

What are the effects of increasing the availability of animal-free foods on animal product consumption?

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Summary

In this research brief, we consider how increasing the availability of animal-free foods could affect animal product consumption and connect these two outcomes using our [theory of change](#) model. Animal-free foods include both plant-based foods and animal-free meat alternatives (e.g., plant-based and cell-cultured meat). We also consider evidence from studies involving vegetarian options that may contain dairy or eggs.



Our assessment

We believe that increasing the availability of animal-free foods will decrease the consumption of animal products. However, we note that the body of empirical research—especially measuring causal effects—is limited to a few field experiments conducted at universities. We expect that introducing one more plant-based alternative of equivalent price and of/near equivalent taste, texture, and nutrition to conventional meat in a food service or supermarket setting will have a marginal impact on total animal product consumption.

Introduction to Availability Studies

This brief includes the following types of evidence: market research, hypothetical choice experiments, and field experiments. Overall, estimates of how the increased availability of plant-based alternatives at price parity and at or near taste, texture and nutrition parity would decrease animal product consumption vary widely, ranging from 9%¹–66%², and are generally dependent on participants' nationality and attitudes toward animal products. We expect the marginal impact of introducing one more plant-based alternative in a food service or supermarket setting to be towards the lower end of this range.

Market research

Market research by Boston Consulting Group and Blue Horizon estimated that 2% of the global share of the market for animal-based and alternative proteins was animal-free in 2020.³ They projected this to increase to 11% animal-free—or 10%–22%, depending on support from scientists, industry, and government—by 2035, given full parity in price, taste, and texture for comparable animal-based proteins. The report does not explain how they arrived at these estimates.

¹ This estimate is based on a 9% reduction in animal-based entree sales at half of the University of California, Los Angeles' cafeteria, following the introduction of Impossible Foods' plant-based ground beef options. We believe that introducing plant-based options to both halves of the cafeteria would likely have doubled this amount. See [Malan \(2020\)](#).

² This is based on stated preferences of meat eaters between conventional and plant-based meat in Vietnam from [Globescan \(2020\)](#).

³ [Witte et al. \(2021\)](#)

Hypothetical choice experiments

A survey representing 91% of the global population found that, in 27 different countries, between 23%–66% of meat-eating respondents preferred plant-based meat over conventional meat (assuming price, taste and nutrition parity), with an average countrywide estimate of 41%.⁴ In seven of these countries, a majority of respondents preferred plant-based meat. Hypothetical choice experiments in the U.S.⁵ and Canada⁶ seem consistent with this, predicting that 20%–33% of consumers would choose animal-free alternatives to conventional meat at price parity, with respondents being given the option of hypothetical plant-based or cultured burgers or specific existing alternatives like Beyond Meat and Impossible Foods.

However, these hypothetical choice experiments may not reflect actual market shares, and potential major sources of bias in using these as estimates for market shares are:

1. Respondents are forced to choose exactly one option among several—sometimes more than two—rather than quantities or frequencies for each. Results have indicated that large discrepancies are possible.⁷
2. Those who selected animal-free options tended to already consume less meat.⁸

Field experiments

In a trial where Impossible Foods' plant-based ground beef options were introduced to half of the cafeteria at the University of California, Los Angeles, researchers found that the new plant-based menu items made up 11% of entree sales, and that animal-based meal sales decreased by 9%.⁹ Evidence-based social marketing and nudging was used to persuade students to choose lower-carbon options, potentially increasing the effect. On the other hand, it's not clear if taste parity was achieved—while those who tried the Impossible Foods meat agreed that it was delicious (90%) and a satisfying alternative to meat (85%), neither of these questions explain whether they thought it tasted the same as meat. Furthermore, among the different ethnic groups

⁴ [Globescan \(2020\)](#)

⁵ See [Van Loo et al. \(2020\)](#), [Lusk \(2021\)](#), and [Tonsor et al. \(2021\)](#).

⁶ [Slade \(2018\)](#)

⁷ See Tables A6 and 18 from [Tonsor et al. \(2021\)](#).

⁸ [Tonsor et al. \(2021\)](#)

⁹ [Malan \(2020\)](#)

surveyed, East Asians were most likely to try the new plant-based menu items, but they were the least likely to find it delicious and a satisfying alternative to meat. They were also least likely to be repeat consumers.

In cafeterias at the University of Cambridge,¹⁰ increasing the proportion of vegetarian meals from 25%–50% was estimated to decrease the share of meat meals served by 14.9 and 14.5 percentage points (equivalent to increases of 61.8% and 78.8%) in two natural experiments in two cafeterias, and 7.8 percentage points (equivalent to 40.8%) in an experiment in a third cafeteria, with larger effects in those who ate more meat. The authors also tested for but did not find any significant rebound effects in which diners would eat more meat at dinner if relatively more vegetarian meals were available at lunch.

Another cafeteria study at the University of Cambridge found that decreasing the prices of already cheaper vegetarian meals and increasing the prices of meat meals, both roughly by 10%, had a small, nonsignificant impact on food choices.¹¹

Generalizability

All of the field studies we reviewed were conducted in university cafeterias in the U.S. and the U.K., and therefore, we are not confident that the effects are generalizable to other regions or settings. We believe this topic would benefit from future studies in other regions and settings to generate more high-quality, relevant data.

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¹⁰ [Garnett et al. \(2019\)](#)

¹¹ [Garnett et al. \(2021\)](#)

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