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Willingness to Buy Organically Grown Ethnic Greens and Herbs: A Consumers Survey in the East-Coast Region of United States

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Abstract

The willingness to buy organically grown ethnic greens and herbs in the east-coast region of United States has been predicted by developing a logit model. The coefficients of the included ethnicities, namely Asian Indians, Mexicans, and Puerto Ricans have been found negative, indicating that they are less willing to buy organic ethnic greens and herbs compared to the Chinese. Better availability and wider variety positively influence the consumers' willingness to buy organic ethnic greens and herbs. Those who give importance to food safety, food label, and health care, and are self-employed individuals, are more likely to buy organic ethnic greens and herbs. The households with an annual income of less than \$ 20,000 or between \$ 20,000 and \$ 40,000 are less likely to buy organic ethnic greens and herbs compared to those with an annual income of at least \$80,000. The study has indicated that further research is needed to examine the relationships between farm size and location, land operator characteristics, mix of products and marketing outlets, and relative costs and returns associated with cultivation of organic ethnic greens and herbs.

Key words: Willingness to buy, organic products, ethnic greens, Asian Indians, Mexicans, Puerto Ricans, Chinese, East-Coast region of US

JEL Classification: Q13

Introduction

Farmers in the east coast region of the United States, in general, operate on a relatively small land and bear a higher production cost per unit of crop output. Limited farm land and higher input costs put them at a disadvantage against larger commodity growers from the mid-west region where production costs are comparatively low. To enhance profitability, many farmers have been adopting the move towards growing niche crops, for which some consumers are typically willing to pay a premium. For example, growers along the east coast have focus on high-value specialty crops such as ethnic produce. Additionally,

high proportion and rapid growth of ethnic population in this region provide an opportunity for farmers to market these niche products.

The east coast region of the United States is characterized by the high proportion of a growing ethnic immigrant population. The total population of United States increased by 9.5 per cent, from 282 million in 2000 to 309 million in 2010 (US Census Bureau, 2011). As per the Census data from 2000 to 2010, the Hispanic population increased by 34 per cent, from 35.6 million to 47.8 million, while the Asian population increased by 32 per cent, from 10.7 million to 14.2 million, which exceeded the 9.5 per cent growth rate of the mainstream population during this period. The US Census data also project that New York State and Maryland, each with 40 per cent of the projected

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population being a minority, are among the next set of states to become “majority-minority” states (Bernstein, 2005). More than 1 million foreign-born people become legal permanent residents in the US each year, with Mexico accounting for the largest number, according to the market researcher Mintel International Group, which cited Department of Homeland Security data. The rapid expansion of ethnic populations and their purchasing power present significant opportunities for the produce sector, especially greens and herb producers in the region to take advantage of their close proximity to densely populated areas (Govindasamy, *et al.*, 2006; Tubene, 2001).

Asp (1999) has argued that food decisions are made by consumers based on cultural and psychological factors as well as lifestyle and food trends. According to Bhugra *et al.* (1999), food is an integral part of the culture and there is an established linkage between food and culture. The immigrants assimilate more on consumption patterns associated with the US consumer culture while maintaining some patterns of consumption that they have acquired in their home country (Peñaloza, 1994; Bojanic and Xu, 2006). Enhanced by increases in ethnic population and their buying power along with income growth encourage demand for specialty (ethnic) greens and herbs (Humphreys, 2006). Austrade (2008), has shown that in the past 10 years, specialty food sales have grown approximately 7 per cent per annum in the USA. In 2010, ethnic food sales in the US reached a record \$2.4 billion, up by 9 per cent from 2009. Sales are expected to grow another 10 per cent by 2015, adjusted for inflation (Bruce Blythe, 2011).

Even though organically grown produce have a price premium, returns to growers depend on the demand and the availability of organic outlets (Klonsky *et al.*, 1993). According to the 2007 and 2010 Manufacture Surveys by the Organic Trade Association, the sales of US organic products increased by 21 per cent, from \$14.6 billion to \$17.7 billion in 2006. Organic foods are still the largest segment of organic products, reaching \$16.7 billion in consumer sales, making up over 95 per cent of all organic product sales (Organic Trade Association, 2007). Driven by consumer choice, the United States organic industry grew by 9.5 per cent in 2011, reaching \$31.5 billion in total sales revenue (Organic Trade Association, 2012).

*\$ refers to US \$ in the paper

Against this background, this study has attempted to predict the factors that influence the consumers’ willingness to buy organically grown ethnic greens and herbs. The ethnic consumer characteristics such as purchasing behaviour, attitudes, and social demographic attributes were analyzed. In addition, we have predicted the relationship between ethnic product attributes and the willingness to buy organically grown ethnic greens and herbs. The findings of this study may provide a better understanding of ethnic consumers’ purchasing behaviour to support growers in the east-coast region of the United States.

Data and Methodology

A telephonic consumer survey was conducted along the east-coast region in 16 states (Connecticut, Delaware, Florida, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia and Washington, DC) of the United States. The survey was executed by Perceptive Marketing Research, Inc. (Gainesville, Florida), a market research firm. The survey was administered in 2010 to gather information that can be used to assist small and medium farmers to better understand consumer’s perceptions and preferences for organically grown ethnic greens and herbs among Asian Indian, Chinese, Mexican, and Puerto Rican consumers. The survey instrument was approved by the Office of Research Protections at The Pennsylvania State University (University Park, PA) and the Office of Research and Sponsored Programs, Rutgers-The State University of New Jersey (New Brunswick, NJ), and was pre-tested on a subset of the target consumer population. A bilingual phone-survey, which was designed based on the group panel survey, was conducted by a market research firm. Finally, a total of 1,244 responses were received from all the four ethnic consumers, of which, 1,117 respondents were in the purchasers categories (Chinese-276, Asian Indians-277, Mexicans-280, and Puerto Ricans-284) and 127 respondents were from the non-purchasers of ethnic greens and herbs categories (Chinese-21, Asian Indians-45, Mexicans-24, and Puerto Ricans-37).

Model Framework

The respondents were asked whether they were willing to buy organically grown ethnic greens and

herbs. In the logit model framework, the dependent variable is defined as, '1' if the respondent was willing to buy organically grown ethnic greens and herbs, '0' otherwise. The empirical model assumes that the probability of observing the dependent variable (P_i) is contingent upon a vector of independent variables (X_{ij}) associated with consumer (i) and variable (j). The relationship between willingness to buy and product attributes, consumers' purchasing behaviour, ethnicity related characteristics and socio-demographic characteristics were formulated as follows:

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

$$= \beta_0 + \beta_1 \text{ Consumers purchase behaviors} +$$

$$\beta_2 \text{ Ethnic greens and herbs attributes} +$$

$$\beta_3 \text{ Socio-demographic characteristics} +$$

$$\beta_4 \text{ Ethnicity related characteristics} + \varepsilon$$

where,

P_i is the probability of willingness to pay (WTP),
 $\beta_j \chi_{ij}$ is the linear combination of independent variables,
 β is the parameters to be estimated, and
 ε is an error-term or disturbance-term.

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

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

The estimated coefficients of Equation (2) do not directly represent 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 by Equation (3):

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

In the case of a binary explanatory variable χ_{ij} , that takes values of 1 or 0, the marginal effect is determined as per Equation (4):

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

The Logit model is formulated as Equation (5) (given in box).

The variables used in this model are explained in Table 1. The dependent variable is dichotomous such that it equals '1' if a respondent is willing to buy organic ethnic greens and herbs, '0' otherwise. To capture the influence of ethnic attribute, dummy variables for ethnicity, such as, if the respondent was born in the ethnic country, whether respondent speaks the ethnic language and the number of years the respondent has been living in the United States, were included in the model. Further, the model includes socio-demographic variables, such as education, age, employment status, marital status, gender, households' residential location, annual household income, family size, number of children under 17, and whether the respondent is a vegetarian or not.

$$WTP_{organic} = \beta_0 + \beta_1 \text{Familiarity} + \beta_2 \text{Affordability} + \beta_3 \text{Availability} + \beta_4 \text{Quality} +$$

$$\beta_5 \text{Foodsafety} + \beta_6 \text{Convience} + \beta_7 \text{AD}_{PPA} + \beta_8 \text{Homegrow} + \beta_9 \text{Mtime} + \beta_{10} \text{Nosub} +$$

$$\beta_{11} \text{LabelRead} + \beta_{12} \text{Incbuy} + \beta_{13} \text{Distance} + \beta_{14} \text{Estore} + \beta_{15} \text{AlternativeUse} +$$

$$\beta_{16} \text{HealthUse} + \beta_{17} \text{Language} + \beta_{18} \text{Usborn} + \beta_{19} \text{Liveyear} + \beta_{20} \text{Indian} +$$

$$\beta_{21} \text{Puerto Rican} + \beta_{22} \text{Mexican} + \beta_{23} \text{Urban} + \beta_{24} \text{Suburban} + \beta_{25} \text{Income}_{less20} +$$

$$\beta_{26} \text{Income}_{21to40} + \beta_{27} \text{Income}_{41to60} + \beta_{28} \text{Income}_{61to80} + \beta_{29} \text{Edu} + \beta_{30} \text{Age}_{Less20} +$$

$$\beta_{31} \text{Age}_{21TO35} + \beta_{32} \text{Age}_{36TO50} + \beta_{33} \text{Age}_{51TO65} + \beta_{34} \text{Emp} + \beta_{35} \text{Selfemp} + \beta_{36} \text{Married} +$$

$$\beta_{37} \text{Gender} + \beta_{38} \text{Household} + \beta_{39} \text{Kidnumber} + \beta_{40} \text{Veg} + \varepsilon \quad \dots(5)$$

Table 1. Description of explanatory variables

Sl No.	Variable	Description	Mean (Per cent)
	WTP_Organic	1 if respondents willing buy organic ethnic greens and herbs than the comparable American or conventional substitutes, otherwise 0.	75
Attributes			
1	FAMILARITY	1 if respondent's are willingness to buy more of the ethnic greens and herbs because they feel more familiar with ethnic greens and herbs as well as ethnic greens and herbs are sold by a brand that they know and trust; otherwise, 0.	45
2	AFFORDABILITY	1 if the respondents think lower price for ethnic greens and herbs available to them will influence their willingness to buy more of the ethnic greens and herbs; otherwise, 0.	80
3	AVAILABILITY	1 if the respondents think better access and wider variety to ethnic greens and herbs will influence their willingness to buy more of the ethnic greens and herbs; otherwise, 0	71
4	QUALITY	1 if the respondents think higher quality and fresher of ethnic greens and herbs will influence their willingness to buy more of the ethnic greens and herbs; otherwise, 0.	79
5	FOODSAFETY	1 if the respondents concerned about food safety issues relating to ethnic greens and herbs; otherwise, 0.	54
6	CONVIENCE	1 if the respondents think the ethnic greens and herbs are sold in packages rather than sold loose is a factor to affect their willingness to buy more of the ethnic greens and herbs, otherwise, 0.	37
7	ADPPA	1 if point-of-purchase ads, including price tag or produce identification as well as labels is an effective way to influence consumers' purchase decision, would influence decision to purchase ethnic greens and herbs; 0 if not	46
Purchase behaviours			
8	HOMEGROW	1 if the respondents grow ethnic greens and herbs for consumption at home, otherwise 0.	43
9	MTIME	On average, how many times a month do the respondents typically purchase ethnic greens and herbs? (No.)	3
10	NOSUB	1 if the respondents will not buy non-ethnic greens and herbs, if the ethnic greens and herbs are not available at the market where they usually shop, 0 if they will not.	42
11	LABELREAD	1 if the respondents read food labels, 0 if not	80
12	INCBUY	1 if the amount of ethnic greens and herbs that they purchase increase throughout the year, 0 if not	41
13	DISTANCE	The distance between respondents' home to the nearest ethnic grocery store (km)	8
14	ESTORE	1 if during the course of the year, they tend to buy ethnic greens and herbs in ethnic grocery stores; 0 if not	88
15	ALTERNATEUSE	1 means the respondents use traditional ethnic greens and herbs for natural remedies instead of health reasons. 0 if not because of natural remedies.	24
16	HEALTHUSE	1 means the respondents use traditional ethnic greens and herbs for health reasons; otherwise 0	30

Contd...

Table 1. Description of explanatory variables — *Contd.*

Sl No.	Variable	Description	Mean (Per cent)
Ethnicity related			
17	LANGUAGE	1 if the respondents speak ethnic language	95
18	USBORN	1 if the respondent born in US; 0 if not	19
19	LIVEYEAR	How many years have the respondents been living in US (years)	13
20	INDIAN	1 if the respondent belongs to Indian ethnic group, 0 otherwise	25
21	PUERTRIC	1 if the respondent belongs to Puerto Rico ethnic group, 0 otherwise	25
22	MEXICAN	1 if the respondent belongs to Mexican ethnic group, 0 otherwise	25
Demographic			
23	URBAN	1 if the respondents live in urban ; 0 otherwise	47
24	SUBURBAN	1 if the respondents live in suburban ; 0 otherwise	41
25	INCOME _{Less 20}	1 if household annual income range is less than \$20,000, 0 if not	33
26	INCOME _{20 to 40}	1 if household annual income range is between \$20,000 and \$39,999, 0 if not	20
27	INCOME _{40 to 60}	1 if household annual income range is between \$40,000 and \$59,999, 0 if not	13
28	INCOME _{60 to 80}	1 if household annual income range is between \$60,000 and \$79,999, 0 if not	8
29	EDU	1 if the respondent' highest level of education is higher than 12th grade, 0 otherwise	74
30	AGEG _{Less 20}	1 if the age range is less than 20 years, 0 if not	3
31	AGEG ₃₁₋₃₅	1 if the age range is 21 to 35 years, 0 if not	26
32	AGEG ₃₆₋₅₀	1 if the age range is 36 to 50 years, 0 if not	39
33	AGEG ₅₁₋₆₅	1 if the age range is 51 to 60 years, 0 if not	21
34	EMP	1 if the respondents are employed by someone else, 0 if not	51
35	SELFEMP	1 if the respondents are self-employed, 0 if not	8
36	MARRIAGE	1 if the respondent's marital status is married, 0 otherwise	67
37	GENDER	1 means female, 0 means male.	66
38	HOUSEHOLD	How many people live in the household (No.)	3.7
39	KIDNUMBER	How many of the people in household are age 17 or younger (No.)	1.2
40	VEG	1 if the respondent is a vegetarian, 0 if not	23

Results and Discussions

Table 2 shows the summary statistics of the sample. Females were the principal shoppers in all the ethnic categories with varying proportion for each ethnic subgroups: Puerto Ricans (72%), Mexicans (71%), Chinese (64%), and Asian Indians (57%). Pertaining to age distribution, 43 per cent of Asian Indians, and 49 per cent of Chinese were between 36 and 50 years of age and 49 per cent of Puerto Ricans, and 19 per cent of Mexicans were between 21 and 35 years of age categories. The average family-size was 3 for all ethnicities. Among them, 67 per cent of Mexican respondents had four to six family members, 66 per cent of Puerto Rican respondents had one to three

family members, 53 per cent of Asian Indians had four to six members and 50 per cent Chinese families had one to three members. These ethnic figures seem to correspond with the respective national average household size. In terms of education, nearly half of the Hispanic groups had the education level of less than the 12th grade (62% of Mexicans and 39% of Puerto Ricans), while more than 40 per cent of the respondents in the Asian groups had a post graduate or advanced degree (49% of Asian Indians and 40% of Chinese). Relating to income, 24 per cent of the Asian Indians and 11 per cent of the Chinese earned more than \$150,000 per year, while 59 per cent of the Mexicans and 53 of the Puerto Ricans belonged to less than \$ 20,000 income categories.

Table 2. Summary statistics of demographic characteristics of households

(in per cent)

Distribution of variable	Asian Indians	Chinese	Mexicans	Puerto Ricans	All
Gender					
Female	57	64	71	72	66
Male	43	36	29	28	34
Ranges of age					
Less than 20	1	3	5	3	3
21 to 35	25	12	49	19	26
36 to 50	43	49	37	28	39
51 to 65	22	26	8	29	21
Over 65	8	10	1	21	10
Level of education					
Less than 12th grade	0	5	62	39	27
High school graduate	9	19	30	36	24
2 year college degree	9	7	5	14	9
4 year college degree	33	29	2	8	18
Post graduate or advanced degrees	49	40	0	3	23
Number of family members					
1-3	44	50	20	66	45
4-6	53	49	67	30	50
7-9	3	1	10	4	4
10+	0	0	3	0	1
Annual income of household before taxes					
Less than \$ 20,000	6	7	59	53	33
\$ 20,000 to \$ 39,999	8	15	32	21	20
\$ 40,000 to \$ 59,999	15	12	7	17	13
\$ 60,000 to \$ 79,999	14	16	0	5	8
\$ 80,000 to \$ 99,999	10	13	1	1	6
\$ 100,000 to \$ 124,999	17	20	0	2	9
\$ 125,000 to \$ 149,999	8	7	.	1	4
\$ 150,000 to \$ 199,999	10	6	.	.	4
\$ 200,000 or more	13	5	.	.	4

The summary statistics of sample respondents' purchasing behaviours are presented in Table 3. The majority of respondents purchased ethnic greens and herbs one to five times in a month (89%) — the percentage was highest for Mexicans (91%), followed by Puerto Ricans (90%) and Asian Indians (88%), and the lowest was for Chinese (85%). A large section (24 – 42%) of the respondents of each ethnicity spent \$ 40 to \$ 80 for ethnic greens and herbs monthly. On an average, more than 60 per cent of the respondents spent \$ 25 or less on the ethnic greens and herbs. The average frequency of purchase was 4.2 times in a month, but

this varied among the ethnic groups; for example, Chinese shopped 4.7 times, Asian Indians 3.7 times, Mexicans 4.2 times, and Puerto Ricans 3.8 times in a month. Further, the ethnic greens and herbs expenditure per visit was almost same for all the ethnic groups; it being \$ 24 for Asian Indians, \$ 26 for Chinese, \$ 23 for Mexicans, and \$ 23 for Puerto Ricans.

Approximately 81 per cent of Mexicans, 75 per cent of Puerto Ricans, 56 per cent of Asian Indians, and 40 per cent of Chinese bought ethnic greens and herbs from a typical American grocery store. The ethnic outlets were most frequented with approximately 96

Table 3. Consumer's preference related to ethnic greens and herbs

(in per cent)

Particulars	Asian Indians	Chinese	Mexicans	Puerto Ricans	All
Monthly purchase frequency					
1-5	88	85	91	90	89
6-10	11	9	5	7	8
11-15	.	3	2	2	2
16+	1	3	2	0	2
Monthly expenditure					
\$1-\$39.99	4	14	11	9	11
\$40-\$79.99	24	31	25	41	31
\$80-\$119.99	27	31	37	29	32
\$120-\$159.99	15	12	22	15	16
\$160+	30	13	4	5	10
Expenditure per purchase visit					
1-25	66	63	66	66	65
26-50	31	35	39	32	34
50+	2	1	4	1	2
Visits in a month (No.)	3.7	4.7	4.2	3.8	4.2
Ethnic greens/Herbs expenditure per visit	\$24	\$26	\$23	\$23	\$24
Type of purchase stores					
Typical American Grocery	56	40	81	75	63
Ethnic grocery	96	96	86	76	88
Community farmers market	48	28	38	37	38
On-farm or road side stands	17	8	28	24	19
Pick own farms	8	8	16	10	10
Grown at home	42	46	52	32	43
Others	10	14	13	18	14
Proximity to the nearest ethnic grocery store	12.8	11.6	3.4	4.6	8
Willingness to buy					
Yes	81	70	76	73	75
No	11	16	18	21	17
Unsure	8	14	5	6	8

per cent of Chinese, 96 per cent of Asian Indians, 86 per cent of Mexicans, and 76 per cent of Puerto Ricans for purchase of ethnic greens and herbs. In terms of community farmers markets, 48 per cent of Asian Indians, 38 per cent of Mexicans, 37 per cent of Puerto Ricans, and 22 per cent of Chinese respondents sourced their ethnic greens and herbs from this venue.

In the case of on-farm markets or roadside stands, 28 per cent of Mexicans, 24 per cent of Puerto Ricans, 17 per cent of Asian Indians, and only 8 per cent of Chinese participated in buying ethnic greens and herbs

from these places. About 16 per cent of Mexicans, 10 per cent of Puerto Ricans, and about 8 per cent each of Asian Indians and Chinese respondents purchased ethnic greens and herbs from pick-your-own farm. Beside these channels, 52 per cent of Mexicans, 46 per cent of Chinese, 42 per cent Asian Indians, and 32 per cent of Puerto Ricans grew ethnic greens and herbs at home. The respondents had to travel, on average a distance which was 21 km for Asians, 19 km for Chinese, 8 km for Puerto Ricans, and 6 km for Mexicans to reach the nearest ethnic green store. Approximately 75 per cent of the purchasers in the

total sample were willing to buy organically grown ethnic greens and herbs, the Asians were at the lower extremes and Hispanics were at the higher extremes, relatively.

Empirical Results for Logit Model of WTP for Organic Ethnic Greens and Herbs

The description of logit model explanatory variables is presented in Table 1. Among all the independent variables, DISTANCE, LIVEYEAR, HOUSEHOLD and KIDNUMBER were continuous variables, while all other variables were binary dummy variables. The continuous variables have been explained in terms of average units; for example, the distance between respondents' home to the nearest ethnic grocery store is 13 km, on average. The binary dummy variables have been explained in term of percentage; for example, 88 per cent of the respondents were willing to buy organically grown ethnic greens and herbs from the ethnic grocery store.

The prediction success of logit model is presented in Table 4. With a 50-50 classification scheme, approximately 87.11 per cent of the individuals in the sample were correctly classified as those who place a high degree of importance on willingness to buy organic ethnic greens and herbs.

The empirical results of logit model are shown in Table 5. Out of 40 independent variables, 10 variables are statistically significant at least at 10 per cent level. The chi-square statistics exceeded its critical value and, thus, rejected the null hypothesis that none of the explanatory variables was statistically significant. Also, the model could achieve 87 per cent success in prediction rate.

Table 4. Predictive accuracy of logit model

Actual value	Predicted value		Corrected total
	0	1	
0	11 (0.98%)	118 (10.56%)	129 (11.54)
1	26 (2.33%)	962 (86.13%)	988 (88.46%)
Total	35 (3.31%)	1,082 (96.69)	1,117 (100.00%)

Number of correct predictions (11+962) =973;
Percentage of correct predictions= 87.11%

The marginal effects reported under the column (MF_OG) in Table 5, indicate the magnitude and direction of the impact of each independent variable on the willingness to buy organic ethnic greens and herbs. In general, ethnicity has a significant influence on the willingness to buy organically grown ethnic greens and herbs, which our model has also confirmed. However, compared to the Chinese, the other three ethnic groups have shown the negative signs — suggesting that they were less likely to buying organic ethnic greens and herbs because their selling price was more than of the traditional greens and herbs. Especially, the Mexicans were significantly less likely to buy organically grown ethnic greens and herbs compared to the Chinese. The variable, AVAILABILITY, has indicated that better availability and wider variety of organic ethnic greens and herbs would increase the probability of their buying by 7 per cent.

The factor FOODSAFETY was another reason to increased purchase of organic ethnic greens and herbs. More specifically, the variable increased the probability of willing to buy organic ethnic produce by 5.2 per cent. The variable, HEALTHUSE has shown that respondents who ate ethnic greens and herbs for health reason were more likely (8%) to buy organic ethnic greens and herbs. Those who read food labels were more likely to buy organic ethnic greens and herbs compared to the respondents who did not read the food labels. Further, distance from home to the nearest ethnic grocery store has shown a statistically significant negative effect on respondents' willingness to buy organic ethnic greens and herbs. For example, 1 more kilometre from home to the nearest ethnic grocery store would decrease the probability of buying organic ethnic produce by 9 per cent. Neighbourhood has been found another key factor, for instance, those who lived in a suburban were 7 per cent less likely to buy organic ethnic greens and herbs. This was seemingly correlated and perhaps was due to the large distance between home and the nearest ethnic grocery store.

As expected, household income played an important role in the willingness to buy organic ethnic greens and herbs. Those having income of less than \$ 20,000 and those with an income between \$ 20,000 and \$ 40,000 were 6.7 per cent and 11 per cent less likely to buy organic ethnic greens and herbs, respectively, compared to the respondents with annual

Table 5. Summary of estimation results of willingness to buy organically grown greens and herbs: Logit model estimates (Four ethnic groups)

Variable	Coef._OG	(SD)	MF_OG	(SD)
FAMILARITY	-0.300	(-0.202)	-0.044	(0.034)
AFFORDABILITY	-0.195	(-0.250)	-0.034	(0.040)
AVAILABILITY	0.398*	(-0.223)	0.072	(0.043)
QUALITY	0.259	(-0.253)	0.036	(0.046)
FOODSAFETY	0.496*	(-0.179)	0.052	(0.030)
CONVIENCE	0.155	(-0.186)	0.029	(0.032)
ALTERNATEUSE	0.112	(-0.212)	0.021	(0.030)
HEALTHUSE	0.488***	(-0.191)	0.081	(0.030)
AD PPA	-0.063	(-0.174)	0.021	(0.036)
HOMEGROW	0.325	(-0.212)	0.054	(0.034)
MTIME	-0.016	(-0.173)	-0.003	(0.030)
INCBUY	-0.198	(0.179)	0.077	(0.033)
LABELREAD	0.572**	(0.201)	0.004	(0.001)
NOSUB	0.228	(0.171)	0.123	(0.068)
DISTANCE	-0.021**	(-0.007)	-0.087	(0.061)
ESTORE	-0.227	(-0.317)	-0.041	(0.060)
INDIAN	-0.230	(-0.339)	-0.042	(0.065)
PUERTRIC	-0.402	(-0.297)	-0.070	(0.052)
MEXICAN	-0.679**	(-0.310)	-0.122	(0.057)
USBORN	0.118	(-0.241)	0.021	(0.043)
LANGUAGE	0.973	(-0.727)	0.128	(0.067)
LIVEYEAR	0.461	(-0.402)	0.075	(0.062)
URBAN	0.595	(-0.365)	0.099	(0.059)
SUBURBAN	-0.632**	(0.307)	-0.077	(0.048)
INCOME _{Less 20}	-0.592*	(-0.353)	-0.067	(0.037)
INCOME _{21 To 40}	-0.566*	(-0.326)	-0.110	(0.070)
INCOME _{41 To 60}	-0.269	(-0.206)	-0.046	(0.034)
INCOME _{60 To 80}	0.169	(-0.180)	0.030	(0.032)
AGEG _{LESS 20}	0.205	(-0.235)	0.034	(0.038)
AGEG _{21 To 35}	-0.005	(-0.009)	0.001	(0.002)
AGEG _{36 To 50}	-0.070	(-0.059)	-0.012	(0.010)
AGEG _{51 To 65}	0.008	(-0.084)	0.001	(0.014)
EDU	0.379	(-0.381)	0.071	(0.078)
EMP	0.195	(-0.245)	0.033	(0.040)
SELFEMP	0.602**	(-0.274)	0.094	(0.038)
MARRIED	0.048	(-0.306)	0.008	(0.052)
GENDER	0.314	(-0.351)	0.052	(0.056)
VEG	0.236	(-0.243)	0.015	(-0.009)
HOUSEHOLD	-0.007	(0.056)	-0.002	(0.014)
KIDNUMBER	0.080	(0.080)	0.020	(0.020)
Successful predication rates		87.11		
Pseudo R ²		0.079		
Overall model significance		0.000		

*P<0.10 **P<0.05 ***P<0.01

Note: *,** and *** denote significance at 10 per cent, 5 per cent and 1 per cent levels, respectively

household income of at least \$ 80,000. Furthermore, the respondents who were self-employed had a higher likelihood of buying organic ethnic greens and herbs.

Conclusions

This paper has identified the factors that influence consumers' willingness to buy organic ethnic greens and herbs, using logit model. The study has shown that the preferences for ethnic produce are different among the selected four ethnicity groups. While demographic characteristics have revealed that consumers' preferences towards organic ethnic greens and herbs are different among individuals, age is a significant determinant when the respondents make food purchase decisions. Moreover, job status and income status also play important roles. The assessment of perception of consumers' willingness to buy organic ethnic greens and herbs will help the producers, wholesalers, and retailers to target ultimate consumers and specific market segments. However, further research will be needed to examine the relationships between farm-size and location, land and operator characteristics, mix of products and marketing outlets, and relative costs and returns associated with farming of organic ethnic greens and herbs.

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