Why Are Fewer Grocery Shoppers Buying Meat? Declining Grocery Sales, Prices, and Cultural Change

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Abstract

The past decades have seen a number of new policies and food technology businesses concerned with alleviating animal welfare or environmental impacts of animal agriculture. We study whether there is evidence that consumer behavior is changing in parallel by examining real grocery purchases matched with machine-scanned label data. We find that meat consumption has been at its highest in recent years, consistent with prior observations, but we offer the first observational evidence that a growing share of the population is purchasing fewer or no meat items and other animal products. While some of this trend can be explained by changes in the volume of grocery purchases, we suggest that media and generational turnover are further driving this trend. We finally discuss the plausible effects of meat alternatives, finding that they cannot have been a primary driver of this trend and have an unclear effect on meat and animal product consumption.

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1 Introduction

Is the end of meat on its way? The past two decades have seen rapid innovation in meat alternatives (Treich, 2021; Cuffey et al., 2023; Zhao et al., 2023) and an expanding set of government and corporate policies regarding farmed animal welfare (Malone and Lusk, 2016; Mullally and Lusk, 2018; Lusk et al., 2019). The ostensible growth in concern for animal welfare has led some to posit that the end of meat, factory farming, or animal agriculture entirely may be afoot (Krauthammer, 2020; Foer, 2020). At the same time, meat consumption in the U.S. is close to its highest-ever level and is growing worldwide (Parlasca and Qaim, 2022).

Methodological issues have thus far made it difficult to test for a shift away from animal products and meat in the U.S. Self-reported dietary behavior has well-known limitations, including social desirability bias that may lead individuals to overreport efforts to avoid animal products (Mathur et al., 2021). Meanwhile, most observational data is highly aggregated, making it difficult to discern whether there are any important trends among subgroups of consumers (e.g., Tonsor and Lusk (2022)). The latter difficulty has the further effect of making it difficult to study the effects of cultural and technological changes.

This paper investigates whether there is any evidence in the U.S. of a shift away from meat and animal products as a result of changes in culture, demographics, or meat alternatives. Using grocery purchase data from a household panel, we offer the first observational evidence that a growing share of the population does not buy meat or animal products at the grocery store. Descriptive evidence suggests that while increased prices play some role in the explanation, younger households' divergent preferences and other cultural changes play a larger role. Novel alternatives to meat and animal products cannot explain much of this shift given the timing of their introduction. Nevertheless, we offer suggestive evidence that these alternatives do displace meat using causal inference methods. Growth in aggregate meat consumption appears to mask important changes driven by young households and new products.

We combine consumer panel data and product information to understand meat and animal product grocery purchases at the household level. Specifically, we obtain data on which products households buy and in what quantity from the NielsenIQ Consumer Panel of 40,000-60,000 households from 2004-2020. We then use data from NielsenIQ's Label Insight that record details on products' labels to classify which purchases are meat or animal products for the roughly 59% of purchases that overlap between the two datasets. To label the 41% of purchases not covered by Label Insight, we train a machine learning classifier on the covered purchases to identify which products are meat or animal products. This allows us to classify which households do not buy meat with 96% accuracy when we consider only those purchases contained in Label Insight. To estimate the effect of new product introductions, we take records of retailers' sales from NielsenIQ's Retail

Scanner Panel.

We find that the share of the population living in households that do not buy meat in a given month increases by around 10% and the share not buying animal products by around 95% from 2004 through 2020. 4.1% of individuals' households do not buy meat in 2004 compared to 5.2% by the end of 2019, but some of this increase is attributable to a broad decline in the share of food consumed at home. At the end of 2020, when grocery purchases are similar to the 2004 level because of the pandemic, 4.6% of households do not buy meat, and adjusting the growth from 2004 through 2019 for the decline in grocery purchases yields a 10% growth rate consistent with this figure. This happens even while the 75th percentile of meat consumption slightly increases, showing a divergence across households. The share of households avoiding meat, dairy, and eggs is much smaller but doubles in size from about 0.5% to 1% of the population. For both meat and animal products, households with a household head born after 1990 are far more likely not to purchase meat or animal products, with a much smaller trend within age groups.

The data we survey reject the null hypothesis that prices can fully explain the shift in consumer behavior and suggest that cohort turnover and perhaps cultural change have contributed to the growth in meat and animal product avoidance. To test whether prices can fully explain the time trend, we use NielsenIQ consumer panel data from 2005 to estimate an Almost Ideal Demand System for meat and animal products and use this to predict what meat and animal product avoidance would be in later years (2006-2020) under the same price response regime as in 2005. We find that a model relying only on prices and total grocery expenditures can predict most of the past 15 years of change. Demographic changes and media can also play a role, depending on the model one selects. Much of the change over time happens before the introduction of novel meat alternatives, so it appears that innovation is not driving the change. An additional binary choice model yields broadly consistent findings.

Descriptive evidence alone rules out plant-based alternatives as a major factor historically, but we study the potential for future substitution between meat and alternatives through both structural and causal inference approaches. A model of the meat and alternatives market based on the Almost Ideal Demand System suggests that Beyond and Impossible meats are gross substitutes for beef and complements for chicken, fish, and shellfish, but the noisy results vary greatly depending on the timeframe over which the elasticities are estimated. As an alternative, we use event study methods to estimate the effect of beginning to consume a new product. We first do a simple event study of how purchases evolve around the first purchase of a plant-based product, and then we create an adjusted event study that estimates how purchases evolve for a consumer who buys a plant-based product because of its introduction. For a more carefully controlled set of estimates, we estimate a treatment effect using a "matrix completion" method in the family of synthetic controls, which attempts to infer, for the plant-based purchasers, what would have happened if they never

purchased the product (Athey et al., 2021; Liu et al., 2024). The event studies appear seriously confounded because the consumers who suddenly purchase plant-based alternatives are more likely to be reducing their consumption of animal products anyway, and the range of plausible levels of displacement is large.

Our study is the first, to our knowledge, that identifies households that do not purchase meat in observational data and investigates the plausible drivers. Many papers study trends in meat consumption over time but without analyzing observational data on households' holistic consumption (Henchion et al., 2014; Sans and Combris, 2015; Godfray et al., 2018; Milford et al., 2019; Tonsor et al., 2021; Whitton et al., 2021; Parlasca and Qaim, 2022; Tonsor and Lusk, 2022). Zhao et al. (2023) precede us in estimating elasticities using the AIDS model, but we estimate elasticities over a broader array of time periods and versions of the model (e.g., a quadratic term), and we use it to project counterfactuals. Cuffey et al. (2023) measure the change in meat purchases before and after buying a new plant-based substitute, but we add to this with methods that produce plausibly causal results. Finally, we contribute to a growing literature on the economics of animal welfare (Malone and Lusk, 2016; Mullally and Lusk, 2018; Lusk et al., 2019; Carlier and Treich, 2020; Jalil et al., 2020; Treich, 2021; Espinosa and Treich, 2021a,b, 2023; Schwitzgebel et al., 2023; Espinosa and Treich, 2024).

The remainder of this article proceeds as follows: In Section 2, we describe the data used in our analysis. Section 3 discusses trends in meat consumption and avoidance. Section 4 attempts to explain these trends using a binary choice model, the Almost Ideal Demand System (AIDS), and causal inference techniques. Section 5 concludes.

2 Data

To investigate the evolution of meat and animal product consumption over time, we use data on households, groceries, and stores. The data come from linked datasets provided by NielsenIQ: the Consumer Panel, Label Insight, and the Retail Scanner Panel. The data enable us to construct a probability-weighted representative sample and cover a broad swath of the U.S. retail landscape.

2.1 Consumers

Our primary focus is on households' purchases, which we investigate using a panel of U.S. consumers and data on products' labels and ingredients.

Our purchase data come from the NielsenIQ Consumer Panel, which we match with 2022 data from Label Insight that records each UPC code's name, ingredients, and grocery category. The Consumer Panel records demographics, the date, retailer, and location of each grocery store trip,

and the amount, price, and product details for each purchase on that trip by a sample of 40,000-60,000 households from 2004 through 2020 that scan their grocery receipts in exchange for rewards.[1] We use the Label Insight data to identify which products are meat (including fish), milk, eggs, or a plant-based alternative for one of these categories. Specifically, we manually identify all ingredients in the Label Insight data that correspond to a particular category of ingredient (e.g., synonyms for chicken). We then create indicators for products that contain the relevant ingredient and have a related term in the product name (e.g., chicken wings).[2]

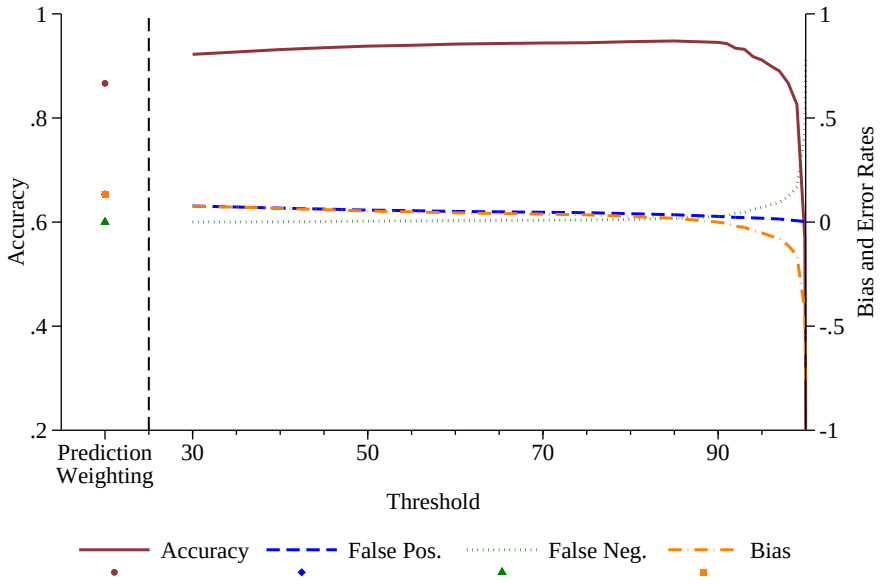
The Label Insight data contain only a subset of the products in the Consumer Panel, so we use a machine-learning classifier to extend our labels to the full set of products. Specifically, the Label Insight data cover 7% of UPC codes in a typical year but 59% of products by amount spent over the full sample period. The first step in our classification procedure involves using the Word2Vec algorithm to obtain vector representations of each UPC's (abbreviated) description in the Consumer Panel dataset. The Word2Vec algorithm is a machine learning model that uses the contexts in which a term appears to infer the term's meaning so that, e.g., it can infer that the abbreviation "CHK" refers to "chicken" when followed by "VGTBL" but "chunky" when followed by "PNT BTTR" (Bengio et al., 2003; Mikolov et al., 013a,b; Ash and Hansen, 2023). Then, we train a logistic regression to predict whether a given UPC is in a particular category of meat, milk, eggs, or an alternative for one of these based on the UPC description and the brand. Intuitively, the approach converts the meaning of each UPC into a probability that a product belongs in a given category.

We then combine the predictions with the panel data to estimate the amount purchased in each category and to identify households that do not purchase items in a given category. We classify a product as meat or an animal product just when the classifier predicts at least a 90% chance it is, a specific category of meat or animal product just when the classifier predicts at least a 95% chance it is, and a plant-based alternative just when the classifier predicts a 99% chance it is. For products included in Label Insight, these cutoffs have low type I and type II error rates and roughly minimize bias, i.e., the difference between the ounces actually purchased in a given category and the ounces purchased with a likelihood in that category above the cutoff. Figure 1 shows the accuracy, error rates, and bias of the approach to classifying which households purchase meat in a given month,

[1] For the descriptive analysis, we include preliminary results for 2021 and 2022 in the appendix. The data structure changes significantly between 2020, 2021, and 2022 so that the classification system differs in each respective year. To deal with this, we adjust each of the 2021 and 2022 time series so that the change in a given variable from December to January matches the change in the average of that variable between December and January for 2018-2019 and 2019-2020.

[2] We consider several alternative methods, including all products with a relevant ingredient, all products with that ingredient in the top five, and all products with that as the primary ingredient. We find that the set of products we identify in a particular category largely match the set of products with the respective item as a top-five ingredient.

Figure 1: The machine learning classifier accurately identifies households purchasing meat



Notes: The plot shows the performance of our classification approach using the machine learning classifier. We consider a random 0.1% subsample of households throughout our entire sample frame and identify which households buy meat in a given month using Label Insight ingredients and descriptive data. We then classify products as meat in the machine learning classifier based on whether the predicted likelihood exceeds a given threshold, which is on the x-axis. The lines show the share of households accurately assigned over the threshold (accuracy) on the left y-axis, the share of households wrongly identified as buying meat (false positive), the share wrongly identified as not buying meat (false negative), and the difference between the predicted share buying meat and the actual share (bias) on the right y-axis.

and Appendix Figure A1 shows the performance of the predictions for a broader array of variables. Households' recording of their purchases is imperfect (Einav et al., 2010), so we limit our analysis of households' meat avoidance to households whose grocery spending exceeds the minimal cost of a healthy diet according to the US Department of Agriculture, adjusted for a reasonable degree of underreporting.[3] Tables B1-B4 show the average amounts of various categories consumed overall and as a share of total grocery weight, respectively.

A central limitation of our data is that they capture supermarket purchases rather than the

[3]Specifically, we adjust from the April 2022 Thrifty Food Plan cost, which determines the minimal amount of food spending necessary for use in calculating food stamps benefits. The cost depends on household composition and is equal to $901.30 per month for a family with two adults and two children. We then multiply this by 60%, which is the approximate share of purchases that are reported according to Einav et al. (2010), 90% since 10% of grocery purchases are online over our sample period, and 45%, which is the average share of food consumed at home in our sample period. When excluding fresh and in-store items called "magnet data," we further multiply by 70%, which is the share of all spending that is on non-magnet goods. This drops 15% of the sample households.

full universe of food purchases. In particular, there is a steady trend away from food at home during the period we study (Zeballos, 2020). To account for this, we focus on trends in the share of groceries by weight and dollars that fall in a given category, and when describing trends by weight, we investigate the degree to which the trends are driven by the amount of groceries purchased over time. In addition, the grocery purchase data we use cover only products with a standard UPC, i.e., excluding fresh and in-store items. Where relevant, we use probability weights provided by NielsenIQ to ensure our results are representative of the U.S. population.

2.2 Comparison of Demographic and Socioeconomic Characteristics

Households' demographics are broadly consistent with those of the U.S. population, enabling us to accurately understand the evolution in households' grocery purchases over time.

Table 1 compares demographic and socioeconomic characteristics between the panelists (weighted and unweighted) and data from the US Census Bureau for 2020. The comparison indicates that the weighted NielsenIQ data matches the general population statistics well. The unweighted NielsenIQ data shows a significantly higher median age, but this discrepancy decreases with the application of projection weights. The NielsenIQ panel accurately reflects the population's gender distribution and median household income. Income in the NielsenIQ data is reported in income brackets, with \$65,000 indicating that the median household income lies within the \$60,000-\$70,000 bracket, which aligns with the census data.

The main discrepancies concern race and education, but neither appears to be major. The NielsenIQ panel is slightly more educated on average compared to the general population. The only large discrepancy seems to be the fraction of White respondents and those that answered "Other" to the race question. However, the Census survey offers additional answer options and allows for multiple racial identities, which we have all grouped into the "Other" category. This could explain some of the difference that we observe.

2.3 Stores

We explore the dynamic effects of meat alternatives on other products using an additional dataset on U.S. retailers. The Retail Scanner Panel, also from NielsenIQ, contains stores' direct scans of how much of each UPC they sell in a given week and at what price. The panel covers 30,000-50,000 food, drug, and convenience stores across the U.S. out of an estimated total of around 300,000. The panel is especially focused on food, mass retailer, dollar, and wholesale stores. Our focus is generally on the stores, generally in the food or wholesale categories, that introduce a meat or animal product alternative during our sample frame. For those stores, the panel covers around 25% of the U.S. market, though we cannot identify any particular retailers.

Table 1: Panel members are broadly representative of the US

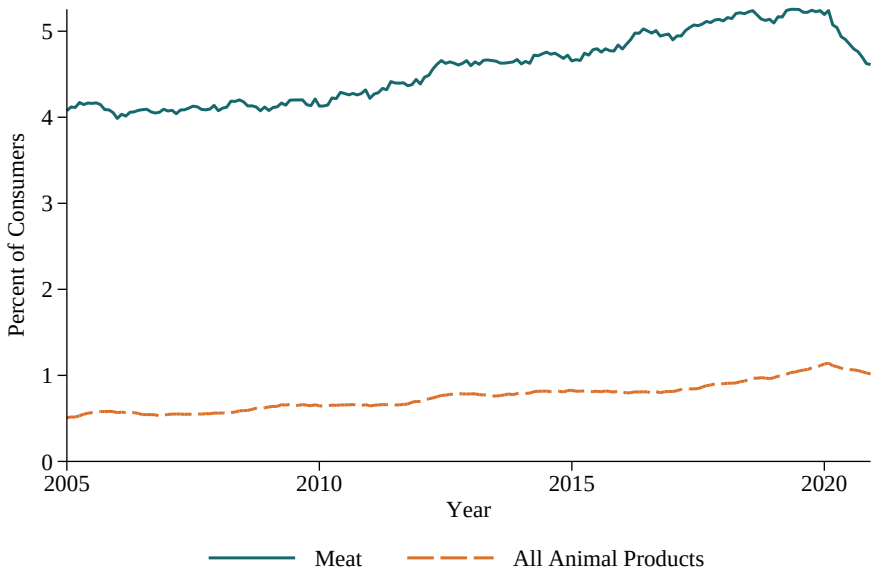
	Unweighted	Weighted	US
Median Age	50.00	41.00	38.80
Fraction of Women	0.54	0.51	0.51
Median Income	65000	65000	67521
Education			
Didn't Graduate High School	2.78	4.11	9.77
Graduated High School	24.11	31.14	27.84
Some College	28.61	29.80	27.60
Graduated College	30.44	23.16	22.13
Post College Grad	14.07	11.79	12.66
Race			
White	79.04	74.30	61.63
Black	11.65	12.58	12.40
Asian	4.10	4.88	6.00
Other	5.21	8.25	19.97

3 Growth in Meat Avoiders, Alternatives, and Prices

Time trends in meat consumption indicate a divergence in households' consumption, with a growing number not purchasing any meat at the grocery store. While changes in prices and purchasing volume explain much of the trend, a trend remains after controlling for these factors, seemingly driven by younger households' lower proclivity to buy meat.

The share of consumers not buying meat or animal products in a given month increases steadily from 2004 through pre-pandemic 2020, with around around a third of the trend remaining after controlling for grocery purchase volume. Figure 2 shows that the share of households not buying meat increases from 3.4% to 4.5% by the start of 2020, and the share not buying animal products increases from 0.5% to 1.1%. (Throughout this section, we use a 12-month moving average to smooth over seasonality and reduce minor fluctuations, which accordingly requires a 2005 rather than a 2004 baseline.) Appendix Figure A3 shows that purchasing volume appears to explain

Figure 2: An increasing share of households does not buy meat or animal products in a given month



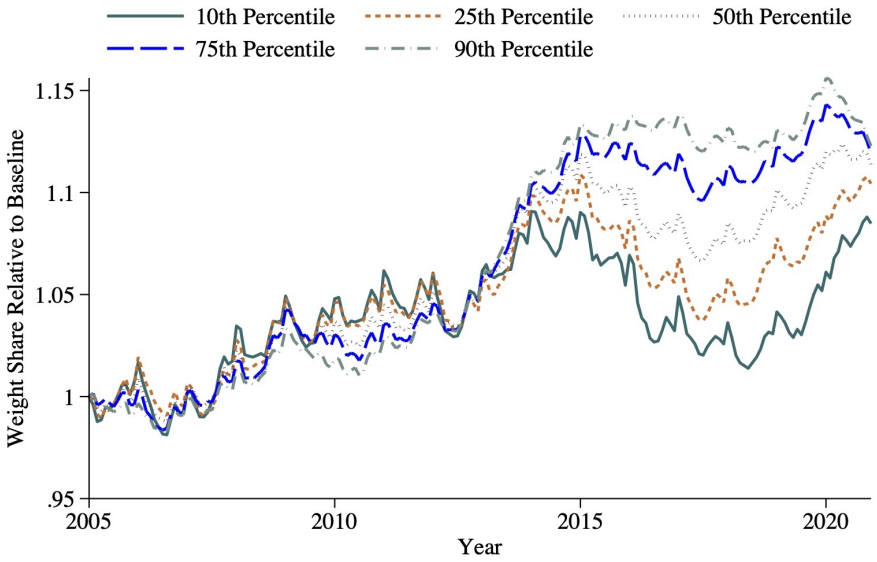
Notes: Each line displays the 12-month moving average of the share of households not buying a particular product category over time. The sample is restricted to households that spend at least the expenditure minimum defined as 15% of the USDA's Thrifty Food Plan to account for non-response and the share of food purchased at the grocery store. View Appendix Figure A2 for an extension to 2022.

slightly more than half of the growth in meat avoidance and a quarter of the growth in animal product avoidance. Even while grocery purchasing volume was at around the same level at the end of 2020 as at the start of 2004, meat and animal product avoidance are significantly higher at the end of 2020. Predicted changes based on volume alone amount to 0.35 percentage points by the end of 2020 versus 0.5 percentage points in the actual data. When we plot meat and animal product avoidance within tiers of grocery purchasing volume, we get an average growth rate of around 10% for the former and 100% for the latter.

Greater meat and animal product avoidance among the young is a plausible major driver of the remaining trend, with a secondary role for economics. Households with a household head born after 1980 are 50% more likely not to buy meat and about twice as likely not to buy animal products in a given month as other households. These households go from less than 1% of the sample in 2004 to over 15% in 2020.[4] Economic factors may also play a role, although this correlates with age: the

[4]An analysis of movers from an earlier phase of this project offers additional evidence for cohort turnover. We analyze the effect of the average purchases of a particular category of animal product or plant-based alternatives in a given designated market area (DMA) on a mover's purchases before and after their move, controlling for purchases at the origin DMA and the price at both the origin and destination DMAs. The methodology is similar to methods

Figure 3: Variance in meat consumption across households is rising



Notes: Each line displays the 12-month moving average of the meat share of groceries by weight divided by the 2005 baseline for that percentile. The distribution spreads out over time.

trend is strongest among those below the 75th percentile by income (Appendix Figure A4).

The empirical patterns suggest that average meat consumption is rising in tandem with greater variation in meat consumption across households. While the average amount of meat purchased at grocery stores goes down over time, it does so roughly in parallel with the total amount of groceries purchased (Appendix Figure A5). Thus, the decline in average meat consumption can be explained by the increased share of food consumed away from home (Lin, 2017, 2021). The share of groceries that are meat actually rises by 15%, but Figure 3 shows that the 10th percentile increases by 8% while the 90th percentile rises by 16%.

Two salient factors are changes in prices and the arrival of meat alternatives over time, but only the former is a plausible explanation for growing meat avoidance given the timing of the two. In Appendix Figure A6, we see that the share of consumers' budgets spent on meat alternatives increases by 43% over the sample period, but this is since the release of the Beyond Burger and thus cannot explain the fairly steady rise in meat avoidance before then. The number of households

used in Bronnenberg et al. (2012) and Allcott et al. (2019). Appendix Figure A23 shows the effect. The effect should be zero before the move but between zero and one after the move depending on whether movers mimic those around them. The estimated effect for meat consumption is below 50% and generally close to zero, indicating little influence of a consumer's surroundings in their adult life.

buying meat alternatives follows a similar shape, indicating that it this growth is not only from the existing meat alternative buyers' increasing their purchasing volume. At the same time, prices on both meat and alternatives increase over the course of the sample period. As others have noted, this alone could explain any apparent shift away from meat (Tonsor and Lusk, 2022). The rise in both price and volume purchased for meat alternatives indicates an increase in demand, while the rise in price for meat implies that growth in meat avoidance does not automatically imply a change in consumer preferences.

4 The Principal Drivers of Changing Meat Consumption

Modeling consumer choice suggests that cultural shifts can explain the growth in meat avoidance, and causal inference analysis indicates that plant-based alternatives could displace a substantial amount of animal products if sold at higher volumes. We investigate the roles of prices, purchasing volume, demographic trends, and cultural shifts in evolving grocery purchases with two models of consumer choice: a binary choice model and the Almost Ideal Demand System (Deaton and Muelblbauer, 1980). Prices and purchasing volume explain around half of the shift, with the rest potentially explained by expanded media coverage of animal welfare. Elasticities from the Almost Ideal Demand System (AIDS) give a mixed picture of whether plant-based alternatives are complements or substitutes for animal products on the margin. Causal inference analysis of grocery purchases before and after a consumer first purchases a plant-based alternative indicates that plant-based milk displaces animal-based milk at nearly a one-to-one ratio, while patterns for meat are too noisy to detect.

4.1 Explaining the Decline in Meat Consumption via Binary Choice

We first investigate the roles of different factors in the changing market using a simple model of the binary choice whether to purchase or not purchase meat. The trend appears to be a mix of declining grocery purchases and a growing share of millennials, with possible roles or prices and media influences.

We consider a simple binary choice model in which consumers decide whether to purchase meat in a given month as a function of prices, demographic characteristics, and the cultural environment. Specifically, we assume consumer i gets utility from purchasing meat given by the following:

$$U_{it} = \beta_0 + \beta_1 \log p_{m,t} + \beta_2 \log p_{o,t} + \beta_3 \log V_{it} + \beta_4 \log n_t + \gamma_i X_i + \varepsilon_{it} \tag{1}$$

where $p_{m,t}$ and $p_{o,t}$ are the price of meat and other groceries in month t, V_{it} is the total weight of groceries purchased in month t, n_t is the number of news articles in month t related to animal

welfare, X_i is a vector of individual characteristics, and ε_{it} is independently and identically distributed according to the type I extreme value distribution. We estimate the model for 2004-2006 with population weights for representativeness and then predict the likelihood an individual does not purchase meat through 2020. We consider versions of the model where V_{it}, n_t, and X_i are constant and then gradually introduce variation along these dimensions. Finally, since prices may be confounded with local demand, we use a Hausman instrument for prices, which predicts the price each consumer faces by the average price in other Designated Market Areas (Hausman et al., 1994; Hausman, 1996; Nevo, 2001; Berry and Haile, 2021).

We measure cultural change based on the number of news articles on animal welfare in the two preceding months. We search for news articles on Proquest TDM Studio and follow Tonsor and Olynk (2011) in constructing an index of animal welfare media coverage that records the number of articles in a given month matching the search terms ("animal welfare" OR "animal well-being" OR "animal friendly" OR "animal care" OR "animal handling" OR "animal transportation") AND ("food" OR "diet" OR "meat"). Media coverage rises over the course of the sample, with a particular rise in the early years (Appendix Figure A8). Our binary choice model does not find a statistically significant effect of media coverage on meat consumption, though the estimates are roughly consistent with those in Tonsor and Olynk (2011) (Appendix Table B5; see Appendix Table B6 and Appendix Table B7 for estimates over time and by category of animal product, including coverage of food, diet, or meat and health or environmental search terms).

With the binary choice model demographic turnover and cultural change explain roughly equal parts of the trend not accounted for by changes in prices and purchasing volume. Figure 4 shows the actual trend compared to the predictions. Prices alone predict about a third of the growth in meat avoidance, and declining purchasing volume explains another third. Accounting for growing media coverage of animal welfare predicts even more change than actually occurred, although this may capture latent cultural change rather than the causal effect of media. Figure 4 leaves little role for demographics, but this changes when we examine avoidance of animal products entirely or estimate the model in 2009-2011. Appendix Figure A7 shows that when we predict 2011-2020 meat avoidance based on 2009-2011 predictions, demographic change in general and cohort turnover in particular appear to be plausible explanations for growing meat avoidance.

4.2 Explaining the Trends via the Almost Ideal Demand System (AIDS)

We next investigate whether a model of consumer choice with a convex budget can predict the change in meat consumption. Again, we find that prices and diminishing grocery purchases explain most of the trend, though again we find a role for cultural change and a smaller role for demographic turnover.

We model consumption following the Almost Ideal Demand System proposed by Deaton and Muelblbauer (1980). Specifically, the model assumes that the amount a consumer spends can be given by the following (Stata, 2023):

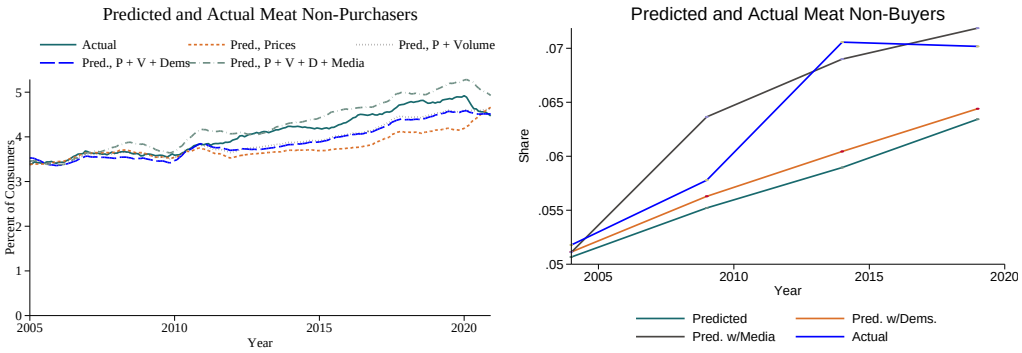
$$\ln e(p,u) = \alpha_0 + \sum_g \alpha_g \ln p_g + \frac{1}{2}\sum_g \sum_h \gamma_{gh} \ln p_g \ln p_h + \beta_0 \Pi_g p_g^{\beta_g}$$

where p_g is the price of good g, and $e(p,u)$ is the consumer's total expenditure. We estimate the model by nonlinear least squares using weekly purchases. At baseline, the model considers only the consumer's total expenditure on groceries and the price of each good. We incorporate demographic factors and control variables using the scaling method developed by Ray (1983) and Poi (2002), which allows the expenditures of a household and the composition of their bundle to flexibly depend on demographics. A feature of the model we exploit is that individual demands following this model yield aggregate demand that is also consistent with it, allowing us to consider demand both at the household and county levels.

At the household level, the Almost Ideal Demand System can explain most, but not all, of the change based on prices and purchasing volume. The right panel of Figure 4 presents the actual share of households buying little or no meat in four different years (2004, 2009, 2014, 2019) against predictions from the AIDS model estimated in 2004. The predictions in Figure 4 come from a version of the AIDS model where the product categories are broad: meat, meat alternatives, and other goods. Since the AIDS model underpredicts the dispersion of households' purchases even at baseline, we plot the share of households in each year that purchase less than the fifth percentile in meat share by weight for the respective model in 2004. The share increases from 5% to 7%, while the AIDS model predicts an increase from 5% to just under 6.5%. Media coverage can explain the rest of the gap and largely predicts the actual movement in the data.

The model also broadly predicts trends in the share of groceries purchased in specific categories. To test for model fit, we estimate a more granular model including six meat categories (beef, pork, chicken, fish, shellfish, and other) as well as meat alternatives and traditional plant protein (tofu, seitan, and tempeh) at both the household and county levels in 2004. Appendix Figure A9 shows the predicted expenditure over time for households, and Appendix Figure A10 shows results for counties. In both cases, the model broadly matches key trends, especially for beef, fish, and meat overall. A salient deviation is for meat alternatives, where the model predicts decreasing consumption but the actual data show increasing consumption.

Figure 4: Demographic turnover and media can explain the growth in meat avoidance



Notes: The left panel shows the actual and predicted share of consumers not buying meat in a given month, with the predictions coming from a discrete choice model estimated with 2004-2006 monthly in which consumers decide whether to be meat buyers given the price. See Appendix Figure A7 for a version of this plot for consumers not purchasing animal products. The right panel shows the actual and predicted share of consumers purchasing less than the 5th percentile of meat grocery share by weight, calibrated to the 2004 baseline from an estimate of the Almost Ideal Demand System using budget shares of meat, meat alternatives, and other products.

4.3 The Role of Meat Alternatives

A natural question in our context is whether the rise of alternatives to animal products, most notably Beyond and Impossible meat but also egg substitutes and the growth of oat- and nut-based milks, contributes to the growth in meat avoidance. Combining evidence on the total amount of meat substitutes purchased and plausible ranges for their effects, however, suggest their role is currently small.

The current levels of meat alternative consumption preclude a major role in trends in grocery meat purchases even with a very high rate of substitution. By both weight and dollars, average meat purchases are twenty times larger than purchases of meat alternatives. While the number of households buying meat alternatives has risen sharply, the amount bought by the marginal household is quite small, with the average share spent on meat alternatives growing from just above 0.2% to just above 0.3%. Thus even if meat alternatives displaced meat one-for-one, this would only generate about a 0.1% reduction in the share of households' groceries that are spent on meat.

Nevertheless, we attempt to get a sense of the potential displacement of animal products by plant-based alternatives in two different ways. First, we study cross-price elasticities estimated using the AIDS model described in Section 4.2. Second, we use causal inference techniques to study how adopting plant-based alternatives affects consumers' purchases using two methods. The first method is a standard event study with an adjustment that places more weight on periods around

the introduction of plant-based alternatives. The second method infers what a consumer would have done had they not purchased plant-based alternatives by computing a weighted average of similar consumers who did not purchase alternatives. No method appears well identified, but if we treat them as upper bounds, they suggest the displacement of animal products by alternatives is likely well short of a one-to-one ratio.

4.3.1 Elasticities

Studying the elasticities from an AIDS model as described in Section 4.2 indicates that displacement of animal products by plant-based alternatives is small or negative for changes induced by marginal shifts in price. We explore different versions of the model by varying the time period represented by each observation to be semiannual, annual, or quinquennial, tweaking the model to include a quadratic term, and using an instrument for the prices households face.

Plausible rates of replacement suggest plant-based alternatives are complements rather than substitutes for many meat categories, but the results are noisy. Table 2 and Appendix Tables B8-B26 show the elasticities of each category of meat, traditional alternatives like tofu and seitan, and plant-based meats, including novel and heritage plant-based meats for time periods when there is variation. We find that novel plant-based meats are a substitute for beef, and a complement for chicken and shellfish, while heritage plant-based meats are a complement across the board. In contrast, Zhao et al. (2023) find substitution for chicken and fish and complementarity with beef, while Liu and Ansink (2024) find complementarity with beef and substitution for pork. Heritage plant-based meats and traditional plant proteins like tofu and seitan are substitutes, but novel plant-based meats are a complement for these more traditional alternatives. Controlling for income effects changes the sign on the elasticity with regard to pork (Appendix Table B8), using an instrument flips the sign on chicken for heritage plant-based meats (Appendix Table B16), and moving to longer-term elasticities (Appendix Tables B21-B26) does not yield any dramatic directional changes but does alter the results quantitatively.

The estimated elasticities are somewhat odd given that the plant-based alternatives are designed to be substitutes, raising the question of whether the methodology might not be identifying the true parameter of interest. Converting the elasticities into estimates of displacement further sharpens the concern, as it indicates that an additional unit of Beyond or Impossible consumed because of a marginal change in price displaces 3.7 units of beef, and crowds in an additional 5.7 units of chicken and 3.4 units of shellfish.[5] Zhao et al. (2023) and Liu and Ansink (2024), the two previous papers to

[5]Specifically, comparison of Table 2 with Appendix Tables B1 and B3 implies that, for a household whose consumption is at the average level, a 1% decrease in the price of Beyond or Impossible induces the household to buy 0.0017 ounces more of Beyond or Impossible, 0.0063 ounces less of beef, 0.0097 ounces more of chicken, and 0.0057 ounces more of shellfish.

Table 2: County-level uncompensated elasticities (weekly, 2016-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.4878	.0345	-.0439	.0031	-.0154	-.0253	-.1830	-.1141	-.0807	-.0029
	(0.0299)	(0.0199)	(0.0095)	(0.0106)	(0.0097)	(0.0129)	(0.0418)	(0.0295)	(0.0289)	(0.0007)
Fish	.0412	-.9241	-.0027	.0103	-.0135	.0162	-.0506	.0060	-.0507	-.0015
	(0.0232)	(0.0354)	(0.0102)	(0.0116)	(0.0107)	(0.0144)	(0.0388)	(0.0300)	(0.0301)	(0.0007)
Chicken	-.1439	-.0071	-1.0094	-.0179	.0406	-.0110	-.0243	-.0942	-.1050	.0030
	(0.0320)	(0.0295)	(0.0207)	(0.0161)	(0.0154)	(0.0207)	(0.0578)	(0.0416)	(0.0446)	(0.0012)
Pork	.0133	.0304	-.0203	-.7154	-.0073	-.0933	-.2089	.0017	-.1008	-.0088
	(0.0372)	(0.0349)	(0.0168)	(0.0315)	(0.0175)	(0.0227)	(0.0838)	(0.0587)	(0.0534)	(0.0014)
Beef	-.0384	-.0304	.0321	-.0046	-.8832	-.0256	.0331	.0640	-.0612	-.0034
	(0.0260)	(0.0245)	(0.0123)	(0.0133)	(0.0198)	(0.0186)	(0.0492)	(0.0321)	(0.0332)	(0.0011)
Other	-.0449	.0291	-.0045	-.0485	-.0165	-1.1664	.1407	.0723	.0123	.0065
	(0.0249)	(0.0239)	(0.0119)	(0.0125)	(0.0134)	(0.0267)	(0.0436)	(0.0299)	(0.0349)	(0.0010)
Tofu/Seitan	-.0218	-.0053	-.0011	-.0072	.0013	.0084	-.7827	-.0351	.0099	.0002
	(0.0050)	(0.0040)	(0.0020)	(0.0028)	(0.0022)	(0.0027)	(0.0244)	(0.0118)	(0.0075)	(0.0001)
Beyond/Imp	-.0336	.0008	-.0089	-.0005	.0063	.0099	-.0861	-.9493	-.0125	.0004
	(0.0086)	(0.0075)	(0.0036)	(0.0049)	(0.0035)	(0.0045)	(0.0290)	(0.0269)	(0.0135)	(0.0002)
PBM	-.0417	-.0230	-.0168	-.0153	-.0125	.0021	.0429	-.0216	-.8420	.0016
	(0.0149)	(0.0133)	(0.0068)	(0.0078)	(0.0064)	(0.0093)	(0.0325)	(0.0238)	(0.0333)	(0.0004)
NonMeat	-.1660	-.1083	.0492	-.1895	-.1186	.1678	.2504	.2862	.3400	-.9938
	(0.0532)	(0.0501)	(0.0275)	(0.0306)	(0.0320)	(0.0431)	(0.0888)	(0.0659)	(0.0699)	(0.0030)

Number of obs = 531,281

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

estimate elasticities, estimated different signs on three out of four cross-price elasticities, although the latter studied the Netherlands as opposed to the U.S. The suggested explanation for these complementarities in Zhao et al. (2023) is that plant-based meats might attract more attention to the entire meat category, but it would be surprising if that effect was still dominant over the course of years and not only for plant-based meats but also for tofu and seitan. It is difficult to explain why lower prices on tofu should also lower pork consumption over the course of years. An alternative possibility is that the elasticity estimates are picking up a spurious correlation between prices and meat demand driven by fluctuations in demand.

4.3.2 Event Studies

As an alternative measure of displacement of animal products by plant-based alternatives, we study how consumers' purchases of animal products change after they first purchase a plant-based alternative and compare them to similar consumers using two distinct methods. Placebo tests and pretrends indicate the methods do not adequately control for confounding factors in most cases, though we obtain plausible estimates of significant displacement by plant-based milk.

We begin our event study approach with a traditional two-way fixed effect estimator. We estimate the following equation:

$$Y_{it} = \tau_{t-T} + \delta_t + \omega_i + \varepsilon_{it}$$

where Y_{it} is either the ounces purchased or the share of groceries by weight for a particular category for household i in month t, δ_t and ω_i are month and household fixed effects, and T is the first month in which a household purchases the alternative in question. We cluster the standard errors at the household level. Appendix Figures A11-A16 plot the coefficient of interest, τ_{t-T}, which measures the change in consumption over time. There are problematic pretrends in many cases, especially pork and other plant-based alternatives, and a now-substantial literature gives reason to worry about whether the effects are interpretable without the strong assumption that the change is homogenous, and households exhibit parallel trends (De Chaisemartin and d'Haultfoeuille, 2020; Sun and Abraham, 2021; Callaway and Sant'Anna, 2021; Athey and Imbens, 2022). Consumption of chicken is lower in the long run for Beyond and Impossible purchasers and there are some apparent declines for heritage plant-based meat purchasers, but there is no obvious overall decline just as in Cuffey et al. (2023).

We attempt to adjust for possible confounding (though not the strong homogeneity assumption) in the two-way fixed effect estimator by creating adjusted two-way fixed effect estimators that predict the change in consumption for a consumer who first purchases a particular alternative during a surge in demand. We estimate the following equation:

$$Y_{it} = \tau_{1,t-T} + s_T \tau_{1,t-T} + \delta_t + \omega_i + \varepsilon_{it}$$

where s_T is equal to one minus the ratio between the average share of households who first buy the alternative across all months and the share of households who first buy the alternative in month T. s_T measures whether there is a surge in demand, approaching one when the share of households first buying an alternative in a given month gets especially high. $\tau_{1,t-T}$ represents the difference between the estimated treatment effect during a surge in demand and the estimated treatment effect when demand is at its average level. $\tau_{1,t-T} + \tau_{2,t-T}$ captures estimates the treatment effect for a consumer during arbitrarily high demand.

Estimates of the amount of meat displaced by plant-based alternatives are noisy, but estimates for milk, if we accept the pretrends, center around 0.73-0.93 units displaced per alternative unit. Appendix Tables B27-B32 show coefficient estimates for the raw two-way fixed effects, and Appendix Tables B33-B38 show coefficient estimates for this adjusted version. The adjustment generally, though not always, attenuates the treatment effects, with milk alternatives a notable exception in Appendix Tables B36-B37. The confidence intervals are generally large for the displacement of meat by plant-based alternatives, with some statistically significant estimates in the opposite direction. For milk alternatives, however, we do obtain statistically significant estimates of 0.73-0.74 or 0.89-

0.93 units of milk displaced per unit of plant-based milk depending on whether the outcome is share of grocery weight or ounces. This is similar to but smaller than the estimate in Stewart (2020).

Our second causal inference strategy for understanding the displacement effects of meat alternatives uses a machine learning-based model to flexibly predict a counterfactual for each consumer who buys a plant-based alternative. We adopt the matrix completion strategy outlined in Athey et al. (2021) as implemented by Liu et al. (2024). This procedure constructs two matrices, one for units and one for time periods, that approximate the behavior of the "control" consumers, which we take to be those who have not yet purchased a given alternative, and "treated" consumers (i.e., those that purchase an alternative) when multiplied together. This allows for there to be some trends over time that may vary by consumer in a flexible but unobserved way and calibrates them for predictive accuracy.[6] A useful feature of the approach is that it allows for a placebo test, where we match the consumers up to four months before an initial purchase and can then check whether there is a treatment effect before the introduction of the product.

Placebo tests indicate that the estimates produced by this strategy are substantially confounded by unobserved differences between consumers. Appendix Figures A17-A22 plot the estimates from the Liu et al. (2024) procedure, and Appendix Tables B39-B44 show the point estimates of a post-adoption treatment effect. The number of significant placebo tests is more than would be expected by chance, indicating that the adopters and the consumers we compare them to are not similar even with our method for controlling. Estimated displacement of meat by alternatives is negative when measured in share of groceries and implausibly large when measured in ounces (Appendix Tables B39-B41). The one case where estimates of displacement are positive but not implausibly large is for plant-based milk, where estimates suggest displacement of around one-to-one (Appendix Tables B42-B43).

5 Conclusion

The share of households not buying meat at the grocery store in a given month increased steadily from 2004-2019, with a divergence apparently driven by a combination of price changes and cultural shifts including cohort turnover. This evidence suggests that a combination of demand- and supply-driven forces are changing the market for meat and animal products. While purchases of meat alternatives have risen dramatically, their share of the market is currently too small for this to explain much of the shift. Future developments depend both on whether this sector becomes a substantial share of the market and the economic and cultural trends that appear to have been the primary driver of changes to date.

[6] The method is similar to synthetic controls Abadie et al. (2015) and synthetic difference-in-differences Arkhangelsky et al. (2019) but does not require parallel trends across units.

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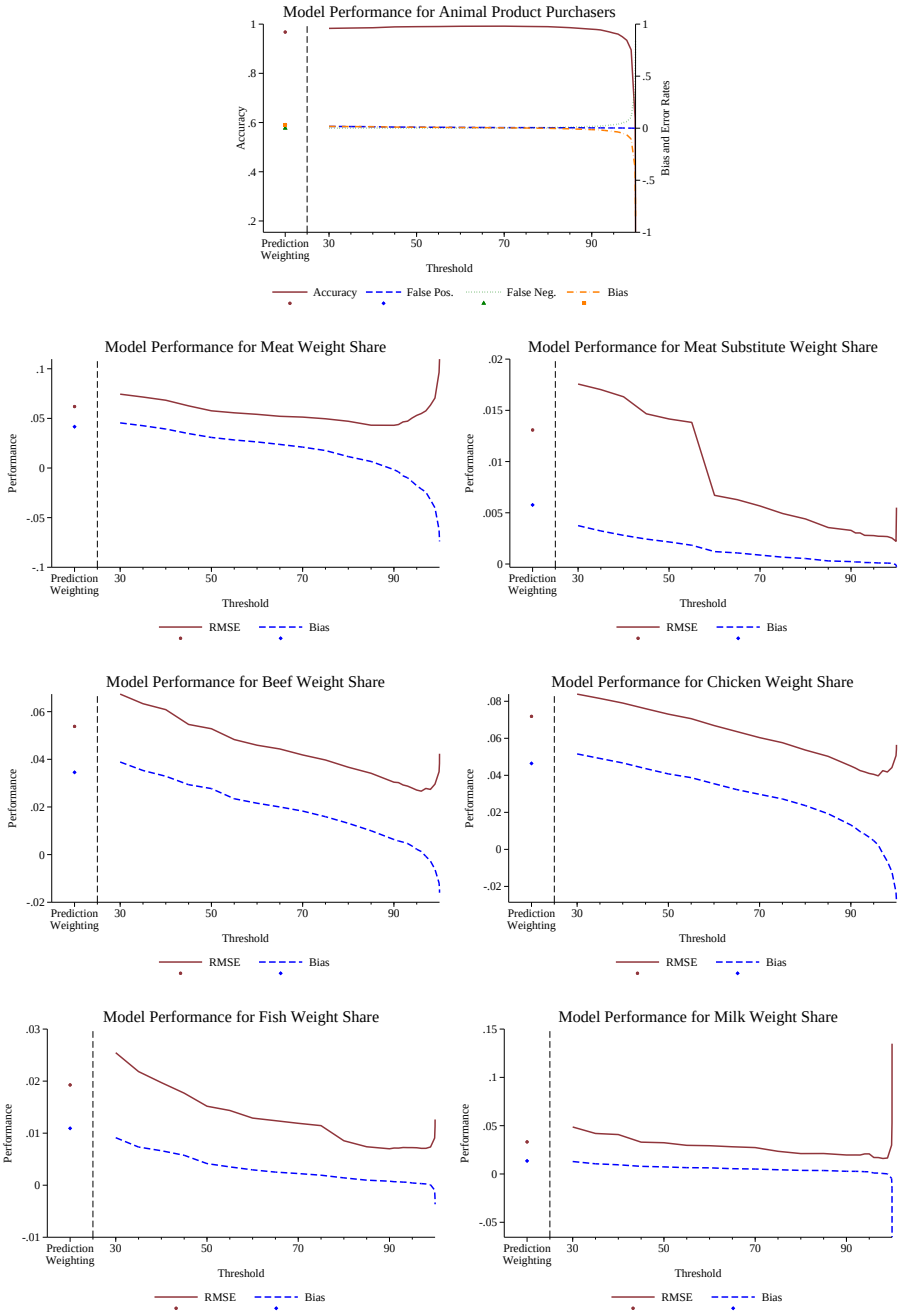
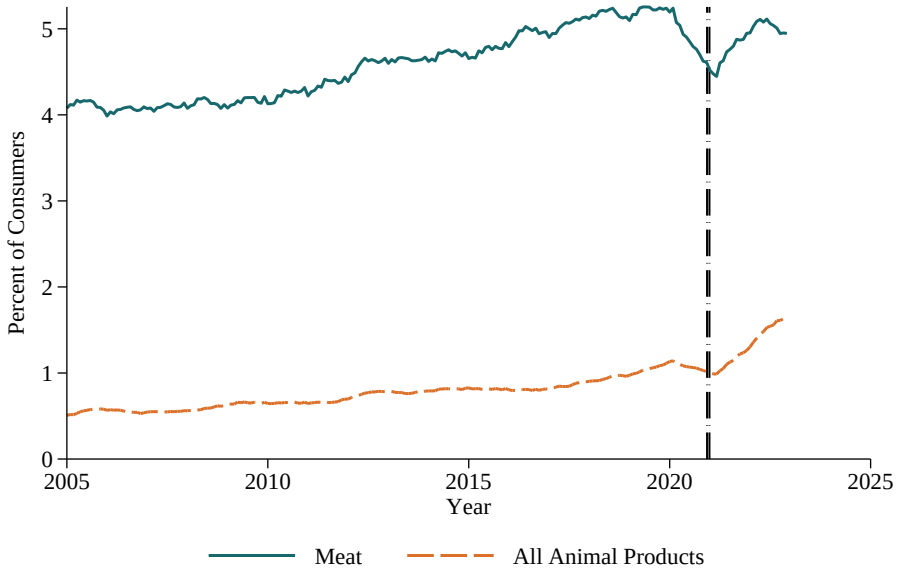
A Additional Figures

Appendix Figure A1: The machine learning classifier accurately classifies products and households



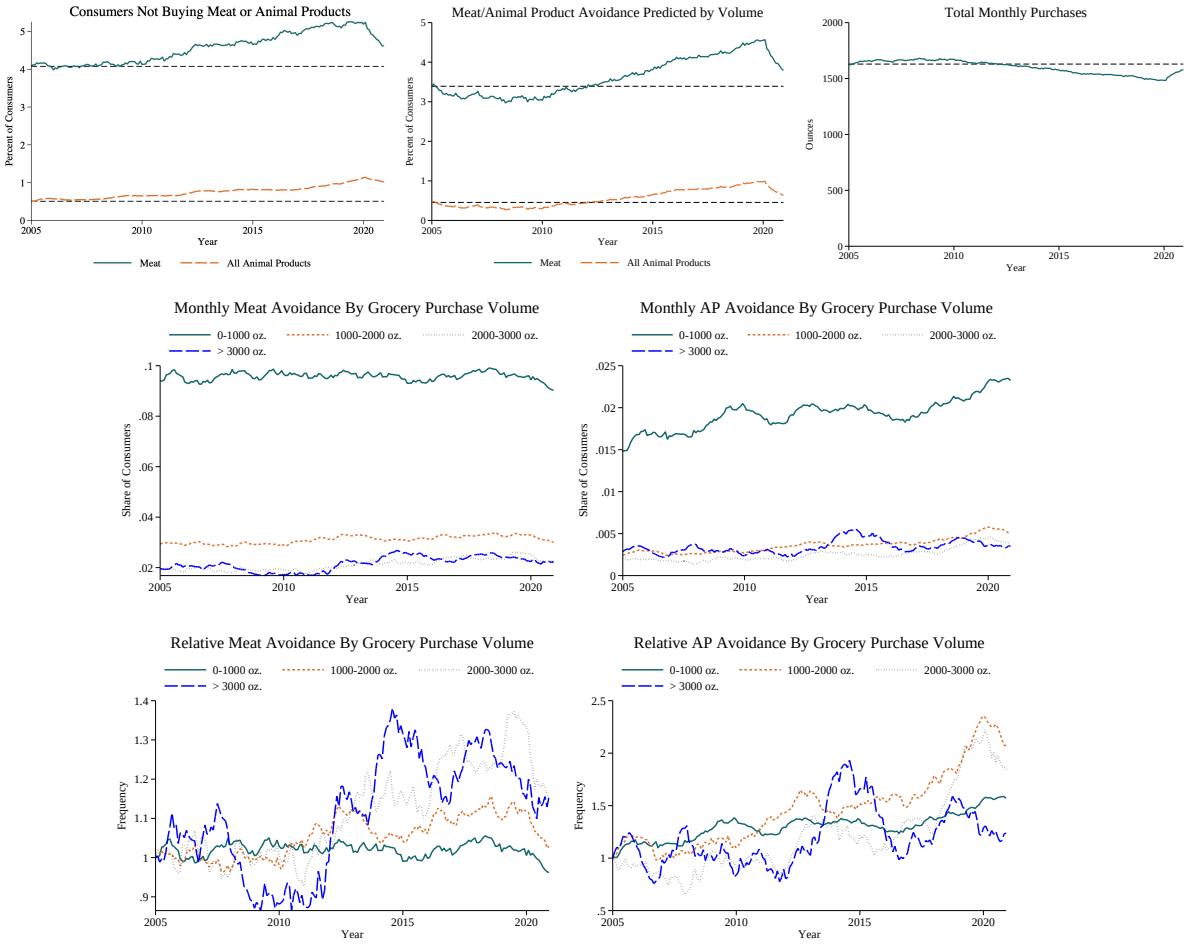
Notes: The plot shows the performance of our classification approach using the machine learning classifier for a wider range of products and measures than in Figure A1. The top panel shows performance for classifying which households buy animal products in a given month. The other panels show bias and root mean squared error for the share of purchases by weight that are in a given category. We consider a random 0.1% subsample of households throughout our entire sample frame and calculate the relevant outcome variable for each household (weight share for a given category or, for the top panel, a binary indicator for whether they purchase the category). We then classify products using the machine learning classifier based on whether the predicted likelihood exceeds a given threshold, which is on the x-axis.

Appendix Figure A2: An increasing share of households does not buy meat or animal products in a given month (2022)



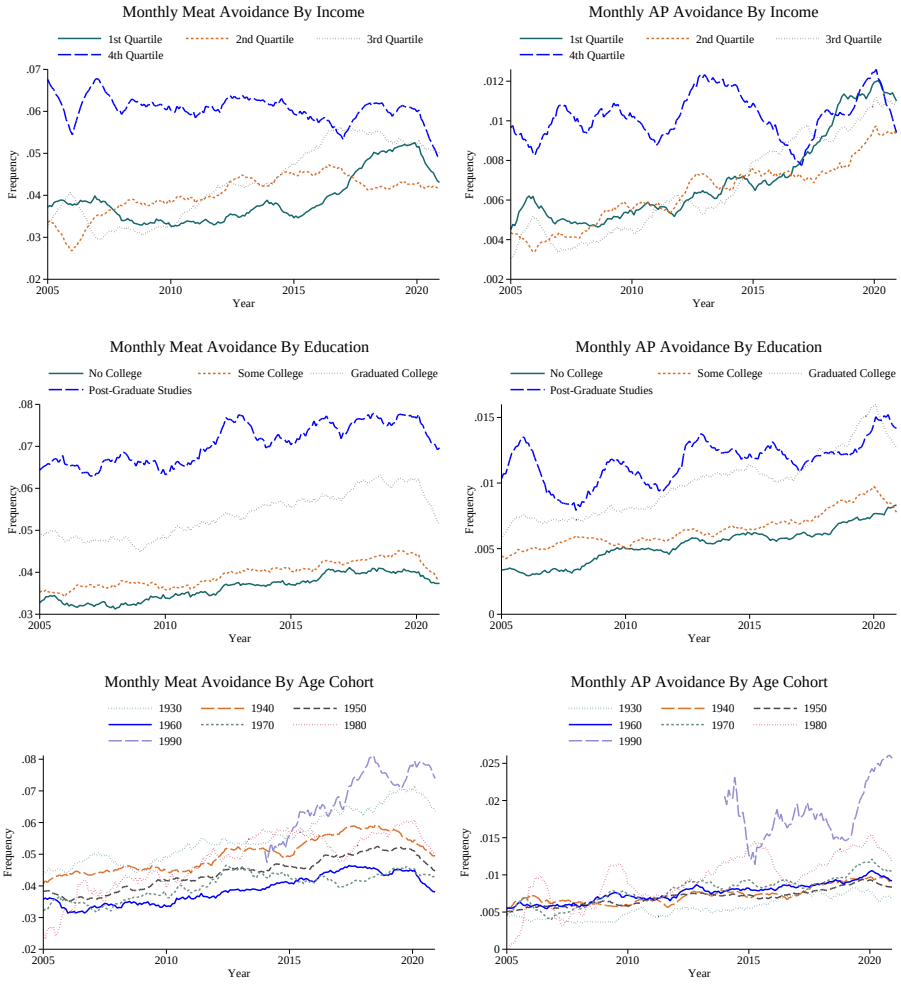
Notes: This is an extension of Figure 2 to 2022. To deal with a change in the data structure among 2020, 2021, and 2022, we adjust each of the 2021 and 2022 time series so that the change in a given variable from December to January matches the change in the average of that variable between December and January for 2018-2019 and 2019-2020. Each line displays the 12-month moving average of the share of households not buying a particular product category over time. The sample is restricted to households that spend at least the expenditure minimum defined as 15% of the USDA's Thrifty Food Plan to account for non-response and the share of food purchased at the grocery store.

Appendix Figure A3: Changes in grocery purchasing volume cannot explain rising meat avoidance



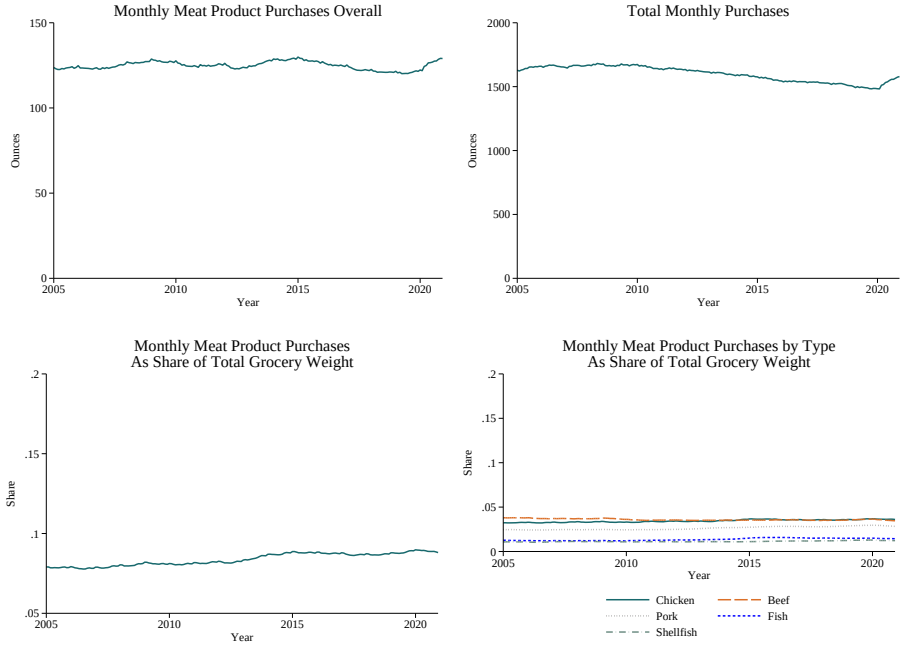
Notes: All panels show 12-month moving averages. The first panel shows Figure 2 with dashed horizontal lines at the baseline value of each series. The middle panel in the first row shows the rate of meat and animal product avoidance that would be predicted based on volume alone. The right panel in the first row shows the volume of groceries purchased over time with a dashed horizontal line at the baseline value. The second row shows the share of consumers not buying meat and not buying animal products for various tiers of overall grocery purchases as in Figure 2. The third shows the same measures but divided by the January 2005 baseline for comparability. Controlling for volume, there are increases of 15% and 84% in each. The final figure predicts the share of households not buying groceries based on purchasing volume. Volume alone predicts increases of 13% and 25% in households not buying meat and animal products, respectively.

Appendix Figure A4: Changes in meat avoidance largely occur outside of top incomes



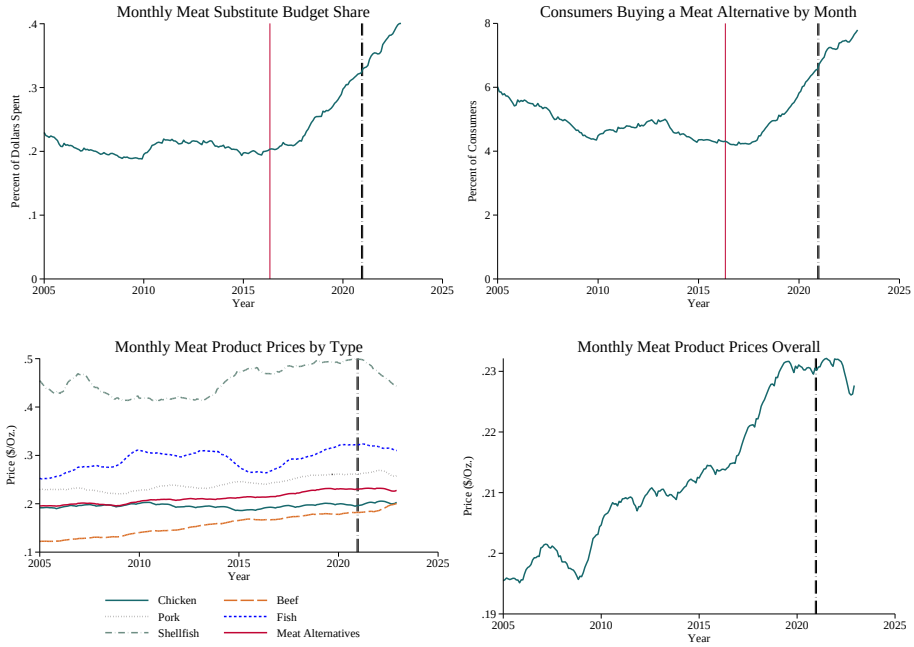
Notes: The panels show 12-month moving averages of the share of consumers not buying meat and not buying animal products, as in Figure 2, by demographic group.

Appendix Figure A5: Changes in grocery purchasing volume cannot explain rising meat avoidance



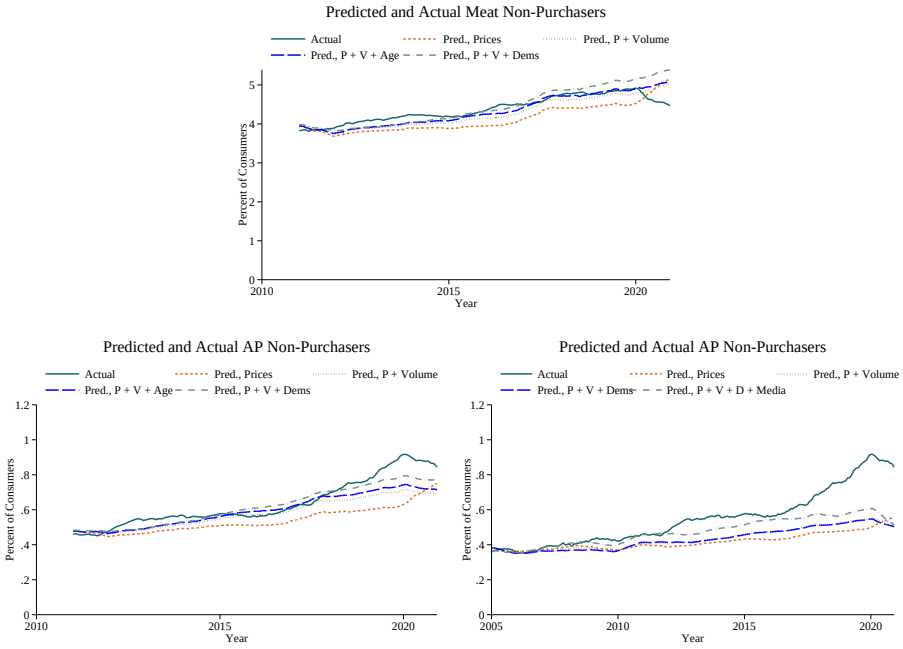
Notes: The first two panels show 12-month moving averages of the amount of meat and groceries purchased over time. The second two panels show 12-month moving averages of the share of groceries that are a particular product over time. The average share of groceries that are meat by weight increases from 7.7% to 8.8% (lower-left panel), and the shares that are chicken, beef, pork, fish, and shellfish change, respectively, from 3.3% to 3.8%, 3.7% to 3.6%, 2.6% to 3%, 1.3% to 1.6%, and 1.1% to 1.4%.

Appendix Figure A6: Meat prices rise alongside an expansion of meat alternatives



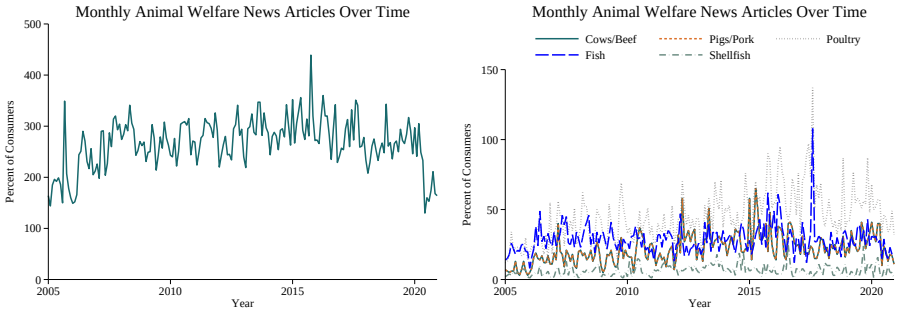
Notes: The top two panels show 12-month moving averages of the share of grocery budgets spent on meat substitutes and the share of consumers purchasing meat substitutes over time. The lower two panels show the prices of various categories of meat over time after adjusting for inflation.

Appendix Figure A7: Demographic turnover and grocery budgets predict more meat avoidance



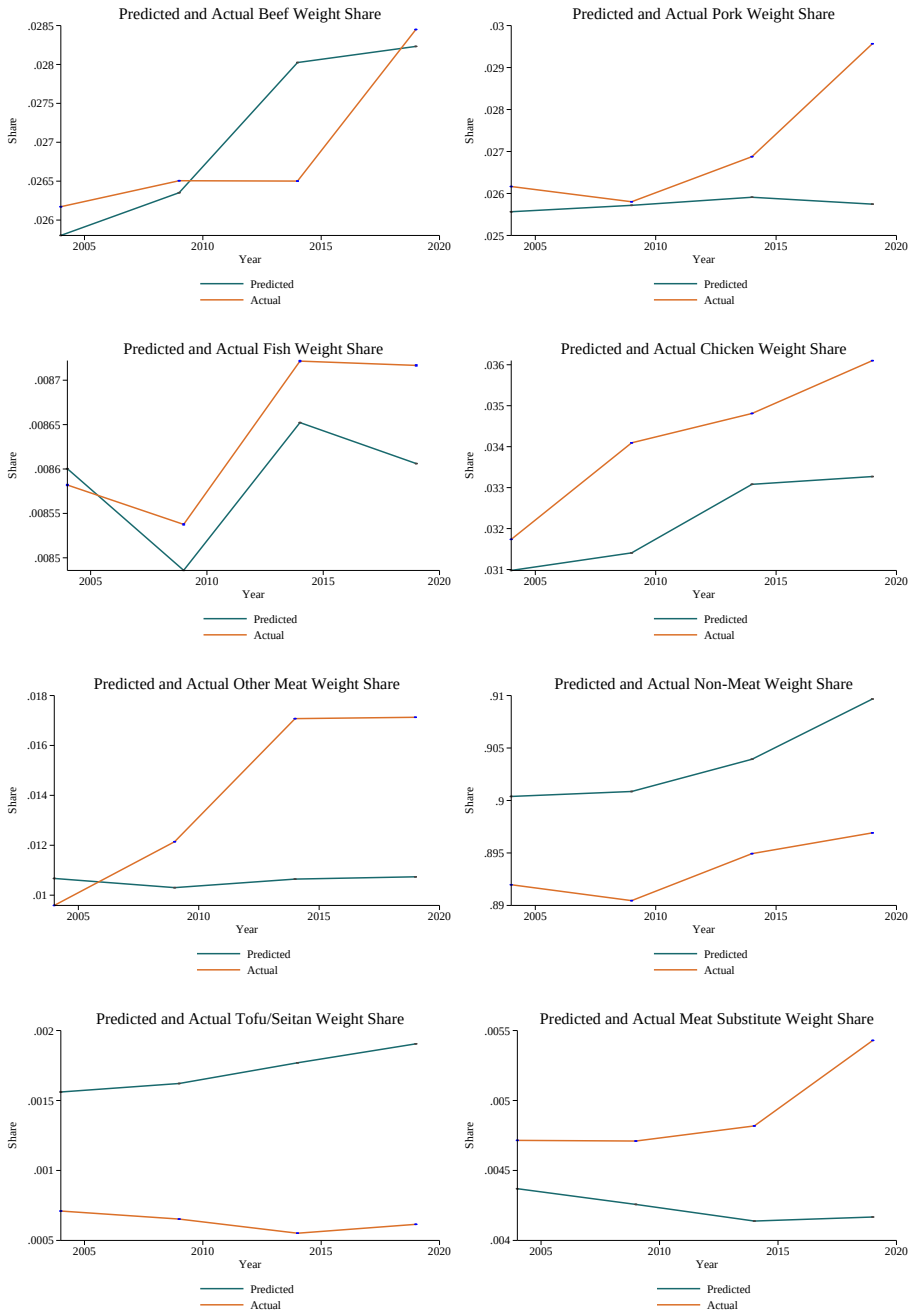
Notes: The top panel shows the actual and predicted share of consumers not buying meat in a given month, with the predictions coming from a discrete choice model estimated with 2009-2011 monthly in which consumers decide whether to be meat buyers given the price. The bottom-left panel shows the same plot but for the share of consumers not buying animal products, and the bottom-right panel replicates Figure 4 for the share of consumers not buying animal products.

Appendix Figure A8: Media coverage of animal welfare, especially poultry, has grown over time



Notes: Each line plots the number of articles covering animal welfare search terms (left panel) or animal welfare search terms plus a term for a specific animal (e.g., "chicken", "turkey", or "poultry" for poultry). Following Tonsor and Olynk (2011), we search Proquest TDM Studio for ("animal welfare" OR "animal well-being" OR "animal friendly" OR "animal care" OR "animal handling" OR "animal transportation") AND ("food" OR "diet" OR "meat").

Appendix Figure A9: Household-level AIDS predictions for product categories resemble actual trends

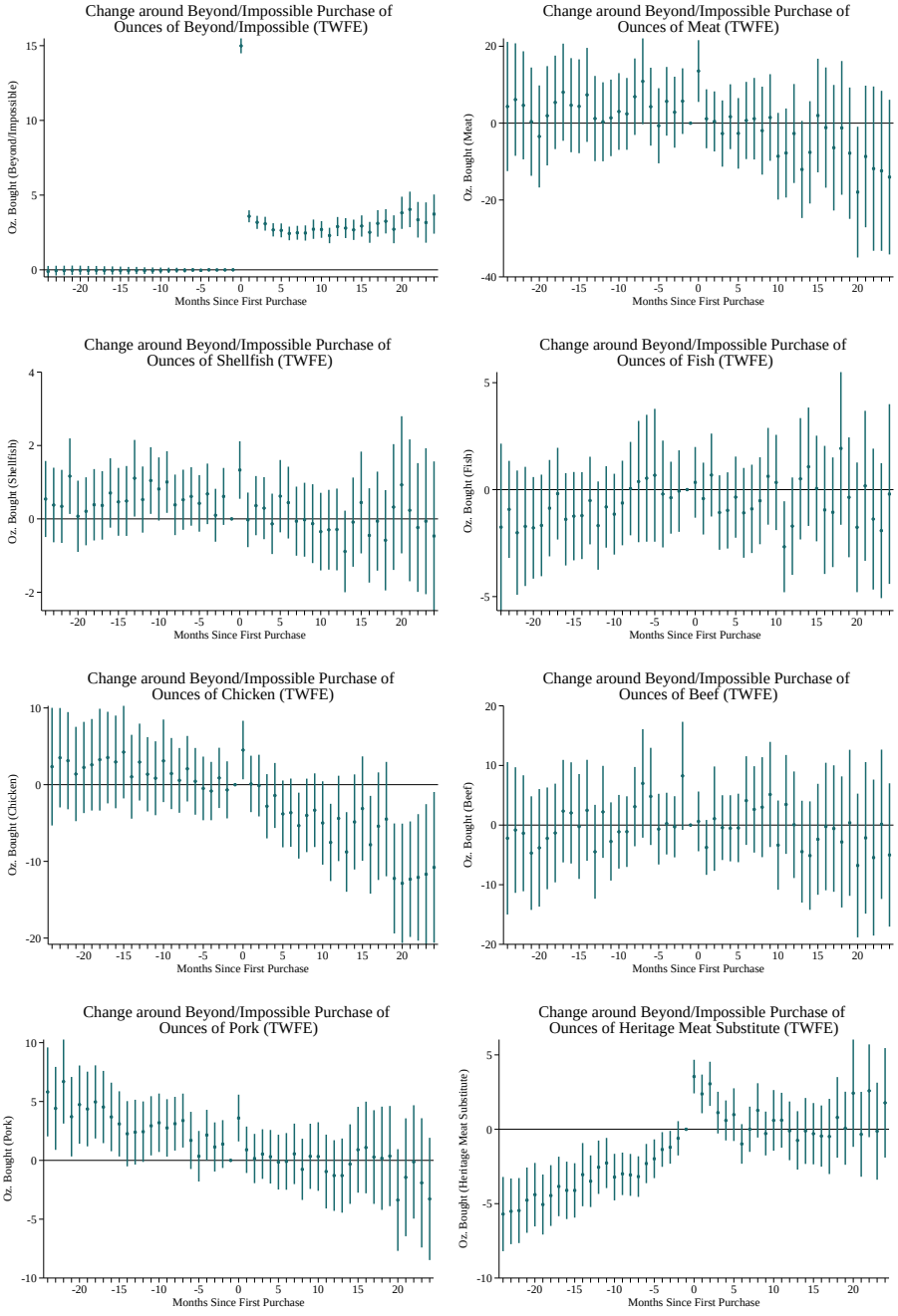


Notes: Each figure plots the actual and predicted share of groceries by weight for a given category estimated via the Almost Ideal Demand System as described in Section 4.2, taking households as the unit of observation.

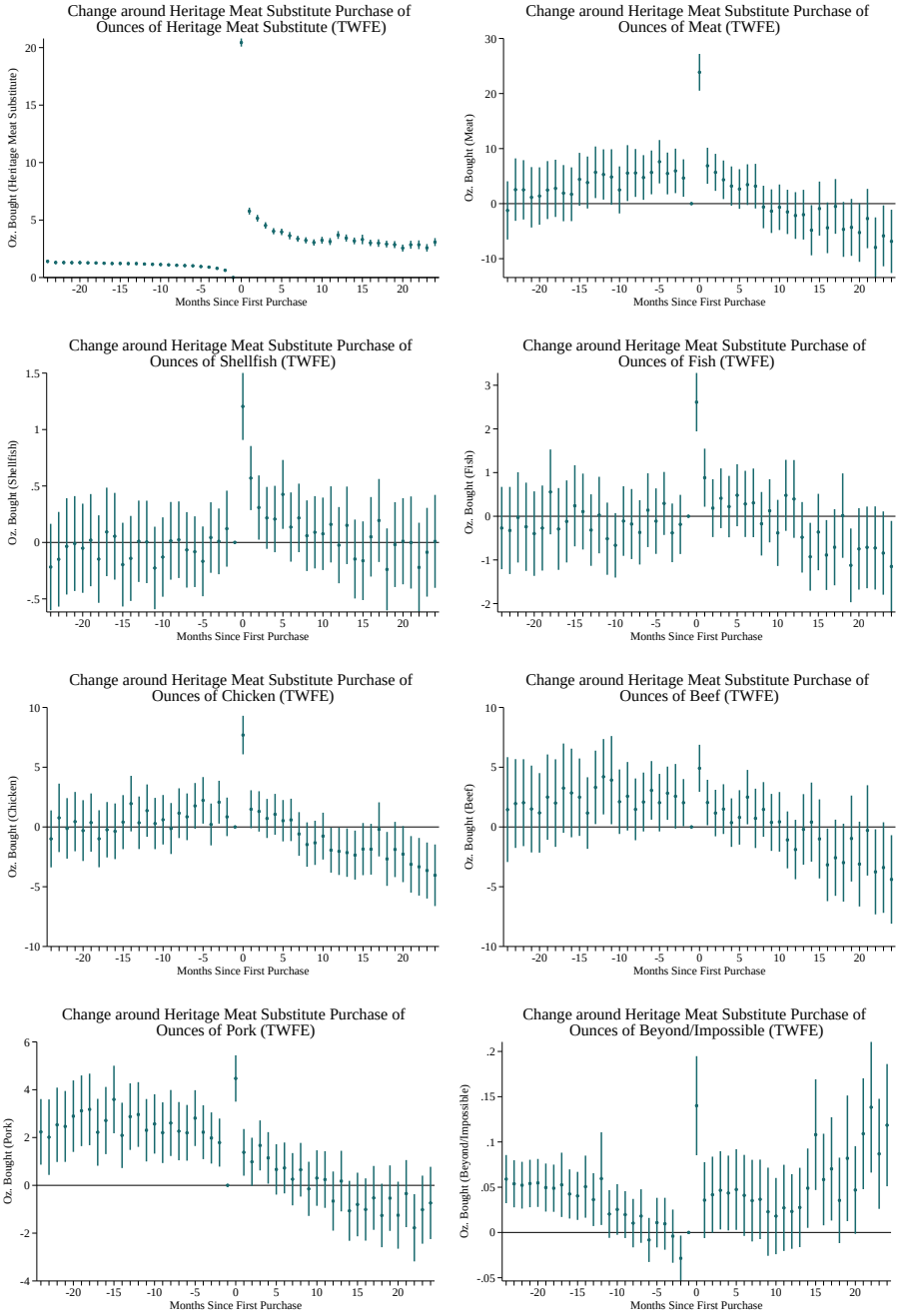
Appendix Figure A10: County-level AIDS predictions for product categories resemble actual trends

Notes: Each figure plots the actual and predicted share of groceries by weight for a given category estimated via the Almost Ideal Demand System as described in Section 4.2, taking counties as the unit of observation.

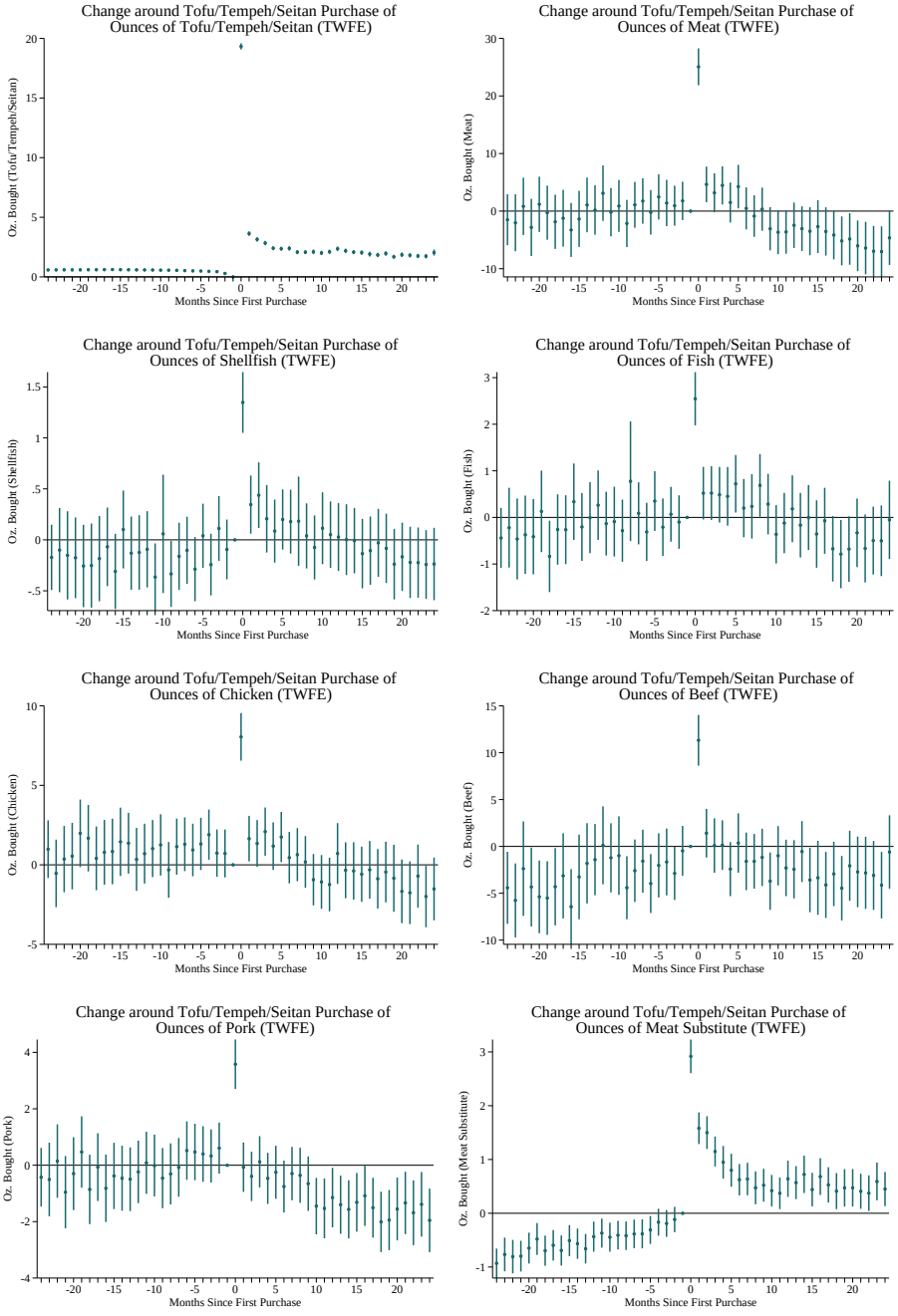
Appendix Figure A11: Change in meat and alternatives purchases around first purchase of Beyond/Impossible (grocery weight share, two-way fixed effects)



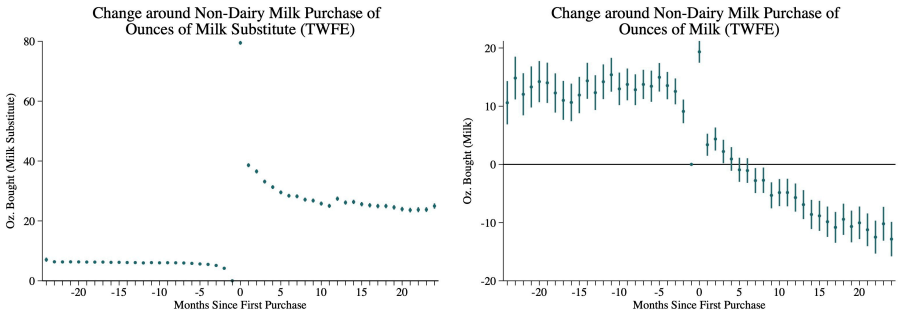
Appendix Figure A12: Change in meat and alternatives purchases around first purchase of heritage plant-based meats (grocery weight share, two-way fixed effects)



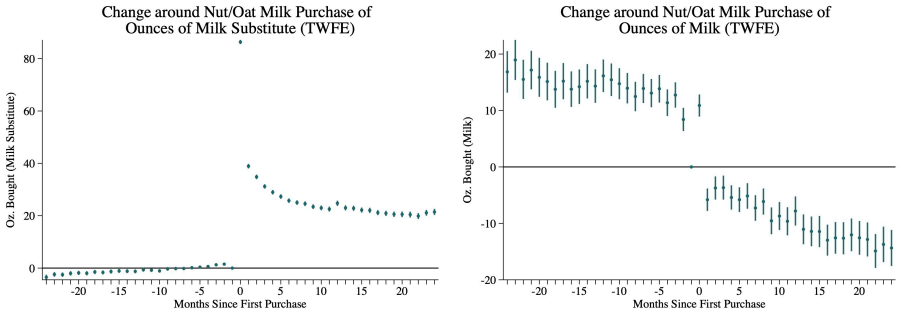
Appendix Figure A13: Change in meat and alternatives purchases around first purchase of tofu/seitan (grocery weight share, two-way fixed effects)



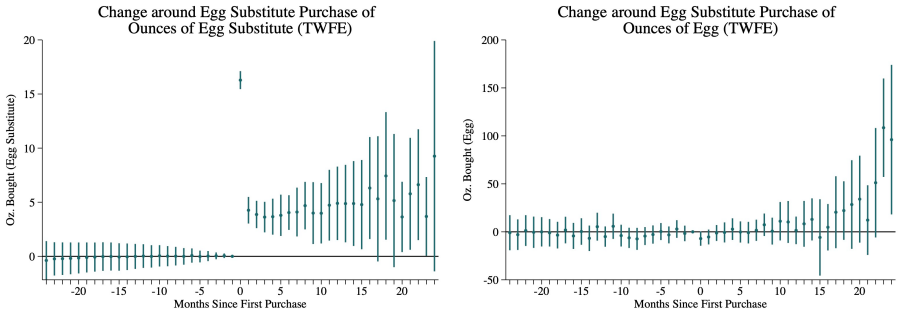
Appendix Figure A14: Change in milk purchases around first purchase of plant-based milk (grocery weight share, two-way fixed effects)



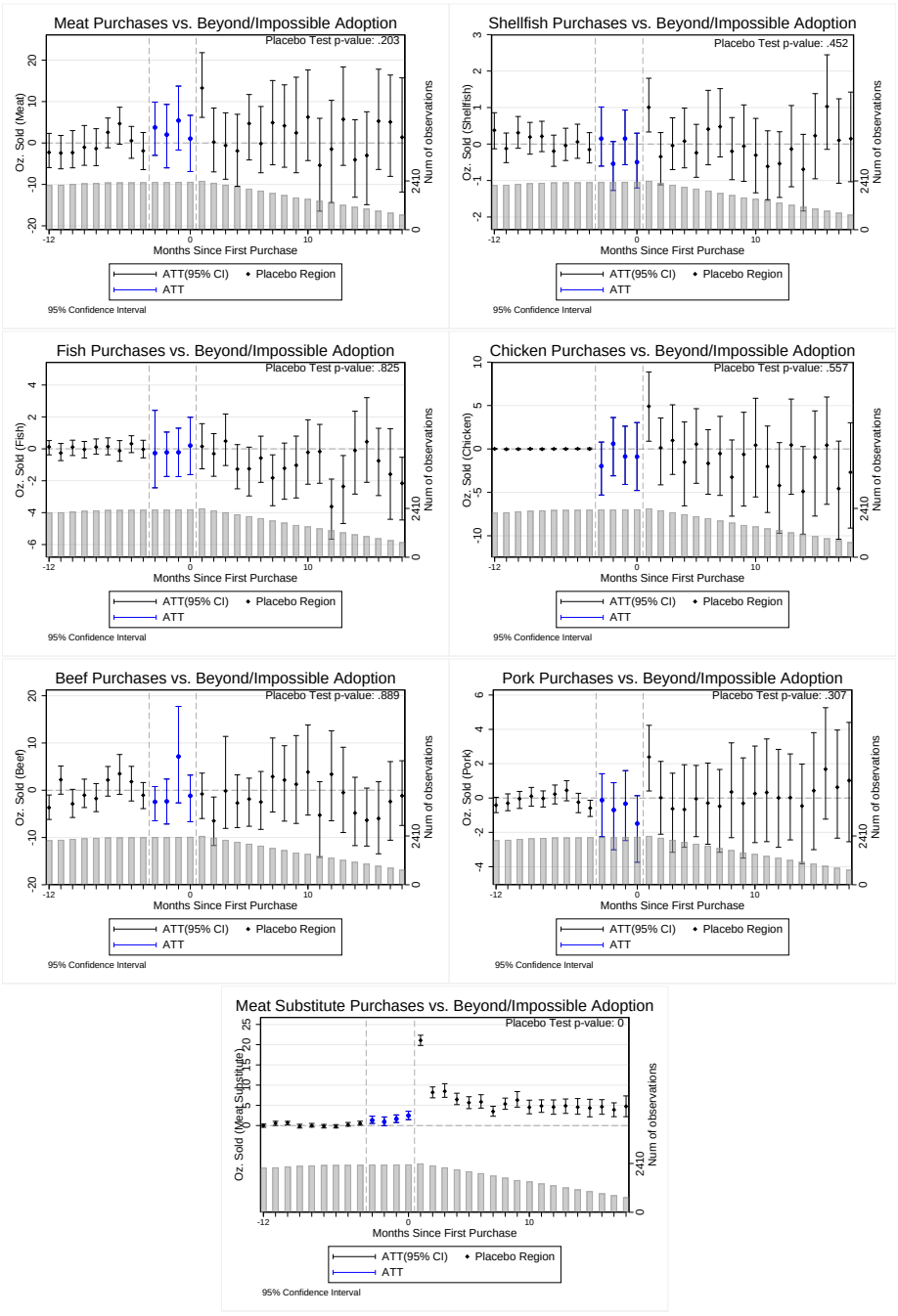
Appendix Figure A15: Change in milk purchases around first purchase of oat or almond milk (grocery weight share, two-way fixed effects)



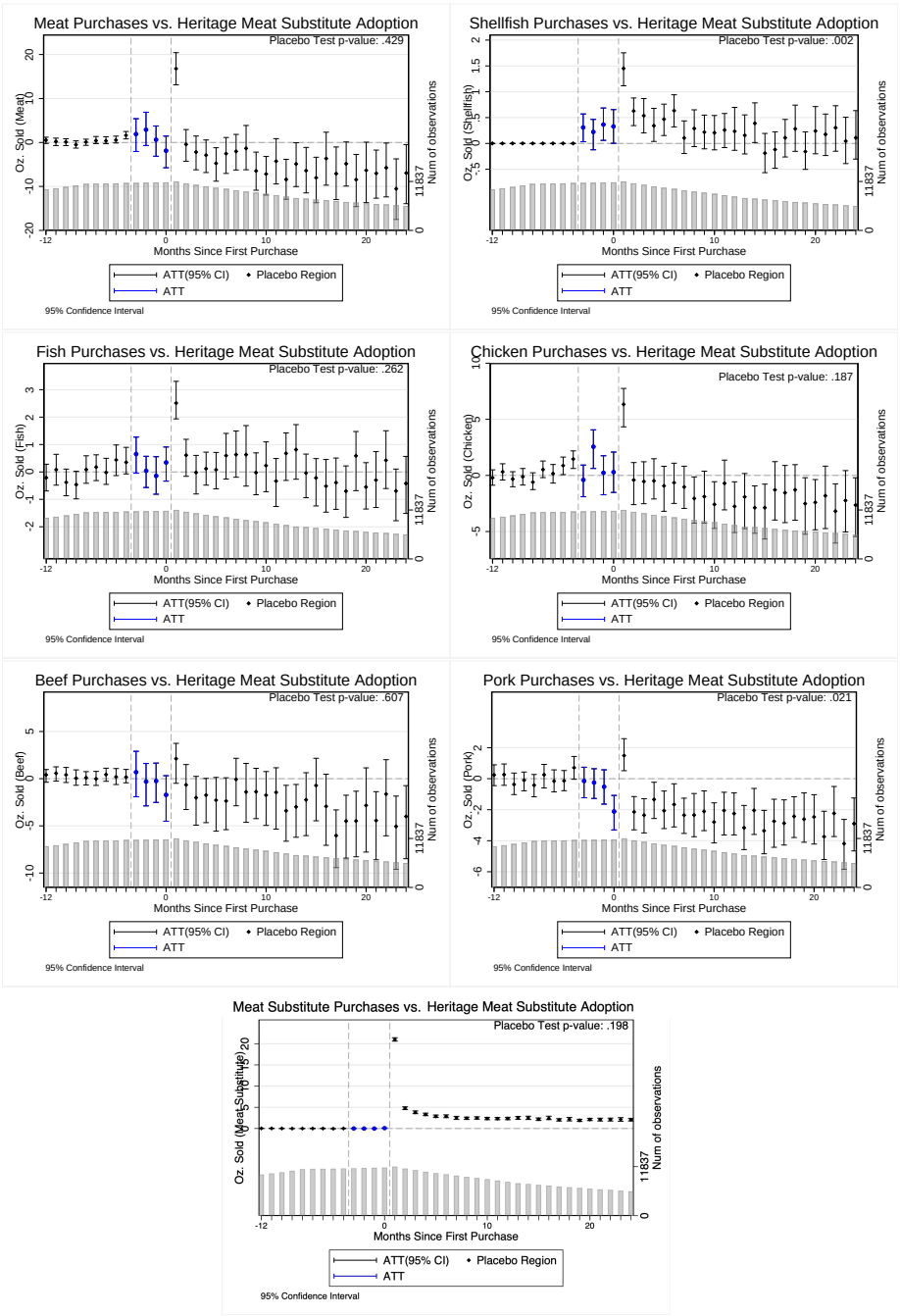
Appendix Figure A16: Change in egg purchases around first purchase of egg alternative (grocery weight share, two-way fixed effects)



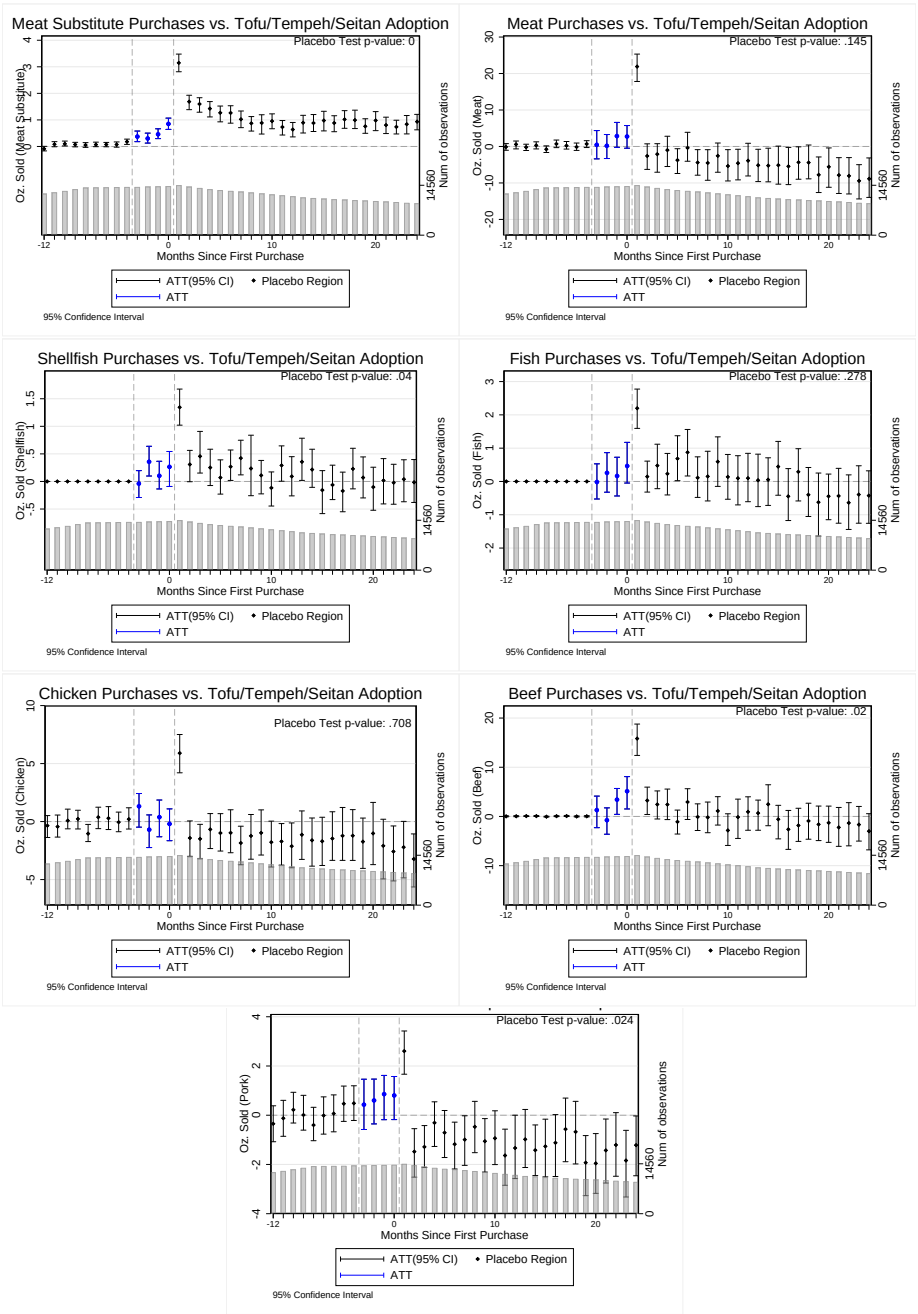
Appendix Figure A17: Effect of Beyond/Impossible intro on meat and alternatives purchases (grocery weight share, matrix completion)



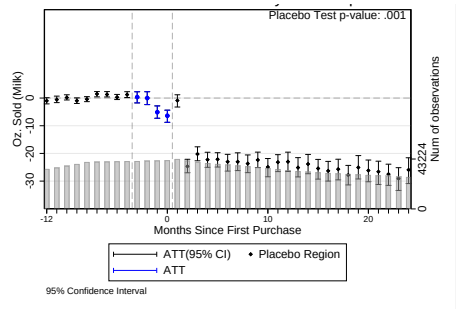
Appendix Figure A18: Effect of heritage plant-based meat intro on meat and alternatives purchases (grocery weight share, matrix completion)



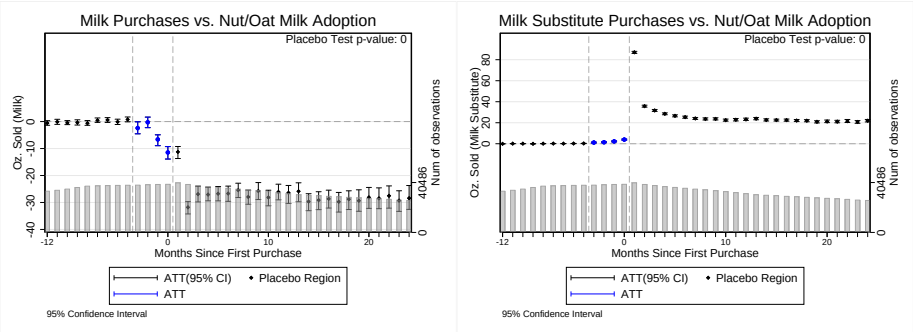
Appendix Figure A19: Effect of tofu/seitan intro on meat and alternatives purchases (grocery weight share, matrix completion)



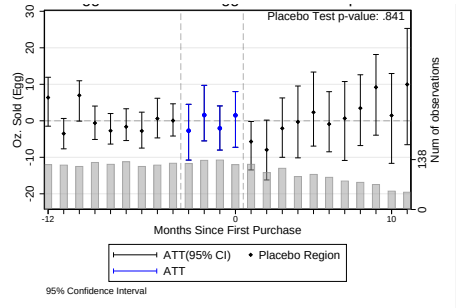
Appendix Figure A20: Effect of plant-based milk intro on milk purchases (grocery weight share, matrix completion)



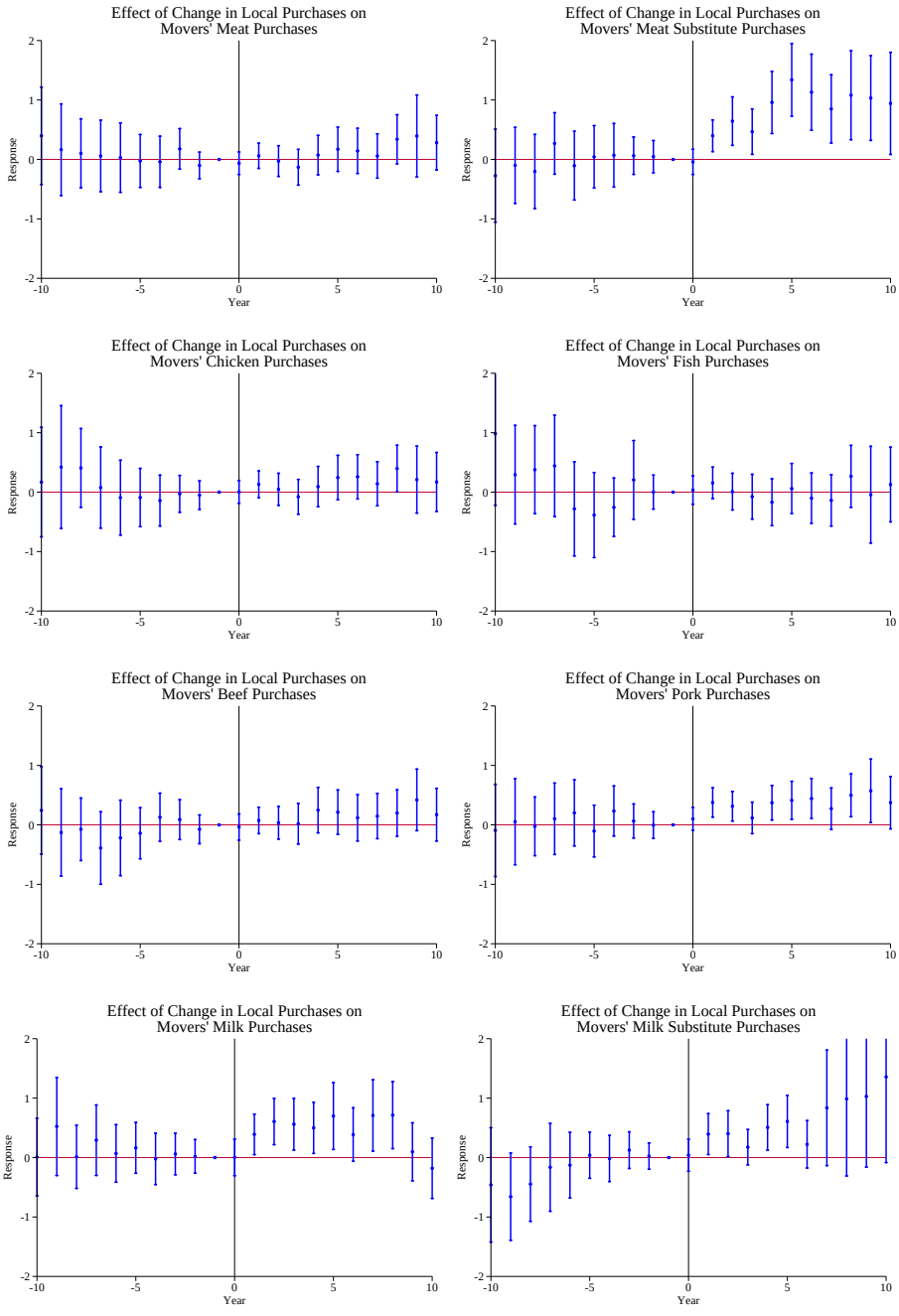
Appendix Figure A21: Effect of almond/oat milk intro on milk and alternatives purchases (grocery weight share, matrix completion)



Appendix Figure A22: Effect of egg alternative intro on egg purchases (grocery weight share, matrix completion)



Appendix Figure A23: Effect of destination consumption on movers' purchases



B Additional Tables

Appendix Table B1: Consumption in weight by demographic group

	Shellfish	Fish	Chicken	Beef	Pork	Any Meat	Alt Meat	Animal Product	N
Age									
Overall	17.04	29.74	108.83	100.14	83.52	251.29	13.04	628.89	736908
Cohort >= 1980	14.57	22.92	101.07	80.93	75.62	214.75	12.19	594.87	82082
Cohort < 1980	17.29	30.69	109.13	102.34	83.97	255.02	13.07	628.42	625570
Education									
Overall	17.04	29.74	108.83	100.14	83.52	251.29	13.04	628.89	736908
No College	16.4	31.08	114.24	115.98	91.76	273.31	12.86	662.1	127275
Some College	17.45	31.12	114.91	108.71	90.09	269.51	13.24	650.74	203195
College Grad	17.1	29.22	107.35	95.12	80.84	243.89	12.99	620.23	260916
Post-Grad Study	16.91	27.55	98.26	83.32	71.94	219.84	13.02	584.84	145522
Race									
Overall	17.04	29.74	108.83	100.14	83.52	251.29	13.04	628.89	736908
White	16.75	30.43	112.97	107.39	86.41	261.56	13.05	673.12	552455
Black	17.28	24.88	86.32	64.29	75.01	210.55	11.98	409.74	82047
Asian	20.44	29.82	92.97	71.66	63.37	192.83	12.25	504.84	28057
Hispanic	17.63	29.42	109.44	97.28	78.43	241.23	14.66	593.61	55194
Other	17.51	31.26	107.42	94.5	80.8	244.12	13.99	575.08	19155
Income									
Overall	17.04	29.74	108.83	100.14	83.52	251.29	13.04	628.89	736908
1st Quartile	18.42	32.67	129.39	119.35	100.27	290.91	14.08	740.47	149125
2nd Quartile	16.92	30.27	109.16	103.28	85.7	255.59	13.19	636.92	261562
3rd Quartile	16.53	28.4	101.92	92.1	76.98	236.37	12.59	592.67	184363
4th Quartile	16.46	27.4	95.59	84.61	70.4	221.09	12.27	543.84	141858

Notes: Each column shows the weight of a given grocery category consumed by a different demographic group in January 2020.

Appendix Table B2: Percet of groceries in category by demographic group

	Shellfish	Fish	Chicken	Beef	Pork	Any Meat	Alt Meat	Animal Product	N
Age									
Overall	0.78	1.37	4.72	4.06	3.68	10.88	0.57	26.94	736908
Cohort >= 1980	0.73	1.17	4.67	3.56	3.47	9.97	0.58	26.73	82082
Cohort < 1980	0.79	1.41	4.73	4.13	3.71	11.03	0.57	26.95	625570
Education									
Overall	0.78	1.37	4.72	4.06	3.68	10.88	0.57	26.94	736908
No College	0.7	1.31	4.67	4.46	3.85	11.17	0.5	27.04	127275
Some College	0.76	1.37	4.81	4.27	3.82	11.26	0.55	26.9	203195
College Grad	0.8	1.39	4.74	3.94	3.63	10.79	0.58	26.93	260916
Post-Grad Study	0.83	1.4	4.58	3.62	3.4	10.26	0.63	26.92	145522
Race									
Overall	0.78	1.37	4.72	4.06	3.68	10.88	0.57	26.94	736908
White	0.74	1.37	4.78	4.24	3.7	11.02	0.55	28.18	552455
Black	0.89	1.31	4.24	3.04	3.79	10.43	0.59	20.1	82047
Asian	1.22	1.71	5.03	3.59	3.47	10.44	0.64	26.86	28057
Hispanic	0.78	1.35	4.68	4.0	3.41	10.42	0.63	25.34	55194
Other	0.82	1.43	4.68	3.92	3.54	10.66	0.6	24.99	19155
Income									
Overall	0.78	1.37	4.72	4.06	3.68	10.88	0.57	26.94	736908
1st Quartile	0.71	1.28	4.73	4.22	3.74	10.75	0.52	27.0	149125
2nd Quartile	0.75	1.36	4.7	4.18	3.74	10.97	0.56	27.2	261562
3rd Quartile	0.81	1.42	4.76	3.99	3.68	11.01	0.59	27.08	184363
4th Quartile	0.84	1.44	4.68	3.76	3.48	10.67	0.61	26.19	141858

Notes: Each column shows the share of groceries by weight that are in a given category consumed by a different demographic group in January 2020.

Appendix Table B3: Plant-based alternative consumption in weight by demographic group

	Heritage Meat Alternative	Beyond/Impossible	Tofu/Seitan	N
Age				
Overall	1.5	0.18	3.54	736908
Cohort >= 1980	1.89	0.2	1.83	82082
Cohort < 1980	1.42	0.17	3.82	625570
Education				
Overall	1.5	0.18	3.54	736908
No College	0.94	0.1	3.92	127275
Some College	1.27	0.14	3.53	203195
College Grad	1.63	0.19	3.36	260916
Post-Grad Study	2.08	0.25	3.56	145522
Race				
Overall	1.5	0.18	3.54	736908
White	1.36	0.15	3.93	552455
Black	2.02	0.29	1.2	82047
Asian	1.41	0.18	5.17	28057
Hispanic	1.9	0.23	2.49	55194
Other	2.2	0.19	2.97	19155
Income				
Overall	1.5	0.18	3.54	736908
1st Quartile	1.44	0.13	2.77	149125
2nd Quartile	1.43	0.14	3.74	261562
3rd Quartile	1.48	0.21	3.8	184363
4th Quartile	1.71	0.23	3.65	141858

Notes: Each column shows the weight of a given grocery category consumed by a different demographic group in January 2020.

Appendix Table B4: Percent of groceries in plant-based category by demographic group

	Heritage Meat Alternative	Beyond/Impossible	Tofu/Seitan	N
Age				
Overall	0.08	0.01	0.14	736908
Cohort >= 1980	0.12	0.02	0.09	82082
Cohort < 1980	0.08	0.01	0.15	625570
Education				
Overall	0.08	0.01	0.14	736908
No College	0.05	0.01	0.13	127275
Some College	0.07	0.01	0.13	203195
College Grad	0.09	0.01	0.13	260916
Post-Grad Study	0.12	0.02	0.16	145522
Race				
Overall	0.08	0.01	0.14	736908
White	0.07	0.01	0.14	552455
Black	0.13	0.02	0.06	82047
Asian	0.09	0.01	0.33	28057
Hispanic	0.1	0.02	0.1	55194
Other	0.12	0.01	0.13	19155
Income				
Overall	0.08	0.01	0.14	736908
1st Quartile	0.07	0.01	0.1	149125
2nd Quartile	0.08	0.01	0.14	261562
3rd Quartile	0.08	0.01	0.15	184363
4th Quartile	0.11	0.02	0.16	141858

Notes: Each column shows the share of groceries by weight that are in a given category consumed by a different demographic group in January 2020.

Appendix Table B5: Effect of media coverage on meat demand

	Log(Meat)	Log(Meat)	Log(Meat)	Log(Meat)
L.Log(Articles)	-0.004	-0.004	-0.006	-0.009
	(0.006)	(0.009)	(0.008)	(0.009)
L2.Log(Articles)		0.001	-0.002	-0.002
		(0.010)	(0.012)	(0.012)
L3.Log(Articles)			0.006	0.006
			(0.010)	(0.012)
L4.Log(Articles)				-0.001
				(0.010)
Log(Groceries)	0.774***	0.779***	0.782***	0.785***
	(0.005)	(0.005)	(0.005)	(0.005)
Time Trend	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Log(Meat Price Instrument)	-0.242***	-0.245***	-0.244***	-0.245***
	(0.025)	(0.025)	(0.026)	(0.026)
Log(Non-Meat Price Instrument)	0.242***	0.248***	0.247***	0.247***
	(0.032)	(0.032)	(0.033)	(0.033)
Observations	8459199	7755273	7189659	6714347

Appendix Table B6: Effect of media coverage on meat demand

	2005	2011	2017
L.Log(Articles)	0.005	0.020	0.022
	(0.012)	(0.018)	(0.013)
L2.Log(Articles)	0.010	-0.007	0.025
	(0.014)	(0.024)	(0.017)
Log(Groceries)	0.794***	0.781***	0.760***
	(0.006)	(0.006)	(0.008)
Time Trend	0.000**	0.001***	0.002***
	(0.000)	(0.000)	(0.000)
Log(Meat Price Instrument)	-0.176***	-0.464***	-0.279***
	(0.025)	(0.052)	(0.033)
Log(Non-Meat Price Instrument)	0.226***	0.415***	0.330***
	(0.026)	(0.074)	(0.044)
Observations	2638476	2898835	1923841

Appendix Table B7: Effect of media coverage on meat demand

	Log(Fish)	Log(Shellfish)	Log(Chicken)	Log(Beef)	Log(Pork)
L.Log(Enviro Articles)	-0.014	0.044***	0.012	0.033***	0.001
	(0.018)	(0.015)	(0.013)	(0.011)	(0.013)
L.Log(Health Articles)	-0.013	-0.027**	-0.005	-0.045***	-0.018
	(0.019)	(0.012)	(0.010)	(0.010)	(0.012)
L.Log(Poultry Articles)	-0.010	-0.014**	-0.004	-0.012*	-0.007
	(0.008)	(0.007)	(0.006)	(0.006)	(0.006)
L.Log(Shellfish Articles)	-0.000	-0.007**	-0.005	-0.008**	-0.002
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
L.Log(Pork Articles)	0.004	-0.006	0.000	-0.008*	0.005
	(0.007)	(0.004)	(0.004)	(0.004)	(0.005)
L.Log(Fish Articles)	0.008	-0.001	0.000	0.005	0.014**
	(0.008)	(0.006)	(0.006)	(0.005)	(0.007)
L.Log(Beef Articles)	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L2.Log(Enviro Articles)	-0.005	0.065***	0.037**	0.065***	0.040**
	(0.017)	(0.013)	(0.015)	(0.013)	(0.017)
L2.Log(Health Articles)	0.043**	-0.032***	0.015	-0.041***	-0.033**
	(0.019)	(0.012)	(0.013)	(0.010)	(0.013)
L2.Log(Poultry Articles)	0.017*	-0.004	-0.011**	-0.014***	0.005
	(0.009)	(0.006)	(0.006)	(0.005)	(0.006)
L2.Log(Shellfish Articles)	-0.006	-0.007**	0.002	-0.008**	-0.001
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
L2.Log(Pork Articles)	0.005	-0.009**	0.005	-0.005	-0.002
	(0.006)	(0.004)	(0.004)	(0.005)	(0.005)
L2.Log(Fish Articles)	-0.016*	-0.001	-0.008	-0.003	0.005
	(0.009)	(0.006)	(0.006)	(0.006)	(0.006)
L2.Log(Beef Articles)	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(Groceries)	0.337***	0.255***	0.544***	0.570***	0.521***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
Month	0.001***	0.001***	0.001***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(Meat Price Instrument)	-0.010	0.050***	-0.168***	-0.244***	-0.100***
	(0.015)	(0.018)	(0.017)	(0.017)	(0.013)
Log(Non-Meat Price Instrument)	0.056*	0.008	0.235***	0.101***	0.094***
	(0.029)	(0.029)	(0.027)	(0.031)	(0.022)
Constant	-0.529***	-0.257**	-0.888***	-1.194***	-1.065***
	(0.136)	(0.129)	(0.122)	(0.119)	(0.114)
Observations	3291996	1448607	6605181	5836463	6601988

Appendix Table B8: County-level compensated elasticities (weekly, 2016-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.4781	.0451	-.0331	.0135	-.0046	-.0135	-.1739	-.1058	-.0713	.0077
	(0.0299)	(0.0199)	(0.0095)	(0.0106)	(0.0097)	(0.0129)	(0.0418)	(0.0295)	(0.0289)	(0.0007)
Fish	.0526	-.9118	.0099	.0224	-.0009	.0300	-.0399	.0156	-.0397	.0108
	(0.0232)	(0.0354)	(0.0102)	(0.0116)	(0.0107)	(0.0144)	(0.0388)	(0.0300)	(0.0301)	(0.0007)
Chicken	-.1112	.0285	-.9730	.0170	.0768	.0286	.0065	-.0663	-.0734	.0385
	(0.0320)	(0.0295)	(0.0207)	(0.0161)	(0.0154)	(0.0207)	(0.0578)	(0.0416)	(0.0446)	(0.0012)
Pork	.0476	.0676	.0178	-.6788	.0305	-.0518	-.1767	.0307	-.0678	.0282
	(0.0372)	(0.0349)	(0.0168)	(0.0315)	(0.0175)	(0.0227)	(0.0838)	(0.0587)	(0.0534)	(0.0014)
Beef	-.0124	-.0021	.0610	.0232	-.8544	.0059	.0576	.0861	-.0361	.0248
	(0.0260)	(0.0245)	(0.0123)	(0.0133)	(0.0198)	(0.0186)	(0.0492)	(0.0321)	(0.0332)	(0.0011)
Other	-.0261	.0496	.0164	-.0285	.0042	-1.1436	.1584	.0883	.0305	.0268
	(0.0249)	(0.0239)	(0.0119)	(0.0125)	(0.0134)	(0.0267)	(0.0436)	(0.0299)	(0.0349)	(0.0010)
Tofu/Seitan	-.0207	-.0041	.0002	-.0060	.0026	.0098	-.7816	-.0341	.0110	.0015
	(0.0050)	(0.0040)	(0.0020)	(0.0028)	(0.0022)	(0.0027)	(0.0244)	(0.0118)	(0.0075)	(0.0001)
Beyond/Imp	-.0308	.0039	-.0057	.0025	.0094	.0133	-.0834	-.9469	-.0098	.0034
	(0.0086)	(0.0075)	(0.0036)	(0.0049)	(0.0035)	(0.0045)	(0.0290)	(0.0269)	(0.0135)	(0.0002)
PBM	-.0367	-.0175	-.0112	-.0099	-.0070	.0081	.0476	-.0173	-.8372	.0070
	(0.0149)	(0.0133)	(0.0068)	(0.0078)	(0.0064)	(0.0093)	(0.0325)	(0.0238)	(0.0333)	(0.0004)
NonMeat	.6156	.7408	.9177	.6444	.7435	1.1134	.9855	.9498	1.0938	-.1487
	(0.0534)	(0.0507)	(0.0277)	(0.0308)	(0.0320)	(0.0432)	(0.0885)	(0.0659)	(0.0699)	(0.0030)

Number of obs = 531,281

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B9: County-level compensated elasticities (weekly, 2019-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.4567	.0480	-.0308	.0024	-.0031	-.0140	-.1229	-.1086	-.0576	.0077
	(0.0358)	(0.0241)	(0.0115)	(0.0123)	(0.0110)	(0.0146)	(0.0452)	(0.0349)	(0.0322)	(0.0008)
Fish	.0534	-.8848	-.0066	.0116	-.0141	.0407	-.0264	.0317	-.0203	.0111
	(0.0269)	(0.0386)	(0.0121)	(0.0132)	(0.0121)	(0.0158)	(0.0453)	(0.0368)	(0.0336)	(0.0008)
Chicken	-.1024	-.0197	-.9597	.0116	.0810	.0306	-.0039	-.0644	-.0579	.0386
	(0.0383)	(0.0362)	(0.0242)	(0.0187)	(0.0171)	(0.0237)	(0.0681)	(0.0524)	(0.0508)	(0.0013)
Pork	.0085	.0364	.0122	-.6598	.0400	-.0340	-.0670	.0312	.0217	.0274
	(0.0432)	(0.0415)	(0.0197)	(0.0372)	(0.0197)	(0.0257)	(0.0920)	(0.0681)	(0.0564)	(0.0016)
Beef	-.0083	-.0337	.0650	.0305	-.8884	.0235	.0625	.1234	-.0340	.0256
	(0.0294)	(0.0290)	(0.0138)	(0.0150)	(0.0211)	(0.0203)	(0.0467)	(0.0366)	(0.0355)	(0.0012)
Other	-.0274	.0715	.0180	-.0190	.0172	-1.1564	.1389	.0609	.0660	.0266
	(0.0285)	(0.0278)	(0.0139)	(0.0143)	(0.0148)	(0.0303)	(0.0474)	(0.0349)	(0.0386)	(0.0012)
Tofu/Seitan	-.0140	-.0027	-.0001	-.0022	.0027	.0081	-.8268	-.0341	.0001	.0013
	(0.0051)	(0.0046)	(0.0023)	(0.0030)	(0.0020)	(0.0028)	(0.0261)	(0.0133)	(0.0074)	(0.0001)
Bey/Imp	-.0309	.0081	-.0055	.0025	.0131	.0089	-.0852	-.9539	-.0063	.0033
	(0.0099)	(0.0094)	(0.0045)	(0.0055)	(0.0039)	(0.0051)	(0.0332)	(0.0350)	(0.0149)	(0.0003)
PBM	-.0303	-.0096	-.0091	.0033	-.0067	.0178	.0005	-.0117	-.8647	.0063
	(0.0169)	(0.0159)	(0.0080)	(0.0085)	(0.0070)	(0.0104)	(0.0341)	(0.0276)	(0.0377)	(0.0005)
NonMeat	.6080	.7865	.9167	.6191	.7583	1.0748	.9301	.9254	.9529	-.1481
	(0.0603)	(0.0589)	(0.0318)	(0.0350)	(0.0348)	(0.0478)	(0.0962)	(0.0750)	(0.0737)	(0.0034)

Number of obs = 266,207

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B10: County-level uncompensated elasticities (weekly, 2019-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.4667	.0370	-.0418	-.0081	-.0140	-.0258	-.1321	-.1170	-.0670	-.0030
	(0.0358)	(0.0241)	(0.0115)	(0.0123)	(0.0110)	(0.0146)	(0.0452)	(0.0348)	(0.0322)	(0.0008)
Fish	.0423	-.8970	-.0188	-.0002	-.0261	.0277	-.0366	.0223	-.0307	-.0008
	(0.0269)	(0.0386)	(0.0121)	(0.0132)	(0.0121)	(0.0158)	(0.0453)	(0.0368)	(0.0336)	(0.0008)
Chicken	-.1355	-.0560	-.9962	-.0235	.0449	-.0085	-.0346	-.0925	-.0892	.0031
	(0.0383)	(0.0362)	(0.0242)	(0.0187)	(0.0171)	(0.0237)	(0.0681)	(0.0524)	(0.0508)	(0.0013)
Pork	-.0264	-.0018	-.0263	-.6968	.0020	-.0751	-.0992	.0016	-.0112	-.0100
	(0.0432)	(0.0415)	(0.0197)	(0.0372)	(0.0197)	(0.0257)	(0.0920)	(0.0681)	(0.0564)	(0.0016)
Beef	-.0349	-.0629	.0356	.0024	-.9174	-.0078	.0379	-.1009	-.0591	-.0029
	(0.0294)	(0.0290)	(0.0138)	(0.0150)	(0.0211)	(0.0203)	(0.0467)	(0.0366)	(0.0355)	(0.0012)
Other	-.0468	.0502	-.0035	-.0396	-.0040	-1.1793	.1210	.0444	.0476	.0057
	(0.0285)	(0.0278)	(0.0139)	(0.0143)	(0.0148)	(0.0303)	(0.0474)	(0.0349)	(0.0386)	(0.0012)
Tofu/Seitan	-.0151	-.0039	-.0014	-.0034	.0014	.0068	-.8278	-.0350	-.0010	.0001
	(0.0051)	(0.0046)	(0.0023)	(0.0030)	(0.0020)	(0.0028)	(0.0261)	(0.0133)	(0.0074)	(0.0001)
Bey/Imp	-.0337	.0050	-.0086	-.0005	.0101	.0055	-.0878	-.9563	-.0090	.0003
	(0.0099)	(0.0094)	(0.0045)	(0.0055)	(0.0039)	(0.0051)	(0.0332)	(0.0350)	(0.0149)	(0.0003)
PBM	-.0355	-.0153	-.0149	-.0023	-.0124	.0116	-.0043	-.0161	-.8696	.0007
	(0.0169)	(0.0159)	(0.0080)	(0.0085)	(0.0070)	(0.0104)	(0.0341)	(0.0276)	(0.0377)	(0.0005)
NonMeat	-.1788	-.0752	.0489	-.2135	-.0988	.1471	.2028	.2583	.2104	-.9922
	(0.0599)	(0.0579)	(0.0316)	(0.0350)	(0.0348)	(0.0481)	(0.0968)	(0.0754)	(0.0734)	(0.0034)

Number of obs = 266,207

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B11: County-level compensated elasticities (weekly, 2016-2018)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.5070	.0217	-.0464	.0350	-.0211	-.0291	-.2731	-.0440	-.1064	.0083
	(0.0575)	(0.0352)	(0.0163)	(0.0207)	(0.0202)	(0.0241)	(0.0801)	(0.0565)	(0.0636)	(0.0014)
Fish	.0304	-.9818	.0442	.0413	.0386	.0231	.0010	-.0719	-.0838	.0103
	(0.0493)	(0.0780)	(0.0194)	(0.0250)	(0.0230)	(0.0306)	(0.0695)	(0.0475)	(0.0685)	(0.0016)
Chicken	-.1716	.1168	-1.0175	.0252	.0651	.0332	.0106	-.0874	-.0915	.0386
	(0.0604)	(0.0512)	(0.0400)	(0.0323)	(0.0344)	(0.0406)	(0.1012)	(0.0636)	(0.0903)	(0.0023)
Pork	.1312	.1104	.0255	-.7531	-.0071	-.0885	-.3492	-.0181	-.3964	.0322
	(0.0775)	(0.0668)	(0.0327)	(0.0540)	(0.0378)	(0.0434)	(0.1641)	(0.1220)	(0.1340)	(0.0026)
Beef	-.0604	.0786	.0503	-.0054	-.7302	-.0411	.0291	-.0485	-.0421	.0220
	(0.0578)	(0.0469)	(0.0266)	(0.0289)	(0.0482)	(0.0410)	(0.1230)	(0.0685)	(0.0836)	(0.0024)
Other	-.0617	.0349	.0190	-.0501	-.0305	-1.0836	.1831	.1356	-.1716	.0279
	(0.0511)	(0.0463)	(0.0232)	(0.0245)	(0.0304)	(0.0542)	(0.0898)	(0.0579)	(0.0779)	(0.0021)
Tofu/Seitan	-.0421	.0001	.0004	-.0144	.0016	.0133	-.7121	-.0364	.0570	.0017
	(0.0124)	(0.0077)	(0.0042)	(0.0068)	(0.0066)	(0.0065)	(0.0483)	(0.0223)	(0.0220)	(0.0003)
Bey/Imp	-.0143	-.0167	-.0077	-.0016	-.0055	.0209	-.0767	-.8293	-.0216	.0037
	(0.0184)	(0.0110)	(0.0056)	(0.0106)	(0.0078)	(0.0089)	(0.0471)	(0.0465)	(0.0265)	(0.0005)
PBM	-.0552	-.0310	-.0128	-.0549	-.0076	-.0421	.1916	-.0343	-.7501	.0092
	(0.0330)	(0.0254)	(0.0127)	(0.0186)	(0.0152)	(0.0191)	(0.0739)	(0.0422)	(0.0642)	(0.0010)
NonMeat	.7507	.6671	.9449	.7779	.6969	1.1939	.9957	1.0342	1.6064	-.1540
	(0.1232)	(0.1038)	(0.0568)	(0.0629)	(0.0769)	(0.0904)	(0.1936)	(0.1460)	(0.1776)	(0.0065)

Number of obs = 265,074

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B12: County-level uncompensated elasticities (weekly, 2016-2018)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.5156	.0126	-.0561	.0257	-.0309	-.0400	-.2813	-.0512	-.1151	-.0011
	(0.0575)	(0.0352)	(0.0163)	(0.0207)	(0.0202)	(0.0241)	(0.0800)	(0.0565)	(0.0635)	(0.0014)
Fish	.0183	-.9946	.0307	.0282	.0249	.0079	-.0105	-.0820	-.0960	-.0028
	(0.0494)	(0.0780)	(0.0194)	(0.0250)	(0.0230)	(0.0307)	(0.0695)	(0.0475)	(0.0685)	(0.0016)
Chicken	-.2035	.0829	-1.0532	-.0093	.0290	-.0068	-.0197	-.1142	-.1236	.0039
	(0.0603)	(0.0513)	(0.0400)	(0.0323)	(0.0344)	(0.0406)	(0.1012)	(0.0636)	(0.0902)	(0.0023)
Pork	.0989	.0761	-.0107	-.7880	-.0435	-.1290	-.3798	-.0451	-.4290	-.0029
	(0.0775)	(0.0668)	(0.0327)	(0.0540)	(0.0378)	(0.0434)	(0.1640)	(0.1221)	(0.1339)	(0.0026)
Beef	-.0851	.0525	.0226	-.0321	-.7580	-.0720	.0057	-.0691	-.0670	-.0048
	(0.0578)	(0.0469)	(0.0266)	(0.0289)	(0.0483)	(0.0411)	(0.1234)	(0.0685)	(0.0836)	(0.0024)
Other	-.0799	.0155	-.0014	-.0698	-.0511	-1.1065	.1657	.1203	-.1901	.0081
	(0.0511)	(0.0464)	(0.0232)	(0.0245)	(0.0304)	(0.0542)	(0.0898)	(0.0579)	(0.0779)	(0.0021)
Tofu/Seitan	-.0435	-.0013	-.0010	-.0158	.0001	.0117	-.7134	-.0375	.0557	.0003
	(0.0124)	(0.0077)	(0.0042)	(0.0068)	(0.0066)	(0.0065)	(0.0483)	(0.0223)	(0.0220)	(0.0003)
Bey/Imp	-.0171	-.0197	-.0109	-.0046	-.0087	.0173	-.0794	-.8317	-.0244	.0007
	(0.0184)	(0.0110)	(0.0056)	(0.0106)	(0.0078)	(0.0089)	(0.0471)	(0.0465)	(0.0265)	(0.0005)
PBM	-.0597	-.0358	-.0178	-.0598	-.0127	-.0477	.1874	-.0381	-.7546	.0043
	(0.0330)	(0.0254)	(0.0127)	(0.0186)	(0.0152)	(0.0191)	(0.0739)	(0.0422)	(0.0642)	(0.0010)
NonMeat	-.0305	-.1612	.0701	-.0669	-.1842	.2144	.2546	.3799	.8192	-1.0030
	(0.1224)	(0.1033)	(0.0562)	(0.0619)	(0.0767)	(0.0888)	(0.1924)	(0.1434)	(0.1795)	(0.0064)

Number of obs = 265,074

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B13: County-level compensated elasticities (weekly, 2016-2020) in QUAIDS model

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.3792	.0443	-.0346	.0097	-.0090	-.0049	-.0672	-.0530	-.0422	.0058
	(0.0359)	(0.0207)	(0.0094)	(0.0116)	(0.0103)	(0.0092)	(0.0194)	(0.0176)	(0.0196)	(0.0007)
Fish	.0601	-.9090	.0095	.0228	-.0023	.0248	-.0146	.0123	-.0238	.0103
	(0.0281)	(0.0368)	(0.0101)	(0.0126)	(0.0113)	(0.0103)	(0.0180)	(0.0177)	(0.0205)	(0.0007)
Chicken	-.1419	.0288	-.9723	.0156	.0794	.0318	.0212	-.0261	-.0376	.0389
	(0.0386)	(0.0306)	(0.0205)	(0.0175)	(0.0163)	(0.0147)	(0.0267)	(0.0247)	(0.0303)	(0.0012)
Pork	.0379	.0656	.0148	-.6597	.0245	-.0234	-.0542	.0388	-.0308	.0251
	(0.0450)	(0.0363)	(0.0166)	(0.0342)	(0.0185)	(0.0162)	(0.0388)	(0.0347)	(0.0360)	(0.0014)
Beef	-.0274	-.0052	.0589	.0191	-.8508	.0148	.0492	.0677	-.0124	.0231
	(0.0314)	(0.0253)	(0.0121)	(0.0145)	(0.0209)	(0.0131)	(0.0231)	(0.0190)	(0.0226)	(0.0011)
Other	-.0161	.0599	.0254	-.0197	.0159	-1.0974	.0736	.0538	.0245	.0352
	(0.0301)	(0.0250)	(0.0118)	(0.0137)	(0.0141)	(0.0190)	(0.0200)	(0.0179)	(0.0238)	(0.0010)
Tofu/Seitan	-.0205	-.0033	.0016	-.0043	.0049	.0069	-.8958	-.0180	.0080	.0029
	(0.0059)	(0.0041)	(0.0020)	(0.0030)	(0.0023)	(0.0019)	(0.0113)	(0.0069)	(0.0049)	(0.0001)
Bey/Imp	-.0312	.0053	-.0037	.0059	.0131	.0097	-.0347	-.9629	-.0057	.0055
	(0.0104)	(0.0077)	(0.0035)	(0.0052)	(0.0037)	(0.0032)	(0.0133)	(0.0162)	(0.0088)	(0.0002)
PBM	-.0385	-.0160	-.0084	-.0072	-.0037	.0068	.0239	-.0088	-.8869	.0096
	(0.0179)	(0.0138)	(0.0067)	(0.0084)	(0.0068)	(0.0066)	(0.0146)	(0.0136)	(0.0221)	(0.0005)
NonMeat	.5568	.7297	.9087	.6177	.7280	1.0310	.8988	.8962	1.0069	-.1564
	(0.0645)	(0.0526)	(0.0274)	(0.0336)	(0.0339)	(0.0307)	(0.0415)	(0.0391)	(0.0475)	(0.0031)

Number of obs = 531,281

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B14: County-level uncompensated elasticities (weekly, 2016-2020) in QUAIDS model

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.3885	.0353	-.0434	.0005	-.0183	-.0124	-.0719	-.0579	-.0481	-.0030
	(0.0359)	(0.0207)	(0.0094)	(0.0116)	(0.0103)	(0.0092)	(0.0194)	(0.0176)	(0.0196)	(0.0007)
Fish	.0474	-.9213	-.0025	.0104	-.0149	.0146	-.0209	.0056	-.0319	-.0016
	(0.0280)	(0.0367)	(0.0101)	(0.0126)	(0.0113)	(0.0103)	(0.0180)	(0.0177)	(0.0205)	(0.0007)
Chicken	-.1803	-.0083	-1.0088	-.0222	.0412	.0009	.0022	-.0463	-.0620	.0028
	(0.0388)	(0.0308)	(0.0205)	(0.0175)	(0.0163)	(0.0148)	(0.0267)	(0.0247)	(0.0303)	(0.0012)
Pork	.0016	.0304	-.0198	-.6955	-.0118	-.0527	-.0723	.0197	-.0540	-.0092
	(0.0452)	(0.0365)	(0.0167)	(0.0343)	(0.0186)	(0.0164)	(0.0387)	(0.0347)	(0.0360)	(0.0014)
Beef	-.0558	-.0327	.0319	-.0089	-.8791	-.0081	.0350	.0528	-.0305	-.0037
	(0.0315)	(0.0253)	(0.0121)	(0.0146)	(0.0209)	(0.0132)	(0.0234)	(0.0191)	(0.0227)	(0.0011)
Other	-.0467	.0303	-.0038	-.0499	-.0146	-1.1220	.0584	.0377	.0050	.0064
	(0.0301)	(0.0248)	(0.0117)	(0.0136)	(0.0141)	(0.0189)	(0.0201)	(0.0178)	(0.0236)	(0.0010)
Tofu/Seitan	-.0234	-.0060	-.0011	-.0071	.0021	.0046	-.8973	-.0195	.0062	.0002
	(0.0059)	(0.0041)	(0.0020)	(0.0030)	(0.0023)	(0.0019)	(0.0113)	(0.0069)	(0.0049)	(0.0001)
Bey/Imp	-.0367	0.0000	-.0090	.0005	.0076	.0052	-.0375	-.9658	-.0092	.0003
	(0.0104)	(0.0077)	(0.0035)	(0.0052)	(0.0037)	(0.0032)	(0.0133)	(0.0162)	(0.0088)	(0.0002)
PBM	-.0470	-.0243	-.0165	-.0156	-.0122	-.0000	.0196	-.0132	-.8924	.0016
	(0.0179)	(0.0138)	(0.0067)	(0.0084)	(0.0068)	(0.0066)	(0.0146)	(0.0136)	(0.0221)	(0.0005)
NonMeat	-.3388	-.1365	.0562	-.2654	-.1647	.3096	.4539	.4254	.4367	-.9997
	(0.0752)	(0.0688)	(0.0331)	(0.0377)	(0.0410)	(0.0382)	(0.0534)	(0.0468)	(0.0606)	(0.0036)

Number of obs = 531,281

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B15: County-level compensated elasticities (weekly, 2016-2020) with Hausman instrument

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.7735	-.0396	-.1961	.2331	.2243	-.1878	-.4773	-9.0504	-2.2333	.0075
	(0.1658)	(0.0849)	(0.0193)	(0.0247)	(0.0321)	(0.0487)	(0.7043)	(1.1233)	(0.3253)	(0.0018)
Fish	-.0602	-2.1690	-.0292	.2671	.1303	.0096	-.7512	16.7421	1.8599	.0017
	(0.1289)	(0.1297)	(0.0219)	(0.0277)	(0.0358)	(0.0530)	(0.6780)	(1.1257)	(0.3309)	(0.0021)
Chicken	-1.1270	-.1105	-1.0296	.1025	-.0683	.2998	.4670	-1.2699	.9687	.0441
	(0.1112)	(0.0830)	(0.0356)	(0.0289)	(0.0356)	(0.0515)	(0.5006)	(0.8610)	(0.2542)	(0.0027)
Pork	1.4836	1.1202	.1135	-1.3310	-.2373	.3052	.7329	-2.7559	.0263	.0376
	(0.1574)	(0.1162)	(0.0320)	(0.0545)	(0.0481)	(0.0709)	(0.7519)	(1.3520)	(0.3699)	(0.0035)
Beef	1.1087	.4243	-.0588	-.1843	-.5627	-.1482	1.5207	4.2210	.2021	.0229
	(0.1585)	(0.1166)	(0.0306)	(0.0373)	(0.0637)	(0.0690)	(0.7547)	(1.3411)	(0.3743)	(0.0031)
Other	-.6939	.0234	.1927	.1771	-.1108	-.9376	.8634	5.8662	1.5042	.0146
	(0.1800)	(0.1290)	(0.0331)	(0.0411)	(0.0516)	(0.1050)	(0.9800)	(1.5569)	(0.4410)	(0.0033)
Tofu/Seitan	-.0171	-.0177	.0029	.0041	.0110	.0084	-1.0193	-1.7134	-.0579	.0001
	(0.0252)	(0.0160)	(0.0031)	(0.0042)	(0.0055)	(0.0095)	(1.9148)	(0.4753)	(0.1657)	(0.0003)
Bey/Imp	-.2299	.2802	-.0056	-.0110	.0217	.0403	-1.2164	-9.4361	-1.1633	.0021
	(0.0285)	(0.0188)	(0.0038)	(0.0054)	(0.0069)	(0.0107)	(0.3374)	(0.4619)	(0.1125)	(0.0004)
PBM	-.6300	.3457	.0475	.0012	.0115	.1149	-.4568	-12.9181	-1.6781	.0013
	(0.0918)	(0.0615)	(0.0125)	(0.0164)	(0.0214)	(0.0337)	(1.3061)	(1.2492)	(0.4844)	(0.0011)
NonMeat	.9393	.1429	.9626	.7412	.5803	.4956	.3370	10.3146	.5715	-.1318
	(0.2293)	(0.1713)	(0.0588)	(0.0689)	(0.0793)	(0.1107)	(1.0222)	(1.8165)	(0.5114)	(0.0076)

Number of obs = 533,740

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B16: County-level uncompensated elasticities (weekly, 2016-2020) with Hausman instrument

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.7807	-.0468	-.2028	.2267	.2178	-.1948	-.4861	-9.0598	-2.2414	.0008
	(0.1658)	(0.0849)	(0.0193)	(0.0247)	(0.0321)	(0.0487)	(0.7043)	(1.1233)	(0.3253)	(0.0018)
Fish	-.0711	-2.1799	-.0394	.2574	.1204	-.0010	-.7646	16.7278	1.8476	-.0085
	(0.1289)	(0.1297)	(0.0219)	(0.0277)	(0.0358)	(0.0530)	(0.6780)	(1.1257)	(0.3309)	(0.0021)
Chicken	-1.1683	-.1518	-1.0685	.0660	-.1058	.2597	.4162	-1.3240	.9220	.0055
	(0.1112)	(0.0830)	(0.0356)	(0.0289)	(0.0356)	(0.0515)	(0.5006)	(0.8610)	(0.2542)	(0.0027)
Pork	1.4379	1.0745	.0705	-1.3714	-.2788	.2608	.6767	-2.8158	-.0254	-.0051
	(0.1574)	(0.1162)	(0.0320)	(0.0545)	(0.0481)	(0.0709)	(0.7519)	(1.3520)	(0.3699)	(0.0035)
Beef	1.0732	.3888	-.0922	-.2157	-.5949	-.1827	1.4770	4.1744	.1620	-.0103
	(0.1585)	(0.1166)	(0.0306)	(0.0373)	(0.0637)	(0.0690)	(0.7547)	(1.3411)	(0.3743)	(0.0031)
Other	-.7204	-.0031	.1677	.1536	-.1349	-.9634	.8308	5.8314	1.4742	-.0102
	(0.1800)	(0.1290)	(0.0331)	(0.0411)	(0.0516)	(0.1050)	(0.9800)	(1.5569)	(0.4410)	(0.0033)
Tofu/Seitan	-.0173	-.0180	.0027	.0039	.0108	.0081	-1.0196	-1.7138	-.0582	-.0001
	(0.0252)	(0.0160)	(0.0031)	(0.0042)	(0.0055)	(0.0095)	(1.9148)	(0.4753)	(0.1657)	(0.0003)
Bey/Imp	-.2301	.2800	-.0058	-.0112	.0215	.0402	-1.2166	-9.4364	-1.1635	.0019
	(0.0285)	(0.0188)	(0.0038)	(0.0054)	(0.0069)	(0.0107)	(0.3374)	(0.4619)	(0.1125)	(0.0004)
PBM	-.6320	.3437	.0456	-.0006	.0097	.1129	-.4593	-12.9208	-1.6804	-.0006
	(0.0918)	(0.0615)	(0.0125)	(0.0164)	(0.0214)	(0.0337)	(1.3061)	(1.2492)	(0.4844)	(0.0011)
NonMeat	.0394	-.7592	.1146	-.0559	-.2377	-.3796	-.7718	9.1326	-.4476	-.9736
	(0.2293)	(0.1713)	(0.0588)	(0.0689)	(0.0793)	(0.1107)	(1.0222)	(1.8165)	(0.5114)	(0.0076)

Number of obs = 533,740

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B17: County-level compensated elasticities (half-yearly, 2016-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.2459	.1236	-.0563	.0602	-.0205	.0188	-1.6054	-.9406	-.2116	.0031
	(0.0628)	(0.0343)	(0.0142)	(0.0173)	(0.0129)	(0.0153)	(0.2262)	(0.2275)	(0.0891)	(0.0009)
Fish	.1606	-.7764	.0198	-.0459	-.0259	.0716	-.2113	.1684	-.3086	.0098
	(0.0445)	(0.0543)	(0.0149)	(0.0197)	(0.0147)	(0.0195)	(0.1635)	(0.1947)	(0.0879)	(0.0010)
Chicken	-.2680	.0727	-.6532	.1282	.1605	.0496	-1.0824	-1.3757	-.3998	.0214
	(0.0678)	(0.0546)	(0.0333)	(0.0260)	(0.0216)	(0.0269)	(0.2714)	(0.2857)	(0.1266)	(0.0018)
Pork	.2992	-.1754	.1338	-.4788	.1590	-.0871	-.5483	.7211	-.4240	.0142
	(0.0858)	(0.0753)	(0.0271)	(0.0538)	(0.0284)	(0.0332)	(0.3935)	(0.3853)	(0.1922)	(0.0025)
Beef	-.0801	-.0777	.1316	.1249	-.7782	.0482	.2337	-.3529	.0164	.0179
	(0.0502)	(0.0440)	(0.0177)	(0.0224)	(0.0384)	(0.0260)	(0.1783)	(0.1920)	(0.0986)	(0.0020)
Other	.0550	.1610	.0304	-.0512	.0360	-1.0986	.0826	-.0462	-.1093	.0288
	(0.0448)	(0.0437)	(0.0165)	(0.0195)	(0.0194)	(0.0394)	(0.1916)	(0.2261)	(0.1170)	(0.0017)
Tofu/Seitan	-.0814	-.0082	-.0115	-.0056	.0030	.0014	-.8672	-.0518	.0641	.0017
	(0.0115)	(0.0064)	(0.0029)	(0.0040)	(0.0023)	(0.0033)	(0.0765)	(0.0482)	(0.0170)	(0.0002)
Bey/Imp	-.0657	.0090	-.0202	.0101	-.0063	-.0011	-.0714	-1.0750	.0386	.0019
	(0.0159)	(0.0105)	(0.0042)	(0.0054)	(0.0034)	(0.0054)	(0.0664)	(0.1009)	(0.0252)	(0.0003)
PBM	-.0892	-.1002	-.0354	-.0360	.0018	-.0158	.5333	.2330	-.5762	.0078
	(0.0376)	(0.0285)	(0.0112)	(0.0163)	(0.0107)	(0.0169)	(0.1417)	(0.1523)	(0.1190)	(0.0009)
NonMeat	.3155	.7715	.4609	.2939	.4706	1.0129	3.5365	2.7198	1.9104	-.1066
	(0.0946)	(0.0829)	(0.0391)	(0.0517)	(0.0514)	(0.0609)	(0.3984)	(0.4241)	(0.2300)	(0.0059)

Number of obs = 26,635

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B18: County-level uncompensated elasticities (half-yearly, 2016-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.2539	.1150	-.0644	.0524	-.0285	.0102	-1.6140	-.9479	-.2194	-.0051
	(0.0628)	(0.0343)	(0.0142)	(0.0173)	(0.0129)	(0.0153)	(0.2263)	(0.2275)	(0.0891)	(0.0009)
Fish	.1501	-.7876	.0093	-.0561	-.0363	.0604	-.2225	.1589	-.3189	-.0009
	(0.0445)	(0.0543)	(0.0149)	(0.0197)	(0.0147)	(0.0195)	(0.1636)	(0.1947)	(0.0879)	(0.0010)
Chicken	-.3064	.0317	-.6920	.0908	.1222	.0085	-1.1233	-1.4103	-.4373	-.0177
	(0.0678)	(0.0546)	(0.0333)	(0.0260)	(0.0216)	(0.0269)	(0.2712)	(0.2856)	(0.1265)	(0.0018)
Pork	.2591	-.2182	.0933	-.5179	.1191	-.1300	-.5910	.6849	-.4631	-.0265
	(0.0859)	(0.0754)	(0.0272)	(0.0539)	(0.0284)	(0.0333)	(0.3938)	(0.3855)	(0.1922)	(0.0025)
Beef	-.1115	-.1113	.0998	.0942	-.8096	.0145	.2001	-.3813	-.0143	-.0141
	(0.0503)	(0.0440)	(0.0177)	(0.0224)	(0.0384)	(0.0261)	(0.1785)	(0.1921)	(0.0987)	(0.0020)
Other	.0315	.1358	.0066	-.0741	.0126	-1.1238	.0575	-.0674	-.1323	.0049
	(0.0448)	(0.0437)	(0.0165)	(0.0195)	(0.0195)	(0.0394)	(0.1916)	(0.2260)	(0.1171)	(0.0017)
Tofu/Seitan	-.0818	-.0087	-.0119	-.0060	.0026	.0010	-.8676	-.0522	.0637	.0013
	(0.0115)	(0.0064)	(0.0029)	(0.0040)	(0.0023)	(0.0033)	(0.0765)	(0.0482)	(0.0170)	(0.0002)
Bey/Imp	-.0662	.0084	-.0207	.0096	-.0069	-.0017	-.0720	-1.0755	.0380	.0013
	(0.0159)	(0.0105)	(0.0042)	(0.0054)	(0.0034)	(0.0054)	(0.0664)	(0.1009)	(0.0252)	(0.0003)
PBM	-.0926	-.1038	-.0388	-.0393	-.0016	-.0194	.5297	.2299	-.5795	.0044
	(0.0376)	(0.0285)	(0.0112)	(0.0163)	(0.0107)	(0.0169)	(0.1417)	(0.1523)	(0.1190)	(0.0009)
NonMeat	-.5114	-.1128	-.3755	-.5131	-.3536	.1269	2.6545	1.9736	1.1028	-.9487
	(0.0932)	(0.0821)	(0.0388)	(0.0511)	(0.0516)	(0.0596)	(0.3933)	(0.4253)	(0.2255)	(0.0059)

Number of obs = 26,635

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B19: County-level compensated elasticities (yearly, 2016-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.1526	.1484	-.0752	.0670	-.0179	.0251	-1.7956	-1.3609	-.2829	.0024
	(0.0826)	(0.0415)	(0.0186)	(0.0207)	(0.0149)	(0.0182)	(0.3337)	(0.3507)	(0.1205)	(0.0011)
Fish	.2001	-.7146	.0056	-.0479	-.0153	.0699	-.1857	.2073	-.3753	.0093
	(0.0559)	(0.0692)	(0.0187)	(0.0245)	(0.0175)	(0.0235)	(0.2285)	(0.3106)	(0.1146)	(0.0012)
Chicken	-.3698	.0206	-.6379	.1536	.1456	.0541	-1.3168	-1.5547	-.4643	.0214
	(0.0917)	(0.0682)	(0.0430)	(0.0336)	(0.0274)	(0.0340)	(0.3894)	(0.4302)	(0.1730)	(0.0022)
Pork	.3486	-.1846	.1624	-.4652	.1727	-.0841	-.5492	.8552	-.5009	.0119
	(0.1079)	(0.0946)	(0.0355)	(0.0691)	(0.0342)	(0.0407)	(0.5169)	(0.6072)	(0.2492)	(0.0031)
Beef	-.0732	-.0462	.1208	.1356	-.8070	.0709	.2505	-.4391	.0650	.0180
	(0.0608)	(0.0531)	(0.0227)	(0.0269)	(0.0528)	(0.0295)	(0.2106)	(0.3357)	(0.1256)	(0.0024)
Other	.0765	.1584	.0336	-.0494	.0530	-1.0996	.1174	.0556	-.1188	.0282
	(0.0557)	(0.0531)	(0.0211)	(0.0239)	(0.0221)	(0.0449)	(0.2550)	(0.3026)	(0.1601)	(0.0020)
Tofu/Seitan	-.0853	-.0065	-.0127	-.0050	.0029	.0018	-.9589	-.0306	.0766	.0017
	(0.0158)	(0.0080)	(0.0038)	(0.0047)	(0.0024)	(0.0040)	(0.1054)	(0.0775)	(0.0236)	(0.0002)
Bey/Imp	-.0773	.0087	-.0179	.0093	-.0061	.0010	-.0366	-1.0640	.0314	.0017
	(0.0199)	(0.0131)	(0.0050)	(0.0066)	(0.0047)	(0.0056)	(0.0927)	(0.1741)	(0.0426)	(0.0003)
PBM	-.1155	-.1136	-.0386	-.0393	.0065	-.0159	.6585	.2261	-.5109	.0080
	(0.0492)	(0.0347)	(0.0144)	(0.0196)	(0.0126)	(0.0214)	(0.2030)	(0.3063)	(0.1487)	(0.0011)
NonMeat	.2485	.7296	.4599	.2413	.4655	.9767	3.8164	3.1049	2.0802	-.1025
	(0.1183)	(0.0932)	(0.0466)	(0.0638)	(0.0618)	(0.0695)	(0.5101)	(0.5965)	(0.2949)	(0.0072)

Number of obs = 13,351

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B20: County-level uncompensated elasticities (yearly, 2016-2020)

	Goods									
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	Bey/Imp	PBM	NonMeat
Prices										
Shellfish	-.1605	.1401	-.0831	.0595	-.0257	.0167	-1.8041	-1.3683	-.2906	-.0056
	(0.0826)	(0.0414)	(0.0186)	(0.0207)	(0.0149)	(0.0182)	(0.3337)	(0.3507)	(0.1204)	(0.0011)
Fish	.1895	-.7259	-.0050	-.0581	-.0257	.0587	-.1972	.1975	-.3857	-.0014
	(0.0559)	(0.0692)	(0.0187)	(0.0245)	(0.0175)	(0.0235)	(0.2286)	(0.3107)	(0.1146)	(0.0012)
Chicken	-.4085	-.0204	-.6768	.1163	.1075	.0131	-1.3586	-1.5907	-.5023	-.0178
	(0.0917)	(0.0682)	(0.0430)	(0.0336)	(0.0274)	(0.0340)	(0.3892)	(0.4299)	(0.1729)	(0.0022)
Pork	.3076	-.2279	.1213	-.5047	.1324	-.1274	-.5934	.8171	-.5411	-.0295
	(0.1079)	(0.0947)	(0.0355)	(0.0692)	(0.0342)	(0.0408)	(0.5173)	(0.6075)	(0.2492)	(0.0031)
Beef	-.1054	-.0802	.0886	.1046	-.8386	.0369	.2159	-.4690	.0334	-.0145
	(0.0609)	(0.0531)	(0.0227)	(0.0269)	(0.0528)	(0.0296)	(0.2106)	(0.3354)	(0.1257)	(0.0024)
Other	.0525	.1330	.0094	-.0726	.0293	-1.1250	.0914	.0333	-.1424	.0039
	(0.0557)	(0.0531)	(0.0211)	(0.0239)	(0.0221)	(0.0449)	(0.2550)	(0.3027)	(0.1602)	(0.0020)
Tofu/Seitan	-.0856	-.0069	-.0131	-.0054	.0025	.0014	-.9593	-.0309	.0762	.0013
	(0.0158)	(0.0080)	(0.0038)	(0.0047)	(0.0024)	(0.0040)	(0.1053)	(0.0775)	(0.0236)	(0.0002)
Bey/Imp	-.0777	.0083	-.0184	.0089	-.0065	.0006	-.0370	-1.0644	.0310	.0012
	(0.0199)	(0.0131)	(0.0050)	(0.0066)	(0.0047)	(0.0056)	(0.0927)	(0.1741)	(0.0426)	(0.0003)
PBM	-.1187	-.1170	-.0418	-.0424	.0033	-.0193	.6551	.2231	-.5141	.0048
	(0.0492)	(0.0347)	(0.0144)	(0.0196)	(0.0126)	(0.0214)	(0.2030)	(0.3063)	(0.1487)	(0.0011)
NonMeat	-.5840	-.1509	-.3755	-.5609	-.3542	.0961	2.9183	2.3301	1.2640	-.9440
	(0.1166)	(0.0927)	(0.0464)	(0.0631)	(0.0622)	(0.0678)	(0.5052)	(0.5957)	(0.2895)	(0.0071)

Number of obs = 13,351

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B21: County-level compensated elasticities (half-yearly, 2004-2020)

	Goods								
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	PBM	NonMeat
Prices									
Shellfish	-.2384	.0871	-.0634	.0246	.0095	-.0181	-.4716	-.3357	.0039
	(0.0260)	(0.0106)	(0.0042)	(0.0053)	(0.0038)	(0.0049)	(0.0735)	(0.0462)	(0.0003)
Fish	.1464	-.7188	.0213	-.0715	.0306	.0204	-.0697	-.1824	.0091
	(0.0178)	(0.0213)	(0.0055)	(0.0073)	(0.0052)	(0.0061)	(0.0759)	(0.0630)	(0.0004)
Chicken	-.3930	.0786	-.5895	-.0490	.1125	.0666	-1.2138	-.6200	.0283
	(0.0260)	(0.0203)	(0.0124)	(0.0103)	(0.0081)	(0.0098)	(0.1042)	(0.0613)	(0.0008)
Pork	.1438	-.2482	-.0462	-.3611	.2345	.0439	-.4358	-.5585	.0123
	(0.0311)	(0.0253)	(0.0097)	(0.0184)	(0.0097)	(0.0112)	(0.1319)	(0.0792)	(0.0009)
Beef	.0451	.0865	.0863	.1908	-.8137	.0773	.1651	.0900	.0129
	(0.0182)	(0.0148)	(0.0062)	(0.0079)	(0.0108)	(0.0083)	(0.0594)	(0.0449)	(0.0007)
Other	-.0681	.0457	.0406	.0284	.0614	-1.0453	.0471	-.0400	.0247
	(0.0186)	(0.0138)	(0.0060)	(0.0072)	(0.0066)	(0.0130)	(0.0701)	(0.0459)	(0.0006)
Tofu/Seitan	-.0259	-.0023	-.0108	-.0041	.0019	.0007	-.9471	.0199	.0012
	(0.0040)	(0.0025)	(0.0009)	(0.0012)	(0.0007)	(0.0010)	(0.0294)	(0.0164)	(0.0001)
PBM	-.1200	-.0388	-.0358	-.0342	.0068	-.0038	.1298	-.3512	.0054
	(0.0165)	(0.0134)	(0.0035)	(0.0049)	(0.0034)	(0.0044)	(0.1065)	(0.0931)	(0.0003)
NonMeat	.5102	.7103	.5976	.2760	.3566	.8583	2.7960	1.9778	-.0979
	(0.0436)	(0.0337)	(0.0163)	(0.0208)	(0.0194)	(0.0213)	(0.1750)	(0.1182)	(0.0022)

Number of obs = 89,938

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B22: County-level uncompensated elasticities (half-yearly, 2004-2020)

	Goods								
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	PBM	NonMeat
Prices									
Shellfish	-.2449	.0804	-.0699	.0185	.0032	-.0248	-.4780	-.3423	-.0026
	(0.0260)	(0.0106)	(0.0042)	(0.0053)	(0.0038)	(0.0049)	(0.0735)	(0.0462)	(0.0003)
Fish	.1355	-.7302	.0104	-.0818	.0199	.0091	-.0804	-.1935	-.0018
	(0.0178)	(0.0213)	(0.0055)	(0.0073)	(0.0052)	(0.0061)	(0.0759)	(0.0630)	(0.0004)
Chicken	-.4331	.0367	-.6296	-.0872	.0733	.0250	-1.2532	-.6607	-.0119
	(0.0260)	(0.0203)	(0.0124)	(0.0103)	(0.0081)	(0.0098)	(0.1042)	(0.0613)	(0.0008)
Pork	.1059	-.2877	-.0839	-.3971	.1975	.0047	-.4730	-.5968	-.0255
	(0.0311)	(0.0253)	(0.0097)	(0.0184)	(0.0097)	(0.0112)	(0.1319)	(0.0792)	(0.0009)
Beef	.0143	.0543	.0555	.1615	-.8438	.0454	.1349	.0588	-.0178
	(0.0182)	(0.0148)	(0.0062)	(0.0079)	(0.0108)	(0.0083)	(0.0594)	(0.0449)	(0.0007)
Other	-.0925	.0202	.0162	.0051	.0375	-1.0707	.0230	-.0648	.0003
	(0.0186)	(0.0138)	(0.0060)	(0.0072)	(0.0066)	(0.0130)	(0.0701)	(0.0459)	(0.0006)
Tofu/Seitan	-.0263	-.0026	-.0111	-.0044	.0016	.0003	-.9474	.0196	.0008
	(0.0040)	(0.0025)	(0.0009)	(0.0012)	(0.0007)	(0.0010)	(0.0294)	(0.0164)	(0.0001)
PBM	-.1223	-.0412	-.0381	-.0364	.0045	-.0062	.1275	-.3536	.0031
	(0.0165)	(0.0134)	(0.0035)	(0.0049)	(0.0034)	(0.0044)	(0.1065)	(0.0931)	(0.0003)
NonMeat	-.3374	-.1749	-.2489	-.5302	-.4718	-.0211	1.9628	1.1176	-.9459
	(0.0436)	(0.0337)	(0.0163)	(0.0208)	(0.0194)	(0.0213)	(0.1750)	(0.1182)	(0.0022)

Number of obs = 89,938

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B23: County-level compensated elasticities (yearly, 2004-2020)

	Goods								
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	PBM	NonMeat
Prices									
Shellfish	-.1919	.1070	-.0746	.0191	.0144	-.0208	-.5136	-.3744	.0039
	(0.0353)	(0.0141)	(0.0055)	(0.0071)	(0.0048)	(0.0064)	(0.1186)	(0.0859)	(0.0004)
Fish	.1832	-.6711	-.0114	-.0702	.0318	.0240	.0381	-.0704	.0092
	(0.0241)	(0.0289)	(0.0071)	(0.0093)	(0.0066)	(0.0077)	(0.1223)	(0.1094)	(0.0005)
Chicken	-.4732	-.0423	-.5508	-.0495	.1256	.0799	-1.6959	-.8057	.0280
	(0.0351)	(0.0263)	(0.0165)	(0.0134)	(0.0102)	(0.0125)	(0.1604)	(0.0868)	(0.0010)
Pork	.1155	-.2481	-.0472	-.3196	.2524	.0532	-.5558	-.6902	.0101
	(0.0428)	(0.0328)	(0.0128)	(0.0236)	(0.0124)	(0.0143)	(0.2010)	(0.1082)	(0.0012)
Beef	.0712	.0916	.0975	.2056	-.8111	.0757	.1748	.0630	.0118
	(0.0235)	(0.0189)	(0.0079)	(0.0101)	(0.0140)	(0.0106)	(0.0888)	(0.0626)	(0.0009)
Other	-.0811	.0547	.0491	.0343	.0599	-1.0438	.0324	-.0519	.0243
	(0.0248)	(0.0176)	(0.0077)	(0.0092)	(0.0084)	(0.0167)	(0.0977)	(0.0678)	(0.0008)
Tofu/Seitan	-.0241	.0010	-.0125	-.0043	.0017	.0004	-1.0303	.0117	.0012
	(0.0056)	(0.0033)	(0.0012)	(0.0016)	(0.0008)	(0.0012)	(0.0435)	(0.0281)	(0.0001)
PBM	-.1265	-.0139	-.0429	-.0386	.0043	-.0045	.0848	-.3209	.0056
	(0.0290)	(0.0216)	(0.0046)	(0.0060)	(0.0043)	(0.0059)	(0.2027)	(0.1643)	(0.0004)
NonMeat	.5270	.7211	.5928	.2232	.3210	.8359	3.4654	2.2388	-.0941
	(0.0564)	(0.0424)	(0.0204)	(0.0263)	(0.0241)	(0.0267)	(0.2567)	(0.1635)	(0.0027)

Number of obs = 45,271

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B24: County-level uncompensated elasticities (yearly, 2004-2020)

	Goods								
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	PBM	NonMeat
Prices									
Shellfish	-.1983	.1004	-.0809	.0131	.0083	-.0273	-.5202	-.3810	-.0024
	(0.0353)	(0.0141)	(0.0055)	(0.0071)	(0.0048)	(0.0064)	(0.1186)	(0.0858)	(0.0004)
Fish	.1722	-.6824	-.0222	-.0804	.0213	.0128	.0267	-.0817	-.0016
	(0.0241)	(0.0289)	(0.0071)	(0.0093)	(0.0066)	(0.0077)	(0.1222)	(0.1093)	(0.0005)
Chicken	-.5137	-.0842	-.5908	-.0875	.0866	.0385	-1.7381	-.8478	-.0121
	(0.0351)	(0.0263)	(0.0165)	(0.0134)	(0.0102)	(0.0125)	(0.1605)	(0.0869)	(0.0010)
Pork	.0768	-.2881	-.0854	-.3558	.2152	.0137	-.5960	-.7303	-.0282
	(0.0428)	(0.0328)	(0.0128)	(0.0236)	(0.0124)	(0.0143)	(0.2010)	(0.1083)	(0.0012)
Beef	.0397	.0590	.0664	.1761	-.8413	.0436	.1420	.0304	-.0193
	(0.0235)	(0.0189)	(0.0079)	(0.0101)	(0.0140)	(0.0106)	(0.0888)	(0.0626)	(0.0009)
Other	-.1060	.0289	.0245	.0110	.0360	-1.0693	.0065	-.0777	-.0003
	(0.0248)	(0.0176)	(0.0077)	(0.0092)	(0.0084)	(0.0167)	(0.0977)	(0.0679)	(0.0008)
Tofu/Seitan	-.0244	.0007	-.0128	-.0046	.0014	.0001	-1.0306	.0114	.0009
	(0.0056)	(0.0033)	(0.0012)	(0.0016)	(0.0008)	(0.0012)	(0.0435)	(0.0281)	(0.0001)
PBM	-.1287	-.0161	-.0450	-.0406	.0022	-.0067	.0825	-.3232	.0035
	(0.0290)	(0.0216)	(0.0046)	(0.0060)	(0.0043)	(0.0059)	(0.2027)	(0.1643)	(0.0004)
NonMeat	-.3301	-.1661	-.2535	-.5798	-.5028	-.0403	2.5727	1.3492	-.9420
	(0.0564)	(0.0420)	(0.0203)	(0.0261)	(0.0240)	(0.0265)	(0.2524)	(0.1595)	(0.0027)

Number of obs = 45,271

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B25: County-level compensated elasticities (five-yearly, 2004-2020)

	Goods								
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	PBM	NonMeat
Prices									
Shellfish	-.0257	.1164	-.1073	.0272	.0269	-.0244	-.8704	-.3385	.0032
	(0.0581)	(0.0268)	(0.0095)	(0.0137)	(0.0083)	(0.0123)	(0.2755)	(0.2813)	(0.0008)
Fish	.1985	-.6169	-.0115	-.0872	.0277	.0214	.3490	.1972	.0087
	(0.0457)	(0.0489)	(0.0126)	(0.0158)	(0.0110)	(0.0137)	(0.2625)	(0.2513)	(0.0008)
Chicken	-.6897	-.0434	-.5396	-.0286	.1413	.0637	-2.1195	-1.0740	.0281
	(0.0611)	(0.0474)	(0.0261)	(0.0227)	(0.0165)	(0.0207)	(0.2901)	(0.1534)	(0.0015)
Pork	.1725	-.3237	-.0282	-.2608	.3042	.0826	-1.2721	-1.1630	.0052
	(0.0867)	(0.0587)	(0.0224)	(0.0394)	(0.0203)	(0.0258)	(0.4880)	(0.1868)	(0.0022)
Beef	.1387	.0839	.1136	.2481	-.7894	.0609	.3626	.1679	.0087
	(0.0429)	(0.0334)	(0.0133)	(0.0165)	(0.0235)	(0.0178)	(0.1630)	(0.1057)	(0.0016)
Other	-.0971	.0501	.0394	.0519	.0469	-1.0499	.1262	-.0580	.0248
	(0.0491)	(0.0319)	(0.0128)	(0.0162)	(0.0137)	(0.0297)	(0.2081)	(0.2138)	(0.0013)
Tofu/Seitan	-.0319	.0075	-.0121	-.0074	.0026	.0012	-1.2529	-.0529	.0014
	(0.0101)	(0.0056)	(0.0017)	(0.0028)	(0.0012)	(0.0019)	(0.0849)	(0.0539)	(0.0001)
PBM	-.1005	.0343	-.0496	-.0545	.0097	-.0043	-.4281	-.7032	.0066
	(0.0835)	(0.0438)	(0.0071)	(0.0088)	(0.0061)	(0.0159)	(0.4356)	(0.2648)	(0.0005)
NonMeat	.4353	.6917	.5953	.1112	.2302	.8488	5.1051	3.0243	-.0866
	(0.1084)	(0.0664)	(0.0327)	(0.0463)	(0.0411)	(0.0451)	(0.5095)	(0.2371)	(0.0048)

Number of obs = 11,292

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B26: County-level uncompensated elasticities (five-yearly, 2004-2020)

	Goods								
	Shellfish	Fish	Chicken	Pork	Beef	Other	Tofu/Seitan	PBM	NonMeat
Prices									
Shellfish	-.0322	.1099	-.1135	.0214	.0209	-.0308	-.8778	-.3455	-.0030
	(0.0581)	(0.0268)	(0.0095)	(0.0137)	(0.0083)	(0.0123)	(0.2755)	(0.2813)	(0.0008)
Fish	.1875	-.6280	-.0221	-.0971	.0175	.0105	.3365	.1853	-.0019
	(0.0457)	(0.0489)	(0.0126)	(0.0158)	(0.0110)	(0.0137)	(0.2625)	(0.2513)	(0.0008)
Chicken	-.7309	-.0854	-.5796	-.0663	.1029	.0224	-2.1666	-1.1191	-.0119
	(0.0611)	(0.0474)	(0.0261)	(0.0227)	(0.0165)	(0.0207)	(0.2901)	(0.1534)	(0.0015)
Pork	.1319	-.3651	-.0676	-.2979	.2663	.0420	-1.3185	-1.2074	-.0342
	(0.0867)	(0.0587)	(0.0224)	(0.0394)	(0.0203)	(0.0258)	(0.4880)	(0.1868)	(0.0022)
Beef	.1056	.0502	.0815	.2179	-.8204	.0277	.3248	.1316	-.0234
	(0.0429)	(0.0334)	(0.0133)	(0.0165)	(0.0235)	(0.0178)	(0.1630)	(0.1057)	(0.0016)
Other	-.1226	.0240	.0147	.0286	.0231	-1.0754	.0970	-.0859	.0001
	(0.0491)	(0.0319)	(0.0128)	(0.0162)	(0.0137)	(0.0297)	(0.2081)	(0.2138)	(0.0013)
Tofu/Seitan	-.0322	.0073	-.0123	-.0076	.0024	.0009	-1.2532	-.0532	.0011
	(0.0101)	(0.0056)	(0.0017)	(0.0028)	(0.0012)	(0.0019)	(0.0849)	(0.0539)	(0.0001)
PBM	-.1024	.0324	-.0515	-.0563	.0079	-.0062	-.4302	-.7053	.0047
	(0.0835)	(0.0438)	(0.0071)	(0.0088)	(0.0061)	(0.0159)	(0.4356)	(0.2648)	(0.0005)
NonMeat	.4383	.1986	.2516	.6862	.5852	.0250	4.1062	2.0676	-.9332
	(0.1084)	(0.0664)	(0.0327)	(0.0463)	(0.0411)	(0.0451)	(0.5095)	(0.2371)	(0.0048)

Number of obs = 11,292

Notes: "PBM" refers to heritage plant-based meats, or plant-based meats excluding Beyond and Impossible. Other refers to meat not falling in one of the listed categories, and NonMeat refers to all other food groups.

Appendix Table B27: Change in purchases around Beyond/Impossible introductions (two-way fixed effects)

	Weight Share	Ounces
Shellfish		
ATT	-0.00007	-0.25980
	(0.000)	(0.250)
Fish		
ATT	-0.00011	-0.20031
	(0.000)	(0.615)
Chicken		
ATT	-0.00106*	-3.03344**
	(0.001)	(1.448)
Beef		
ATT	-0.00177**	-1.86966
	(0.001)	(2.425)
Pork		
ATT	-0.00092**	-1.00915
	(0.000)	(0.793)
Meat		
ATT	-0.00204*	-3.22604
	(0.001)	(3.293)
Meat Substitute		
ATT	0.00514***	7.31259***
	(0.000)	(0.597)
Heritage Meat Substitute		
ATT	0.00148***	2.90941***
	(0.000)	(0.534)
Beyond/Impossible		
ATT	0.00371***	4.39588***
	(0.000)	(0.176)
Tofu/Tempeh/Seitan		
ATT	0.00030*	0.58752***
	(0.000)	(0.193)
Observations	246105	246193

Appendix Table B28: Change in purchases around heritage plant-based meat introductions (two-way fixed effects)

	Weight Share	Ounces
Shellfish		
ATT	0.00006	0.29961***
	(0.000)	(0.088)
Fish		
ATT	0.00012	0.38720*
	(0.000)	(0.231)
Chicken		
ATT	-0.00043**	-0.68515
	(0.000)	(0.583)
Beef		
ATT	-0.00038	-1.17862
	(0.000)	(1.091)
Pork		
ATT	-0.00058***	-1.47441***
	(0.000)	(0.347)
Meat		
ATT	-0.00075*	-0.94853
	(0.000)	(1.361)
Meat Substitute		
ATT	0.00278***	4.37956***
	(0.000)	(0.078)
Heritage Meat Substitute		
ATT	0.00265***	4.17757***
	(0.000)	(0.072)
Beyond/Impossible		
ATT	0.00003***	0.03825***
	(0.000)	(0.010)
Tofu/Tempeh/Seitan		
ATT	0.00010***	0.24753***
	(0.000)	(0.035)
Observations	1285003	1285514

Appendix Table B29: Change in purchases around tofu/seitan introductions (two-way fixed effects)

	Weight Share	Ounces
Shellfish		
ATT	0.00002	0.23150***
	(0.000)	(0.085)
Fish		
ATT	0.00006	0.34969*
	(0.000)	(0.188)
Chicken		
ATT	-0.00046***	-0.63675
	(0.000)	(0.525)
Beef		
ATT	0.00030	1.81364*
	(0.000)	(1.101)
Pork		
ATT	-0.00033***	-0.64578**
	(0.000)	(0.272)
Meat		
ATT	-0.00086**	-0.29593
	(0.000)	(1.216)
Meat Substitute		
ATT	0.00056***	1.35404***
	(0.000)	(0.081)
Heritage Meat Substitute		
ATT	0.00045***	1.11217***
	(0.000)	(0.073)
Beyond/Impossible		
ATT	0.00001	0.02423**
	(0.000)	(0.010)
Tofu/Tempeh/Seitan		
ATT	0.00165***	2.71696***
	(0.000)	(0.055)
Observations	1881203	1881941

Appendix Table B30: Change in purchases around plant-based milk introductions (two-way fixed effects)

	Weight Share	Ounces
Milk		
ATT	-0.00765***	-13.88944***
	(0.000)	(1.026)
Milk Substitute		
ATT	0.01287***	25.67027***
	(0.000)	(0.302)
Observations	6216287	6218778

Appendix Table B31: Change in purchases around almond/oat milk introductions (two-way fixed effects)

	Weight Share	Ounces
Milk		
ATT	-0.01039***	-20.94670***
	(0.000)	(1.058)
Milk Substitute		
ATT	0.01579***	30.01417***
	(0.000)	(0.378)
Observations	5335564	5337659

Appendix Table B32: Change in purchases around egg alternative introductions (two-way fixed effects)

	Weight Share	Ounces
Egg		
ATT	-0.00058	-0.51733
	(0.002)	(3.870)
Egg Substitute		
ATT	0.00455***	6.22429***
	(0.001)	(0.720)
Observations	13499	13500

Appendix Table B33: Estimated treatment effects of Beyond/Impossible introductions on purchasers (adjusted two-way fixed effects)

	Weight Share	Ounces
Shellfish		
ATT	0.00019	0.36554
	(0.000)	(0.414)
Fish		
ATT	0.00018	0.67674
	(0.001)	(0.915)
Chicken		
ATT	-0.00064	-0.43754
	(0.001)	(2.551)
Beef		
ATT	-0.00111	-0.17038
	(0.001)	(4.246)
Pork		
ATT	-0.00152**	-1.06168
	(0.001)	(1.359)
Meat		
ATT	-0.00154	3.63531
	(0.002)	(5.343)
Meat Substitute		
ATT	0.00600***	8.37722***
	(0.001)	(0.900)
Heritage Meat Substitute		
ATT	0.00168***	3.17995***
	(0.000)	(0.802)
Beyond/Impossible		
ATT	0.00420***	4.89703***
	(0.000)	(0.326)
Tofu/Tempeh/Seitan		
ATT	0.00017	0.33009
	(0.000)	(0.309)
Observations	246105	246193

Appendix Table B34: Estimated treatment effects of heritage plant-based meat introductions on purchasers (adjusted two-way fixed effects)

	Weight Share	Ounces
Shellfish		
ATT	0.00009	0.75534*
	(0.000)	(0.408)
Fish		
ATT	0.00011	-0.90164
	(0.000)	(1.273)
Chicken		
ATT	0.00044	3.22199
	(0.001)	(2.885)
Beef		
ATT	-0.00263**	-10.11769**
	(0.001)	(4.983)
Pork		
ATT	-0.00097	-3.06717*
	(0.001)	(1.856)
Meat		
ATT	-0.00256	-4.84525
	(0.002)	(6.877)
Meat Substitute		
ATT	0.00378***	5.16525***
	(0.000)	(0.369)
Heritage Meat Substitute		
ATT	0.00355***	4.87815***
	(0.000)	(0.339)
Beyond/Impossible		
ATT	0.00012**	0.08546
	(0.000)	(0.058)
Tofu/Tempeh/Seitan		
ATT	-0.00000	0.20707
	(0.000)	(0.143)
Observations	1285003	1285514

Appendix Table B35: Estimated treatment effects of tofu/seitan introductions on purchasers (adjusted two-way fixed effects)

	Weight Share	Ounces
Shellfish		
ATT	-0.00012	-0.21621
	(0.000)	(0.240)
Fish		
ATT	-0.00018	0.07508
	(0.000)	(0.557)
Chicken		
ATT	0.00184***	1.41280
	(0.001)	(2.144)
Beef		
ATT	0.00121	9.15601
	(0.001)	(5.804)
Pork		
ATT	0.00043	-0.42124
	(0.000)	(0.962)
Meat		
ATT	0.00297**	5.67202
	(0.001)	(6.776)
Meat Substitute		
ATT	-0.00016	-0.11160
	(0.000)	(0.259)
Heritage Meat Substitute		
ATT	-0.00003	0.01708
	(0.000)	(0.234)
Beyond/Impossible		
ATT	-0.00005**	-0.07676***
	(0.000)	(0.024)
Tofu/Tempeh/Seitan		
ATT	0.00108***	1.95498***
	(0.000)	(0.119)
Observations	1881203	1881941

Appendix Table B36: Estimated treatment effects of plant-based milk introductions on purchasers (adjusted two-way fixed effects)

	Weight Share	Ounces
Milk		
ATT	-0.00947***	-25.24501***
	(0.001)	(3.657)
Milk Substitute		
ATT	0.01300***	27.12120***
	(0.000)	(0.773)
Observations	6216287	6218778

Appendix Table B37: Estimated treatment effects of almond/oat milk introductions on purchasers (adjusted two-way fixed effects)

	Weight Share	Ounces
Milk		
ATT	-0.01249***	-29.96685***
	(0.001)	(4.139)
Milk Substitute		
ATT	0.01684***	33.79165***
	(0.001)	(1.323)
Observations	5335564	5337659

Appendix Table B38: Estimated treatment effects of egg alternative introductions on purchasers (adjusted two-way fixed effects)

	Weight Share	Ounces
Egg		
ATT	0.00254	-8.15212
	(0.005)	(6.564)
Egg Substitute		
ATT	0.00363***	5.98747***
	(0.001)	(1.836)
Observations	13499	13500

Appendix Table B39: Estimated treatment effects of Beyond/Impossible introductions on purchasers (matrix completion)

	Weight Share	Ounces
Shellfish		
ATT	0.01858	-0.06203
Fish		
ATT	-0.04930	-1.30120
Chicken		
ATT	0.04418	-1.94692
Beef		
ATT	-0.13957	-5.13288
Pork		
ATT	0.02037	-0.69517
Meat		
ATT	0.09588	-5.08535
Meat Substitute		
ATT	0.39414	5.39232
Heritage Meat Substitute		
ATT	0.12143	1.88438
Beyond/Impossible		
ATT	0.01166	0.22649

Appendix Table B40: Estimated treatment effects of heritage plant-based meat introductions on purchasers (matrix completion)

	Weight Share	Ounces
Shellfish		
ATT	0.00007	-0.02584
Fish		
ATT	0.00342	-0.20423
Chicken		
ATT	-0.02833	-2.67633
Beef		
ATT	-0.04339	-4.80540
Pork		
ATT	0.00210	-2.47622
Meat		
ATT	0.00237	-7.68648
Meat Substitute		
ATT	0.18813	3.06511
Heritage Meat Substitute		
ATT	0.00595	0.09109
Beyond/Impossible		
ATT	0.00414	0.10099

Appendix Table B41: Estimated treatment effects of tofu/seitan introductions on purchasers (matrix completion)

	Weight Share	Ounces
Shellfish		
ATT	0.00237	-0.17655
Fish		
ATT	0.02563	-0.21412
Chicken		
ATT	0.04141	-2.73776
Beef		
ATT	-0.01118	-3.24543
Pork		
ATT	-0.01256	-2.54579
Meat		
ATT	0.00377	-10.84665
Meat Substitute		
ATT	0.01455	0.31148
Heritage Meat Substitute		
ATT	0.01671	0.39151
Beyond/Impossible		
ATT	0.00253	0.02812

Appendix Table B42: Estimated treatment effects of plant-based milk introductions on purchasers (matrix completion)

	Weight Share	Ounces
Milk		
ATT	-0.94185	-31.15799

Appendix Table B43: Estimated treatment effects of almond/oat milk introductions on purchasers (matrix completion)

	Weight Share	Ounces
Milk		
ATT	-1.10307	-27.74153
Milk Substitute		
ATT	1.26484	21.47979

Appendix Table B44: Estimated treatment effects of egg alternative introductions on purchasers (matrix completion)

	Weight Share	Ounces
Egg		
ATT	0.05090	0.94204