AN ANALYSIS OF CONSUMER PREFERENCES FOR BED AND BREAKFAST IN THE ECO-AGRITOURISM ACTIVITIES

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ABSTRACT

This study evaluatesthe socio-economic demographic, as well as the preferences and behavioral characteristics of consumers who participate in bed and breakfast agritourism activity. The results from the logit model indicate that those who consumed a wider variety of fruits in the past 5 years, those who learn about agritourism from sign at market, those who consider that the facility at agritourism sites are important, those who have children under the age of 17, those who are retired from the job, and whose income range between $60,000 to $79,000 are more likely to be willing to participate in the bed and breakfast agritourism activity. However, those who learn about agritourism from newspapers, those who have two year collage education, male, homemakers, and whose income range from $20, 000 to $39,000 are less likely to be participate in bed and breakfast agritourism activity in Mid-Atlantic Region.

Keywords: Agritourism, willing to participate, bed and breakfast, logit model, mid-atlantic region

INTRODUCTION

Land use activities, for example transforming natural environment for human use or altering management practices on lands, have converted a large portion of the planet as a developed land surface (DeFries et al., 2004; Foley et al., 2005; Sutherland et al., 2016). One of the consequences of this transformation is the disappearance of farmland in favor of 'urban sprawl', especially in the North Eastern

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United States. Corollary to this transformation is the emergence of two types of farm holdings: farms with less than 50 acres and farms with more than 500 acres have both of which have increased their share of total farm holdings since 1974, with a decline in the midsize farms (USDA, 2012). Small farms, mainly family owned, still hold the 'mythic standing' in the United States, harking back to the 'Jeffersonian romantic sensitivities' (Browne, 2001; Lipton, 2005; Schilling, 2014; Onyango et al., 2015). Protecting small farms has long been a federal and State policy objective, rationalized in part by the priority of maintaining local food production, and safeguarding the environment and reflection of the inherent value Americans place on the rural landscape. The local economy has a direct impact on the prosperity of these family farms through the availability of off-farm jobs and the success of nonfarm businesses owned by farm operators and their family members. On an average 91 percent of U.S. farms are classified as small farm with a gross cash farm income (GCFI) of less than $250,000. About 60 percent of these small farms are very small, generating GCFI of less than $10,000 (USDA, 2010).The sustainability and the long term viability of these farms are at stake, unless farmers adapt by finding new market niches in alternate income generating activities.

Tourism is one of the fastest and leading industries in the world (Edgell, 1990; WTO, 2004; Kumar et al, 2016). In both developed and developing countries, tourism, eco-tourism and agritourism are frequently considered to be a sustainable way of raising the economic activity of regions (Ceballos, 1995, Surendran and Sekar, 2010; Tew and Barbieri, 2012; Koutsouris et al., 2014; Chiu et al., 2016). A recent trend in this regard is the utilization of natural resources for tourismto diversify income, and to reduce risks that are an inherent nature of agriculture, ecosystem services, and biodiversity (Nickerson et al., 2001; McGehee and Kim, 2004; Che et al., 2005; Surendran and Sekar, 2011; Tew and Barbieri, 2012; Barbieri, 2013). Agritourism is defined "as embracing the full range of products and services, development options and marketable linkages possible across the Agri-Food-Tourism value chain, including those tourism products developed for rural/urban/agricultural environments" (Harvey, 2001). University of California Small Farm program (2012) define it as "Agricultural tourism is a profitable venture at a working farm, ranch or agricultural plant conducted for the enjoyment or education of visitors, and that generates additional income for the farmers". Agritourism can include U-pick, farm stays, farm stand or shops, tours, on-farm classes, orchard dinners, fairs, festivals, Christmas tree farms, pumpkin patches, winery weddings, youth camps, hunting or fishing, barn dances, guest ranches, and more'.

U. S. Department of Agriculture assessed that more than 62 million Americans, who were at least 16 years of age or older, and 20 million children, under the age of 16, visited agricultural farm (NSRE 2002; Wilson, Thilmany and Sullins 2006;Onyango et al., 2015).Their genuine interest in agritourism and supporting direct marketing also fuels travel and tourism. It is clear that the desire for tourism,

along with the value and quality of goods and services, will continue to attract consumers in the future, assuming that demand will continue to be met by farm operators. The purpose of this study is to elucidate consumers' perception to participating in bed and breakfast agritourism activity and attributes that influence their decision to undertake such agritourism activities. Factors that derive demand for agritourism businesses and determine who will visit are imperative to know in order to further develop plans on an individual level. Since, agritourism activities are key regional business development strategies, all information that comes directly from consumers could motivate owners to plan, act, and improve their businesses in accordance with the findings.

METHODOLOGY

An online survey of consumers living in New Jersey, Pennsylvania, and Delaware was conducted in 2010 to document the characteristics of consumers who visit agritourism operations and/or buy at farmer-to-consumer direct market outlets in the northeastern United States. Among the 2594 members who were registered with this panel and accessed the survey, 1134 met the screener criteria and began the survey (133 from DE, 424 from NJ, and 577 from PA), with 993 completing the 15-minute survey questionnaire (364 from NJ, 507 from PA and 122 from DE). Panelists were enquired to quantify the amount of produce procured at direct marketing outlets, the number of visits per month, the type of produce bought and dollars spent during per visit at the farmer-to-consumer direct market outlets, as well as demographic questions (e.g., gender; age; household size; annual gross household income etc.).

MODEL SPECIFICATION

The respondents were interviewed whether they are willing to participate in a bed and breakfast event in the agritourism activity. In the logit model framework, the dependent variable is defined as '1'if the respondent is willing to participate in a bed and breakfast agritourism activity and'0' otherwise. The empirical model assumes that the probability of observing the dependent variable P_i is contingent upon the vector of independent variables Xij associated with visitor (i) and variable (j). The relationship between willingness to participate in a bed and breakfast agritourism activity, visitor's behaviors, agritourism attributes, and socio-demographic characteristics were explored as follows:

$$P_i = F(\beta_j \chi_{ij} + \varepsilon) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

$$= \beta_0 + \beta_1 \text{Visitor's Behavior} + \beta_2 \text{ Agri} - \text{tourism Attributes}$$

$$+ \beta_3 \text{Socio} - \text{Demographic Characteristics} + \varepsilon$$

Where:

P_i is the probability of willing to participate in the bed and breakfast event,

$\beta_j \chi_{ij}$ is the linear combination of independent variable.

βis the parameters to be estimated. - ε is adisturbance term orerror term.

Logistic distributional assumption for the random term, the probability P_i can be expressed as:

$$P_i = F\left(\beta_0 + \sum_{j=1}^{j} \beta_j \chi_{ij}\right) = F(\beta\chi_i) = 1/[1 + \exp(-\beta\chi_i)] \ldots\ldots\ldots\ldots (2)$$

The estimated coefficients in Equation 2 do not directly represent the marginal effects of the independent variables on the probability P_i.

If the dependent variable is continuous, the marginal effect of χ_i on P_i is given as:

$$\partial P_i/\partial \chi_{ij} = [\beta_j \exp(-\beta\chi_i)]/[1 + \exp(-\beta\chi_i)]^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

In the case of a binary explanatory variable χ_{ij} which take values of 1 and 0, and the marginal effect is determined as:

$$\partial P_i/\partial \chi_{ij} = [P(\chi_{ij} = 1) - P(\chi_{ij} = 0)]/[1 - 0] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (4)$$

The logit model is formulated as:

BBFAST= =β$_0$ +β$_1$ MOREFRUITS+β$_2$ WIDERFRUITS+β$_3$ PYOVISITS +β$_4$ PYOEXP

+β$_5$ AGRITOURVISITS +β$_6$ DMBILLBOARDADV+β$_7$ DMATMARKETADV

+β$_8$ WTPDIRECTMKT+β$_9$WTBGM+β$_{10}$AGRITOURMKT

+β$_{11}$ AGRITOURPAPER +β$_{12}$ FACILITYIMP+ β$_{13}$ EDUCATIONIMP

+β$_{14}$ GARDEN +β$_{15}$ URBAN+β$_{16}$ HOUSEHOLD+β$_{17}$ UNDER17

+β$_{18}$ MALE+β$_{19}$ AGE<20+β$_{20}$ AGE21TO35+β$_{21}$ AGE36TO50

+β$_{22}$ 2YEARCOLLGE +β$_{23}$ 4YEARCOLLEGE +β$_{24}$ GRADUATE

+β$_{25}$ RETIRED+β$_{26}$ EMPLOYED +β$_{27}$ HOMEMAKER+β$_{28}$ STUDENT

+β$_{29}$ CAUCASIAN + β$_{30}$ INC20K-39K +β$_{31}$ INC40K-59K+β$_{32}$ INC60K-79K+β$_{33}$ INC80K-99K +β$_{34}$ INCABOVE100K……………… (5)

The dependent variable is dichotomous such that it equals '1' if the respondent participated in bed and breakfast agritourism activities; 0=otherwise. Independent variables include participant's attitudes, behaviors and socio-economics characteristics.

RESULT AND DISCUSSION

Survey participants were selected randomly from direct marketing and agritourism consumers in the Mid-Atlantic region, specifically in the states of New Jersey, Delaware, and Pennsylvania. The independent variables were used in the logit model to predict the factors that influence the respondent's willingness to participate

in bed and breakfast agritourism activity. In table 1, the discrete and continuous independent variables are explained in terms of average units and the binary dummy variables are explained in terms of percentage distribution. For example, On an average, 17% of respondent participated in bed and breakfast agritourism activity (BBFAST) and the remaining 63% of them were not. The average number of visits per year to a Pick-Your-Own operation was about 1.97 times (PYOVISITS) and per visit they spent about $13.51 (PYOEXP) etc,. Hence, none of the hypothesis was made towards behavioral and perceptional attitudes of participants.

Table 1. Description of independent variables

S. No	Variable	Description	Mean Units/ %	SD Units/ %
	BBFAST	1 if participant participated in bed and breakfast agritourism activity; 0=otherwise	0.17	0.37
1.	MOREFRUITS	1 if the participant consumed more fruits in the past 5 years; 0=otherwise	0.73	0.44
2.	WIDERFRUITS+	1 if the participant consumed a wider variety of fruits in the past 5 years; 0=otherwise	0.85	0.36
3.	PYOVISITS	Average number of visits per year to a Pick-Your-Own operation	1.97	2.79
4.	PYOEXP	Average amount spent per visit at a Pick-Your-Own operation	13.51	13.05
5.	AGRITOURVISITS	Average number of visits per year to an agritourism location	2.96	2.43
6.	DMBILLBOARDADV	1 if the participant learns about direct markets through billboard and roadside sign advertisements; 0=otherwise	0.39	0.49
7.	DMATMARKETADV	1 if the participant learns about direct marketing outlets from sign at the market entrance; 0=otherwise	0.51	0.50
8.	WTPDIRECTMKT	1 if the participant is willing to pay more for agricultural products from direct markets compared to supermarkets; 0=otherwise	0.64	0.48
9.	WTBGM	1 if the participant is willing to buy genetically modified products; 0=otherwise	0.17	0.37
10.	AGRITOURMKT+	1 if the participant learns about agritourism from sign at market; 0=otherwise	0.37	0.48

S. No	Variable	Description	Mean Units/%	SD Units/%
11.	AGRITOURPAPER-	1 if the participant learns about agritourism from newspaper; 0=otherwise	0.53	0.50
12.	FACILITYIMP+	1 if the participant thinks that the facility at agritourism site is important; 0=otherwise	0.70	0.46
13.	EDUCATIONIMP	1 if the participant thinks that educational demonstration and workshops at agritourism site is important; 0=otherwise	0.38	0.48
14.	GARDEN	1 if the participant has a vegetable garden at home; 0=otherwise	0.47	0.50
15.	URBAN	1 if the participant lives in an urban location; 0=otherwise	0.11	0.31
16.	HOUSEHOLD	Number of people in the household	2.89	1.40
17.	UNDER17-	Number of children below 17 years in the household	1.72	1.09
18.	MALE-	1 if the participant is a male; 0=otherwise	0.25	0.43
19.	AGE<20	1 if the participant is less than 20 years old; 0=otherwise	0.02	0.15
20.	AGE21TO35	1 if the participant is between 21 and 35 years old; 0=otherwise	0.29	0.46
21.	AGE36TO50	1 if the participant is between 36 and 50 years old; 0=otherwise	0.29	0.45
22.	2YEARCOLLGE-	1 if the participant has a two-year college education: 0=otherwise	0.27	0.44
23.	4YEARCOLLEGE	1 if the participant has a four-year college education: 0=otherwise	0.29	0.45
24.	GRADUATE	1 if the participant has a graduate degree: 0=otherwise	0.16	0.36
25.	RETIRED+	1 if the participant is retired; 0=otherwise	0.14	0.35
26.	EMPLOYED	1 if the participant is employed by others; 0=otherwise	0.54	0.50
27.	HOMEMAKER-	1 if the participant is a homemaker; 0=otherwise	0.17	0.38
28.	STUDENT	1 if the participant has up to high school education: 0=otherwise	0.07	0.25

S. No	Variable	Description	Mean Units/ %	SD Units/ %
29.	CAUCASIAN	1 if the participants Caucasian: 0=otherwise	0.88	0.32
30.	INC20K-39K-	1 if the participant's income is between 20,000 and 39,999; 0=otherwise	0.19	0.39
31.	INC40K-59K	1 if the participant's income is between 24,000 and 59,999; 0=otherwise	0.22	0.41
32.	INC60K-79K+	1 if the participant's income is between 60,000 and 79,999; 0=otherwise	0.19	0.39
33.	INC80K-99K	1 if the participant's income is between 80,000 and 99,999; 0=otherwise	0.13	0.34
34.	INCABOVE100K	1 if the participant's income is above 100,000; 0=otherwise	0.19	0.39

Results from the logit model confirm the factors that influence respondents' willingness to participate in the bed and breakfast agritourism activity. The chi-square statistics rejected the null hypothesis that the explanatory variables as a set were not important in explaining variations in the dependent variable at 0.001 level and the McFadden's R^2 was 0.06265. The χ^2 value was 64.22 with 34 degrees of freedom. The tabulation of prediction success is shown in the classification table (Table 2).

Table 2. Logit model predictive accuracy

Actual Value	Predicted		Correct Total
	0	1	
0	940(83 %)	4 (0.4 %)	944 (83%)
1	182(28%)	8 (0.7 %)	190 (17%)
Total	1122(99 %)	12 (1.1 %)	1134 (100.00%)

Number of correct predictions: 948,   Percentage of correct predictions: 83.6%

McFadden R^2: 0.06265   Chi squared: 64.22

Degrees of freedom: 34.0   P-value = 0.117 with degrees of freedom = 8

Overall Model Significance: 0.00

With a 50-50 classification system, almost 84 percent of the individuals in the sample were correctly classified as those who place high degree of importance on bed and breakfast events when participating in the agritourism activities.

The logit model summary for participation in bed and breakfast events is displayed in table 3. Among the 34 independent variables, WIDERFRUITS, AGRITOURMKT, FACILITYIMP, UNDER17, RETIRED and INC60K-79K variables are positively influencing, whereas, AGRITOURPAPER, MALE, 2YEARCOLLGE, HOMEMAKER and INC20K-39K are negatively impacting, at least at a 10% level on bed and breakfast events when participating in the agritourism activities. The model results indicate that, among the respondents, those who consumed a wider variety of fruits in the past 5 years (WIDERFRUITS) are 5% more to be willing to participate in the bed and breakfast agritourism activity because of concerns about fresh fruits and vegetables compared to those who thought otherwise.

Table 3. Logit regression results

S.No	Variable	Coefficient	Standard Error	T-Ratio	Probability	Marginal effect
	Constant	-0.182***	0.023	-8.057	0.000	-0.1817
1.	MOREFRUITS	-0.00017	0.00011	-1.512	0.131	-0.0002
2.	WIDERFRUITS	0.055***	0.011	5.146	0.000	0.0555
3.	PYOVISITS	-0.0004	0.0003	-1.211	0.226	-0.0001
4.	PYOEXP	0.0001	0.0001	1.566	0.118	0.0001
5.	AGRITOURVISITS	0.0001	0.0001	0.614	0.539	0.0000
6.	DMBILLBOARDADV	-0.018	0.012	-1.58	0.114	-0.0182
7.	DMATMARKETADV	0.018	0.012	1.578	0.115	0.0182
8.	WTPDIRECTMKT	-0.0001	0.0001	-0.047	0.963	0.0000
9.	WTBGM	-0.0001	0.0001	-0.024	0.981	0.0000
10.	AGRITOURMKT	0.022*	0.012	1.795	0.073	0.0217
11.	AGRITOURPAPER	-0.021*	0.013	-1.799	0.074	-0.0217
12.	FACILITYIMP	0.0002*	0.0001	1.687	0.092	0.0002
13.	EDUCATIONIMP	0.0001	0.0001	-1.501	0.134	-0.0001
14.	GARDEN	-0.0001	0.0001	-0.914	0.361	-0.0001
15.	URBAN	-0.001	0.001	-0.521	0.603	-0.0005
16.	HOUSEHOLD	0.0001	0.001	0.352	0.725	0.0004
17.	UNDER17	0.0006**	0.0003	-2.051	0.040	-0.0002

S.No	Variable	Coefficient	Standard Error	T-Ratio	Probability	Marginal effect
18.	MALE	-0.0001*	0.0001	-1.795	0.073	-0.0001
19.	AGE<20	-0.003	0.025	-0.127	0.899	-0.0032
20.	AGE21TO35	0.003	0.016	0.206	0.837	0.0032
21.	AGE36TO50	0.0001	0.016	0.000	0.999	0.0001
22.	2YEARCOLLGE	-0.022*	0.013	-1.678	0.093	-0.0223
23.	4YEARCOLLEGE	0.007	0.011	0.647	0.518	0.0073
24.	GRADUATE	0.015	0.013	1.178	0.239	0.0154
25.	RETIRED	0.034*	0.018	1.876	0.061	0.0336
26.	EMPLOYED	0.003	0.012	0.28	0.780	0.0034
27.	HOMEMAKER	-0.032*	0.019	-1.666	0.096	-0.0316
28.	STUDENT	-0.005	0.023	-0.237	0.812	-0.0054
29.	CAUCASIAN	0.0001	0.0001	0.251	0.802	0.0000
30.	INC20K-39K	-0.039**	0.019	-2.082	0.037	-0.0394
31.	INC40K-59K	-0.011	0.014	-0.767	0.443	-0.0111
32.	INC60K-79K	0.025*	0.015	1.662	0.096	0.0248
33.	INC80K-99K	0.016	0.017	0.98	0.327	0.0163
34.	INCABOVE100K	0.009	0.014	0.642	0.521	0.0093

*** Significant at 1%; **Significant at 5%; * Significant at 10%.

In terms of agritourism information, those who learned about agritourism from signs at farm markets (AGRITOURMKT) were 2.2% more likely to be willing to participate in bed and breakfast agritourism activity, whereas those who learned about agritourism from newspapers (AGRITOURPAPER) were 2% less likely to be willing to participate in the bed and breakfast agritourism activity. A conflicting result were observed among those who learn about agritourism events through newspapers positively contributed towards the likelihood of participation in farm wine tasting events but were unwilling to participate in a bed and breakfast agritourism activity (Govindasamy and Kelley, 2014).

In the case of onsite facility, those who thought that the facility at an agritourism site important (FACILITYIMP) were 0.02% more likely to be willing to participate in a bed and breakfast agritourism activity. However, the

AGRITOURPAPER and FACILITYIMP variable is significant at 90% level but the impact on dependent variables was not statistically significant. Furthermore, respondents who had children under the age of 17 (UNDER17) were 0.02% more likely to be willing to participate in the bed and breakfast agritourism activity because this may be a new experiences for children who have had little exposure to farm life, growing up in a midsize city. Gender also play a vital role in participation in a bed and breakfast agritourism activity, 0.1% % of males (MALE) were less likely to be willing to participate in this event. However, results showed that males were more willing to make more trips to agritourism spots than females (Carpio et al., 2008). This clearly indicates that male were more willing to participate other agritourism events than in a bed and breakfast.

Among respondents, those who have a two year collage education (2YEARCOLLGE) are 2% less likely to be willing to participate in the bed and breakfast agritourism compared to those who have up to a graduate level and above. A similar result was found in agritourism wine testing event (Govindasamy and Kelley, 2014). Also those who are retired (RETIRED) are 3% more likely to be willing to participate in a bed and breakfast agritourism activity due to availability of time compared others. Another interesting finding was that homemakers (HOMEMAKER) were less likely to be willingness to participate in the bed and breakfast agritourism activity. A similar result was also found in agritourism wine testing event (Govindasamy and Kelley, 2014). Those who had an income range from 20, 000 to 39,000 (INC20K-39K) were 3% less likely to be willing to participate in the bed and breakfast agritourism activity, whereas those who had an income ranging from 60,000 to 79,000 (INC60K-79K) were 2% more likely to be willing to participate in the bed and breakfast agritourism activity, because of concerns about the affordability of the event.

CONCLUSION

Survey results demonstrate that agritourism outlets across the mid-Atlantic region generally appeal to consumers, with a few areas needing improvement. Research and data provided by this study may bring about a useful understanding of consumers' perceptions, behaviors, and actions concerning their purchases, decision to visit, and general preferences towards bed and breakfast and agritourism activity. It may also generate conversation on how to advance businesses in order to benefit consumers and owners alike in the mid-Atlantic region of the United States, and perhaps may extend to similar nearby farming states outside of the region studied.

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