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Examining food purchase behavior and food values during the COVID-19 pandemic

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Abstract: The COVID-19 pandemic has fundamentally altered what is "normal" across the globe, and food purchasing and acquisition decisions are no different. In this paper, we surveyed a panel of 1,370 U.S. households at four different points during the COVID-19 pandemic from mid-March to late April 2020. The rapid panel design uniquely positions us to observe changes in households' food expenditures, shopping behaviors, and food values as the pandemic evolved in the U.S. Our results reveal significant reductions in food-away-from-home expenditures and increases in online grocery shopping. Food values appear to be fairly stable in the early stages of the pandemic; however, decreases in the importance of price and nutrition reveal tradeoffs households may be willing to make in times of scarcity.

Keywords: COVID-19, survey, food expenditures, food values, consumer behavior

JEL codes: Q18

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1. Introduction

The COVID-19 pandemic has created enormous societal disruptions in the United States and elsewhere with serious implications for employment, travel, education, and business owners. Media sources have reported widely of the negative effects for retail markets (*e.g.*, see Leatherby and Gelles 2020), and overall we have seen substantial decreases in sales of many goods, particularly durable goods, in the second quarter of 2020. During this time, discussions in the popular press about the effects of COVID-19 on food and agricultural markets include the effects at the farm level, to processors, to the host of issues at the retail level, and complications that consumers face. For food markets, economists have written about the largely altered patterns of household expenditures on food (Goddard, 2020), with an emphasis on the major shift from foodservice sales to food retail sales during the pandemic. Additionally, an outward shift in online purchasing has also impacted food and beverage markets (Albrecht, 2020).

Early evidence from U.S. food retail markets, between March and July 2020, shows that sales for most food categories have increased, and increased largely in some cases. The magnitude of such changes dampened in May and June 2020, relative to changes observed in late-March and April 2020 (Statista, 2020). To date, academics have had limited access to detailed household food purchase data, so it is difficult to assess the tradeoffs that consumers have made between brands, price and quality points, and across retailers. However, based on aggregate changes in sales within and across food categories, economists and other pundits expect that food consumers have shifted purchasing patterns towards foods that are priced lower, with a greater shelf life. Consumers may be less interested in certain credence attributes (Cranfield, 2020); these general shifts imply that consumers have shifted their "food values" (Lusk and Briggeman, 2009) during the pandemic. The primary objective of this research is to

understand better changes in food purchases that households made during the opening weeks of the COVID-19 pandemic in the U.S. and to assess if consumers altered the set of specific values or characteristics embedded in their bundle of food and beverage products.

Other recent economic events in U.S. history have negatively affected markets, including the 9/11 terrorist attacks, the SARS epidemic in 2003, and most notably the Great Recession in 2008-09. Economists have examined the effects of the Great Recession on subsamples of the U.S. population, on geographical markets (Connaughton and Swartz, 2017), as well as product-level effects in various categories including food (Ng, Slining, and Popkin, 2014). Research using detailed scanner data in the United States (see Kuchler, 2011; Cha, Chintagunta, and Dhar, 2015) and the United Kingdom (see Griffith, O'Connell, and Smith, 2016) examined the effect of the Great Recession on the composition of food retail sales. Overall, this research finds that the Recession had a limited effect on the caloric quantity or the nutritional quality of the foods purchased; evidence suggests that the Great Recession affected other attributes, including convenience. Other research shows that the Great Recession led to an improvement in nutritional intake, given the increase in the share of food consumed at home (Todd and Morrison, 2014). Economists predict that the negative economic effects from COVID-19 will be substantially larger than those in 2008-09, at least in the short run. However, the economic decline of the pandemic has different origins and appears different than the Great Recession (Kochhar, 2020; Sheiner, 2020). Thus, the predicted changes in consumer purchasing in 2020 may not look like the changes in 2008-2009. In particular, the economic stress, social circumstances, and the various constraints facing consumers shopping in grocery stores due to COVID-19 may have much greater implications on convenience and nutrition.

Our research uses data from a longitudinal survey with a panel of consumers that we collected during the pandemic. Beginning March 13, 2020, and every two weeks over six weeks, we asked panelists questions about their purchases in specific food categories, in specific types of food retailers, and for specific purchase attributes or characteristics across all food purchases. The first round of our survey coincided with early school closures and the start of the stockpiling behavior among consumers. The second round began at the same time as many states began to issue shelter in place orders. The third round began as eligible households were expecting (and possibly receiving) the Coronavirus Aid, Relief, and Economic Security (CARES) Act impact payments distributed by the federal government. Our fourth round began as some states began to unveil their phased reopening plans. Overall, the data from our rapid panel design survey allow us the unique opportunity to comment on how food purchase behavior initially responded to COVID-19 and how consumers' shopping habits and purchasing behavior evolved during the quarantine period in the United States.

2. Background

The Food Expenditure Series, published by the U.S. Department of Agriculture, is widely used to examine household food purchasing behavior. This series measures expenditures for both food at home (FAH) and food away from home (FAFH) purchases (Saksena et al., 2018). Between 1988 and 2018, the share of FAFH expenditures has steadily increased relative to FAH expenditures (Saksena et al., 2018). In 2019, FAFH expenditures accounted for 54.8% of total food expenditures (USDA ERS, 2020). While many factors likely contribute to this growth, Saksena et al. (2018) point to changes in income (FAFH expenditures increase with income, as it is considered a luxury good); household time allocation (more dual-income households, resulting in

less time for meal preparation and more demand for FAFH); household structure; and FAFH advertising as important factors that influence FAFH expenditures.

The COVID-19 pandemic has directly impacted FAH and FAFH expenditures. In many jurisdictions, government policies, at the state- or city-level, mandated closures of restaurants and other FAFH venues (e.g., bars, theaters, sporting events) to "flatten the curve." In contrast, at the same time, grocery stores were listed as essential businesses. As a result, FAFH expenditures necessarily declined while FAH expenditures increased. Many FAFH establishments have now reopened in some capacity. Yet, the speed that FAFH expenditures will rebound is unknown, given the longevity of the pandemic and public health recommendations for sustained social distancing.

Further, many of the factors related to FAFH growth may no longer hold in the era of COVID-19. The pandemic has led to a surge in U.S. unemployment. The rates are on par with the Great Depression (Kochhar, 2020). Such negative income shocks mean households are cutting back, and FAFH is more likely to be cut than FAH, as FAFH operates like a luxury good. The rise in unemployment also means that household members may have more time to devote to meal planning and preparation, which would also result in reduced FAFH expenditures (Saksena et al., 2018). Such factors contributed to reduced FAFH expenditures in the U.S. during the Great Recession of 2007-2009 (Saksena et al., 2018). The combination of operational constraints for many restaurants and the dramatic and sudden increases in unemployment may lead to larger reductions in FAFH.

In addition to changes in food expenditures, the COVID-19 pandemic may impact individual food shopping behaviors. One of the most notable changes in behavior thus far has been households' stockpiling behavior. Stockpiling is likely the result of perceived and actual

scarcity (Ellison et al., 2020). The implementation of shelter in place orders likely resulted in early stocking up behavior, as households looked to fill their pantries and freezers because they were uncertain when they could return to the store. Then, the unfamiliarity of empty store shelves (a product of the early stockpiling behavior) increased fear and uncertainty about future food prices and availability, which further exacerbated stockpiling and stock-outs in grocery stores (Lusk and McCluskey, 2020; Ehlen, Bernard, and Scholand, 2009). COVID-19 has also changed how people are shopping; households are taking fewer in-person trips to the grocery store, and more households are engaging with online grocery shopping (IFIC, 2020; Redman, 2020).

As households adjust where they spend their food dollars and how they shop for food during the pandemic, the effect on the nutritional quality of foods purchased is less clear. FAFH is less healthy than FAH (Todd, Mancino, and Lin, 2010), so the shift to more FAH purchases could improve diet quality. This result, however, will be dependent on the types of FAH purchases made. Currently, evidence suggests that households are purchasing more "comfort" foods (e.g., pizza, pasta, ice cream) during the pandemic (Creswell, 2020). These foods are typically more processed and calorie-dense. Thus, it is difficult to predict the expected nutrition or health gains from increased FAH expenditures.

Household food purchases are, in part, driven by the underlying food values of the primary shopper(s) in the household. Food industry surveys suggest that taste is the main driver of food choices, followed by price, healthfulness, convenience, and environmental sustainability (IFIC, 2020). Lusk and Briggeman (2009) proposed a broader set of food values that may influence choice (taste, price, nutrition, environmental impact, appearance, convenience, safety, origin, fairness, tradition, naturalness). They found that, on average, consumers overwhelmingly

value safety, followed by nutrition, taste, and price. In both cases, preferences for the top values have been fairly stable through time (Lusk, 2018; IFIC, 2020). However, the literature has scant evidence of how significant economic shocks like COVID-19 impact food values. The sharp increase in unemployment, coupled with rising food prices, could lead some households to place more importance on price relative to other factors. Further, households may place greater emphasis on storability, given the observed increases in stockpiling behavior during the COVID-19 pandemic.

Our research offers new evidence on how U.S. households' food expenditures, purchasing behaviors, and values are responding to the COVID-19 pandemic *in real time*. Previous studies have attempted to look at changes in food behaviors as a result of other economic shocks, like the Great Recession. These studies rely on large national datasets that lack the flexibility to survey households rapidly (and repeatedly) as economic conditions change, and often experience significant lags between survey fielding and data release. Further, the 'sudden' nature of this pandemic means changes in behavior are occurring more suddenly; therefore, our rapid panel design study allows us to observe and describe these changes across a large number of U.S. households.

3. Survey and Methods

The questions in our survey measure the effects of COVID-19 on stated food spending behavior for both FAH and FAFH, changes in purchases of certain types of food, changes in online grocery shopping behavior, and the relative importance of food values. The Institutional Review Board and COVID-19 Research Oversight Committee approved all questions and procedures at Tufts University before data collection. This study uses a unique panel dataset with a total of 1,370 respondents who completed four rounds of data collection. The start of each data

collection round was approximately two weeks apart. The first round of collection began on March 13 (*Stocking Up*), the second round on March 27 (*Shelter in Place Orders*), the third round on April 10 (*CARES Payment Distribution*), and the final round on April 24 (*Reopening Plans Released*). The characteristics of respondents that participated in all four rounds of data collection are presented in Table 1.

We developed the food acquisition question from the Flexible Consumer Behavior Survey (FCBS) Module of the 2017-2018 round of the National Health and Nutrition Examination Survey (NHANES) (CDC 2018). We measured stated food spending behavior for FAH and FAFH during COVID-19 by asking respondents:

1) During the past [X] days, how much money did your family or did you spend at supermarkets or grocery stores?
2) During the past [X] days, how much money did your family or did you spend money on food at stores other than grocery stores (gas stations, corner stores, convenience stores, bodegas, etc., but not restaurants)?
3) During the past [X] days, how much money did your family or did you spend on eating out?
4) During the past [X] days, how much money did your family, or did you spend on food carried out or delivered?

The response options were provided in a drop-down menu of the following four price ranges: $0, $1-49, $50-99, up to $1000 or more. For the estimated expenditure, we took the mid-point of the ranges and converted $1000 or more to $1050. Respondents could answer the question on a weekly (X = 7 days) or monthly (X = 30 days) basis. We standardized all responses to a weekly basis by dividing the monthly midpoints by 4.3.

To determine the effect of COVID-19 on purchasing patterns for certain types of food, we asked respondents the following question: Because of the Coronavirus (COVID-19), how have you changed food purchases this week compared to a typical week? We asked this question for the following products 1) Washed salad greens; 2) Frozen vegetables; 3) Shelf-stable, not refrigerated milk; 4) Canned fish or meats; 5) Eggs; and 6) Dry staples (e.g., rice, pasta, etc.). With these questions, we intended to document potential household stockpiling behavior. The response options were provided using a five-point Likert scale (1 = Bought a lot less, 2 = Bought a little less, 3 = Bought the same as before, 4 = Bought a little more, and 5 = Bought a lot more) The response option "never purchase" was also available for respondents. We also asked respondents: During the past 30 days, did you acquire food from any other source? (check all that apply). In our analysis, we focus on the frequency of responses to online groceries to determine changes in shopping format preferences during the pandemic.

We adapted questions from the 2009-2010 Flexible Consumer Food Behavior Survey (CDC 2009) to assess food values. We asked, When you buy food from a grocery store or supermarket, how important is…?: 1) How easy the food is to prepare; 2) Nutrition; 3) Price; 4) How well the food keeps after it is bought, and 5) Taste. The potential response options were given using a five-point Likert scale (1 = Not at all important, 2 = Slightly important, 3 = Moderately important, 4 = Very important, and 5 = Extremely important). Respondents could also choose "I don't know" or "I prefer not to answer."

3.1 Statistical Analysis

To illustrate the relationship of the changes in the pandemic on food acquisition behaviors, we use a one-way analysis of variance (ANOVA) to test hypotheses for several of the questions. First, ANOVA was used to test overall hypotheses and determine if mean spending was equal

between FAH and FAFH outlets across the four rounds of data collection. We then assessed if mean changes in purchasing were equal for all types of foods across the four rounds. Finally, we tested if mean levels of importance for food values were equal across the four rounds. If a null hypothesis was rejected, comparisons were conducted using a Tukey's Honest Significant Difference test. Additionally, if an overall hypothesis was rejected, an ANOVA was used to determine differences within each round of data.

To determine if responses changed over the rounds of data collection, we estimated regression models using PROC SURVEYREG in SAS. The general form of the models estimated to determine changes in responses over the rounds of data collection can be represented by:

$$Y = \beta_1 + \beta_2 R_2 + \beta_3 R_3 + \beta_4 R_4 + \varepsilon, \quad (1)$$

where Y is a response variable (i.e., spending on FAH and FAFH, purchasing of types of foods, online grocery shopping, and importance of food values), R_2, R_3, and R_4 are indicator variables for rounds 2, 3, and 4 of data collection, β_1, β_2, β_3, β_4 are estimated coefficients, and ε is a normally distributed error term. To account for the repeated measures, we clustered standard errors by the respondent.

4. Results

Stated spending on FAH and FAFH is shown in Figure 1. Mean spending was not equal across FAH and FAFH outlets (F statistic = 1,564.18; P-value < 0.001), and, as expected, most spending occurred at grocery stores. The next most spending occurred at corner stores, and no difference occurred between spending on eating out or carry out. A substantial shift occurred in spending on eating out. As shown in Appendix Table 1, respondents spent similar amounts on eating out and at corner stores in round 1, then spending on eating out decreased in round 2 and

was similar to carry out, and then spending on eating out decreased even more and was lower than all other outlets in rounds 3 and 4. Changes in spending on FAH and FAFH are documented in Table 2. While slight changes occurred in spending on FAH over the data collection rounds, the major changes in spending occurred on FAFH. Both FAFH models were significant, though with heterogeneous changes in spending. Spending on eating out decreased while spending on carry-out foods increased.

As shown in Figure 2, purchasing behavior varied by food type (F statistic = 662.54; p-value < 0.001). Consumers reported increasing purchases of Dry Staples the most, and the differences in means were significant across all food types. The largest change in purchasing behavior across the rounds occurred for Shelf-Stable Milk (see Table 3), which significantly decreased in all subsequent rounds. Purchases of Eggs and Dry Staples in the second round and Salad Greens in the third round declined; however, the decreases were small. Appendix Table 2 shows that there were small changes in the groupings of food types within rounds.

Approximately 10% of the sample shopped for groceries online in the first round of data collection. As shown in Figure 3, this proportion climbed in the second round and plateaued at around 15% in Rounds 2 and 3 (see Table 4). This change represents a 50% increase in the share of participants who stated that they used online grocers relative to the first round.

The level of importance varied by food value (Taste, Price, Nutrition, Ease of Preparation, and Storage) (F statistic = 966.44; p-value < 0.001), and as shown in Figure 4, Taste was the most important food value, and Ease of Preparation was the least important. The mean importance of Nutrition was less than what was found for both Price and Storage. Appendix Table 3 shows that there were no changes in the groupings of food values within a round. The importance of Taste did not change over the rounds of data collection (see Table 5). Ease of

Preparation, Nutrition, and Price had significant decreases of importance over the rounds, and Storage had a significant increase; however, the magnitudes of these changes, while statically significant, are small.

5. Discussion and Conclusion

The COVID-19 pandemic has fundamentally altered what is "normal" across the globe, and food purchasing and acquisition decisions are no different. We surveyed a panel of 1,370 U.S. households at four different points during the COVID-19 pandemic from mid-March to late April 2020. Results from our research reveal three important insights about households' response to COVID-19 as it relates to food purchasing behavior.

First, as expected, food expenditures changed. Expenditures on FAFH significantly declined over the period studied in our survey. Within FAFH, we saw that reduced expenditures on eating-out drove the decrease, but increases in carry-out orders offset some of this reduction. This result aligns with many states issuing shelter in place orders and restricting foodservice operations to allow only carry-out sales. Many states began relaxing restrictions on restaurants in May and June (after our study was complete), so expenditures on eating out may have rebounded somewhat in June and July 2020. However, as cases continue to surge in the United States, many states have been reinstating restrictions, particularly on bars and restaurants, which is likely to drive eating out expenditures down again.

Second, we observed a significant increase in the proportion of households who use online grocery shopping. We expect this trend to continue as states slow down reopening efforts and encourage individuals to shelter in place and social distance as much as possible. The online SNAP pilot was in effect, and also expanded, during the pandemic (USDA, 2020). Online

shopping could fundamentally reshape access and food choice for the immediate future and the long term.

Third, the food values that were studied appear to be stable over the pandemic and align with findings from other studies showing that taste is a driving factor of food purchases. However, the reductions in importance for nutrition and price, in particular, reveal the tradeoffs households are willing to make in times of scarcity (perceived or actual). This result is important as it shows that these tradeoffs observed during COVID-19 are larger than what was found in studies that focused on the Great Recession (e.g., Ng, Slining, and Popkin 2014).

While this study focused on food expenditures and shopping behavior of the average U.S. household, future research should explore potential heterogeneity across households. Responses to the pandemic likely vary by income and geographical region, for example. As the data on changes in employment differ by race and ethnicity as well as income level (Kochhar 2020), the changes in food consumption patterns may have changed differentially for these groups. As a result, the pandemic could exacerbate inequalities and disparities in food access and nutrition. Low-income households or households that experienced negative income shocks as a result of COVID-19 may not have the financial resources to engage in any stockpiling behavior relative to higher-income households. Future research should consider how the pandemic affects long-term disparities in food and nutrition for disadvantaged populations. Further, households that live in regions that adopted more aggressive quarantine measures (e.g., Illinois, Massachusetts, and New York) may see greater changes in FAH and FAFH expenditures than households that live in regions where FAFH establishments remained open. Future research should also consider how the dietary quality of food purchases may change in response to COVID-19 across subgroups in the United States.

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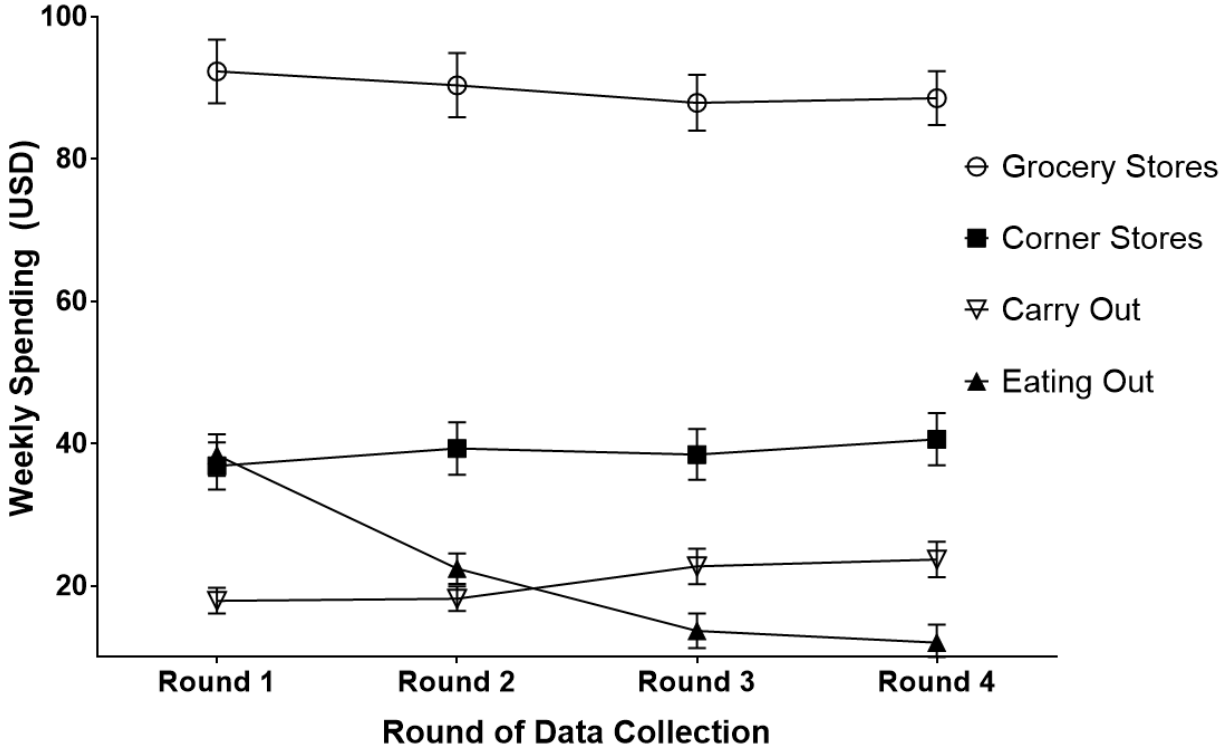

Figure 1. Stated Spending on Food-at-Home and Food-Away-From-Home

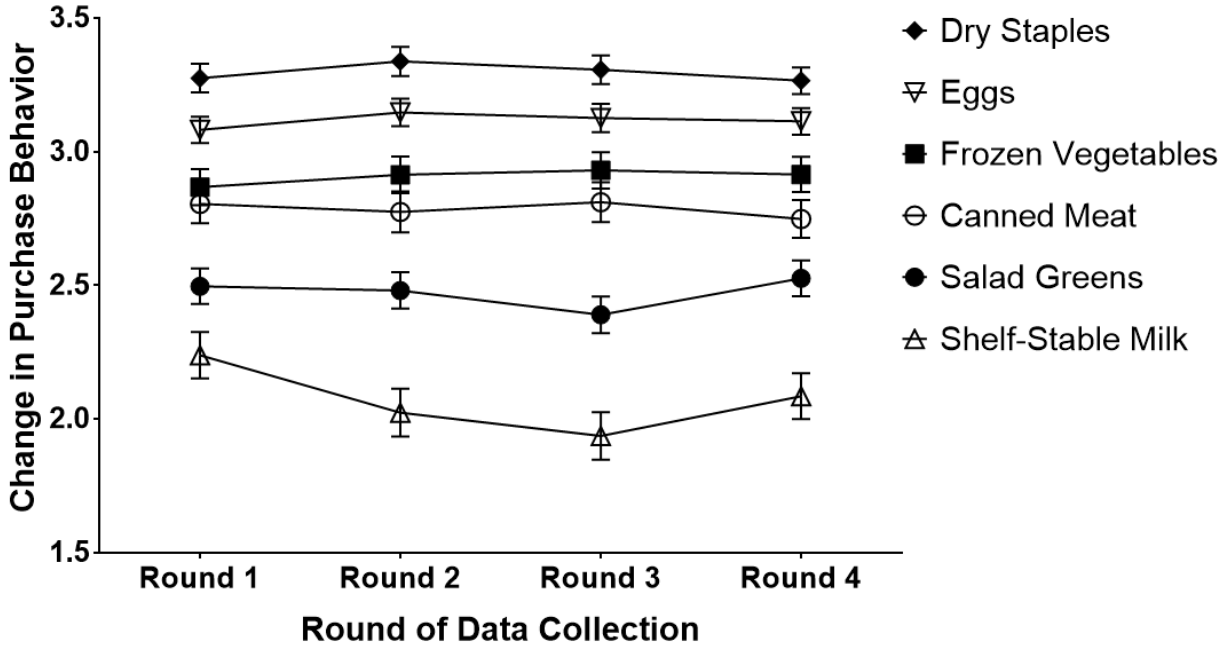

Figure 2. Reported Purchasing Behavior for Certain Types of Food (Note: 1=Bought a lot less and 5=Bought a lot more)

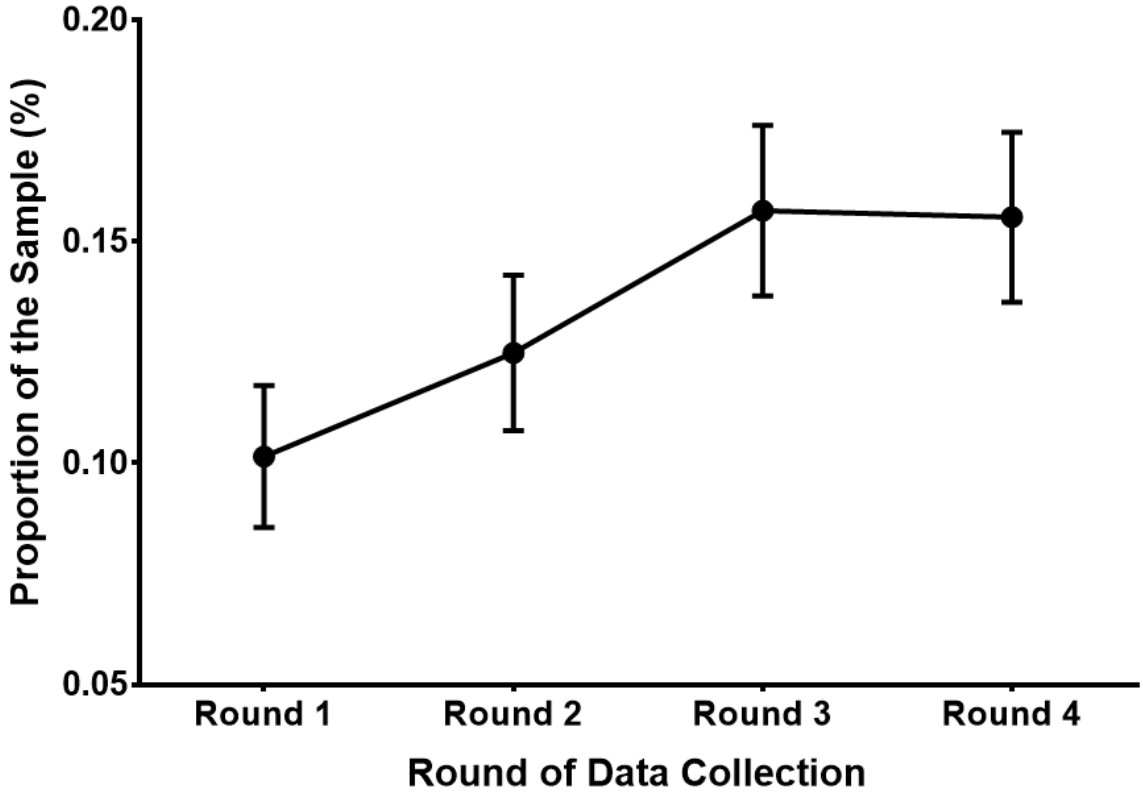

Figure 3. Percent of respondents that engaged in online grocery shopping

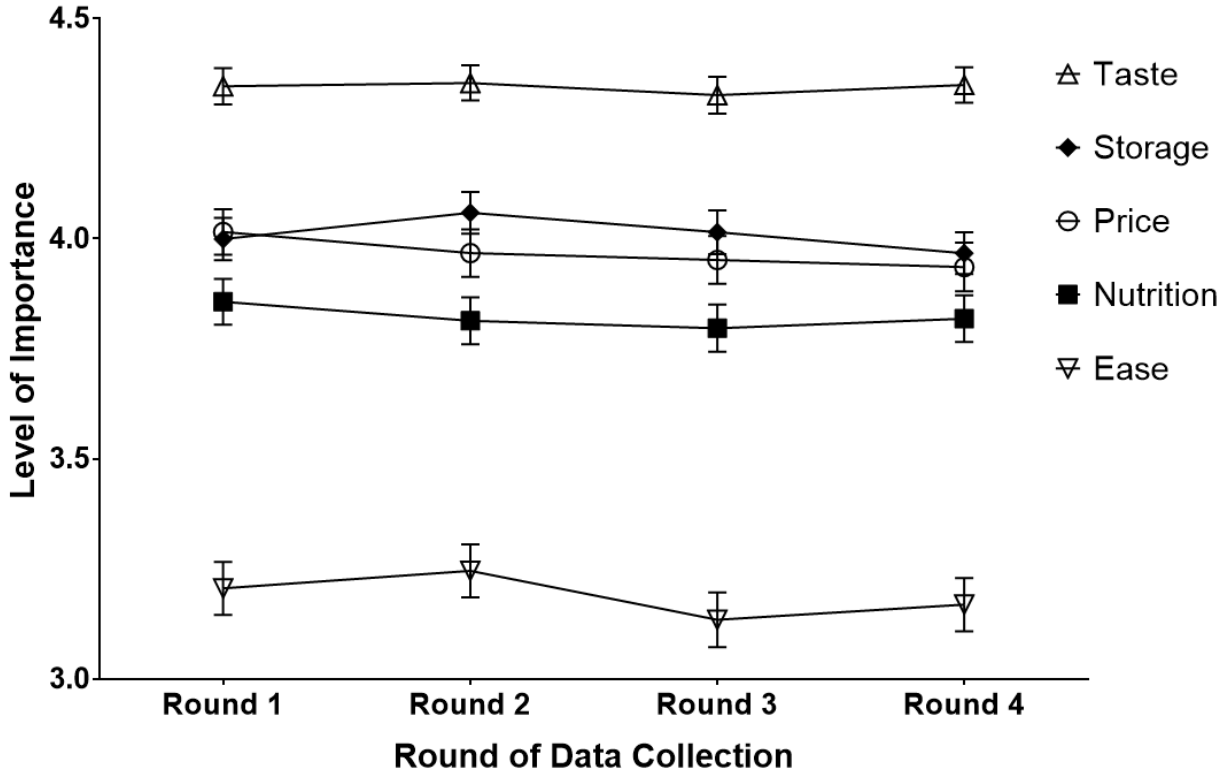

Figure 4. Level of Importance for Food Values
(Note: 1=Not at all important and 5=Extremely important)

Table 1. Respondent Characteristics (*N*=1,370)

Characteristics	Proportion of the Sample
Age	
18-24 years	0.80
25-34 years	7.74
35-44 years	14.16
45-54 years	15.69
55-64 years	28.76
65 or more years	32.77
Prefer not to answer	0.07
Education	
Some High School	1.09
High School Diploma / GED	13.28
Associates or Technical Degree	9.12
Some College	18.03
Bachelor's Degree	34.74
Advanced Degree	23.58
Prefer not to answer	0.15
Income	
Under $25,000 per year	16.13
$25,000-$49,999 per year	20.00
$50,000-$74,999 per year	17.23
$75,000-$99,999 per year	12.92
$100,000 or more per year	33.72
Prefer not to answer	0.00
Race	
White/Caucasian	66.50
Black/African American	9.85
Hispanic or Latino/a or Latinx	11.53
American Indian or Alaska Native	1.46
Asian/Pacific Islander	8.25
Other	2.41
Prefer not to answer	0.00
Geographic Region	
Northeast	18.76
South	36.93
Midwest	18.61
West	25.69
Sex	
Male	58.69
Female	41.24
Other	0.07

Table 2. Change in Stated Spending on Food-at-Home and Food-Away-From-Home

	Spending at Grocery Stores	Spending at Corner Stores	Spending on Eating Out	Spending on Carry Out
Intercept	92.313***	36.864***	38.382***	17.923***
	(2.285)	(1.699)	(1.488)	(0.921)
Round 2	-1.941	2.455	-15.939***	0.287
	(2.442)	(1.911)	(1.380)	(0.950)
Round 3	-4.398**	1.610	-24.696***	4.816***
	(2.227)	(1.822)	(1.652)	(1.169)
Round 4	-3.751*	3.754**	-26.358***	5.791***
	(2.115)	(1.869)	(1.595)	(1.187)
N	5,475	5,473	5,475	5,474
# of Clusters	1,370	1,370	1,370	1,370
Model *F* Statistic	1.57	1.43	98.51***	11.77***

Note: Stated spending is in USD per week. Clustered standard errors are in parentheses. *, **, and *** denote significance level at 0.10, 0.05, and 0.01, respectively.

Table 3. Change in Purchasing Intentions for Certain Types of Food

	Salad Greens	Frozen Vegetables	Shelf-Stable Milk	Eggs	Dry Staples	Canned Meat
Intercept	2.496***	2.867***	2.238***	3.081***	3.275***	2.804***
	(0.034)	(0.034)	(0.044)	(0.025)	(0.027)	(0.037)
Round 2	-0.015	0.046	-0.215***	0.065**	0.063**	-0.030
	(0.035)	(0.034)	(0.049)	(0.026)	(0.029)	(0.037)
Round 3	-0.107***	0.063*	-0.302***	0.045	0.031	0.007
	(0.035)	(0.034)	(0.049)	(0.029)	(0.029)	(0.037)
Round 4	0.030	0.047	-0.153***	0.032	-0.009	-0.060
	(0.035)	(0.032)	(0.049)	(0.028)	(0.028)	(0.037)
N	5,478	5,477	5,479	5,475	5,478	5,479
# of Clusters	1,370	1,370	1,370	1,370	1,370	1,370
Model F Stat	7.03***	1.26	13.29***	2.10*	2.92**	1.56

Note: Purchasing intentions were coded as: 0 = never purchase, 1 = bought a lot less, 2 = bought a little less, 3 = bought the same as before, 4 = bought a little more, 5 = bought a lot more. Clustered standard errors are in parentheses. *, **, and *** denote significance level at 0.10, 0.05, and 0.01, respectively.

Table 4. Change in Engagement with Online Grocery Shopping

	Online Grocery Shopping
Intercept	0.101***
	(0.008)
Round 2	0.023***
	(0.008)
Round 3	0.055***
	(0.010)
Round 4	0.054***
	(0.010)
N	5,480
# of Clusters	1,370
Model F Stat	13.85***

Note: Online grocery shopping was coded as 1 if a respondent indicated purchasing groceries online, and 0 otherwise. Clustered standard errors are in parentheses. *, **, and *** denote significance level at 0.10, 0.05, and 0.01, respectively.

Table 5. Change in Level of Importance for Food Values

	Ease	Nutrition	Price	Storage	Taste
Intercept	3.206***	3.857***	4.015***	3.999***	4.346***
	(0.031)	(0.0264)	(0.026)	(0.025)	(0.021)
Round 2	0.040	-0.0433*	-0.048**	0.059**	0.0078
	(0.028)	(0.022)	(0.023)	(0.025)	(0.020)
Round 3	-0.071**	-0.060***	-0.064***	0.015	-0.020
	(0.028)	(0.023)	(0.023)	(0.026)	(0.021)
Round 4	-0.037	-0.038*	-0.080***	-0.032	0.003
	(0.027)	(0.022)	(0.0230)	(0.026)	(0.020)
N	5,449	5,454	5,463	5,451	5,470
# of Clusters	1,370	1,370	1,370	1,369	1,370
Model F Stat	5.86***	2.57*	4.45***	4.79***	0.74

Note: Importance of food values were coded as: 1 = Not at all important, 2 = Slightly important, 3 = Moderately important, 4 = Very important, and 5 = Extremely important. The "I don't know" and "I prefer not to answer" responses were removed for estimation. Clustered standard errors are in parentheses. *, **, and *** denote significance level at 0.10, 0.05, and 0.01, respectively.

APPENDIX

Appendix Table 1. Within Round Groupings of Stated Spending on Food-at-Home and Food-Away-From-Home

	Round 1	Round 2	Round 3	Round 4
Spending at Grocery Stores	A	A	A	A
Spending at Corner Stores	B	B	B	B
Spending on Eating Out	B	C	D	D
Spending on Carry Out	C	C	C	C

Note: One-way Analysis of Variance was estimated to determine differences between spending (F test statistic = 367.19 (Round 1), 408.02 (Round 2), 419.95 (Round 3), 434.27 (Round 4), all P values < 0.01) and post-hoc Tukey Honestly Significant Difference (HSD) tests were estimated for groupings with a threshold of 0.05.

Appendix Table 2. Within Round Groupings of Purchasing Intentions for Certain Types of Food

	Round 1	Round 2	Round 3	Round 4
Dry Staples	A	A	A	A
Eggs	B	B	B	B
Frozen Vegetables	C	C	C	C
Canned Meat	C	D	C	D
Salad Greens	D	E	D	E
Shelf-Stable Milk	E	F	E	F

Note: One-way Analysis of Variance was estimated to determine differences between spending (F test statistic = 122.23 (Round 1), 179.11 (Round 2), 208.06 (Round 3), 161.57 (Round 4), all P values < 0.01) and post-hoc Tukey Honestly Significant Difference (HSD) tests were estimated for groupings with a threshold of 0.05.

Appendix Table 3. Within Round Groupings of Level of Importance for Food Values

	Round 1	Round 2	Round 3	Round 4
Taste	A	A	A	A
Storage	B	B	B	B
Price	B	B	B	B
Nutrition	C	C	C	C
Ease	D	D	D	D

Note: One-way Analysis of Variance was estimated to determine differences between spending (F test statistic = 966.44 (Round 1), 247.61 (Round 2), 231.85 (Round 3), 245.94 (Round 4), all P values < 0.01) and post-hoc Tukey Honestly Significant Difference (HSD) tests were estimated for groupings with a threshold of 0.05.

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