to \$199,999" and "Prefer not to say" (.000)**
- **"\$200,000 to \$249,999" and "\$20,000 to \$49,999" (.000)**
- **"\$200,000 to \$249,999" and "\$50,000 to \$99,999" (.076)**
- **"\$200,000 to \$249,999" and "Prefer not to say" (.008)**
- **"\$250,000 and over" and "Under \$20,000" (.024)**
- **"\$250,000 and over" and "\$20,000 to \$49,999" (.000)**
- **"\$250,000 and over" and "\$50,000 to \$99,999" (.001)**
- **"\$250,000 and over" and "Prefer not to say" (.000)**