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Who Buys More Directly from Producers in the Southeastern United States? A Research Note

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Abstract

This paper examines factors affecting how much consumers spend when purchasing directly from producers. A joint decision framework models two decisions: 1) whether to purchase directly and 2) how much to spend. Consumers with a greater incidence of family disease or who are immigrants, prepare more meals at home, and are more concerned with U.S. food safety also spend more on food purchased directly from producers. Results suggest that farmers should develop a three-pronged marketing strategy by attracting new consumers, adopting sales promotion tools that encourage existing customers to purchase more frequently, and encouraging consumers to spend more per visit.

Keywords: consumer behavior, direct marketing, food safety, health motivation

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Introduction

A recent study by Key (2016) compared 2007 and 2012 USDA-NASS Census of Agriculture data and found that farms that sell direct to consumers had higher rates of business survival. In 2008, local food market sales in the United States totaled \$4.8 billion, of which 18.3% were direct-to-consumer food sales (Low and Vogel, 2011). Direct-to-consumer transactions can occur through community supported agriculture, farmers' markets, U-pick operations, roadside stands, and online sales. By 2012, U.S. local food sales were estimated at \$6.2 billion, which may underestimate actual sales since the U.S. Census of Agriculture did not include the value of intermediated local foods sales made through grocery stores or institutions (Low et al., 2015). The number of farmers' markets across the nation jumped to 8,628 in 2014, a 180% increase over 2006 numbers (Key, 2016).

The majority of direct-to-consumer sales consist of locally produced food, and several studies have shown that consumers are willing to pay a higher price for locally grown food, which is commonly perceived to be fresh and have lower environmental impact, increased food safety, and support local agriculture (Scarpa, Philippidis, and Spalatro, 2005; Darby et al., 2008; Thilmany, Bond, and Bond, 2008, Maples et al., 2013; Martinez et al., 2010; Zepeda and Li, 2006). While these documented factors may influence a consumer's initial decision to purchase food products directly from producers, marketing theories reveal that the cost-effectiveness of promotional efforts to influence expenditure levels of existing customers are related to consumer willingness to engage with the product (Kotler and Keller, 2016). For example, sales promotion tools, such as recipe cards and cooking demonstrations, return higher margins when aimed at current buyers who may then decide to increase per visit expenditures.

This research examines the factors that significantly impact the expenditure levels of consumers who elect to purchase food items directly from producers. Producers who adopt sales promotion strategies focused on communicating the benefits of direct-marketed food and food products are expected to be effective at recruiting new consumers to the market, increasing the frequency of visits among existing customers, and increasing average expenditures per customer.

Review of Literature

While recent studies have revealed the relative importance of consumer purchase of local foods that is motivated by "proven health benefits" (Onozaka, Nurse, and Thilmany, 2010) and the growing scientific evidence linking food choices to health (Variyam and Golan, 2002), there exists a gap in understanding the relationship, if any, between consumer health outcomes and re-localization of food systems (McFadden and Low, 2012). This information is of particular importance in the Southeastern United States, where evidence from the 2012 Prevalence and Trends Data (CDC, 2017) revealed that residents in Mississippi, Arkansas, Tennessee, Texas, and Louisiana reported lower participation levels in physical activities, were less likely to describe themselves as in "excellent" or "very good" general health, and were more likely to indicate "fair or poor health" status when compared to nationwide averages.

To adequately capture the presence of culturally driven impacts of health conditions and food safety concerns on consumer decisions to purchase foods directly from producers, a clearer

understanding of eating habits and community composition is needed. The prevalence of obesity is higher among Hispanic children of all ages relative to non-Hispanic white children (Cunningham, Kramer, and Venkat Narayan, 2014). Furthermore, Hispanic immigrants who had lived in the United States more than 15 years experienced a four-fold increase in obesity rates relative to newer immigrants (Kaplan et al., 2004). Tovar et al. (2013) used a focus group approach to interview Spanish-speaking female immigrants from Brazil, Latin America, and Haiti about changes in their lifestyle that might be linked to obesity. In the resulting response themes, participants indicated that food was “more natural” in their home country and that they had had more time for shopping and food preparation compared to when they lived in the United States.

Major findings from a qualitative meta-analysis of U.S. Latina food consumption patterns (Gerchow et al., 2014) revealed that dietary habits in terms of frequency of meals, scheduling, and snacking changed post-immigration as they adjusted to new employment schedules and had limited time to prepare and enjoy more traditional, multi-course, leisurely family meals, resulting in poor dietary choices and overeating. They also found that some Latinas attributed weight gain after immigration to the presence of “chemicals” and “harmful additives” in “poor-quality foods” available in the United States.

An important tenet of consumer purchase decisions under conditions of uncertainty is that observed selections are made subject to a rule of thumb that is used to sort purchase alternatives, motivating the need to understand those behaviors which are subject to this bounded rationality assumption. Marketing and economics literature reveals that, while a consumer may demand or require all the factual details related to a food item, the rational choice is not always selected in the presence of objective information (Verbeke, 2005; Tellis and Gaeth, 1990). In fact, Verbeke (2005) concluded that adding more information often resulted in information overload, and frustrated consumers became indifferent and bored, losing confidence in their decisions. A primary goal of attaching educational information to direct-to-consumer marketed food products is to help distinguish these items from similar choices to better inform consumer decisions. Based on these concerns, it appears there is a need to understand the degree to which consumers’ current knowledge of the U.S. agricultural industry might impact their purchase decisions and how much they decide to spend per visit.

Most studies on consumer preferences for locally grown food have been conducted in either the western United States or on the East Coast (Giraud, Bond, and Bond, 2005; Hardesty, 2008), where 52% of the total value of U.S. direct-to-consumer sales were reported in 2015 (USDA, 2016). However, 29% of U.S. farms that offer community supported agriculture programs were located in the Southeast in 2012 (USDA, 2013), and direct-to-consumer sales conducted by 30,014 operations in the Southeast were valued at \$602.6 million in 2015 (USDA, 2016). The Southeast is, therefore, no exception to the trend of increased direct-to-consumer food transactions.

In this paper, we examine the factors that affect how much Southeastern consumers spend when purchasing food directly from producers. We model the two decisions—whether to purchase directly from a producer and, if so, how much to spend per trip—in a joint decision framework, the parameters of which are estimated jointly via maximum likelihood. We find that consumers

with a greater incidence of disease in their families have higher expenditures on food purchased directly from producers. We also find that immigrants, those who prepare more meals at home, and those who are relatively more concerned with the safety of food produced in the United States spend more on food purchased directly from producers. We expect our findings to help farmers develop a three-pronged marketing strategy that 1) brings new direct-from-producer consumers into the market, 2) retains existing customers and encourages more frequent purchases, and 3) induces current customers to spend more per visit through the use of sales promotion tools aimed at improving sales per dollar (or time) expended on marketing communications.

Survey and Data

To better understand consumer decisions about increasing the frequency of their purchases directly from growers, Research Now[®] (Plano, Texas) administered an online survey that collected two hundred observations from adults in five Southeastern cities: Atlanta, Georgia; Austin and Houston, Texas; Birmingham, Alabama; and Nashville, Tennessee. The sample was constructed to be demographically representative, and respondents were pre-screened to ensure that the respondent was the primary food shopper for the household. Further details on the survey and sampling methodology can be found in Maples et al. (2013).

Variables used in the model are described in Table 1. The two dependent variables are c , indicating whether the person has purchased food directly from a producer, and y , indicating average expenditures per direct food purchase. Thirty-six percent of respondents had purchased directly from a producer; of those, the average expenditure per trip was almost \$8.00. We wanted to test whether purchasing directly from a producer was influenced by the respondent's knowledge about the agricultural sector, so the survey included an eight-question true/false survey about agriculture (see Appendix A.1). Respondents' scores on this questionnaire were included as an independent variable. We also hypothesized that respondents' perceptions of the health risk of various food sources affect purchasing decisions. We asked, relative to their friends and family, how concerned respondents were about the safety of food produced in the United States and how concerned they were about imported food. We also asked them to indicate whether they, or members of their family, had been treated for cancer, heart disease, diabetes, back or joint pain, Alzheimer's disease or dementia, and obesity (see Appendix A.2). Their levels of concern about food safety and the incidence of family health issues were included as independent variables. Finally, respondents were asked to indicate whether they were born in the United States.

Conceptual Framework

We model the consumer problem as a joint decision of (1) whether or not the consumer decides to purchase directly from the producer and, if so, (2) how much to spend. The consumer has a set of characteristics, $\mathbf{x}_i = [\mathbf{x}_i^0 \mathbf{x}_i^1 \mathbf{x}_i^2]$, a subset of which (\mathbf{x}_i^1) affects the first decision, a subset of which (\mathbf{x}_i^2) affects the second decision, and a subset of which (\mathbf{x}_i^0) affects both decisions.

We assume that when deciding whether to purchase directly from a producer (for example, whether to visit a farmers' market) the participant compares his utility from the purchase to his

Table 1. Variable Definitions and Descriptive Statistics

Variable Descriptions	Type^a	Mean	S.D.	Min	Max
<i>Dependent Variables</i>					
Over the past six months, have you purchased any food or food products directly from a grower/rancher/farmer/fisherman?	Binary	0.365	0.481	0	1
On average, how much did you spend per trip on food/food products purchased directly from a grower/rancher/farmer/fisherman?	Continuous	7.905	14.432	0	99
<i>Independent Variables</i>					
Atlanta resident ^b	Binary	0.201	0.401	0	1
Nashville resident	Binary	0.197	0.398	0	1
Houston resident	Binary	0.200	0.401	0	1
Birmingham resident	Binary	0.197	0.398	0	1
Austin resident	Binary	0.203	0.403	0	1
Female	Binary	0.680	0.467	0	1
Income (1 = < \$10000, 15 = > \$500,000)	Continuous	7.000	2.550	1	15
Associate's degree or greater education	Binary	0.749	0.434	0	1
Number of residents per household in previous six months	Continuous	2.399	1.234	1	9
Number of meals prepared at home each week (reported in seven, 3-meal increments)	Continuous	4.016	1.754	1	7
Score on 8-question true/false quiz	Continuous	3.93	1.82	0	8
Concern about average US food prices in next six months, relative to friends and family (0 = much less concerned, 4 = much more concerned)	Continuous	2.643	0.928	0	4
Concern about safety of food produced within the US (0 = much less concerned, 4 = much more concerned)	Continuous	2.457	1.084	0	4
Concern about safety of food produced outside the US (0 = much less concerned, 4 = much more concerned)	Continuous	2.891	1.015	0	4
Number of days traveled per month (6 categories)	Continuous	2.083	1.548	1	6
One-way commute time (15-minute increments)	Continuous	1.838	1.053	1	5
Less than 1.5 miles brisk walking per day ^c	Binary	0.434	0.496	0	1
More than 3 miles brisk walking per day	Binary	0.117	0.322	0	1
Number of disease incidences in family	Continuous	3.979	2.848	0	19
Number of times purchased health insurance in past 10 yrs. (1 = never, 5 = 10 times)	Continuous	2.686	1.561	1	5
Born in the United States	Binary	0.925	0.264	0	1

^a All binary variables equal 1 if the description is true, 0 otherwise.

^b Atlanta is the omitted base city.

^c Active (equivalent of 1.5–3 miles brisk walking daily) is the omitted activity level.

utility from not making the purchase. The utility of representative consumer i is a linear-in-parameters function of a vector of consumer characteristics:

$$(1) \quad u_{ic} = \beta^c + \beta_0^c \mathbf{x}_i^0 + \beta_1^c \mathbf{x}_i^1 + \varepsilon_i^c,$$

where i indexes the individual, $c \in \{1, 0\}$ indicates the choice of buying directly from the producer (1) or not (0), β^c , β_0^c , and β_1^c are parameters to be estimated, and ε_i^c is an independent and identically distributed (i.i.d.) error term with a mean of 0.

If the consumer decides to purchase directly from the producer, we assume s/he then decides how much to spend. Her/his average total expenditures per direct-from-producer shopping experience, y_i , are also a function of personal characteristics:

$$(2) \quad y_i = \alpha^c + \alpha_0^c \mathbf{x}_i^0 + \alpha_2^c \mathbf{x}_i^2 + v_i,$$

where α^c , α_0^c , and α_2^c are parameters to be estimated and v_i is an i.i.d. error term with a mean of 0.

We have observations on y_i only for the subset of consumers who have actually purchased directly from producers. Hence, the model specified in equations (1) and (2) is a natural candidate for a sample selection model. One approach to estimating a sample selection model is to use a two-step process in which equation (1) is estimated using a probit model, the estimates from which are then used to estimate the inverse Mills ratio, which itself is included as a regressor in equation (2) (Heckman, 1979). However, this approach is known to have several drawbacks including intrinsic heteroskedasticity, and it is no more consistent than the full information maximum likelihood (FIML) estimator (see Puhani, 2000). Therefore, we estimate the system using a FIML estimator.

Results

The sample selection model specified in equations (1) and (2) was estimated using SAS software, Version 9, of the SAS System for PC. (Copyright © 2002-04. SAS Institute, Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.) The variables, \mathbf{x}_i^0 , common to both equations are the number of household residents, the number of meals prepared at home each week, the respondent's score on the true/false quiz, level of concern for the safety of food produced in the United States, the average number of days the respondent travels per month, her/his activity level (whether s/he walks less than 1.5 miles per day and whether s/he walks more than 3 miles per day), and the number of family health issues. The variable \mathbf{x}_i^2 , which appears only in the expenditure equation (2), are respondent income and whether the respondent was born in the United States. All other variables listed in Table 1 appear only in equation (1). Note that the full set of variables included in equation (1), $\{\mathbf{x}_i^0, \mathbf{x}_i^1\}$, are the same as those used in Maples et al. (2013). We restricted the set of variables in equation (1) to match that used in Maples et al. (2013) in order to examine how the model choice—whether to estimate the decision to purchase directly from a producer as an independent decision or as a joint decision with how much to spend—affects parameter estimates for equation (1).

Table 2. Parameter Estimates

Dependent Variable:	Direct Purchase (Equation 1) N = 1,023		Expenditures (Equation 2) N = 373	
	Est.	S.E.	Est.	S.E.
Nashville resident	0.047	0.059	—	
Houston resident	-0.081	0.126	—	
Birmingham resident	-0.056	0.053	—	
Austin resident	-0.102	0.062*	—	
Female	0.010	0.066	—	
Income (1 = < \$10000, 15 = > \$500,000)	—		0.367	0.287
Associate's degree or greater education	0.060	0.045	—	
Number of household residents in previous six months	0.087	0.033***	2.128	0.790***
Number of meals prepared at home each week (reported in seven, 3-meal increments)	0.047	0.023**	1.279	0.563**
Score on 8-question true/false quiz	0.069	0.022***	1.567	0.562**
Concern about average US food prices in next six months, relative to friends and family (0 = much less concerned, 4 = much more concerned)	-0.024	0.023	—	
Concern about safety of food produced within US (0 = much less concerned, 4 = much more concerned)	0.143	0.042***	3.588	0.926***
Concern about safety of food produced outside the US (0 = much less concerned, 4 = much more concerned)	0.003	0.025	—	
Number of days traveled per month (6 categories)	0.088	0.025***	1.870	0.639***
One-way commute time (15-minute increments)	0.009	0.017	—	
Less than 1.5 miles brisk walking per day	-0.302	0.089***	-7.591	2.562***
More than 3 miles brisk walking per day	0.256	0.126**	6.575	2.928**
Disease incidence in family	0.031	0.014**	0.650	0.344*
Number of times purchased health insurance in past 10 yrs. (1 = never, 5 = 10 times)	0.009	0.011	—	
Born in the United States	—		-3.667	1.763**
Intercept	-1.620	0.215***	-33.018	5.529***
Rho		0.998		
Log-Likelihood		-2,081		

Note: Single, double, and triple asterisks (*, **, ***) indicate significance at the 10%, 5%, and 1% levels.

The parameter estimates and standard errors for equation (1) are presented in Table 2. We see that the decision of whether to purchase directly from a producer depends positively on the respondent's knowledge of the agricultural sector, food safety concerns, number of meals prepared at home each week, number of days spent traveling per month, whether the respondent exercises the equivalent of 3 miles of brisk walking per day, and family health history. In terms of geographic differences, Austin residents are less likely to make direct-from-producer purchases compared to Atlanta residents (omitted base category), as are those who exercise less than the equivalent of 1.5 miles of brisk walking per day.¹

The estimates and standard errors of equation (2)—factors affecting total expenditures—are presented in Table 2. Of the variables common to both the decision to purchase directly from the producer (equation 1) and how much to spend (equation 2), those with significant parameters in equation (1) have the same sign and are significant in equation (2). This indicates that respondent characteristics that increase the likelihood of purchasing directly from a producer also increase expenditures, when the respondent makes such purchases. In particular, respondents who are more concerned about the safety of food produced in the United States spend \$0.14 per trip and average total expenditures are \$3.59 more than those who indicated lower levels of concern. A greater incidence of family health issues results in significant increases of \$0.65 in average total expenditures on food purchased directly from producers. Respondents who performed better on the true/false quiz, and who were, therefore, assumed to have greater knowledge of agriculture, also spend \$0.07 more and increase average total expenditures by \$1.57 per trip. We find that more physically active consumers are significantly more likely to spend more. For example, those respondents who perform the equivalent of more than 3 miles of brisk walking daily spend \$0.26 more per trip, whereas those who completed fewer than 1.5 miles of brisk walking daily spend \$0.30 less per trip.

The two variables that appear only in the expenditure function are income and whether the respondent was born in the United States. Kolodinsky and Pelch (1997) and Onianwa, Wheelock, and Mojica (2005) find that income does not affect purchases of local foods. This study also shows that income does not affect expenditures on food purchased directly from the producer. A new finding, however, is that average total expenditures for respondents who were not born in the United States are \$3.67 higher than those of respondents who were born in the United States. Although we are unable to separate our “born in the United States” variable into respondent country of birth or year of immigration to further investigate any underlying cultural influences on this finding, we do propose two hypotheses for future exploration. First, immigrants may have their own perceptions of the quality, safety, or health impacts of food purchased directly from producers. However, an examination of Pearson correlation coefficients indicates that the correlations are quite weak between being born in the United States and either concern for safety of domestically produced or imported food or total family incidence of health issues. Second, it is possible that purchasing directly from producers is more common in other countries, motivating immigrants to continue this practice in the United States.

¹ The signs and significance of parameters in our model match very closely with those of Maples et al. (2013) for the behavioral variables, but not as well for some demographic variables. For example, Maples et al. find that Nashville and Houston residency as well as gender and education significantly affect the decision to purchase directly from the producer, whereas we do not find significance for those parameters.

Conclusions

There is no indication that growing consumer interest in niche food markets, such as organic and local, is waning, and food producers would be remiss not to differentiate among consumers and the products for which they can potentially charge a price premium. The joint model estimated in this paper provides insight for producers about (1) factors that affect whether or not consumers buy food directly from producers and (2) factors that affect how much consumers spend on food purchased directly from producers.

We find that all the factors increasing the likelihood of direct-from-producer purchases also increase expenditure levels. Consumers are more likely to purchase directly from the producer and spend more on these purchases when they (1) have a more accurate knowledge about agriculture, (2) are more concerned with the safety of food produced in the United States, (3) are more physically active, and (4) have a greater incidence of family health issues. A producer marketing strategy that focuses specifically on the health benefits of fresh produce could, therefore, be effective in recruiting new consumers to the market, increasing the frequency of visits among existing customers, and increasing average expenditures per customer.

In addition, immigrants spend significantly more than U.S.-born respondents, so an effective marketing strategy could target that population. As noted in our review of the literature, eating habits and the cultural composition of immigrant communities are significant factors for food purchase decisions, particularly among U.S. Latina and Spanish-speaking populations. Producers who market directly to consumers are encouraged to explore buyer characteristics, such as cultural food preferences, food preparation methods, shopping habits, and primary language spoken in their customers' households. Armed with this information, producers are encouraged to offer promotional materials (recipes, coupons, product descriptions, and pricing guides) that recognize the cultural and language variations of their client base, better communicate the value of their product offerings to those clients, and secure long-term relationships with them.

In particular, our examination of a respondent's family health history and knowledge of agriculture add to the existing literature exploring characteristics of those consumers who are motivated to spend time and other personal resources to purchase directly from producers on a regular basis. In sum, consumers who are highly motivated to secure food of a known origin, in an effort to control for both the safety of the food and the perceived positive health benefits, appear willing to incur the associated temporal and search costs. Future research might investigate whether these consumer characteristics are important to a larger population, beyond urban consumers in the Southeastern United States.

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Appendix

A.1 Eight-Question True-False Quiz

You will now see a series of statements and will be asked if, in your opinion, they are true or false. There are no wrong answers.

There are more farmers in the U.S. than there were 10 years ago.

- True
- False
- Not Sure

Less than 3 percent of the U.S. gross national product is from agriculture

- True
- False
- Not Sure

For every \$1.00 consumers spend on food in the U.S. the actual farmer/rancher receives less than 25 percent of that dollar.

- True
- False
- Not Sure

One of every five jobs in the U.S. is related to agriculture.

- True
- False
- Not Sure

The average U.S. farm is larger than 500 acres.

- True
- False
- Not Sure

Several countries depend on U.S. agriculture exports for food and fiber.

- True
- False
- Not Sure

The average U.S. farmer feeds about 155 people.

- True
- False
- Not Sure

In the U.S., the agricultural industry has a trade surplus.

- True
- False
- Not Sure

A.2 Family Health History Question

Please check if you or your relatives have been treated for any of the following health issues (check all that apply)

	Me	Siblings	Father	Mother	Children	Grandparents
Cancer						
Heart Disease						
Diabetes						
Back/Joint Pain						
Alzheimer's/Dementia						
Obesity						
None of the above						