



WHEN PLANT-BASED MEETS CULTIVATED

Consumer attitudes towards hybrids of plant-based and cultivated alternatives in the UK



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EXECUTIVE SUMMARY

Cultivated meat presents many benefits in terms of taste, health, food justice, animal welfare, and the environment when compared to conventional meat. However, it will be some years before cultivated-meat products reach the market (other than in Singapore, where regulatory approval has already been granted). In the meantime, there are opportunities to combine plant-based with cultivated-meat components in order to respond more quickly to consumer demands for healthier, more sustainable, and more ethical food products. Developing specific components, such as fat, means facing fewer technological and regulatory hurdles, compared to developing a complete cultivated-meat product, and thus has the potential to get to market more quickly.

How will consumers see hybrid plant-based/cultivated alternatives?

This is the question that ProVeg tried to answer by conducting an online survey of 1,000 UK participants in July 2022. Respondents were asked about their existing perceptions of conventional, plant-based, and cultivated meat, as well as hybrid food products that combine cultivated and plant-based ingredients. In this report, we focus on the findings regarding hybrid plant-based and cultivated alternatives. Here are the main results:

Here are the main results:

- 35% of respondents would probably or definitely buy hybrid plant-based/cultivated meat.
- 30% of respondents are unsure whether they would eat or buy hybrid plant-based/cultivated meat, meaning that there is still plenty of room to inform the public about these food products and their benefits in order to positively influence attitudes.
- Millennials (38%) and members of Gen Z (37%) are more likely to eat and buy hybrid plant-based/cultivated meat than members of Gen X (32%) and Boomers (29%).
- Men (39%) are more likely to eat or buy hybrid plant-based/cultivated meat than women (31%).
- In general, university-educated Millennials and Gen-Z men are more open to eating (51%) and buying (47%) hybrid plant-based/cultivated meat.
- About a third of respondents would eat hybrid plant-based/cultivated meat one-to-three times a week.
- The results are fairly similar when it comes to consumer acceptance of plant-based products with cultivated fat. However, respondents were slightly less receptive to this category of food.
- Consumer expectations in relation to hybrid plant-based/cultivated alternatives are fairly positive. More than half of respondents expect hybrid plant-based/cultivated meat to be good for animals and the environment (57%), nutritious (54%), healthy, and safe (50%).

The results of this survey are promising, especially given the fact that the vast majority of people are not at all familiar with this novel food category. Increasing people's familiarity with hybrid alternatives could play an important role in terms of encouraging acceptance.

With this in mind, further research will be needed to test the various narratives and nomenclatures (other than 'hybrid') being used to describe these innovative food products in different countries in order to create attractive messages and increase acceptance. We chose to use the term 'hybrid' for this first study of consumer attitudes towards products that are a blend of plant-based and cultivated ingredients. To our knowledge, there is no other strongly recognised term to describe these products. We do, however, recognise that the term 'hybrid' might be off-putting to consumers when it comes to food, as it may imply heavy processing. ProVeg welcomes any collaboration or further research into naming conventions and their role in ensuring favourable consumer acceptance of these products.



THE CONTEXT

Plant-based meat is entering the mainstream

The production and consumption of conventional meat has devastating effects on the environment. Intensive livestock farming is responsible for 80% of the destruction of tropical forests,¹ 70% of species extinction,² and is increasing global antibiotic resistance, which could cause 10-million deaths per year by 2050.³

Ethical, environmental, and health concerns linked to conventional meat are driving consumer demand for alternative proteins. As a result, an increasing number of consumers are moving towards a more plant-based diet. Our survey shows that, while 74% of UK consumers would probably or definitely eat conventional meat, an impressive 65% would probably or definitely eat plant-based meat. Plant-based meat was also perceived as being better for the environment, better for animals, safer, and healthier than conventional meat.

The plant-based food sector has been experiencing massive growth over the last few years, with the European plant-based food sector growing by 49% since 2018, reaching a total sales value of €3.6 billion in 2020.⁴ Plant-based meat continues to move into the mainstream and, looking at consumer attitudes towards plant-based foods, it's clear that there is no stopping its rise. Recent research shows that 46% of European consumers are eating less meat than a year ago, while nearly 40% of European consumers intend reducing their meat consumption.⁵ According to the Good Food Institute, Western Europe experienced a 19% growth in plant-based-meat retail dollar sales in 2021, while Eastern Europe showed an even more impressive 34% growth rate.⁶ A striking example of the growth of the plant-based meat sector is German company Rügenwalder Mühle, which saw its meat sales fall by 1.9% in 2021, while its plant-based meat products increased by a staggering 41.6%.⁷

Given that consumer demand for tasty, healthy, and sustainable products has led to the rise of plant-based-meat products, why do we need cultivated meat?





The promises of cultivated meat

Cultivated meat is real meat cultivated directly from animal cells, thus avoiding the need to raise and slaughter animals. Cultivated meat is about changing the process rather than the food (for more information on cultivated meat and cellular agriculture, please visit our [website](#)). Cultivated meat allows for the production of the meat products that people know and love, without all the devastating effects of industrialised animal agriculture. Studies have shown that cultivated meat could result in 92% less greenhouse-gas emissions, 95% less land use, and 78% less water use compared to conventional meat.⁸ Recent research also shows that cultivated meat has the potential to be more nutritious than conventional meat.⁹ While these are still early estimates, cultivated meat has the potential to make meat production substantially healthier and more sustainable.

The cultivated-meat industry has seen remarkable developments over the last few years, from the first public tasting in 2013 to the regulatory approval of cultivated-chicken nuggets in Singapore in 2020 and the first US approval in late 2022. Today, more than a hundred companies around the world are working on making cultivated animal products available for all.¹⁰ However, although cultivated meat is moving closer and closer to market, the majority of people are not at all familiar with this novel food. A recent survey by ProVeg in the UK shows that the majority of respondents have no understanding of cultivated meat at all. We can, however, be cautiously optimistic, as UK respondents indicated a strong likelihood of trying cultivated meat (62%), as well as replacing conventional meat with cultivated meat (around 40%).¹¹

Bringing the best of both worlds

Developments in the cellular agriculture sector, alongside relatively positive consumer perceptions of cultivated meat, represent tremendous opportunities for the global plant-based food sector. Plant-based and cultivated products are not mutually exclusive categories but form a highly promising complementary strategy.

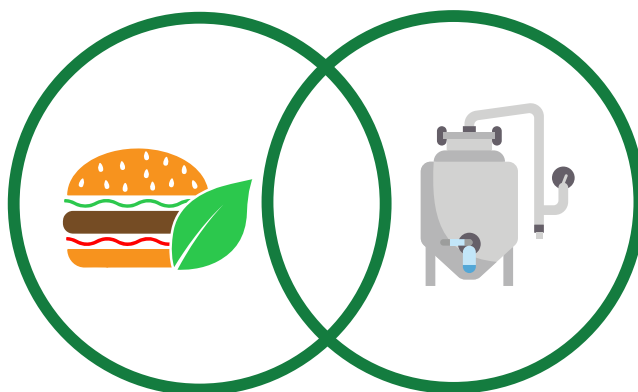
Plant-based products can benefit from certain cultivated animal ingredients in order to provide an enhanced meaty texture and taste. A few companies are now focusing on one special animal-based ingredient which could enhance the meaty quality of plant-based products. That magic ingredient is fat. Fat plays a key role in the experience of eating meat – it provides a specific taste, texture, and appealing juiciness that many people crave.

“The reason we focus on fat is because fat is by far the most important sensory component of all the meat that we love to eat. Whether you’re talking about high-end cuts of meat, or just a hamburger, it really is the fat that makes that meat delicious.”
– Max Jamilly, Cofounder of Hoxton Farms¹²

Adding cultivated animal fat to a plant-based product has many benefits. First, it has huge potential to provide an improved meaty quality. Considering that 90% of consumers of plant-based foods are neither vegetarian nor vegan,¹³ replicating the right meaty, fatty flavour is important when it comes to plant-based-meat products. Adding cultivated animal fat to a plant-based product also has the potential to minimise the number of binding agents, flavourants, and other ingredients traditionally used in plant-based food products. Finally, hybrid plant-based/cultivated meat could improve the nutritional profile of plant-based products. Knowing that taste and health are two of the most important purchase drivers when it comes to plant-based foods,¹⁴ hybrid products show a strong potential to respond to consumer demand.



Plant-based



Blended



Cultivated



Companies producing cultivated fat

Cultivated-fat companies are gaining momentum, and increasingly attracting investors. In 2021, US-based company Mission Barns closed a Series-A fundraising round of \$24 million for the construction of a pilot manufacturing plant.¹⁵ More recently, UK-based Hoxton Farms raised \$22 million in its Series-A funding round.¹⁶

Plant-based and cultivated-meat companies have already started collaborating. In 2021, the Chinese plant-based company Herotein announced that it is developing plant-based products using cultivated fat provided by Mission Barns.¹⁷ More recently, the Scottish company Enough announced a partnership with cultivated-fat producer Peace of Meat.¹⁸ Even more strikingly, the German conventional and plant-based meat manufacturer Rügenwalder Mühle announced a partnership with Swiss company Mirai Foods to develop meat products containing plant proteins and cultivated beef fat.¹⁹

On the other hand, cultivated-meat products can benefit from plant-based ingredients in order to accelerate market entry. This is exactly the approach that Eat Just took in Singapore in 2020, when applying for regulatory approval for its cultivated-chicken nuggets. The nuggets were actually a hybrid product composed of both plant-based and cultivated ingredients.²⁰ Before 100% cultivated-meat products arrive on supermarket shelves, there is the potential to combine plant-based and cultivated-meat ingredients in order to respond faster to consumer demand for tasty, healthy, sustainable, and ethical alternatives to conventional animal-based products. There is huge potential for accelerating market entry by combining the two different approaches to arrive at a perfect result, rather than perfecting just one approach.

How will consumers see hybrid plant-based/cultivated alternatives?

If consumers are now familiar with plant-based food products, how will they perceive foods that are a blend of plant-based and cultivated ingredients? While there has been some research into consumer acceptance and attitudes towards cultivated meat, until now there has been no data on consumer attitudes toward hybrid products that combine plant-based and cultivated ingredients. Given this lack of research on the subject, ProVeg conducted a survey of 1,000 respondents in the UK in order to learn more about levels of consumer acceptance and attitudes towards hybrid food products.

This report provides insight into consumer acceptance of hybrid food products that are a blend of plant-based and cultivated-meat ingredients, as well as into consumer expectations of these products.

About the survey

ProVeg International conducted the online survey in the UK in July 2022. The survey was completed by respondents recruited via the Attest online platform, with a total of 1,000 participants, who were selected to be representative of the general population in terms of age, gender, and region.

Respondents were asked about their existing perceptions of conventional meat, plant-based meat, and cultivated meat, as well as hybrid food products that combine cultivated and plant-based ingredients. We provided a simple and neutral description for each food category. In this report, we focus only on the findings regarding hybrid plant-based/cultivated alternatives. More findings on conventional, plant-based, and cultivated meat can be found in the appendix.



SURVEY RESULTS

Willingness to eat and buy hybrid plant-based/cultivated alternatives

Participants were presented with information about two different hybrid food products: a hybrid of plant-based and cultivated ingredients and a hybrid of plant-based meat and cultivated fat. They were shown two short descriptions of the hybrid food products and asked about their willingness to eat and buy them.

Description of hybrid plant-based/cultivated meat provided to participants:

Cultured meat is real animal meat which is grown from animal cells outside of the animal's body. Hybrid plant-based/cultured meat is a blend of cultured meat and plant ingredients, such as a cultured beef/mushroom burger. Blending cultured meat with plant ingredients can make meat products healthier, as well as improving taste and texture.

Description of hybrid plant-based meat with cultivated fat provided to participants:

Cultured animal fat is real animal fat which is grown from animal cells outside of an animal's body. Hybrid plant-based meat/cultured fat products combine the plant ingredients found in plant-based meat alternatives with cultured animal fat. These products are tastier than regular plant-based meat alternatives, and more sustainable than conventional meat.

Hybrid plant-based/cultivated meat

36%

OF RESPONDENTS

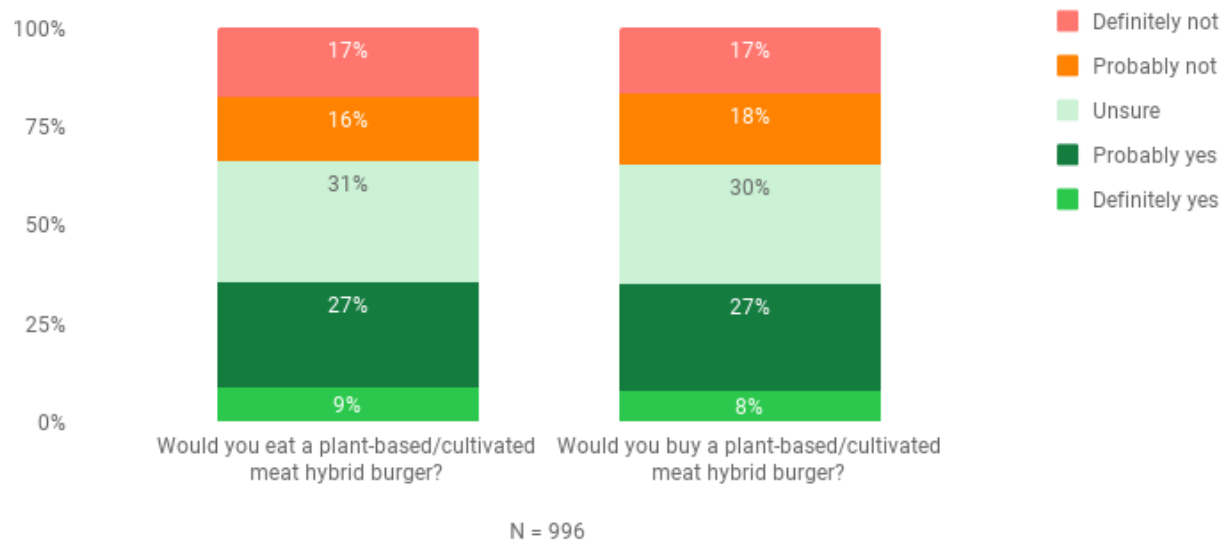
would probably or definitely eat hybrid plant-based/cultivated meat, and 35% of respondents would probably or definitely buy hybrid plant-based/cultivated meat.

30%

OF RESPONDENTS

were unsure, meaning that there is still plenty of room to positively influence the public by informing people about these novel products and their benefits.

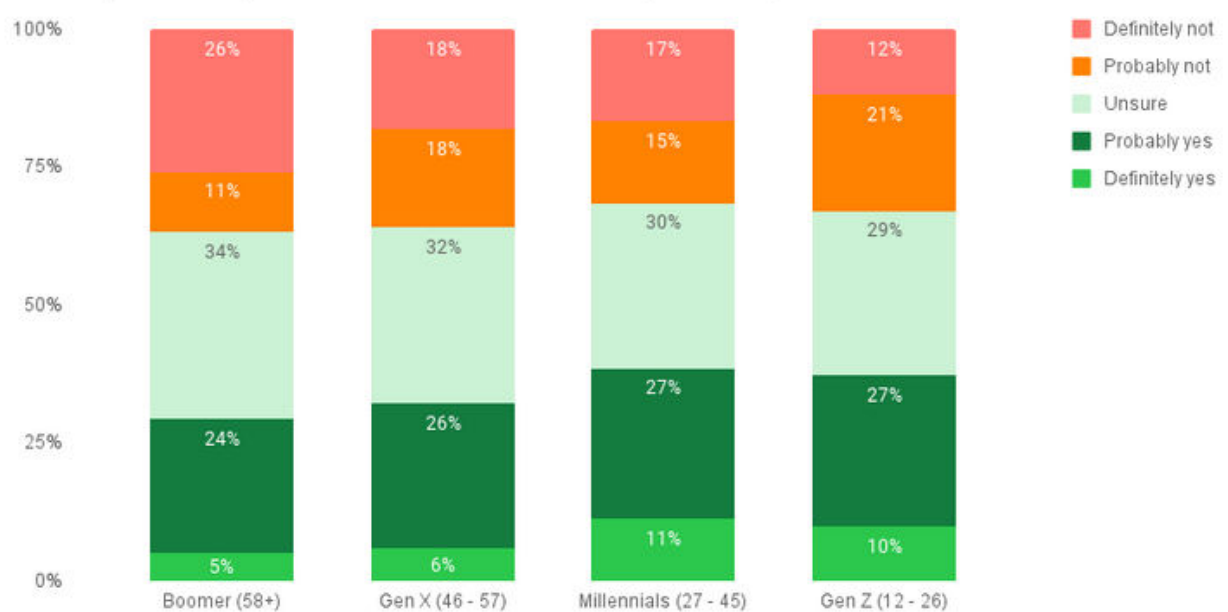
Willingness to eat and buy hybrid plant-based/cultivated meat



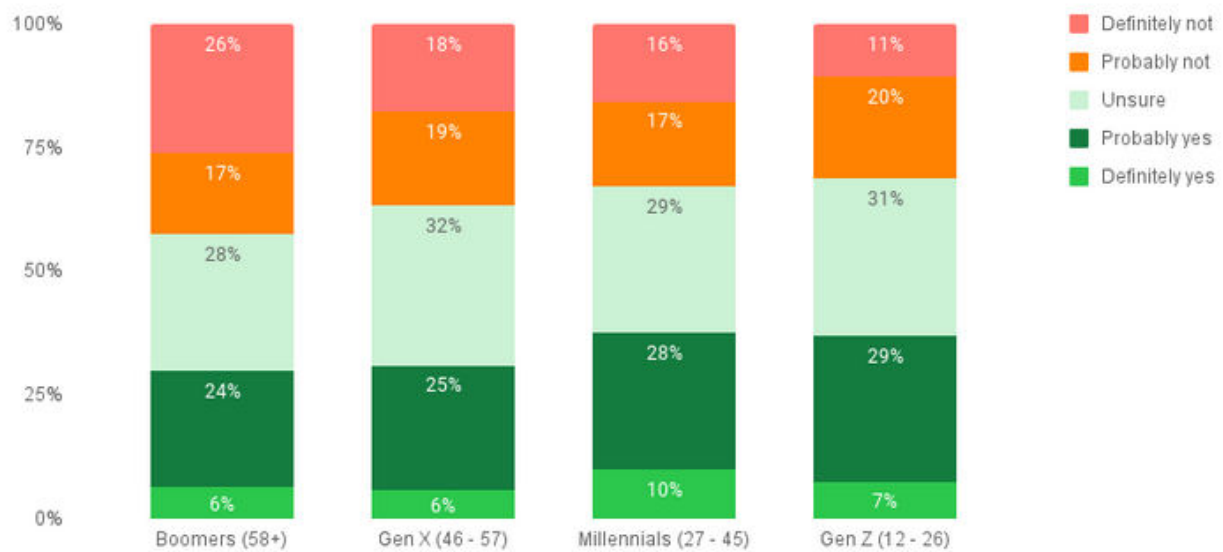
Millennials and members of Gen Z are more open to hybrid plant-based/cultivated meat.

Millennials (38%) and members of Gen Z (37%) are more likely to eat hybrid plant-based/cultivated meat, than members of Gen X (32%) and Boomers (29%). The same is true when it comes to the likelihood of them buying hybrid plant-based/cultivated meat.

Would you eat a plant-based/cultivated meat hybrid burger?



Would you buy a plant-based/cultivated meat hybrid burger?

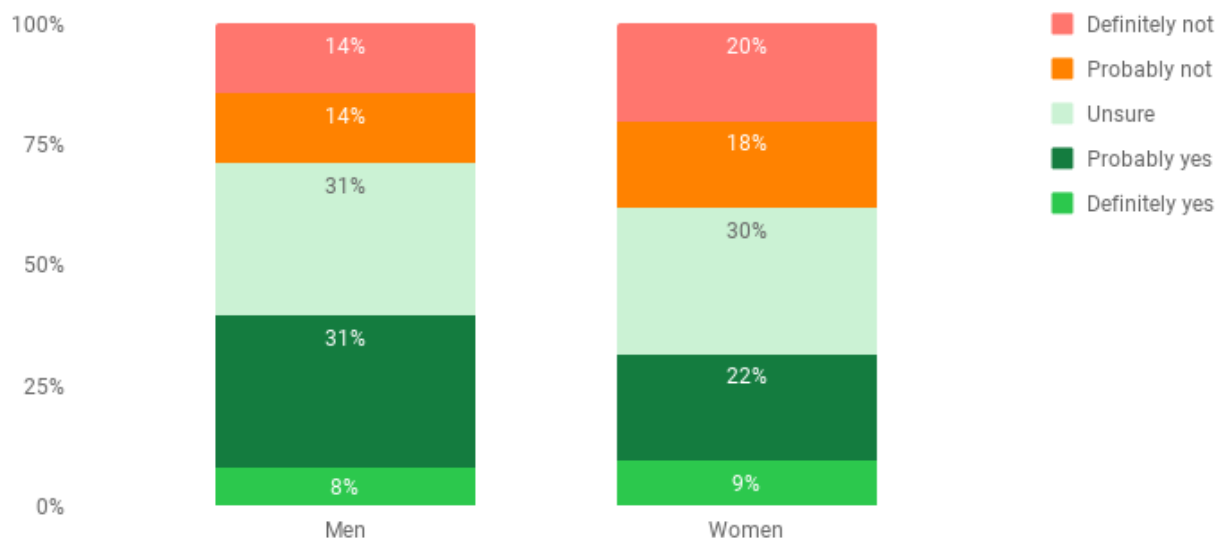


Men are more likely to give plant-based/cultivated hybrid meat a try.

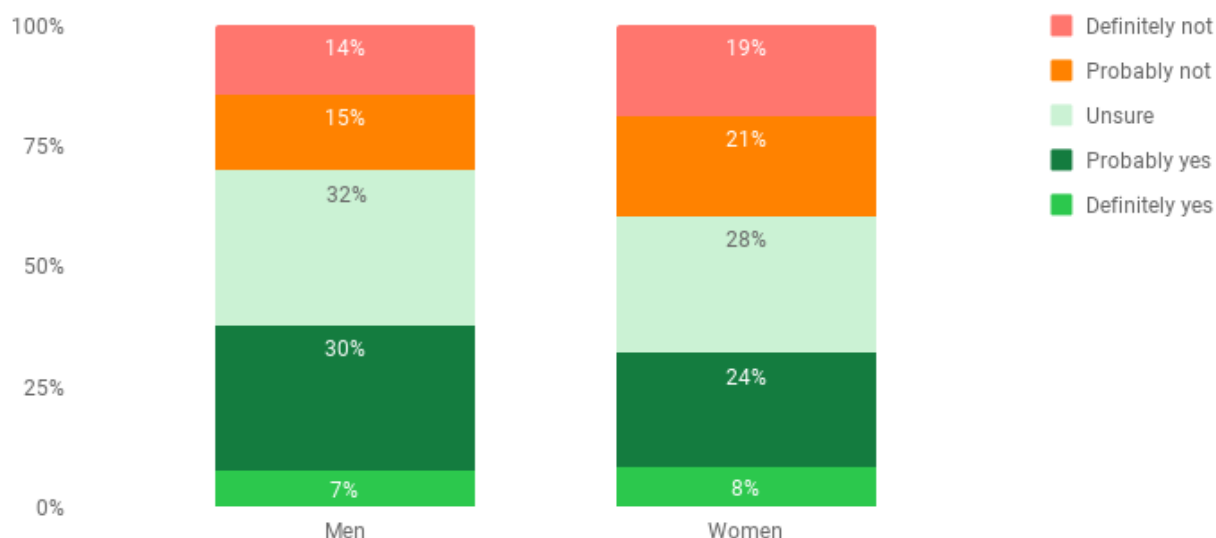
39% of men, compared to 31% of women, would probably or definitely eat hybrid plant-based/cultivated meat.

37% of men, compared to 32% of women, would probably or definitely buy hybrid plant-based/cultivated meat.

Would you eat a plant-based/cultivated meat hybrid burger?



Would you buy a plant-based/cultivated meat hybrid burger?

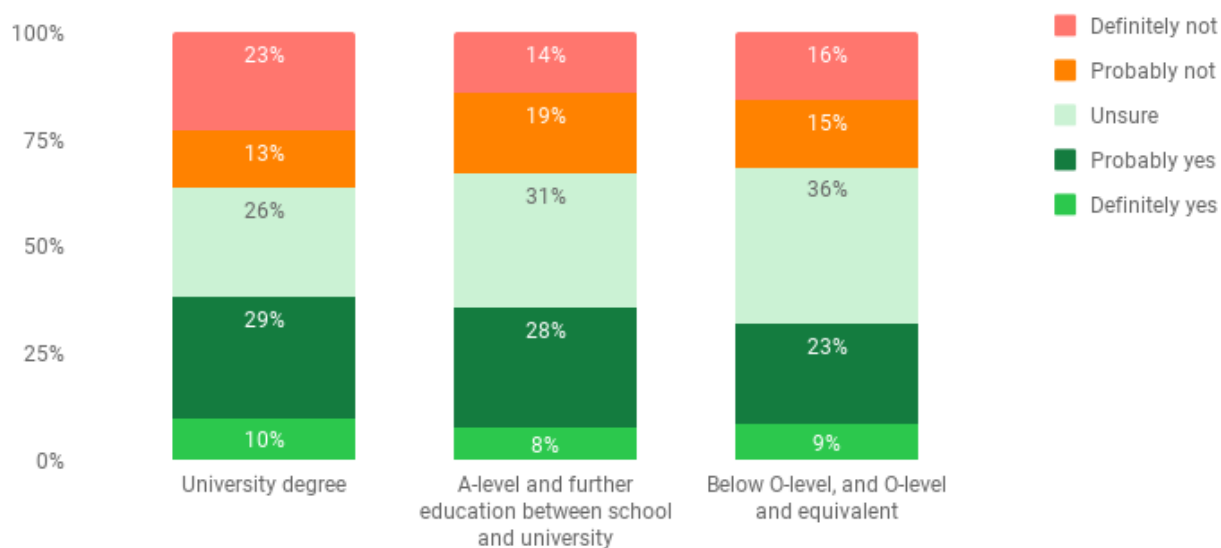


Level of education plays a role in the acceptance of hybrid plant-based/cultivated meat.

University-educated respondents (38%), as well as respondents with A-levels* and further education between school and university (36%) are more likely to eat hybrid plant-based/cultivated meat, compared to respondents with below O-level* and O-level and equivalent (31%). The same is true when it comes to the likelihood of them buying hybrid plant-based/cultivated meat.

Interestingly, university-educated respondents have a more fixed opinion of hybrid plant-based cultivated meat. This group had the most positive (38%) and negative (39%) attitudes towards the products.

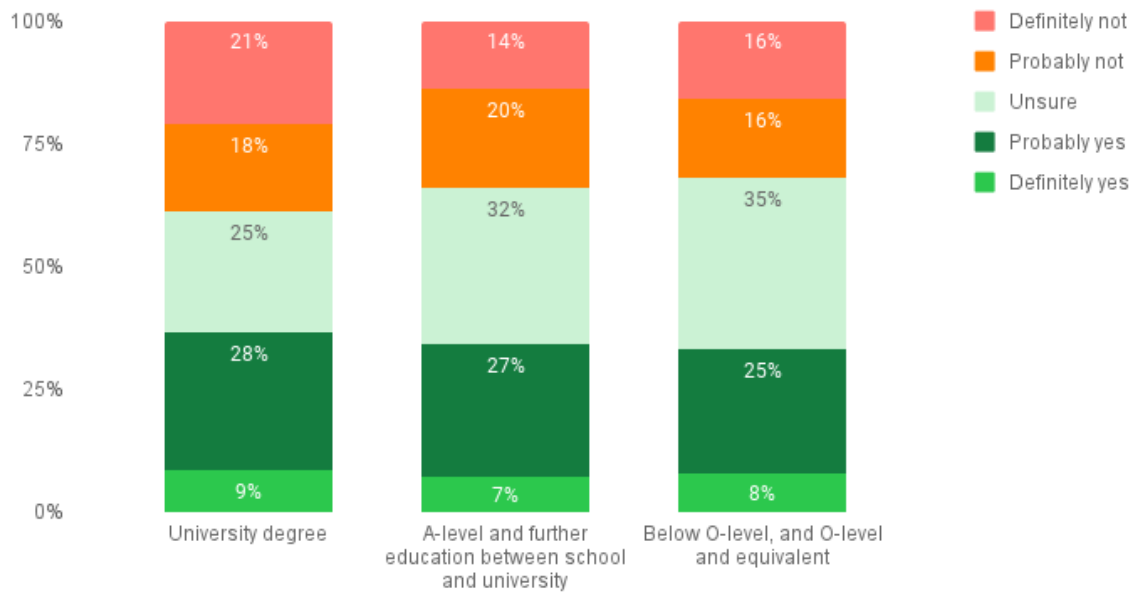
Would you eat a plant-based/cultivated meat hybrid burger?



* A-level: qualification that can lead to university, further study, training, or work.

** O-level: typically represents a total of 11 years of study and marks the end of the secondary education cycle.

Would you buy a plant-based/cultivated meat hybrid burger?

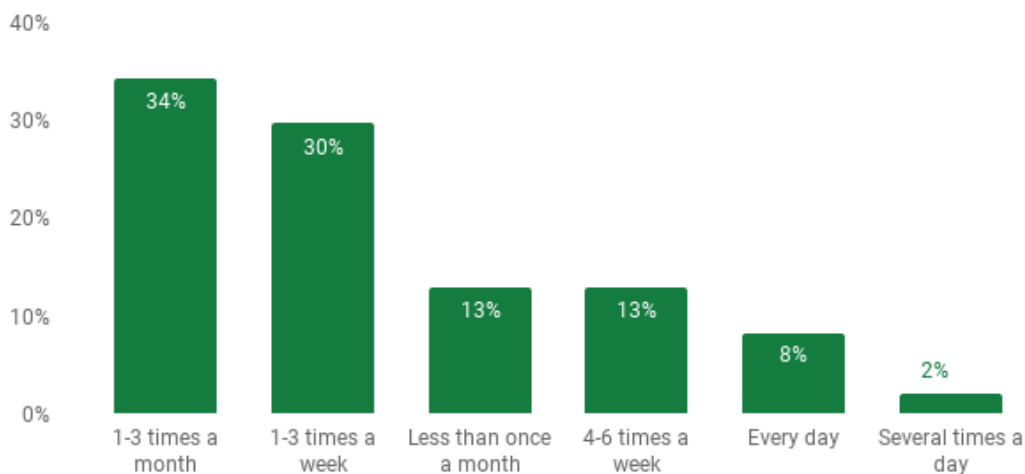


Overall, university-educated Millennials and Gen-Z men are more open to hybrid plant-based/cultivated meat.

51% of university-educated men up to 45 years old (Millennials and members of Gen Z) would probably or definitely eat hybrid plant-based/cultivated meat. 47% of university-educated men up to 45 years old (Millennials and members of Gen Z) would probably or definitely buy hybrid plant-based/cultivated meat.

When asked how frequently they would eat hybrid plant-based/cultivated meat, 30% of respondents said that they would eat the products one-to-three times a week and 34% one-to-three times a month.

How frequently would you eat hybrid plant-based/cultivated meat?



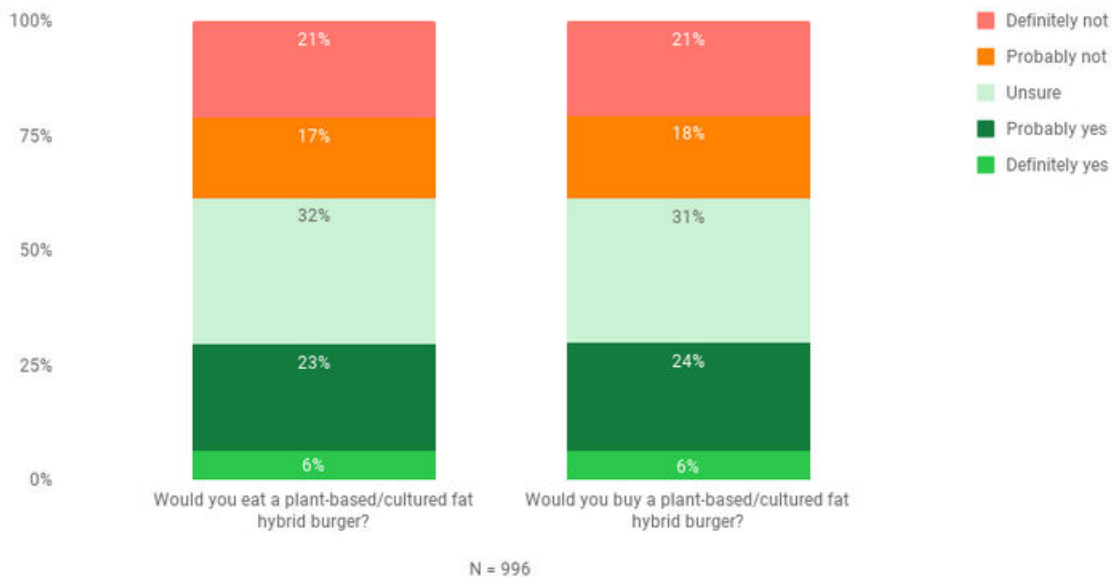
N = 397

Hybrid plant-based meat with cultivated fat

30% of respondents would probably or definitely eat or buy hybrid plant-based meat with cultivated fat.

31% of respondents are unsure. Here again, there is a lot of room to familiarise people with the products and positively influence them.

Willingness to eat and buy hybrid plant-based meat with cultivated fat

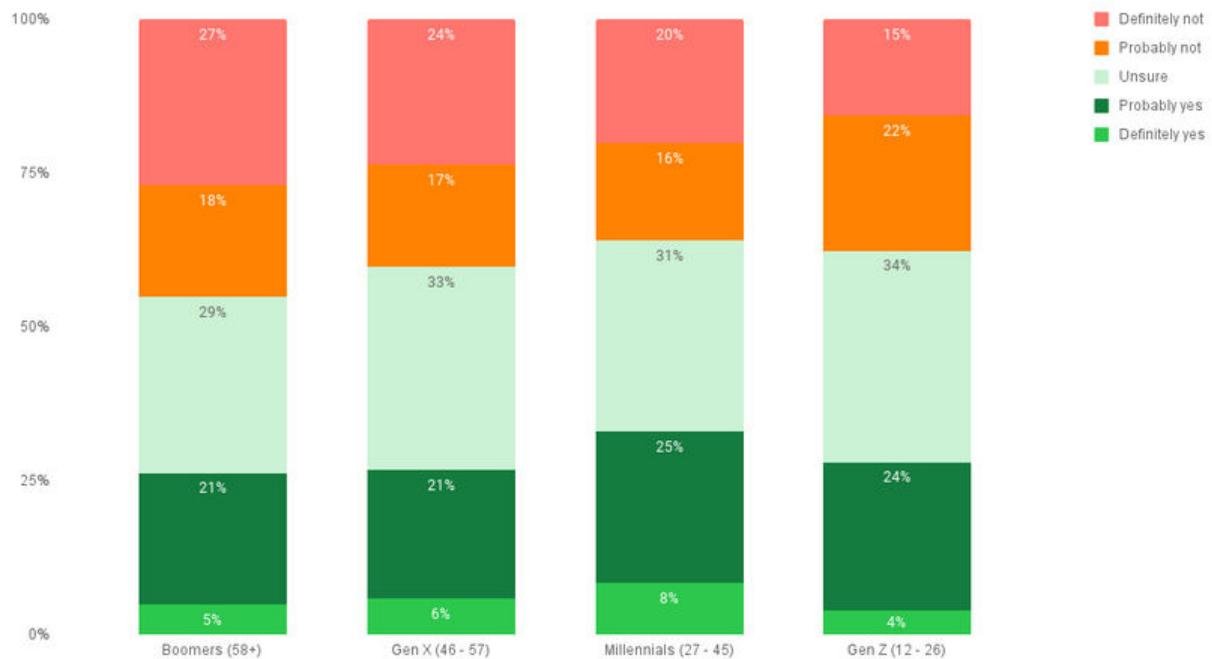


As with the responses to hybrid plant-based/cultivated meat, age, gender, and level of education are key demographic factors that play a role in people's willingness to try and buy hybrid plant-based meat with cultivated fat.

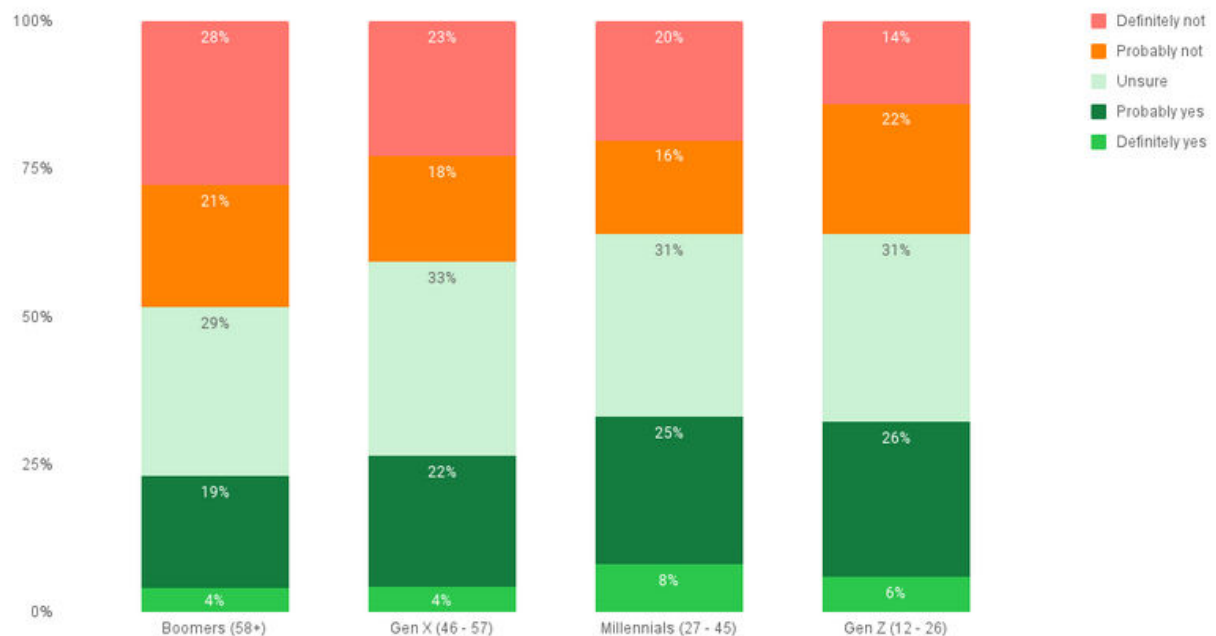


Millennials and members of Gen Z are also more open to hybrid plant-based meat with cultivated fat.

Would you eat a plant-based/cultivated fat hybrid burger?



Would you buy a plant-based/cultivated fat hybrid burger?



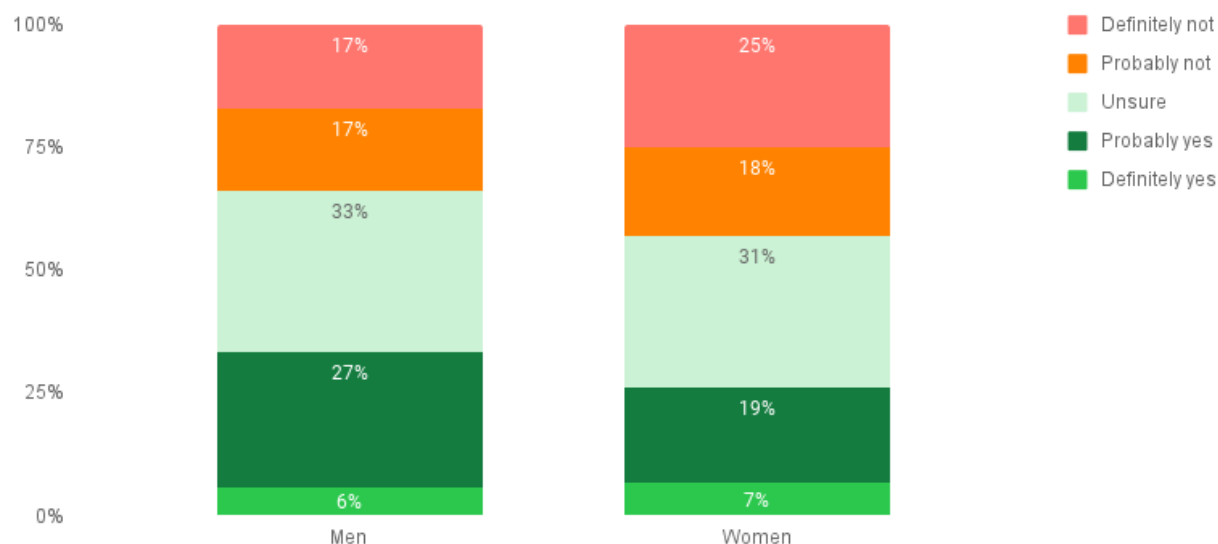
Millennials (33%) and members of Gen Z (28%) are more likely to eat hybrid plant-based/cultivated meat with cultivated fat than are members of Gen X (27%) and Boomers (26%). The same is true when it comes to the likelihood of them buying hybrid plant-based/cultivated meat with cultivated fat.

As with the case of hybrid plant-based/cultivated meat, men are more likely to give hybrid plant-based meat with cultivated fat a try.

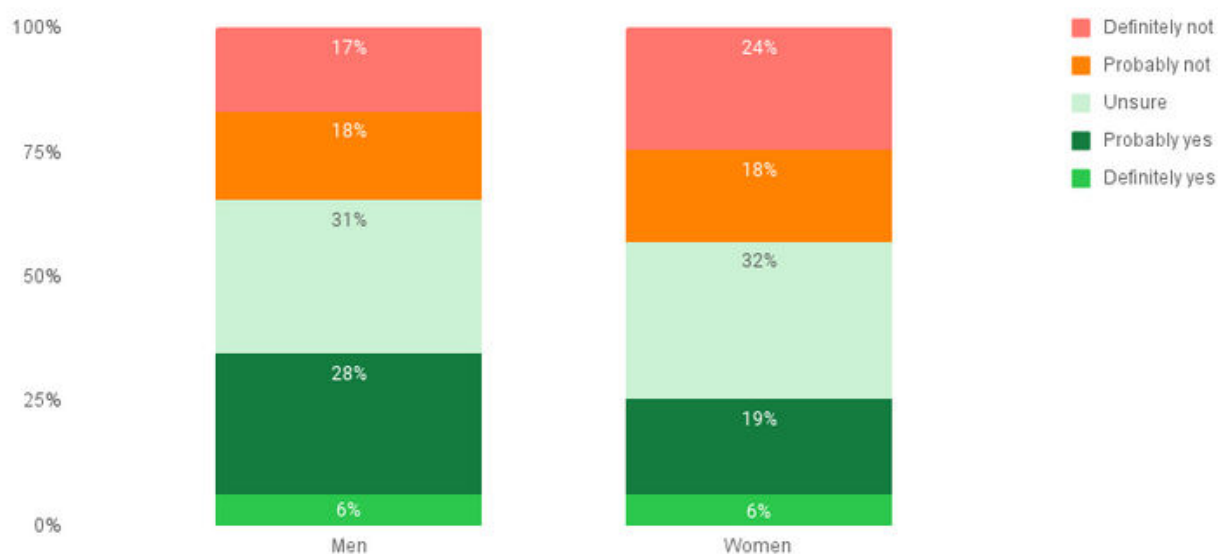
33% of men, compared to 26% of women, would probably or definitely eat hybrid plant-based meat with cultivated fat. The same goes for the likelihood of them buying hybrid plant-based meat with cultivated fat.



Would you eat a plant-based/cultivated fat hybrid burger?



Would you buy a plant-based/cultivated fat hybrid burger?

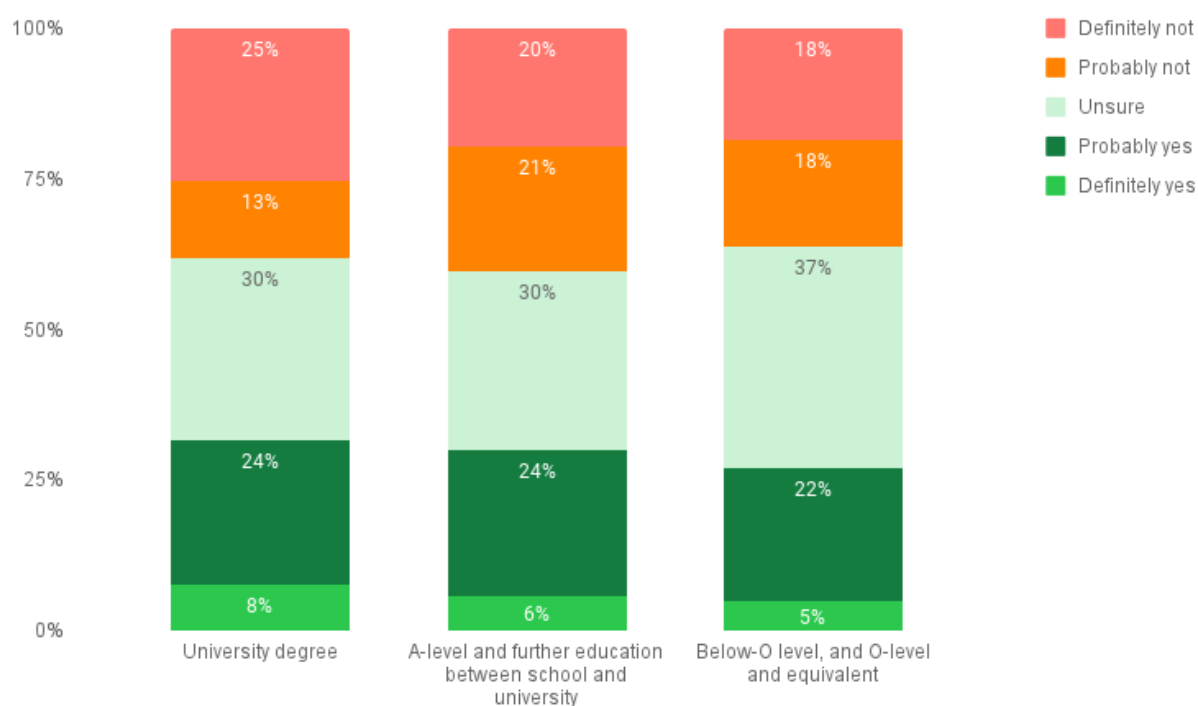




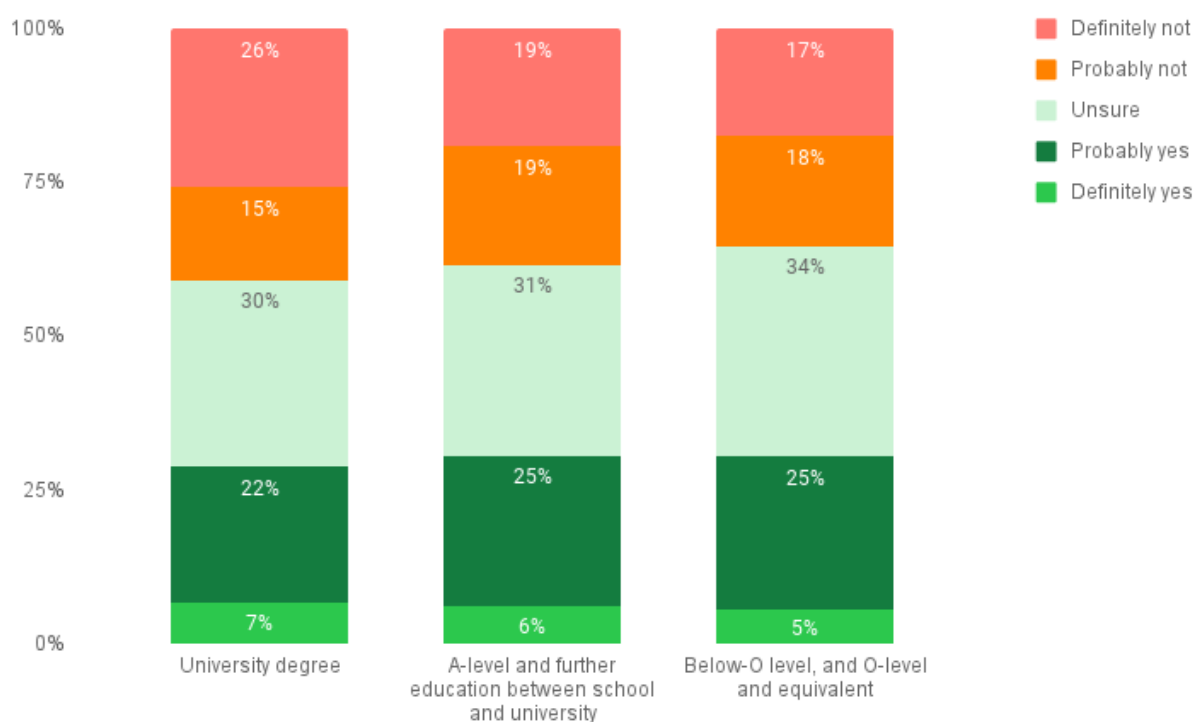
Level of education plays a slight role in the acceptance of hybrid plant-based meat with cultivated fat.

University-educated respondents (32%), as well as respondents with A-levels and further education between school and university (30%), are slightly more likely to eat hybrid plant-based meat with cultivated fat, compared to respondents below O-level and O-level and equivalent (27%).

Would you eat a plant-based/cultivated fat hybrid burger?



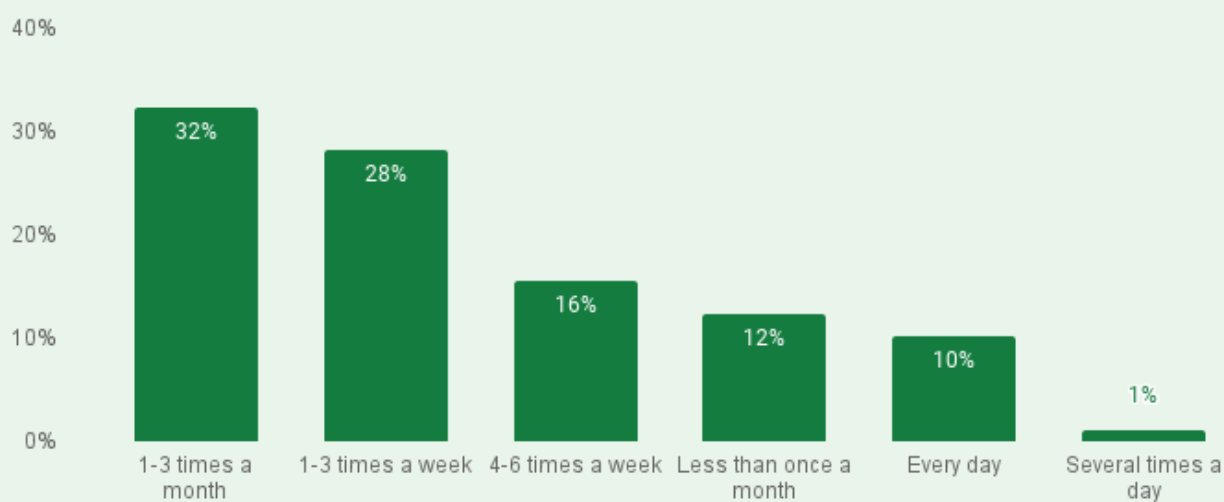
Would you buy a plant-based/cultivated fat hybrid burger?



Overall, university-educated Millennials and Gen Z men are more likely to eat (50%) and buy (45%) hybrid plant-based meat with cultivated fat.

When asked how frequently respondents would eat hybrid plant-based meat with cultivated fat, 28% of respondents would eat the products one-to-three times a week and 32% one-to-three times a month.

How frequently would you eat a hybrid plant-based meat with cultivated fat?



N=341

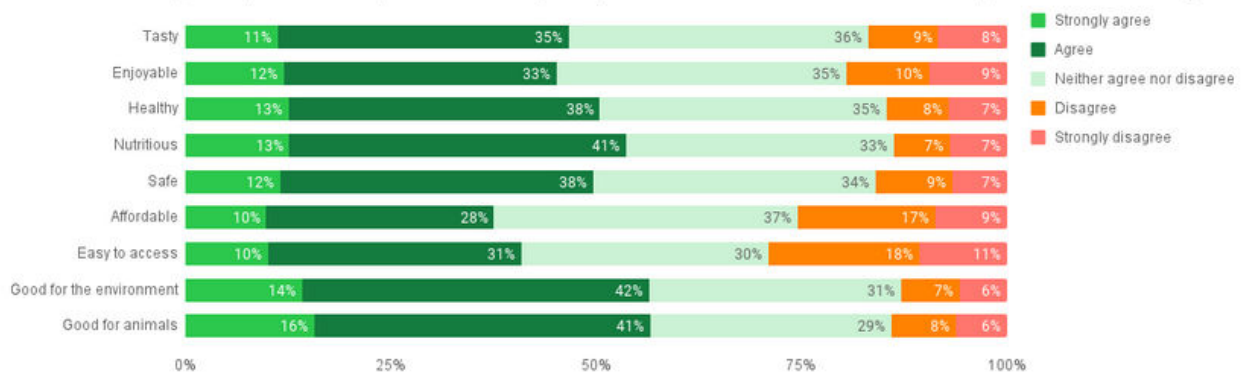
Consumer expectations of hybrid plant-based/cultivated foods

We also asked respondents about their opinions and expectations of hybrid foods, for instance, regarding health, taste, or affordability.

Hybrid plant-based/cultivated meat

- 57% of respondents expect hybrid plant-based/cultivated meat to be **good for the animals**.
- 57% of respondents expect hybrid plant-based/cultivated meat to be **good for the environment**.
- 54% of respondents expect hybrid plant-based/cultivated meat to be **nutritious**.
- 50% of respondents expect hybrid plant-based/cultivated meat to be **healthy**.
- 50% of respondents expect hybrid plant-based/cultivated meat to be **safe**.

Please indicate your opinions or expectations of hybrid plant-based/cultivated meat with respect to the following:

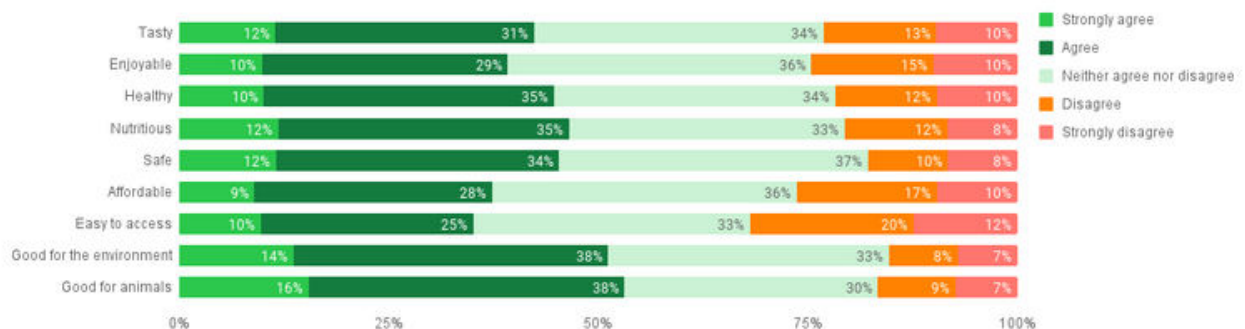




Hybrid plant-based meat with cultivated fat

- 53% of respondents expect hybrid plant-based meat with cultivated fat to be **good for animals**.
- 51% of respondents expect hybrid plant-based meat with cultivated fat to be **good for the environment**.
- 47% of respondents expect hybrid plant-based meat with cultivated fat to be **nutritious**.
- 45% of respondents expect hybrid plant-based meat with cultivated fat to be **healthy** and **safe**.

Please indicate your opinions or expectations of hybrid plant-based meat with cultivated fat products with respect to the following:



KEY TAKEAWAYS

This report makes it clear that combining plant-based and cultivated ingredients presents many opportunities for both plant-based and cellular-agriculture companies. Plant-based and cultivated products are not mutually exclusive categories but present a highly promising prospect for complementary strategies.

These first research findings on consumer acceptance of hybrid plant-based/cultivated alternatives in the UK show that respondents are open to the idea, with young, educated men being the most receptive.

- 35% of respondents would probably or definitely eat or buy hybrid plant-based/cultivated meat, while 30% of respondents would probably or definitely eat or buy hybrid plant-based meat with cultivated fat.
- Age, gender, and educational level are key demographic factors that play a role in terms of people's willingness to try and buy hybrid plant-based/cultivated alternatives.
- In general, university-educated Millennials and Gen-Z men are more open to hybrid plant-based/cultivated meat. 51% of university-educated men up to 45 years old (Millennials and members of Gen Z) would probably or definitely eat hybrid plant-based/cultivated meat. 47% of university-educated men up to 45 years old (Millennials and members of Gen Z) would probably or definitely buy hybrid plant-based/cultivated meat. The same goes for the acceptance of hybrid plant-based meat with cultivated fat.
- Around 30% of respondents were unsure whether they would eat or buy plant-based/cultivated alternatives, meaning that there is still plenty of room to positively influence the public by informing people about these novel products and their benefits.
- Consumer expectations of hybrid plant-based/cultivated food are that it is:
 1. good for the environment and animals
 2. nutritious
 3. healthy and safe.

The results of this survey are quite promising, especially considering that the vast majority of people are not at all familiar with this novel food category. Increasing people's familiarity with these novel food types could play an important role in acceptance. Studies show that the more people know about cultivated meat, the more willing they are to buy and try it.²¹ This is why it is important to communicate about the products before commercialisation. If you want to learn more about cultivated meat and effective messaging on the subject, we strongly recommend that you download our report '[Communicating about cultured meat: a definitive industry guide](#)'.



RECOMMENDATIONS

01

If you are a cultivated-meat company, consider partnering with plant-based companies.

02

The same is true the other way around – if you are a plant-based company, consider partnering with a cultivated-meat company to develop tasty, healthy, and sustainable hybrid food products.

03

Do you have a business idea involving plant-based or cultivated alternatives? Apply to the ProVeg Incubator programme in order to further develop your venture.

04

Additional research will be needed to test the various narratives and nomenclatures being used in different countries to create attractive messages and increase acceptance of these innovative food products. If you would like to research a specific topic, please get in touch with us to partner in a research survey!



ACKNOWLEDGEMENTS

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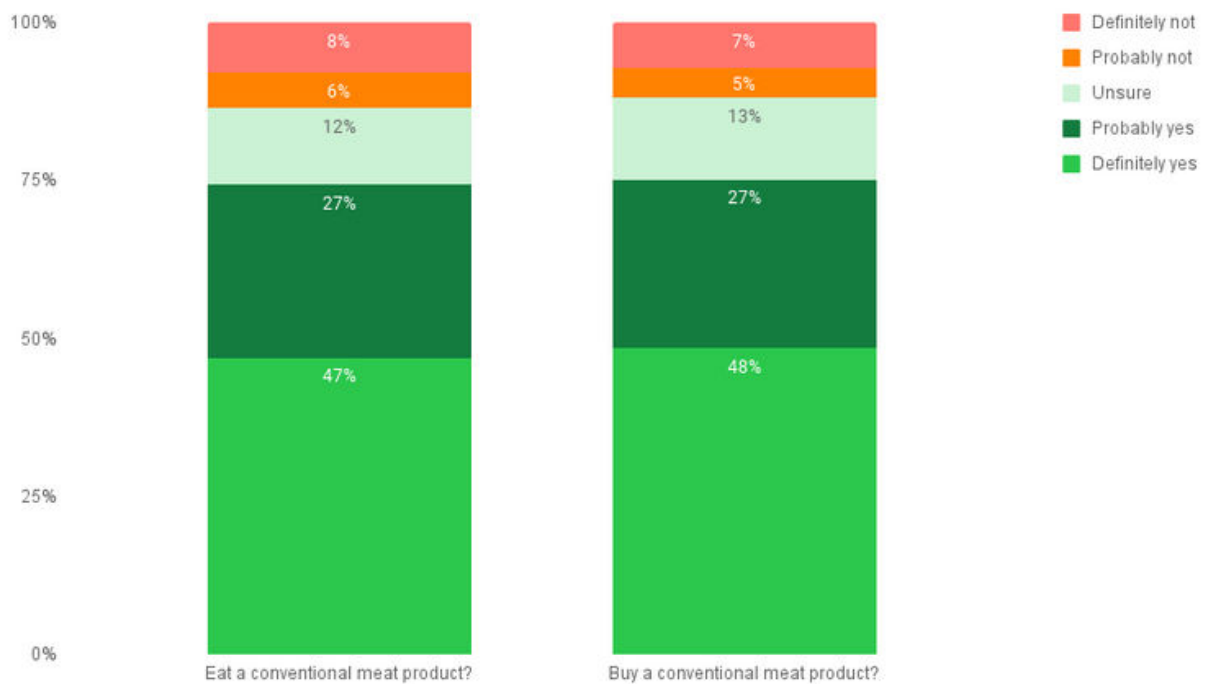
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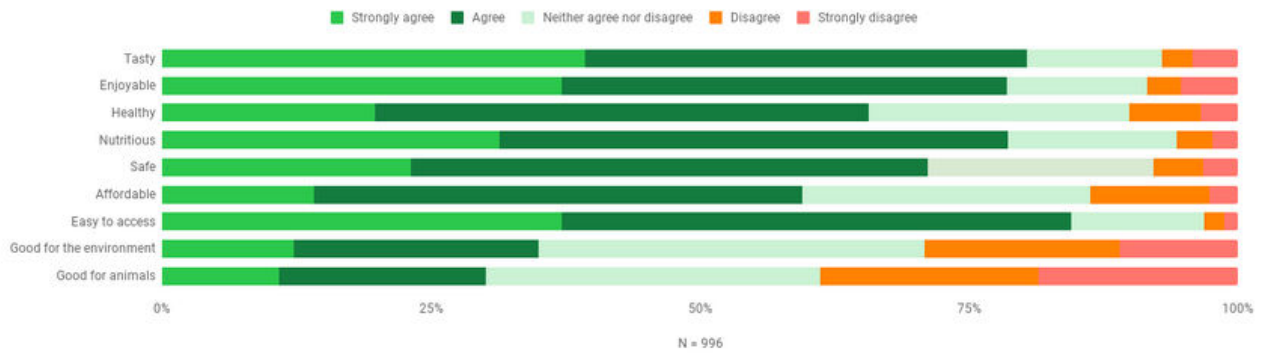
APPENDIX

Conventional meat

Would you

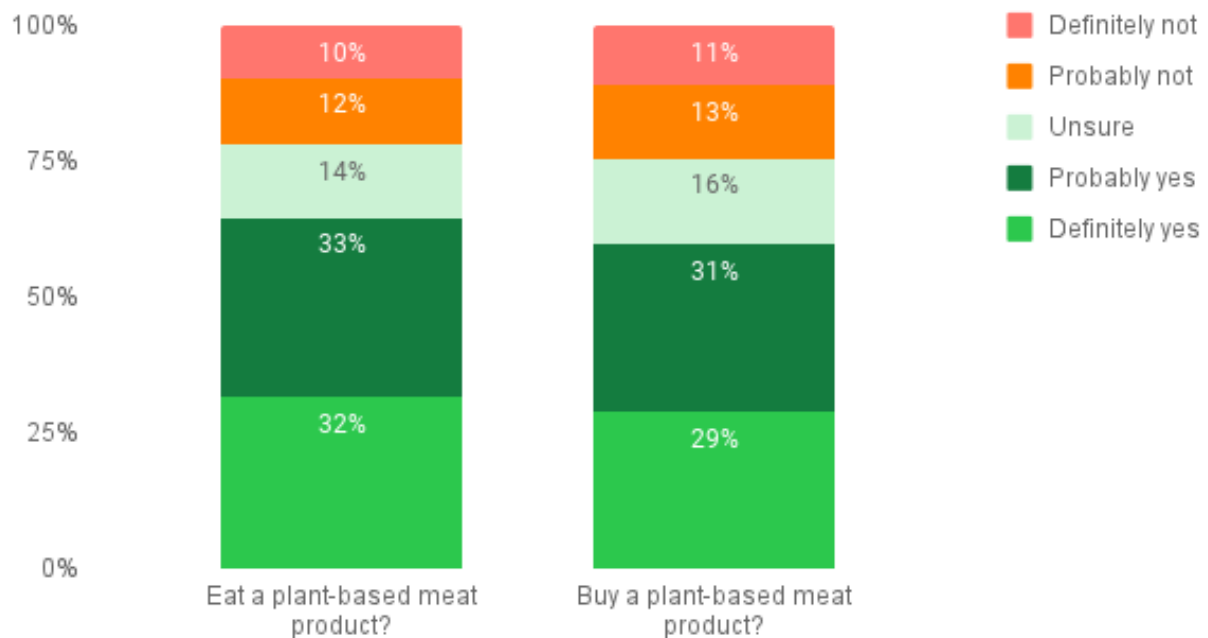


Please indicate your opinions or expectations of conventional meat products with respect to the following:

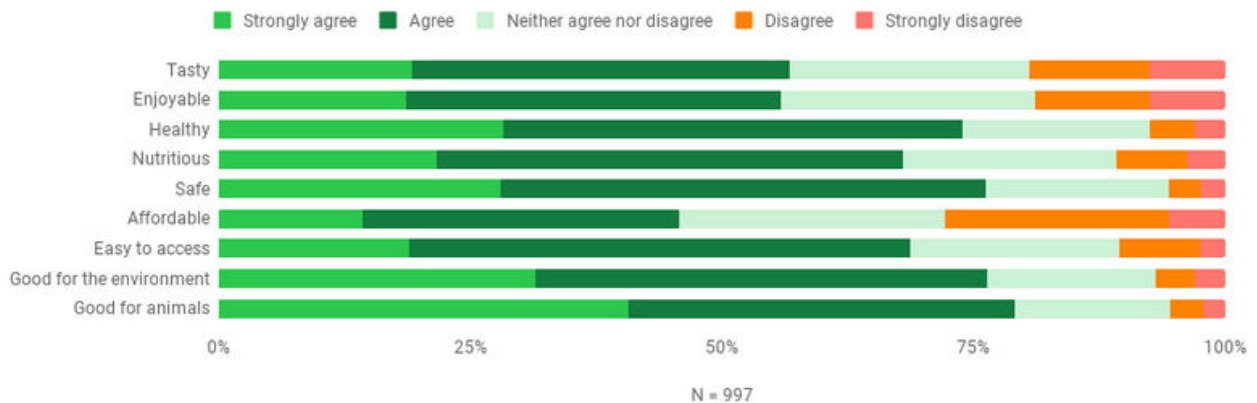


Plant-based meat

Would you

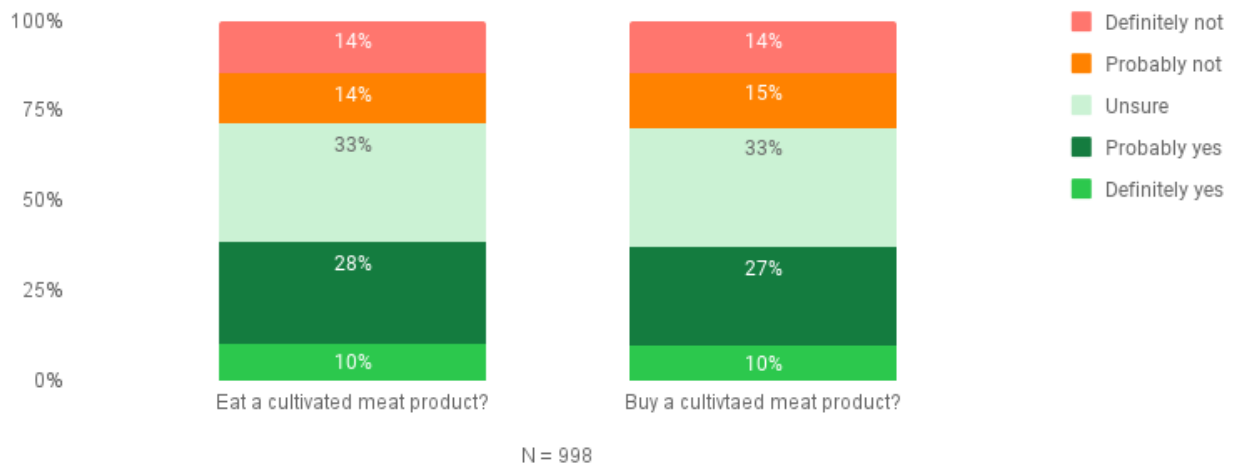


Please indicate your opinions or expectations of plant-based meat products with respect to the following:

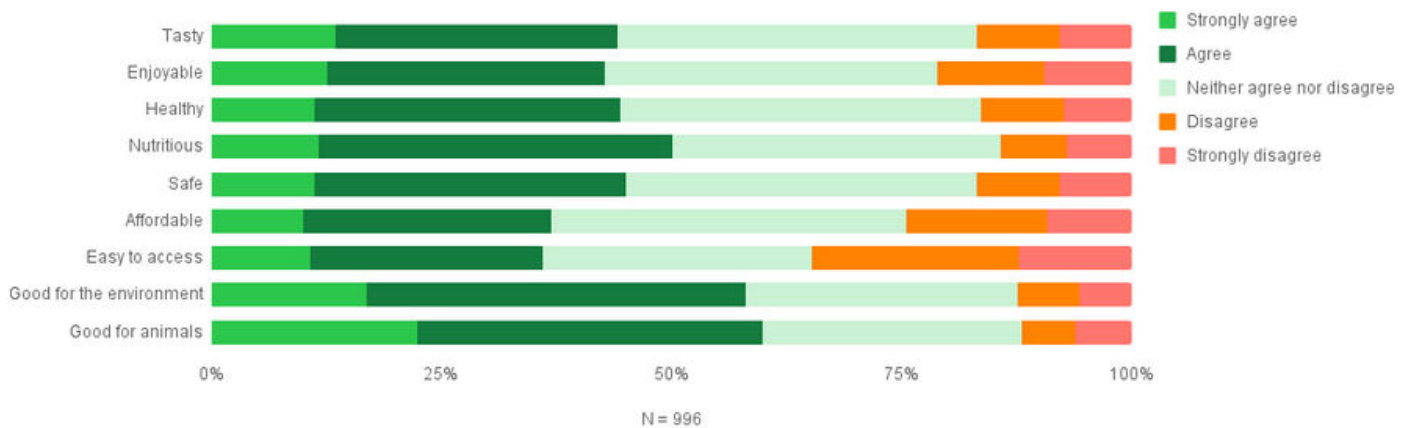


Cultivated meat

Would you



Please indicate your opinions or expectations of cultivated meat products with respect to the following:



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ABOUT PROVEG

ProVeg is an international food awareness organisation working to transform the global food system by replacing conventional animal-based products with plant-based and cultivated alternatives.

ProVeg works with international decision-making bodies, governments, food producers, retailers, investors, the media, and the general public to help the world transition to a society and economy that are less dependent on animal agriculture and more sustainable for humans, animals, and our planet.

As a leading NGO in the alternative-protein space, we have no commercial agenda. This allows us to provide objective expert advice and help support you successfully and effectively by harnessing the power and profitability of the shift to plant-based eating, in the most appropriate way for your business.

We work with companies along the entire value chain, which gives us unique insights into the key challenges, hurdles, and opportunities at every stage of the journey as you take your product to market.

