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Consumer Perceptions of Online Produce Purchases

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Abstract

In the Spring of 2021, a survey of college students' perceptions and behaviors regarding grocery shopping methods, including online purchases of fresh produce, in the post-response to COVID-19 was conducted. The purpose of this research was to analyze the perceptions of online grocery shopping and identify specific factors that significantly influenced the grocery shopping experience. A sample of 203 responses was collected from undergraduate and graduate students within the College of Agricultural & Life Sciences (CALS) at the University of Florida. Participants perceived in-store grocery shopping as superior in terms of product quality, shopping experience, store loyalty, and hygiene while convenience was perceived as an advantage with online grocery shopping. Participants identified product quality and greater transparency regarding food handling as important concerns and factors when purchasing fresh produce online. Although COVID-19 pandemic caused students to explore various online grocery services, it had limited effect on their purchasing of fresh produce. The implications for this study are far reaching, applicable to industry retailers interested in consumer willingness to pay for online grocery options and in identifying value-adding services that would increase consumer participation. This study also provides baseline data useful to researchers interested in consumer behavior, acceptance, and food marketing.

Keywords: Online grocery shopping, fresh produce, consumer perceptions and behaviors, grocery shopping preferences, COVID-19

Introduction

Early estimates for online grocery sales for 2020 were expected to continue their gradual increase within the total grocery market. However, the COVID-19 pandemic, which saw its first case in the United States in January 2020, caused a dramatic rise in online grocery shopping as food retailers' experienced more than a 300% increase in online food sales (Redman, 2020). Market research now suggests that online grocery shopping will make up more than 21% of total grocery sales by 2025, which equates to nearly $250 billion (Mercatus, 2020). With that being said, the traditional brick-and-mortar grocery industry is being forced to adapt, and so it is important for companies to better understand how consumers feel about this societal shift towards online shopping. According to research, two of the most influential factors affecting the grocery industry today are health and convenience (He et al., 2019). This research will not only identify the perceptions associated with online fresh produce shopping, but it will also focus on determining what factors influence consumers to grocery shop in-store versus online.

The question as to whether online grocery shopping services will take off similarly to online retail shopping or if traditional grocery shopping methods will continue to dominate the market is still yet to be determined. The Millennial-aged generation has been found to care less about shopping at traditional grocery stores as they are more concerned with finding specific items (Peregrin, 2015). While we predict this mindset will cause young consumers to be more accepting of purchasing their groceries online, we expect the majority of consumers will still prefer to purchase their groceries in-person themselves. Our research will include a survey that aims to understand what young consumers value within a grocery shopping experience, their perceptions of online grocery shopping in general, and their comfortability with purchasing fresh produce through online grocery shopping services.

Literature Review

Previous studies related to online grocery shopping have been used to identify consumer habits and behavior, while others have been focused on what motivates consumers to explore online grocery shopping services (Pitts et al., 2018). From the available research, convenience was found to be one of the most influential motivations regarding online grocery shopping and consumers between the ages of 15 and 34, Millennials and Generation Z, were found to use online grocery shopping methods the most frequently (The Nielson Group, 2019). Additional advantages perceived with online grocery shopping are a wider variety of product options and the opportunity to find the best prices (Harris et al., 2017).

There are also many disadvantages associated with online grocery shopping that many consumers feel are too important to overlook. Consumers believe that the inability to judge product quality, the perceived complexity, and the lack of social interactions are what make online grocery shopping inferior to the traditional grocery shopping experience (Harris et al., 2017). However, the COVID-19 pandemic dramatically changed the way consumers all over the world shop for groceries and the long-term effects on the industry are yet to be determined, so it will be interesting to see if consumer perceptions of online grocery shopping change as a result (Hobbs, 2020).

A study by Dominici et al. (2021) stresses the importance of socio-demographic factors on consumer grocery shopping behavior and how certain situational influences can cause consumers to alter their grocery shopping methods altogether. For instance, having a baby or dealing with unexpected health problems are significant life events that could cause a consumer to start shopping for groceries online while consistent online grocery shoppers tend to be young, well-educated women with a strong economic standing. However, it was common for respondents to label online grocery shopping as an unreliable chore due to orders consistently being incomplete, which caused nearly all respondents who tried online methods to continue shopping in traditional grocery stores once their lives returned to normal (Hand et al., 2009).

The COVID-19 pandemic has the potential to permanently alter the grocery shopping industry as it has caused major disruptions to the way in which consumers select, purchase, and consume their food (Martin-Neuninger & Ruby, 2020). Limitations on social interactions within grocery stores to reduce the spread of the virus take away from the fun and pleasant atmosphere associated with a traditional grocery shopping experience. This concern for health and safety has also caused an increase in grocery retailers implementing online grocery services such as contactless and curbside delivery (Martin-Neuninger & Ruby, 2020).

Materials & Methods

Design of the Study

The purpose of this research was to analyze the perceptions of online grocery shopping and identify specific factors that significantly influenced the grocery shopping experience. In the Fall of 2020, an online survey was developed by researchers within the College of Agricultural & Life Sciences (CALS) at the University of Florida. The survey included multiple choice and Likert type questions and was available from January 15th to February 5th, 2021. The target population consisted of undergraduate, graduate, and post-graduate students enrolled in CALS. The survey was designed to gather responses on how young consumers perceive the concept of purchasing fresh produce through online grocery services as well as how the COVID-19 pandemic affected their grocery shopping habits. It is hypothesized that while young consumers will be openly optimistic about purchasing fresh produce online, the majority will still prefer selecting their own fresh produce in the traditional grocery store setting. The objectives for this research study are to:

1. Assess young consumers (i.e., college students) attitudes and behaviors to determine factors that influence perceptions of purchasing fresh produce online
2. Explain factors that influence young consumers when it comes to their online produce shopping habits and decisions
3. Identify the level to which the COVID-19 pandemic has impacted young consumers' online produce purchasing and consumption habits

Instrument of the Study

An anonymous, online survey was designed and developed with the Qualtrics survey software. After careful revisions, the survey was then reviewed by the Institutional Review Board (IRB) and approved with exempt status (IRB ID # 202002918) on January 13th, 2021. All participants were provided with a statement of informed consent before agreeing to complete the survey. With permission from the UF CALS Advising Council, the survey and promotional flyer were distributed to students by academic advisors in various CALS departments.

The survey consisted of 30 questions that were categorized into general grocery shopping habits, online purchasing of fresh produce, COVID-19 impacts, and demographic sections. The survey also included two screening questions to ensure that all participants were over the age of 18 and current students at UF. The question types within the survey consisted of multiple choice (select only one choice as well as select all that apply) and ordinal feedback questions with a 5-point Likert scale (where 1 = "unimportant" and 5 = "important").

Sampling Method

A nonprobability convenience sampling strategy was implemented to the 6,519 students enrolled in CALS at UF. Researchers were not granted direct access to student contact information directly and thus were not able to know exactly how many students received the survey; however, our request for the UF CALS Advising Council to distribute our survey to the various department academic advisors and respective department listservs was approved. The survey was distributed through the CALS Advising Council on January 15, 2021, although some departments may not have been able or willing to distribute the survey. Still, there were 240 participants from various departments and at different levels (i.e., undergraduate and graduate). The convenience sampling method was chosen because it was prompt, uncomplicated, and economical.

Data Analysis

The survey data were analyzed using SPSS Statistics 26 and Microsoft Excel where descriptive statistics and measures of central tendency were calculated and reported. Cross tabulation tables were constructed to compare differences of participants for select variables. Paired sample t-tests were used to compare the mean differences between in-store and online grocery shopping factors. Mean and standard deviation of important factors for in-person and online fresh produce shopping in addition to count, cumulative percentages, and frequencies were calculated, analyzed, and reported.

Results & Discussion

Demographics of participants

A total of 240 participants began the survey, but after cleaning and removing responses for participants that did not meet screening requirements (at least 18 years of age and a current student at UF), only 203 responses were used for analysis. A breakdown of the participant sample based on gender, age, occupational status, and student classification can be found in Table 1.

Table 1. Summary of demographic variables

Variable	Response	Count	Percent %
Gender	Male	52	30.8%
	Female	109	64.5%
	Prefer not to say	8	4.7%
Age	18 - 19	9	5.5%
	20 - 21	49	29.7%
	22 - 25	38	23.0%
	26 - 30	33	20.0%
	31 - 40	28	17.0%
	40+	8	4.8%
Occupational Status	Full-time student	94	56.0%
	Part-time student	1	0.6%

	Full-time student and work	43	25.6%
	Part-time student and work	23	13.7%
	Prefer not to say	0	0.0%
	Other	7	4.2%
Student Classification	Freshman	2	1.2%
	Sophomore	15	8.9%
	Junior	35	20.7%
	Senior	29	17.2%
	Fifth year	5	3.0%
	Graduate Student	40	23.7%
	Ph.D. graduate student	41	24.3%
	Faculty	2	1.2%

General grocery purchasing habits

Participants were asked an initial series of questions regarding their general grocery shopping habits. The responses indicated that most participants were relatively new to grocery shopping for themselves and that they normally shop at Publix Super Markets once a week. A more in-depth breakdown of their general grocery shopping habits can be found in Table 2.

Table 2. General grocery shopping habits

Question	Response	Count	Percent %
Are you the primary grocery shopper for where you currently live?	Yes	178	87.7%
	No	25	12.3%
How long have you been the primary grocery shopper for where you currently live?	Less than a year	29	17.9%
	1 - 2 years	38	23.5%
	3 - 4 years	43	26.5%
	More than 4 years	51	31.5%
	Other	1	0.6%
How frequently do you shop for grocery items?	Every day	0	0.0%
	Several times a week	33	17.9%
	Once per week	111	60.3%
	Less than once per week	36	19.6%
	Other	4	2.2%
	Publix	81	44.0%
	Winn-Dixie	5	2.7%

What store/business do you normally purchase your grocery items from?	Whole Food's	7	3.8%
	Aldi	22	12.0%
	Trader Joe's	12	6.5%
	Walmart	30	16.3%
	Other	27	14.7%

To better understand consumer behavior regarding general grocery shopping preferences, participants were asked to indicate which factors influenced their decision on where to shop for groceries. The three most influential factors by far were price, convenient location/proximity, and product quality as they were selected by 28%, 27%, and 25% of the participants respectively (Table 3). Additionally, approximately 33% of participants stated that they purchase groceries online while 67% indicated that they do not. The survey results indicate that consumers who use online grocery shopping services are more likely to be concerned with product quality issues, while those that purchase groceries in-person are more concerned with price, and that the ordering of these factors reflects key differences in consumers' priorities.

Table 3. Influential factors of grocery shopping

Participants purchase groceries online?	**Yes**		**No**	
Influential factors	Count	Percent	Count	Percent
Price	15	25%	37	30%
Product Quality	21	34%	24	20%
Product Selection/Variety	6	10%	15	12%
Customer Service	2	3%	2	2%
Convenient Location/Proximity	14	23%	36	29%
Online Ordering Availability	2	3%	0	0%
Other	1	2%	9	7%
Total	61	100%	123	100%

Online fresh produce purchases

When asked about their general interest in purchasing fresh produce online, most participants were not interested with 28% stating they are slightly uninterested and more than 29% being very uninterested. Even though 27% of participants indicated they were slightly interested in the idea of purchasing fresh produce online, only 16% were very interested in the idea. We find the differences at the extreme values to be quite telling of our participants' perception of purchasing fresh produce online as there appears to be a much stronger negative perception of the idea from our sample.

Approximately 33% of participants indicated they purchased fresh produce while shopping for groceries online and when asked about their overall experience, 77% of those participants expressed that they were either moderately or extremely satisfied. Survey data show that "quality preference options" and "better transparency regarding food handling" were the two most important elements as they were selected by 51% and 43% of all participants (Table 4). Additionally, 70% of participants identified "poor product quality" and 49% of participants indicated that the "inability to inspect products in person" would discourage them from purchasing fresh produce online. This shows that factors related to product quality and safe food handling are a top priority for online fresh produce purchasing.

Table 4. Important factors for purchasing fresh produce online

Question	**Response**	**Count**	**Percent %**
What improvements could be made to enhance the experience of purchasing fresh produce online?	Quality preference options	104	51.2%
	Better transparency regarding food handling	88	43.3%
	Poor product quality	143	70.4%
	Inability to inspect products in person	100	49.3%

Participants were asked to rate factors related to the online purchasing of fresh produce on a 5-point Likert scale (1 = "unimportant" and 5 = "important"). Participants once again highlighted "product quality" and "hygiene/cleanliness" as the most important elements as seen in Table 5 which summarizes the means and standard deviations of important factors related to online fresh produce shopping.

Table 5. Mean and standard deviation of important factors of online fresh produce shopping

Factors	**Mean**	**Std. Deviation**

Convenience	4.22	1.154
Price	4.27	0.953
Product Quality	4.72	0.606
Product Variety	4.05	1.016
Shopping Experience/Environment	3.25	1.282
Store Loyalty	2.23	1.182
Hygiene/Cleanliness	4.34	1.004
Brand Loyalty	2.21	1.277

To gain a better understanding of why consumers may be hesitant to purchase fresh produce online, participants were asked to choose from a list of concerns associated with online fresh produce shopping. By far the most common reason was ripeness preferences as 47% of participants have concerns regarding the level of ripeness they will receive through online grocery shopping services (Figure 1). The second most common response was also related to quality concerns as 30% of participants feared they would receive damaged fresh produce. However, approximately 36% of participants indicated that they “enjoy the experience of physically going grocery shopping” which suggests that the sensory experience of shopping in-person is still an important reason why consumers do not purchase food items online. Our prediction was that younger consumers, those within the Gen Z or Millennial generation, would care less about the physical experience of a grocery shopping trip due to their familiarity with online services and technology in general, but perhaps the traditional grocery shopping experience transcends age groups and technological innovation.

Figure 1. Summary of participant responses for why they have not purchased fresh produce items online

We conducted a paired sample t-test for 10 paired Likert-type items (Table 6). Convenience was found to be greater for online grocery purchases (p=0.012) with a mean difference of -0.284. This was unsurprising given that online grocery purchases are more convenient for reasons such as hands-free shopping and personal delivery options. The mean difference for product quality was positive and statistically significant (p=0.04), indicating that participants perceived the quality of in-store grocery purchases as being superior. The mean difference for hygiene/cleanliness was 0.863 and statistically significant (p=0.000), indicating that participants perceived in-store grocery shopping as the cleaner method for purchasing groceries. This was surprising because online grocery services should be just as hygienic as in-store grocery shopping if not even more so. We speculate that consumers view online grocery services as an additional point of potential contamination as people are usually very risk adverse with respect to who handles their food. Grocery retailers may need to be more transparent about their food handling practices and advertise the safety precautions they have in place for their online grocery shopping services.

Table 6. Mean difference between in-store and online grocery shopping factors

	Mean Diff.	Std. Dev.	Std. Error	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Convenience	-0.284	1.507	0.111	-0.504	-0.064	-2.551	182	**0.012
Price	0.049	1.159	0.086	-0.120	0.218	0.574	182	0.567
Product Quality	0.219	1.025	0.076	0.069	0.368	2.884	182	***0.004
Product Selection/Variety	-0.055	1.221	0.090	-0.233	0.123	-0.605	182	0.546
Shopping Experience/Environment	0.454	1.568	0.116	0.225	0.682	3.913	182	***0.000
Store Loyalty	0.273	1.214	0.090	0.096	0.450	3.044	182	***0.003
Selecting Products in Person	1.082	1.475	0.109	0.867	1.297	9.926	182	***0.000
Hygiene/Cleanliness	0.863	1.417	0.105	0.657	1.070	8.241	182	***0.000
Brand Loyalty	0.082	0.949	0.070	-0.056	0.220	1.169	182	0.244
Packaging/Presentation	-0.109	1.063	0.079	-0.264	0.046	-1.390	182	0.166

*significant at p=0.10, **significant at p=0.05, ***significant at p=0.01

Impacts of COVID-19 on fresh produce purchases

In an attempt to better understand how the COVID-19 pandemic affected the way consumers purchase groceries, participants were asked a series of questions related to their grocery shopping habits before and after the COVID-19 pandemic (Figure 2). Approximately 19% of participants changed their primary method of grocery shopping and more than 40% of those participants switched to online grocery shopping services. When participants were asked if their method of purchasing fresh produce had changed due to the COVID-19 pandemic, approximately 75% of participants did not change their habits as they still purchased all of their fresh produce in-person and 96% of participants indicated that they would be purchasing their fresh produce in-person once COVID-19 was no longer a concern. Based on these responses, it appears that health/safety concerns due to the COVID-19 pandemic are not severe enough to influence young consumers' purchasing behavior of fresh produce in the long run.

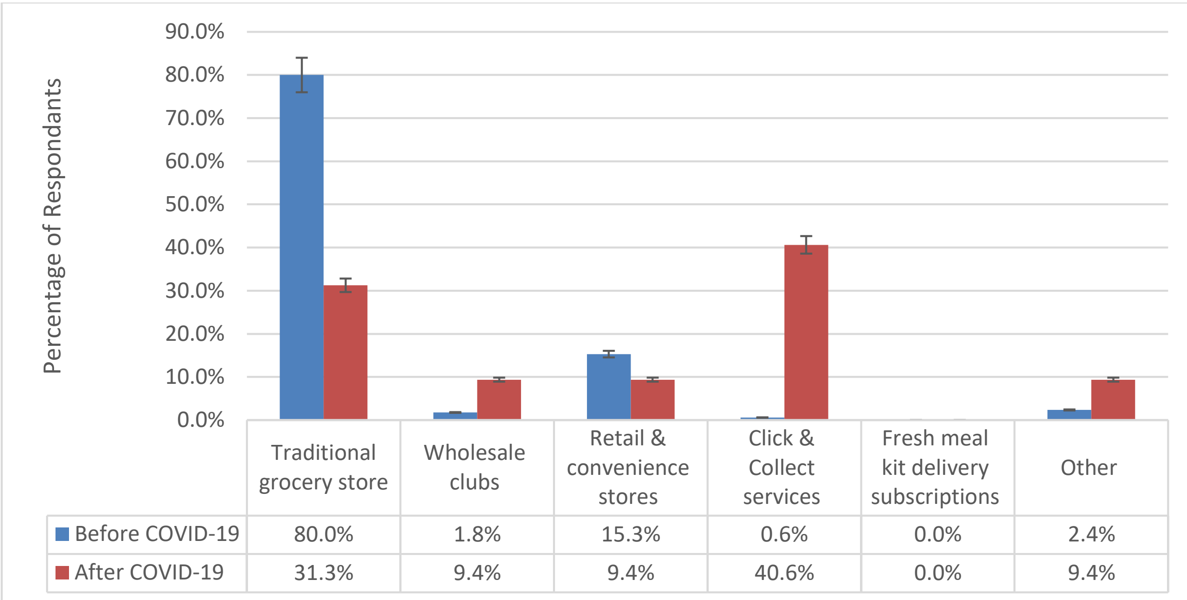

Figure 2. Summary of participants responses for their primary method of purchasing grocery items before COVID-19 (n=170) and after COVID-19 (n=32). Data for after COVID-19 only includes participants that indicated their grocery shopping habits were affected because of the pandemic

Conclusion

Using a survey instrument, researchers were able to study how consumer grocery shopping habits were affected by the COVID-19 pandemic as well as analyze their perceptions of purchasing fresh produce online. This study also focused on comparing in-store and online grocery shopping to determine which factors were the most influential on consumer grocery shopping behavior. It was found that participants perceived in-store grocery shopping as superior in terms of product quality, shopping experience, store loyalty, and hygiene while convenience was perceived as an advantage with online grocery shopping. While the majority of participants still shop at traditional grocery stores, the COVID-19 pandemic did cause participants to switch to online grocery shopping methods. Most participants agreed online grocery shopping would become as popular as online retail shopping as 40% stated it was somewhat likely and 24% indicated it was very likely. Participants also emphasized their concerns over product quality and safety when purchasing fresh produce online, as they identified quality preference options and better transparency regarding food handling as potential improvements. The inability to select ripeness preferences along with the potential of receiving damaged products were specific concerns associated with the product quality of fresh produce purchased online. Overall, the authors hope these survey results will help grocery retailers identify and implement value-added services within their online grocery services to increase consumer participation as well as provide baseline data for academics interested in consumer behavior and food marketing.

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