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REVIEW ON CULTIVATION AND FERTILIZATION OF SUGAR BEET

NAVIGATING THE TIDES OF CHANGE: ONLINE SHOPPING ESTEEM AND COVID-19 EFFECTS IN THE MID-ATLANTIC

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Abstract

There have been changes in consumer markets including agricultural and rural markets with COVID-19 pandemic. Online delivery systems have become important market venues in many countries. This research aimed to differentiate factors affecting tendencies of individuals to make online grocery shopping before and after COVID-19 with a sample of 618 individuals from the Mid-Atlantic States of the USA. Gender and education has been a major differentiating factor. With rising income and spending on FFVs, the probability of online shopping of these males rises. Females and people with lower tendencies to try different products including organic products and that were presented to the market as sustainable. In adaptation of online systems, whether it was not considered at the beginning, the environmental consciousness regarding reducing waste and lower use of individual transportation became attached to purchasing and consumption decisions. Especially female consumers appeared as target audience of sustainability and environmental sensitivity related decision making for online delivery systems.

Keywords: COVID-19, online marketing, fresh fruits and vegetables, probability, logistic regression

JEL Codes: Q11, Q13, Q31, C35

1. INTRODUCTION

The world witnessed many time shifters during its known history. The COVID-19 pandemic that the world faced between 2020 and 2022 was the time-shifter of the early 21st century [1]. With its dispersion throughout the world and its mortality effect, the pandemic left many research topics for future preparation for such kinds of incidents.

In addition to medical research and social services planning, socio-economic observations and records led to the appearance of new research fields. The duration and scope of lockdowns affected the purchasing attitudes or tendencies of individuals, in different territories of the world especially in countries with middle or high per capita income. The first lockdown in the USA was issued in March 2020 and extended or renewed for almost two years in different states [2]. The lockdowns were eased up in many states in time. Elimination of the social restrictions took time for some Mid-Atlantic States, and a complete opening took place between mid-2021 for New York and Maryland and mid-2022 for Delaware, New Jersey, and Pennsylvania.

The socio-economic effects of lockdowns, whether complete or limited, have been widely studied since the very first day of the encounter. The vast literature shows that purchasing and consumption tendencies are changing. Stay-at-home orders, which were suggested at the beginning to stop the dispersion, appeared as a major change in marketing preferences afterward [3]. These online purchases encompassed supermarket shopping for all products, including fresh fruits and vegetables, as well as ready-made meal purchases. The second part, signing home delivery of ready food, was widespread before the pandemic as well, but it has become more widespread and led to more mobility loss with the pandemic. Preliminary research on online grocery shopping in Germany relying on 2021- 2022 consumer data signed a substantial rise after COVID-19 [4]. Due to online survey findings with 361 Indian consumers, it was detected that 151 consumers shifted to online or mixed shopping during the lockdowns. However, 85 of them seemed to reverse their decisions with the end of the isolation process and turned back to the physical market. Yet the research did not get into the details of this decision [5].

A survey was applied to 3,042 online shoppers in 10 countries in 2020 to measure marketing preference changes with four repetitions. It was understood that consumer awareness and experience have increased during the COVID-19 process. Online consumers have become more experienced, and this has influenced their buying behavior [6]. Multilateral research was conducted to understand the changing tendencies of French consumers and the reflection of this change on online retailing with the data retrieved from a leading online healthcare retailer [7]. The findings showed that with COVID-19, the loss of shopping freedom was associated with higher online shopping volume for medical products at the beginning of the isolation in March 2020. By April - May 2020, people started to shop for cosmetics or veterinary products online as well. By June 2020, the reordering tendency increased for products not attached to COVID-19 protection, and the market started to get saturated.

The research with 757 Czech consumers confirmed that the frequency of online grocery shopping increases significantly with the increasing education and income of respondents and decreases for crowded families [8]. The share of online grocery shopping was also found to be high due to convenience, time savings and better product choices. Research with 499 Turkish consumers indicated that probability to use online tools had risen with the pandemic for consumers with higher spendable income. When share of income on food and agricultural products is higher, the consumer’s willingness to make online FFVs shopping seemed to increase [9].

Italian e-grocery consumers' likelihood of buying food online was found out to be influenced by socio-demographic determinants such as gender, age, household size, economic situation, educational level, and marital status [10]. A young, well-educated female living in a small family with a very good or adequate overall economic condition seemed to prefer online shopping more. Besides, situational factors, working time, being obese, having health problems, and practicing a sports activity regularly positively affect the probability of buying food online.

As can be seen, many research findings indicated a varying impact of COVID-19 on the online shopping tendencies of consumers, and the territorial changes can be seen in those findings. Departing from this vast literature, it was intended with this study to measure the change in consumer behaviors of online shopping in the Mid-Atlantic States of the USA. So, an online survey was conducted with 618 individuals from these states to identify the change in purchasing preferences and socio-economic factors affecting this change comparatively. The comparison was made with reference to the factors affecting online purchasing and home

delivery preference for fresh fruits and vegetables (FFVs) before and after the emergence of COVID-19 via logistic estimation of consumer responses.

2. MATERIALS AND METHODOLOGY

The factors influencing the likelihood of online shopping were assessed using a sample of 618 individuals with diverse socio-demographic characteristics and varying purchasing and consumption preferences between pre- and post-COVID-19 periods.

A stratified random sampling method was employed in the Mid-Atlantic region. Consequently, 28% of the households lived in New York (171), 18% in Pennsylvania (112), 17% in North Carolina (105), 14% in New Jersey (84), 13% in Virginia (79), and 11% in Maryland, Delaware, or Washington (67).

The probability of engaging in online shopping, specifically referring to the home delivery of groceries, was estimated using logistic regression. Logistic regression analysis involves estimating the occurrence of a situation against its non-occurrence. Berkson [11] first proposed the analysis of the difference between observed probability and estimated probability. It was later developed, and the probability function can be expressed as follows:

$$log[Pr(Y=1|x)] = \ln\left[\frac{Pr(Y=1|x)}{1-\Pr(Y=1|x)}\right] = \sum \beta_i x_i + \sum \alpha_i D_i + u_i$$

In this formula, the dependent variable Y stands for the occurrence (1) and non-occurrence (0) of a specific situation. The observed situation, showing whether the surveyed household makes online fresh fruits and vegetables (FFVs) purchases and receives home delivery (1) or not (0), was recorded for both before and after the onset of COVID-19 in our case.

The estimated probability, ranging between 0 and 100%, is linked to socio-economic factors counted either as discrete or continuous variables [12]. Therefore, the dependent variables estimated to measure the online fresh product shopping tendencies of 618 survey participants and the corresponding explanatory factors, designated as the relevant independent variables, were described below.

Dependent Variables

The participant makes online FFVs shopping

- **Before COVID - 19 - Yes (1) & No (0)**
- **After COVID - 19 - Yes (1) & No (0)**

A. Independent - Socio Demographic Factors

Household Size & Household Size - Below 17: Discrete (Number of household members)
Gender: male (0), female (1)
Marital Status (3 variables)[1]
a. Married – b. Single – c. Other (separated - divorced – widowed – partner)
Education (4 variables)[1]
a. High school – b. College & tech school – c. BA/BS – d. MS+
Employment (4 variables)[1]
a. Retired – b. Employed – c. Unemployed – d. self-employed/in house working

[1] yes:1 – other categories: 0

Origin (3 variables)[1]

a. White - b. Afro American – c. Other (Indian American & Hawaiian & Asian &Mixed)

Annual Income

Scaled: below $20,000(1), $20,000-$39,999(2), $40,000-$59,999(3), $60,000-$79,999(4), $80,000-$99,999(5), $100,000-$199,999(6), to above $200,000 (7)

Age (Age)

Scaled: from 18-24 years old (1), 25 to 32 years old (2), 33 to 40 years old (3), 41 to 56 years old (4), 57 to 66 years old (5), 67 to 75 years old (6), 76 years and older (7)

Residency: Urban (1), suburban (0)

B. Independent - Consumption/Purchasing Attitudes

Local product use in meals per week

Scaled: none (0), 1-2 meals (1), 3-4 meals (2), more than 4 meals (3)

Dollar payment per month on FFVs: Continuous – US Dollars

Change in fruit and vegetable consumption since 2015

Scaled: reduced (0), same & fluctuating (1), risen (2)

Label reading frequency - Scaled: Frequently (3), Sometimes (2), Seldom (1), Never (0)

Willingness to Pay (WTP) for supporting farmlands and local agriculture

Discrete: yes (1) & no (0)

Willingness to pay for separately categorized products from direct markets (WTP)

***Categories:** Regenerative, Certified, New, GM, Certified Organic, Sustainable

The analysis of probability variation was conducted bidirectionally to confirm the findings and ensure proper evaluation. Firstly, the effects of indicators were estimated through logistic regression in Python, and they were evaluated within the conventional binary logistic framework. Following this, the effects were forecasted with pre-determined parameters in Python [13]. With this double-check, the effective factors for differing tendencies and their degrees of impact were inferred.

3. FINDINGS AND DISCUSSION

3.1. Descriptive Layout of the Sample

Initially, the fundamental sample attributes should be outlined. It was seen that 401 of the respondents were male, constituting 65%, and 217 were female. The average household size for the sample was almost 3 and slightly above the regional average ranging between 2.42 for New York and 2.64 for New Jersey. 139 families (23%) were composed of 3 members in the sample and 89 of these families were recorded as having at least one member below 17 years old. Yet, 110 correspondents were living alone, while 164 were accompanied with one more person (27%) and 30 of these households were again living with a young member. Average age scale was between 33 and 40 for the sample. The share of 41-56 years scale was the highest with 31% (194) and followed by 33-40 age group with 27% (164). When the origin of the sample was visited it was understood that 467 people in the sample representing 76% were white-Americans. There were 55 Afro-Americans and 96 of the sample was from other nationals.

The educational distribution of the sample was representative. The share of individuals with a bachelor's degree or above was 45%, totaling 276 participants; 30% were college or technical

school graduates, accounting for 188 individuals, and there were 152 high school graduates. When the employment status of the participants was checked, it was observed that 52% of the sample was employed on a full-time basis. Including self-employed and in-house workers, the employment rate rises to 76%. The share of retired individuals was 16% (97) and there were only 9 students.

The annual income of the sample was categorized, revealing that 23% of households (145) had an income between 100 and 200 thousand Dollars per year. Meanwhile, 17% (102) reported an annual income ranging between 40 and 60 thousand Dollars, with 15% falling into the income brackets of 20 to 40 thousand (94) and 60 to 80 thousand Dollars (94).

An important differentiating factor for the sample has been considered as the amount spent on grocery shopping per month. The average amount for the sample was $160 per month and 469 people (76%) declared expenditure below average and 149 people were spending more than it. The variation in the amount was evaluated with reference to 2015. More than half of the audience declared an increase in expenditures, and one-third seemed to support the same level of grocery shopping.

The contributing aspect of the research was measuring the effects of these indicators on online shopping tendencies before and after COVID-19. Accordingly, the probabilities estimated and discussed in the following sections focus on COVID-19 for the Mid-Atlantic States.

3.2. Probability of Shopping Online for FFVs before COVID-19

The probability of shopping for groceries online before the emergence or announcement of the COVID-19 pandemic was influenced by various socio-demographic indicators and the shopping and consumption attitudes of these respondents. The number of participants that used to buy fresh products online and received address-delivery was 264, 43% of the sample, as declared before the onset of COVID-19 and the factors affecting this range were estimated. The independent variables were expected to show multicollinearity. Data standing for willingness to pay for different product categories (organic, certified, etc.) were anticipated to be correlated with the payments made for FFVs purchases. After reductions in the number of estimators due to collinearity, statistical fits of alternative models were compared using pseudo-R^2 and the likelihood ratio [14]. However, while R^2 in standard OLS estimation refers to the percentage of variation explained by the variables, in probability estimation, pseudo-R^2 enables the evaluation of the log-likelihood of the situation against its nonexistence [15]. Besides, goodness of fit assessments can also be made with the minimization of Akaike Info Criterion – AIC and Bayesian Info Criterion – BIC [16, 17].

Comparative models, one including all 31 independent variables and a reduced equation with 25 variables were estimated. Due to high variance inflation, household size (10.81) and label reading frequency (10.53) were reduced. After this, potential multi-collinear variables that were multiplied were reduced due to their significance. The unemployment situation was not statistically significant or inferable. The marital status of the participant was measured by only the married versus the non-married due to multicollinearity. Besides, the origin impact appeared to be insignificant.

The fit statistics were close to each other in these two models however, parameter significance and economic interpretability of the reduced model were better. The estimators seemed to explain probability variation with 29.3 % pseudo-R2, having a log-likelihood of -303.23 ($\rho<0.05$) according to an interpretable model. However, joint fit figures were so close to leading a decision. Concurrently, AIC and BIC were checked for comparison. The AIC was 634 and

the BIC was 763 for the full model. The reduced model appeared slightly preferable with 650 AIC and 747 BIC. Therefore, parameter estimates for the reduced model were taken into consideration. The odds ratios of this final model were retrieved from parameter estimates [18] were shown below. The odds ratio infers about likelihood of the online shopping behavior. A ratio above 1 means that higher probability of the individual to buy fresh products, while ratio below 1 refers to reducing effect of the factor. A ratio equal to 1, or very close to 1 in some cases, can be read as the factor has no effect on occurrence of the expected outcome.

Table 1. Factors Affecting the Probability of Shopping Online Before COVID-19

Positive Indicators[2]		**Negative Indicators**[2]	
No of households below 17 years old	1.20	**Gender**	0.72***
Marital Status - Married	1.07	**Education – College & Technical school**	0.79
Education - BA	1.08	**Age**	0.46**
Education – MA +	1.19*	**Vegetable spending change since 2015**	0.84*
Employment - retired	1.15***	**Fruits spending change since 2015**	0.86
Employment – fully employed	1.12*	**WTP for certified products**	0.73
Self-employed	1.28	**WTP for new products**	0.83
Annual income	1.46*	**WTP for sustainable products**	0.81**
Local product use	1.26***		
Dollar spent on FFVs	1.30**		
Residency	1.08*		
WTP for Farmer Support	1.01		
WTP for GM Products	1.15		
WTP for Organic Products	1.04		

Significant from 90 % (*) to 95% (**) and 99 % (***)

Due to the estimated odds ratios, the directions of the impact of concerned factors can be interpreted. So, before COVID-19 male decision makers who are married, who live in urban centers and who have young household members seemed to have a greater tendency to buy agro-food products online. Rising education also appeared as a probability rising factor and employment was effective in positive preference as well. Here, the higher probability for retired individuals can be attributed to the education, and it can be noted that the audience has a higher education level on average. As expected, rising annual income, rising spending on fresh products were also effective in positive direction.

On the other hand, increasing age was identified as a factor that reduces the probability, which could be expected due to the nature of online transaction capabilities. Higher expenditures on fresh vegetables and fruit purchases in comparison to 2015 appeared as factors reducing the probability. While 2015 was chosen for the quinquennial comparison, the changing

[2] Significant from 90 % (*) to 95% (**) and 99 % (***)

consumption patterns can only be attributed to the evolving time and desires of the audiences rather than strict economic shifts.

One critical aspect of the analysis was the effect of changing preferences on different products. Firstly, individuals who prefer using more local crops or products showed a growing interest in online shopping before the pandemic. Additionally, willingness to pay for organic and genetically modified (GM) products had positive impacts on the probability. It can be inferred that access to organic or GM products had become more feasible through online intermediaries than in-store venues by that time. However, participants' responses towards certified, sustainable, and new products, and their willingness to pay more for these products, had an inverse effect on the probability of online shopping prior to the pandemic. This might contradict the declared label-reading frequency of the audience, as more than half (54%) told that they frequently read labels. However, this could also be related to lower awareness about non-organic or non-GM but certified products, potentially due to concerns about pesticides or herbicides or fat content at the time.

Moreover, the willingness to pay for new products or products that contribute to the sustainability of production schemes also seemed to have negative effects. When considering gender, it appears that women, who tend to have more visual perceptions, also prefer to make in-person shopping choices when selecting new or differentiating products perceived as more sustainable. Even though this may seem like a subjective observation, studies have emphasized the preference of women, especially towards physical shopping [19].

After estimating the probabilities, it was deemed beneficial to forecast the probability for future planning. The model's findings provided insights into the future impacts of these factors. The selected parameters accurately explained the model or the probability of making online shopping before COVID-19, with an accuracy of 76%. The confusion matrix depicts the number of true positives, true negatives, false positives, and false negatives, with their ratios providing F1 scores. The explanatory power for non-purchasing individuals was 71%, and for online shoppers, it was 65% based on F1 scores calculated with reference to the confusion matrix. The accuracy score, referring to the fit between predictions and the tested 80% of the sample, was over 70%, showing that this inference for the pre-COVID-19 period could be generalized to a similar sample by around 70%. These scores underscored the interpretative power of the pre-COVID-19 model and the need for comparison with the post-COVID-19 period. The parameter forecasts shown that annual income (1.46) and the amount spent on FFVs monthly (1.30) explained the tendency for online shopping before COVID-19 powerfully and could be used for future forecasting.

3.3. Probability of Shopping Online for FFVs after COVID-19

Using the same methodological approach, the probability of individuals' preferences towards online FFV purchases was estimated for the post-COVID-19 period. The number of participants declaring that they make online grocery shopping after emergence of COVID-19 was 324, 52% of the sample. The background of these online shoppers was overviewed, and it was understood that 239 of 324 people were also used to buy fresh products before the pandemic. Therefore, 26 % of the 324 new online customers were added to the audience after COVID-19.

The same data reduction, due to collinear relationships, was carried out for the post-pandemic period. In addition to household size and label-reading frequency, which inflate the estimation process, all information about the origin, unemployment situation, and marital status, except for whether the person is single, was removed due to multicollinearity.

Before evaluating the detected relationships, both the complete model and the reduced model were compared. So, AIC and BIC comparisons were necessary. These statistics yielded 694 for AIC and 814 for BIC for the full model and were reduced to 650 and 747, respectively, with the exclusion of multi-collinear variables. The full model explained 25% of the variation, as shown by the pseudo-R2. For the reduced model, the joint significance accounted for 26% of R2, and the log-likelihood was -322. Consequently, the reduced model was selected and was shown in Table 4 below.

Table 2. Factors affecting the probability of shopping online after COVID-19

Positive Indicators[3]		Negative Indicators[3]	
No of households below 17 years old	1.07	**Education – College & Technical**	0.89*
Education - BA	1.19*	**Gender**	0.82***
Education – MA +	1.41**	**Age**	0.50
Employment - retired	1.39**	**Marital Status - Single**	0.98**
Employment – fully employed	1.13	**Vegetable spending change since 2015**	0.98
Self-employed	1.31	**WTP for certified products**	0.85*
Annual income	1.20	**WTP for new products**	1.04**
Local product use	1.26**	**WTP for sustainable products**	0.93
Fruits spending change since 2015	1.07	**WTP for organic products**	0.91
Dollar spent on FFVs	1.55***		
Residency	1/21**		
WTP for farmer support	1.21		
WTP for GM products	1.60***		

Significant from 90 % (*) to 95% (**) and 99 % (***)

Almost identical results were reached with the estimation of the decision-making process after the onset of the COVID-19 pandemic. The probability of making online fresh product purchases as an additional shopping tendency continued to rise with education, employment status, income, and spending on fresh products. Significant differences, on the other hand, were recognized in willingness to pay and the changing expenditure structure. While intention to support farmers and desire to buy genetically modified products contributed to the probability, there was a reduction in preference for organic products.

It is known that more fresh fruit and vegetable consumption has been recommended with COVID-19. With a basic interpretation, it can be noted that people paying more for fruits seem to prefer visual selection, while people paying more for vegetables are fine with online purchases. There is some literature supporting this a priori expectation. The color, shape and size of pomegranate appeared as a selective factor for consumers in many studies as inferred in a review by Stiletto and Trestini [20]. The color and shape of fruit, which need to be viewed in person, are considered as significant selection criteria by Islam and friends [21] as well. The 5-year change was in opposite directions for fruits and vegetables; rising spending on fruits seemed to be a probability rising factor. Yet, the preference for fruits and vegetables before and

[3] Significant from 90 % (*) to 95% (**) and 99 % (***)

after the pandemic is sort of indecisive, as the responses date back to earlier times of the pandemic experience.

This should be considered in accordance with changing preferences, or the changing or fluctuating prices of fruits need further focus. This can be interpreted as a willingness to pay for different product varieties as well. However, preference for buying packaged products as organic, GM or certified has been increasing, even though we neglect the situation regarding the pandemic. This is mostly related to the inclusion of generation Z in the consumer market and can be seen from the age impact of our sample. Besides, shift of Gen Z members and millennials to online venues has been verified with much field research.

Following the estimation of the data, future inference was checked with the confusion matrix. The accuracy of the estimation was 79%. The F1 scores calculated with the ratio of correct and incorrect estimates inferred that the explanatory power was 78% and 80% on average representing a good reference for consumer research.

A further forecast of the data was derived for future evaluation. The point estimates, forecast values and their impact on the shopping tendencies of the individuals coincide with each other. Here, more powerful future indicators can be counted as willingness to pay for GM products (1.60), Dollars spending on FFVs (1.55), and having an education level of master's or above (1.41). This post-pandemic interpretation of future expectations is like that of the pre-pandemic. Proximity of future expectations can be awaited regardless of the pandemic, as most of the online delivery preferences were shaped by technological progress and the adaptation of individuals to those.

4. CONCLUSION AND SUGGESTIONS

Online shopping tendencies had already been rising for durable products, especially among younger generations, prior to the COVID-19 pandemic. The significant impact of the pandemic on production and marketing was more related to consumer products. Social observations and academic research pointed out that consumers' willingness to do online shopping for food and agricultural products, even for groceries have been rising. Most marketing research has emphasized reducing physical shopping and preference for home delivery systems of fresh fruits and vegetables as well as non-consumer products since 2020. The major question awaiting is whether this challenge is permanent or whether it may be reversed. With varying economic conditions, rapid changes in consumer demand and the requirement for early response systems, it became obvious that the pandemic related changes have the tendency to become permanent [22]. However, some recent research also notified of a declining tendency for giving online orders for fresh products since the announcement of the end of the pandemic [23]. Accordingly, demand and purchasing attitudes towards consumer products need to be considered when evaluating marketing probabilities.

This study intended to measure online fresh fruit and vegetable shopping in the Mid-Atlantic region of the United States, relying on the online responses of 618 individuals within this research. The comparison of consumer attributes and attitudes before and after COVID-19 revealed how major events lead to significant changes in consumer preference for shopping online. The study also recognized the distinctiveness between fruits and vegetables. A range of factors that could influence online shopping for fruits and vegetables were investigated in the region.

The study revealed that well-educated adult males, whether working or retired, are more willing to buy fresh products online. Having young household members below 17 years old contributes

to this rising tendency both before and after the pandemic. With the increasing involvement of new generations in the consumer market, a rising focus on online shopping has been expected. Higher income and a greater potential to spend on fresh products seem to increase the probability of shopping online. Higher awareness, which also leads to a greater willingness to support farmers and local farming, also appears to be an interesting contributor to the tendency for online shopping. In the USA, some studies have shown that a focus on online shopping has helped the marketing efforts of small-scale producers by shortening supply channels [24, 25].

One significant finding is the positive relationship between urban residency and the probability of accepting online shopping. This is an expected situation and is verified by current findings. Another expectation was in the opposite direction, of age. With increasing age, the tendency for online shopping declines, regardless of the existence of COVID-19 as a factor. While marital status appeared with different variables in pre- and post- COVID-19 analyses, the inferences are similar. The probability of making online purchases is higher for married individuals and those living with youngsters compared to singles and others such as widowed, separated, or partnered individuals. Online shopping has become common for everyone in the last two decades. Ordering ready food or meals through online service providers has been a preferred possibility for single Americans before the pandemic as well, and it became even more prevalent after the pandemic [26]. So, with a negative or almost nonexistent effect (with odds of 0.98) after COVID-19, it can be said that single people continue to buy ready meals, but their tendency to buy fresh products did not change much.

The analysis highlighted the dynamic nature of consumer tastes and the need for businesses to adapt and re-evaluate their strategies to meet the market's current and future needs. In this case, the impact of a world-altering, abrupt occurrence like the COVID-19 pandemic is a significant factor. The market response to consumer demographics and changing attitudes is essential for maintaining activities. By focusing on these demographics, companies or intermediaries may both sustain and grow by accurately delivering non-durable products, as exemplified by FFVs, through setting correct prices, adjusting delivery systems and location planning, and finding the best methods for promoting their products to consumers.

The online market, along with both farmers and intermediaries serving in this market, needs to consider specific household characteristics to increase their market share of fresh products. The analysis findings revealed that educated individuals who are employed and have children might be more focused on targeted information in the Mid-Atlantic region to mature the market. However, new opportunities exist for females and unmarried individuals. As mentioned earlier, unmarried individuals continue to purchase final foods. Health emphasis and suggestions regarding a healthy diet can be promoted for these target groups mostly via online tools. Females and people with lower tendencies to try different products can also be reached and persuaded to make online fresh product purchases. These groups mostly need to be informed about the convenience of buying fresh products online, and especially working women, who have returned to their offices, tend to accept online shopping due to understanding the potential time-saving aspect.

The expected decrease in the intention to do online shopping with age is a common occurrence. However, in contemporary times, Generation Y is mostly middle-aged and above, and they are both familiar with IT tools and continuously use them. Members of Generation Y became the first generation to widely accept online shopping, even in the first two decades of the 21st century, when compared to their elders [27]. Therefore, they need to be reached for buying fresh products as well as final products or non-consumer goods, and they are also part of the target group for non-conventional advertising and promotion activities. Regarding the facilitation of marketing efforts towards this group, the security of the supply system needs to

be emphasized as well. The reasoning behind this is that survey findings in Michigan [28] or Los Angeles [29] indicated a reduction in fresh product purchases due to contamination concerns at the onset of the pandemic.

This study can therefore be considered contributory in emphasizing the attitude towards online shopping. The inferences may also provide practical insights into prevailing online shopping behaviors for businesses and policymakers. It guides them in planning for the future in the Mid-Atlantic consumer market. Many demographic and socio-economic factors that accelerate or decelerate online shopping tendencies were identified for the region. These factors can be incorporated into territorial marketing policies to meet consumers' demands and maintain supplies of online FFVs.

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