The Influence of Perceived Asian Vegetable Quality and Price Concerning the Purchase and Consumption Decisions of Asian Americans: A Case Study

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ABSTRACT—*Information concerning consumer attitudes toward Asian vegetables is not widely published or available. Many Asian crops are considered high-value produce and subsequently people are willing to pay more to purchase these vegetables. However, consumers and grocers alike have difficulty in predicting the vegetables preferred and desired by Asian Americans and therefore making conscientious efforts to obtain these vegetables with corresponding high quality is problematic. The purposes of the study were to identify the most popular Asian vegetables chosen by Asian consumers and to assess the relationships among the frequency of their choices and perceived quality and price. A self-administered questionnaire was developed to identify the most popular Asian vegetables by assessing consumer consumption frequency, perceived quality, and perceived value as measured by price perception of 31 identified Asian vegetables. Nappa cabbage, ginger, and mushroom were identified by the study participants as the most consumed Asian vegetables. The consumption of Asian vegetables was positively associated with perceived vegetable quality and negatively associated with perceived vegetable price.*

Keywords--- Asian Vegetables, Perceived Quality, Perceived Price, Vegetable Consumption, Ethnic Vegetables

1. INTRODUCTION

The United States is experiencing a broadening of its ethnic diversity (Parker, et al., 2007). In particular, people of Asian origin are one of the ethnic groups which are currently growing both in size and consumer influence. In the 2000 census, the growth of the Asian population at the national level was 3.6% (U.S. Census Bureau, 2000) and compared to the 1990 census data, the Asian population had increased about 48% in the last decade of the 20th century (Govindasamy et al., 2006). Most recently, according to the 2010 census, the Asian population has continued to grow at an even higher rate of 4.8% and 43.3% overall in the first ten years of the 21st century (U.S. Census Bureau, 2010). According to the profile developed by the Census Bureau's American Community Survey, the Asian American population in Ohio in 2000 was approximately 202,000 accounting for approximately 1.8 percent of Ohio's total population. Based upon post-2000 data from the same Community Survey, the Asian American population in Ohio has increased by 26.5 percent since the year 2000 (ODOD, 2007).

The Selig Center for Economic Growth at the University of Georgia found that the buying power of Asian Americans is expected to reach $752 billion in 2013. Over the 10 year period from 1990 to 2000, the buying power of Asian Americans more than doubled from $116 billion in 1990 to $269 billion in 2000. Compared to the 2013 projection, the future Asian American buying power will be more than 5 times greater than the 1990 figures and nearly triple to that of 2000 (Humphreys, 2008). The buying power of Asian Americans in Ohio was more than $1.8 billion in 1990 and $7.1 billion in 2000 revealing a 280 percent increase in Asian American buying power over 10 years in Ohio alone (Humphreys, 2008).

Investigating where this spending occurs reveals that one of the distinctive characteristics of Asian-origin consumers is the expenditure of more money on food (Humphreys, 2008). One explanation for this attribute is that culturally based

food habits are particularly difficult to change and people from other countries generally prefer their own food and more specifically fresh vegetables (Tubene, 2002). The demand for Asian vegetables by the Asian American population has steadily increased based their dietary preferences and their increased buying power (Tran et al., 2013). As such, there is some impetus in investigating which vegetables have the highest demand among Asian grocers and consumers so that this issue can be more fully understood. The following questions come to mind when exploring this topic: what vegetables would Asian Americans like to purchase but cannot; of those vegetables which are purchased, what is their perception of quality and/or price, and; which vegetables could be potentially produced by Ohio farmers assuring freshness and high quality? This strand of questioning leads not only to seeking to investigate and subsequently describe the possible supply and demand (consumption frequency) for Asian vegetables in Ohio by the Asian American community, but also to determine the factors of satisfaction associated with Asian vegetables such as price, quality, and availability. In the absence of previous information and literature which would provide answers to many if not all of the previous questions, this study was initiated.

1.1 Product Quality, Price, and Consumption

The relationship between product price and quality may be subsequently related to product consumption. Monroe (2003) found that product price may play a key role in consumer choice. Consumers commonly use price as a guide to budgetary considerations but also as an indicator to evaluate the quality of the product as well. Therefore, the role of price can either be a positive or negative influence depending on the research perspective employed. Marketing research is prone to focus on the positive role of price. In contrast, the economic theory associated with consumer behavior centers on the negative role of price (Volckner & Hofmann, 2007). In the recent decades, additional research has shown that there are other variables or factors which receive consumer attention. Perceived product quality, which is considered as a post purchase construct (Tsiotsou, 2005), is one of those variables. The role of perceived product quality on consumer attitudes has two aspects as well. Studies which have examined the effect of perceived product quality on purchase intentions and post-purchase satisfaction have received mixed results (Boulding et al., 1993; Sweeny et al., 1999; Tsiotsou, 2005). However, a review of literature reveals that few researchers have made an effort to examine the quality-price link in a wide variety of products. Generally, the perceived price-quality link has primarily focused on service, marketing, or brand related sectors rather than on consumer goods. A specific and unique category such as fresh produce including vegetables has not been rigorously investigated regarding the price-quality relationship. A study by Gerstner (1985) which attempted to examine the correlation between quality and price for 145 products provides a platform for researchers to postulate that the relationship between price and quality does exist and can be product and brand specific.

Consumers may perceive a positive relationship between price and quality for durable products. However, this may not be the case for non-durable products (Boyle & Lathrop, 2008). This study investigated attributes associated with Asian vegetables which would be considered non-durable products. Gregoire et al. (2005) found that the freshness which represents the quality of vegetables is the major key to successful sales. Unlike commodities that can be displayed on shelves for longer periods of time, the sales of all vegetables are time sensitive – especially as it relates to quality. From the perspective of consumers, if the quality of vegetables is high (i.e. fresh), they are more likely to consume those vegetables and vice versa. In addition, consumers tend to seek the lowest price possible while still satisfying their needs and are willing to purchase a product if the price of that product is "ideal" and below their budget allocation.

Ohio State University Extension (OSUE) (2009) noted that the demand for Asian crops in Ohio was rising due to the increasing cosmopolitan nature of the state and, as previously noted, the increase in the Asian American population in Ohio (ODOD, 2007). Although many Asian vegetables are suitable to be produced in Ohio, the Asian vegetables available for purchase in Ohio are mostly from California, Florida, and New Jersey (OSUE, 2009). Many Asian crops are considered high-value produce and subsequently people are willing to pay more to purchase these vegetables. Accordingly, being able to provide high-value products are regarded as a vehicle to reach economic sustainability for growers (Jensen, & Morkbak, 2013). However, consumers and grocers alike have difficulty in predicting the vegetables preferred and desired by Asian Americans and therefore making conscientious efforts to obtain these vegetables with corresponding high quality is problematic. As such, identifying the commonly consumed vegetables by Asian American residents in Ohio and the reasons for their preferences concerning these vegetables could illuminate the potential market opportunities for local growers.

2. PURPOSE AND OBJECTIVES

The major purpose of this study was to identify the most popular Asian vegetables consumed by Asian residents of Ohio. To address the vegetable purchase experience, this study also assessed consumption frequency of the vegetables, perceived vegetable quality, and perceived vegetable price. The following model was proposed.

$$C_i = \beta_0 + \beta_1 Q_i - \beta_2 \ln P_i + \varepsilon_i$$

$C_i = 1$, the consumption the *i*th vegetable is at least once weekly
0, the consumption is not at least once weekly

Q_i = the perceived quality of the *i*th vegetable
P_i = the perceived price of the *i*th vegetable

The perceived price was transformed into the natural logarithmic form because the variable would have the "increasing at a decreasing rate" form (Studenmund, 2006). More specifically, as the price of a particular vegetable becomes higher, the lesser consumers are willing to pay the price for that vegetable. The proposed model attempts to examine the relationships among perceived ethnic vegetable consumption, perceived quality, and perceived price. The following research questions were developed to guide the data collection, analysis, and presentation of findings for this study.

1. What is the frequency of consumption of selected Asian vegetables by Asian residents in Ohio?
2. What is the quality of Asian vegetables as perceived by Asian residents in Ohio?
3. What are the price factors of Asian vegetables as perceived by Asian residents in Ohio?
4. What is the nature of the relationships among consumption frequency, perceived vegetable quality, and perceived vegetable price?

3. METHODS

The study employed descriptive-correlational research methodology. A self-administered questionnaire was developed to identify the most popular Asian vegetables by assessing consumer consumption frequency, perceived quality, and perceived value as measured by price perception of identified Asian vegetables. Representative pictures of thirty-one identified Asian vegetables were presented to facilitate participant responses.

The face and content validity of the data collection instrument was collectively assessed by researchers and managers of grocery stores (n=7). The invitation of these individuals to participate on the panel of experts review was based on their knowledge of Asian vegetables, plant identification, and survey instrumentation. For the purpose of improving the instrument validity, the thirty-one vegetables represented by pictures in the survey instrument were also identified in English, Chinese, and Korean to facilitate participant response. Since each respondent would have their individual and unique selection(s) in terms of vegetable preferences and knowledge, reliability became irrelevant and as such no effort was made to establish instrument reliability.

The population for this study was Asian vegetable consumers in Ohio. The data was collected using face-to-face administration for two principal reasons. First, a complete population frame was both unknown and unavailable and as such, using the face-to-face data collection method was desirable (Salant & Dillman, 1994). Secondly, because the survey instrument was relatively complex (i.e., use of triple scales combined with the use of pictures of each vegetable), the presence of data collectors would provide necessary guidance to assist subjects in completing the questionnaire and in collecting meaningful data directly linked to the survey participants.

4. FINDINGS

4.1 Sample description

A total of 190 questionnaires were completed for this study. The average age of the surveyed respondents was 39 years old. The youngest age reported was 18 while the oldest age was 69 years old giving a range of 51 years. The average years of formal education held by respondents was 18.48 with a standard deviation of 3.34. Approximately 67% of the respondents were female and 33% were male. A total of 56% of the respondents were originally from China and Korea (28% each), approximately 38% of the respondents were from Taiwan, and the remaining 6% were from Japan, Thailand, Malaysia and Singapore. Eighty percent of the respondents were married while the remaining 20% indicated that they were single or non-married.

4.2 Consumption frequency of identified Asian vegetables

Table 1 shows the frequency of consumption of each of thirty-one identified vegetables included in the questionnaire as indicated by the study participants. Respondents answering 'yes' to this question on the survey were indicating that the specific vegetable was consumed at least once a week. If they answered 'no', then the vegetable was not consumed weekly. The most frequently consumed Asian vegetables indicated by the respondents were Nappa cabbage, ginger, Nappa cabbage (Chihili type), and mushroom. The least frequent consumed vegetables included lotus root, winter melon, radish sprout, vegetable sponge, burdock, taro, Tung Ho Choy/Chrysanthemum, and yam leaves.

Table 1: Consumption Frequency of Identified Asian Vegetables

Vegetable	f	%	Vegetable	f	%
1. Nappa cabbage			17. Kabocha		
At least once weekly	112	58.9	At least once weekly	32	16.8
Not at least once weekly	78	41.1	Not at least once weekly	158	83.2
2. Ginger			18. Long-purple-oriental Eggplant		
At least once weekly	108	56.8	At least once weekly	29	15.3
Not at least once weekly	82	43.2	Not at least once weekly	161	84.7
3. Nappa cabbage (Chihili type)			19. Snow Pea [a]		
At least once weekly			At least once weekly	25	13.2
Not at least once weekly	98	51.6	Not at least once weekly	165	86.8
4. Mushroom	92	48.4	20. Bamboo Shoot [a]		
At least once weekly			At least once weekly	22	11.6
Not at least once weekly	94	49.5	Not at least once weekly	168	88.4
5. Asian cucumber	96	50.5	21. Basil [a]		
At least once weekly			At least once weekly	20	10.5
Not at least once weekly	84	44.2	Not at least once weekly	170	89.5
6. Daikon Radish	106	55.8	22. Garlic Sprout		
At least once weekly			At least once weekly	20	10.5
Not at least once weekly	83	43.7	Not at least once weekly	170	89.5
7. Bok Choy	107	56.3	23. Bitter Melon		
At least once weekly			At least once weekly	17	8.9
Not at least once weekly	68	35.8	Not at least once weekly	173	91.1
8. Soybean Sprout	122	64.2	24. Lotus Root		
At least once weekly			At least once weekly	16	8.4
Not at least once weekly	62	32.6	Not at least once weekly	174	91.6
9. Soybean	128	67.4	25. Winter Melon		
At least once weekly			At least once weekly	11	5.8
Not at least once weekly	54	28.4	Not at least once weekly	179	94.2
10. Chinese Kale	136	71.6	26. Radish Sprout		
At least once weekly			At least once weekly	10	5.3
Not at least once weekly	53	27.9	Not at least once weekly	180	94.7
11. Leek	137	72.1	27. Vegetable Sponge		
At least once weekly			At least once weekly	8	4.2
Not at least once weekly	49	25.8	Not at least once weekly	182	95.8
12. Mung Bean Sprout	141	74.2	28. Burdock [a]		
At least once weekly			At least once weekly	8	4.2
Not at least once weekly	43	22.6	Not at least once weekly	182	95.8
13. Oriental Celery	147	77.4	29. Tung Ho Choy (Chrysanthemum)		
At least once weekly			At least once weekly	8	4.2
Not at least once weekly	42	22.1	Not at least once weekly	182	95.8
14. Rape	148	77.9	30. Taro		
At least once weekly			At least once weekly	7	3.7
Not at least once weekly	39	20.9	Not at least once weekly	183	96.3
15. Gai Choy; Mustard Green	151	79.1	31. Yam Leaves [a]		
At least once weekly			At least once weekly	2	1.1
Not at least once weekly	36	18.9	Not at least once weekly	188	98.9
16. Kong Shin Choy/Water Convolvulus	154	81.1			
At least once weekly	32	16.8			
Not at least once weekly	158	83.2			

4.3 Perceived Quality of Identified Asian Vegetables

Table 2 presents the average scores of each of the vegetables concerning their perceived quality as indicated by the respondents. Vegetables with higher quality scores (above average) were Nappa cabbage -Chihili type (mean = 3.37, s.d. = .78), mushroom (mean = 3.32, s.d. = .73), soybean (mean = 3.31, s.d. = .63), kabocha (mean = 3.29, s.d. = .72), leek (mean = 3.26, s.d. = .74), garlic sprout (mean = 3.26, s.d. = .76), Chinese kale (mean = 3.25, s.d. = .68), and Daikon radish (mean = 3.24, s.d. = .68). In general, the respondents' perception concerning the quality of Asian vegetables was about average perhaps indicating that quality is not as influential concerning consumer choices as indicated by Gregoire et al. (2005).

Table 2: Scores of Perceived Quality of Identified Vegetables

	Vegetable: Perceived Quality	mean	s.d.	n	"Don't Know" Answered
1	Nappa Cabbage (Chihili type)	3.37	.78	158	32
2	Mushroom	3.32	.73	169	21
3	Soybean	3.31	.63	146	44
4	Kabocha	3.29	.72	136	54
5	Leek	3.26	.74	155	35
6	Garlic Sprout	3.26	.76	111	79
7	Chinese Kale	3.25	.68	122	68
8	Daikon Radish	3.24	.68	170	20
9	Basil	3.22	.73	111	79
10	Snow Pea	3.20	.56	119	71
11	Nappa Cabbage	3.19	.67	176	14
12	Bok Choy	3.19	.71	151	39
13	Radish Sprout	3.18	.64	62	128
14	Asian Cucumber	3.17	74	166	24
15	Ginger	3.17	.78	172	18
16	Burdock	3.16	.67	77	113
17	Oriental Celery	3.14	.76	142	48
18	Rape	3.13	.52	101	89
19	Gai Choy; Mustard Green	3.11	.62	121	69
20	Mung Bean Sprout	3.10	.74	161	29
21	Taro	3.08	.81	100	90
22	Kong Shin Choy/Water Convolvulus	3.07	.74	128	62
23	Winter Melon	3.06	.60	100	90
24	Long-purple-oriental Eggplant	3.05	.72	157	33
25	Tung Ho Choy/Chrysanthemum	3.05	.78	111	79
26	Soybean Sprout	3.00	.76	152	38
27	Vegetable Sponge	2.95	.69	91	99
28	Bitter Melon	2.95	.73	110	80
29	Lotus Root	2.95	.84	127	63
30	Bamboo Shoot	2.95	.86	136	54
31	Yam Leaves	2.94	.83	52	138

0 = Don't Know; 1 = Poor; 2 = Low; 3 = Average; 4 = High; 5 = Excellent

4.4 Perceived Price of Identified Asian Vegetables

The average score addressing the respondent's perception of value as it relates to price is presented in Table 3. It shows that the vegetables with a higher perceived price consisted of garlic sprout (mean = 3.74, s.d. = .77), kong shin choy/water convolvulus (mean = 3.60, s.d. = .70), vegetable sponge (mean = 3.56, s.d. = .70), bamboo shoot (mean = 3.54, s.d. = .81), tung ho choy/chrysanthemum (mean = 3.52, s.d. = .79), lotus root (mean = 3.51, s.d. = .69), and burdock (mean = 3.50, s.d. = .71). Among the 31 Asian vegetables included in the survey, only Nappa cabbage -- Chihili type (mean = 2.87, s.d. = .77), mung bean sprout (mean = 2.88, s.d. = .68), and soybean sprout (mean = 2.99, s.d. = .71) were rated as having a below average price. In general, the respondents indicated that the price of Asian vegetables was slightly higher than average.

Table 3: Scores of Perceived Price of Identified Vegetables

	Vegetable: Perceived Price	mean	s.d.	n	"Don't Know" Answered
1	Garlic Sprout	3.74	.77	103	87
2	Kong Shin Choy/Water Convolvulus	3.60	.70	124	66
3	Vegetable Sponge	3.56	.70	85	105
4	Bamboo Shoot	3.54	.81	124	66
5	Tung Ho Choy/Chrysanthemum	3.52	.79	105	85
6	Lotus Root	3.51	.69	118	72
7	Burdock	3.50	.71	66	124
8	Yam Leaves	3.49	.99	51	139
9	Mushroom	3.42	.79	163	27
10	Basil	3.40	.81	97	93
11	Winter Melon	3.38	.73	97	93
12	Taro	3.38	.76	95	95
13	Bitter Melon	3.32	.71	102	88
14	Snow Pea	3.31	.69	116	74
15	Radish Sprout	3.30	.75	64	126
16	Long-purple-oriental Eggplant	3.28	.58	150	40
17	Leek	3.25	.76	142	48
18	Gai Choy; Mustard Green	3.24	.70	110	80
19	Asian Cucumber	3.22	.67	160	30
20	Chinese Kale	3.21	.59	115	75
21	Rape	3.21	.64	99	91
22	Oriental Celery	3.14	.67	136	54
23	Kabocha	3.14	.72	131	59
24	Bok Choy	3.09	.78	140	50
25	Ginger	3.08	.75	165	25
26	Daikon Radish	3.05	.69	163	27
27	Soybean	3.04	.62	137	53
28	Nappa Cabbage	3.01	.77	168	22
29	Soybean Sprout	2.99	.71	144	46
30	Mung Bean Sprout	2.88	.68	155	35
31	Nappa Cabbage (Chihili type)	2.87	.77	152	38

0 = Don't Know; 1 = Bargain; 2 = Low; 3 = Average; 4 = High; 5 = Costly

4.5 Analysis of Perceived Quality, Perceived Price, and Consumption Frequency

Vegetables with the highest rate of consumption frequency were selected to test the nature of the relationships among consumption frequency, perceived vegetable quality, and perceived vegetable price. Logistic regression was chosen to analyze the data because the outcome variable, vegetable consumption, was dichotomous. The selected vegetables of nappa cabbage, ginger, nappa cabbage (Chihili type), mushroom, Asian cucumber, daikon radish, Bok choy, and soybean sprout were chosen due to the consideration of variance and their status as the most consumed Asian vegetables according to the respondents. The results of the logistic regression model are presented in Table 4.

The regression models were assessed by the Hosmer-Lemeshow goodness-of-fit test (Asian Cucumber: Chi-square = 2.72; Bok Choy: Chi-square = 6.24; Daikon Radish: Chi-square = 1.70; Ginger: Chi-square = 5.11; Mushroom: Chi-square = 3.32; Nappa Cabbage: Chi-square = 8.22; Nappa Cabbage – Chihili type: Chi-square = 11.88; Soybean Sprout: Chi-square = 1.30). None of the above values were significant. The test statistics used to determine the significance of coefficients was the Wald test (Table 4). All coefficients were positive on the perceived quality variable and negative on the perceived price variable. None of the perceived quality variables were significant. However, the coefficients for the perceived price variable were significant on five vegetables. These vegetable were bok choy, ginger, mushroom, nappa cabbage, and nappa cabbage (Chihili type). These results indicate that the price of the above five Asian vegetables as perceived by consumers had a significant effect on vegetable consumption, while perceived vegetable quality did not.

Table 4: Logistic Regression Results for Asian Vegetable Consumption

Variables	Log-odds (β_k)	Std. Error	Odds Ratio (OR)	95% CI For OR	Wald Statistic
Asian Cucumber					
Perceived Quality	.43	.23	1.54	.99 – 2.41	3.66
Perceived Price	-.82	.74	.44	.10 – 1.88	1.23
Intercept	-.43	1.12	.65		.15
Bok Choy					
Perceived Quality	.07	.25	1.08	.66 – 1.77	.08
Perceived Price	-1.31*	.65	.27	.08 - .97	4.04
Intercept	1.03	1.06	2.79		.94
Daikon Radish					
Perceived Quality	.39	.24	1.48	.92 – 2.38	2.61
Perceived Price	-.87	.66	.42	.12 – 1.52	1.76
Intercept	-.48	1.02	.62		.22
Ginger					
Perceived Quality	.16	.23	1.18	.75 – 1.84	.52
Perceived Price	-1.98*	.72	.14	.03 – .56	7.61
Intercept	2.04	1.01	7.72		4.07
Mushroom					
Perceived Quality	.17	.69	1.19	.77 – 1.83	.59
Perceived Price	-1.69*	.22	.19	.05 - .72	5.94
Intercept	1.62	1.10	5.08		2.20
Nappa Cabbage					
Perceived Quality	.15	.24	1.16	.73 – 1.85	.38
Perceived Price	-1.40*	.64	.25	.07 - .87	4.77
Intercept	1.58	1.07	4.88		2.20
Nappa Cabbage--Chihili type;					
Perceived Quality	.07	.25	1.07	.66 – 1.73	.08
Perceived Price	-2.46**	.73	.09	.02 - .36	11.36
Intercept	2.76	1.08	15.81		6.59
Soybean Sprout					
Perceived Quality	.39	.25	1.47	.91 – 2.38	2.48
Perceived Price	-1.19	.63	.30	.09 – 1.05	3.56
Intercept	-.33	.87	.72		.15

Asian Cucumber (n=160); Bok Choy (n=140); Daikon Radish (n=163); Ginger (n=165); Mushroom (n=163); Nappa Cabbage (n=168); Nappa Cabbage – Chihili type (n=152); Soybean Sprout (n=144)
* $p < .05$, ** $p < .01$

5. CONCLUSIONS AND IMPLICATIONS

5.1 Conclusions

The study was an effort to identify frequently consumed Asian vegetables and to describe the relationships among consumption frequency, perceived vegetable price, and perceived vegetable quality. According to the findings of the study, Nappa cabbage, ginger, Nappa cabbage (Chihili type), and mushroom were the most consumed Asian vegetables in the survey area of Columbus, Ohio. More than 50% of the respondents indicated that the above vegetables were frequently consumed. The consumption of Asian vegetables was positively associated with perceived vegetable quality and negatively associated with perceived vegetable price in this study. The respondents might be more likely to seek a lower price in terms of their desire for Asian vegetables. Since the sales of the vegetables used in this study were on open shelves and the perceived quality was not a major factor concerning Asian vegetable consumption, a plausible explanation could be that consumers were able to visually and directly inspect the freshness of the vegetables and could subsequently disregard or "sort" those with lower quality and purchase the higher quality ones while still paying what they perceived as a fair price. Coulibaly et al. (2011) noted that consumers valued vegetable external and visible characteristics and such characteristics might include free from damage, freshness, size, or color. Another explanation could be that consumers were likely to assess their purchase options. For example, when the price of a particular vegetable was high and alternatives for its replacement were available and the price was perceived as better or more affordable, they may decide to select an alternative over the more expensive first choice.

5.2 Implications

Information concerning consumer attitudes toward Asian vegetables is not widely published or available (OSUE, 2009) and no previous study has focused on the investigation of fresh vegetable consumption specific to Asian

Americans. The results of this study provide an empirical knowledge base concerning Asian vegetable consumption by this unique yet expanding segment of the U.S. population. Although the results of the study imply that price may be a key to Asian vegetable selection and subsequent consumption, further studies are recommended to confirm the strength of this relationship.

Asian vegetables are niche products (Tubene, 2002; OSUE, 2009; Adekunle, et al., 2013). How these types of crops can be initiated and established in the American farm production cycle and then connected to the marketplace requires a knowledgeable commitment by local communities and Cooperative Extension professionals. Information concerning the planning, use, networking, and marketing of Asian Vegetables to those who may use and benefit from the information is important to meet both the supply and demand areas of this unique area. Of course, Extension professionals need to first gain the interest and support of local growers to develop viable diffusion and adoption strategies customized to their individual farming operations. That is, growers should be provided with various agricultural production and marketing options to help meet their own situations as well as meeting the needs of their prospective clientele (University of Kentucky Cooperative Extension Service, 2010). In sum, ethnic produce presents a good opportunity for Ohio growers because many are high-valued, sought after by a growing population, can be used for a double crop situation, and farmers may capture a market which shows great potential. Most importantly, many local markets are still untapped. To gain an even broader picture of the market for the produce studied in this research, data from restaurants that also use them and display similar consumer attitudes should be collected to provide a greater understanding of this area of investigation.

6. References

[1] Adekunle, B., Filson, G., & Sethuratnam, S. (2013). Immigration and Chinese food preferences in the Greater Toronto Area. *International Journal of Consumer Studies, 37*(6), 658-665. DOI: http://dx.doi.org/10.1111/ijcs.12051

[2] Boulding, W., Staelin K. A., and Zeithaml, V. A. (1993). A dynamic process model of Service quality: From expectations to behavioral intentions. *Journal of Marketing Research, 30*: 7-27. http://dx.doi.org/10.2307/3172510

[3] Boyle, P. J., & Lathrop, E. S. (2008). Are consumers' perceptions of price-quality relationships well calibrated? *International Journal of Consumer Studies, 33*: 58-63. http://dx.doi.org/10.1111/j.1470-6431.2008.00722.x

[4] Coulibaly, O., Nouhoheflin, T., Aitchedji, C. C., Cherry, A. J., and Adegbola, P. (2011). Consumers' perceptions and willingness to pay for organically grown vegetables. *International Journal of Vegetable Science, 17*(4), 349-362. http://dx.doi.org/10.1080/19315260.2011.563276

[5] Gerstner, E. (1985). Do higher prices signal higher quality? *Journal of Marketing Research, 22*: 209-215. http://dx.doi.org/10.2307/3151366

[6] Gregoire, M. B., Arendt, S. W., & Strohbehn, C. H. (2005). Iowa producers'perceived Benefits and obstacles in marketing to local restaurants and institutional foodservice operations. *Journal of Extension [On-line], 43*.Article 1RIB1. URL http://www.joe.org/joe/2005february/rb1.php (accessed on July 1st, 2009).

[7] Govindasamy, R., Nemana, A., Puduri, V., & Pappas, K. (2006). Ethnic produce marketing in the mid-Atlantic states: Consumer shopping patterns and willingness-to-pay analysis. *Choices, 21*: 237-242.

[8] Humphreys, J. M. (2008). *The multicultural economy*. Athens, GA: The University of Georgia, Selig Center for Economic Growth.

[9] Jensen, J. D., & Morkbak, M. R. (2013). Role of gastronomic, externality and feasibility attributes in consumer demand for organic and local foods: The case of honey and apples. *International Journal of Consumer Studies, 37*(6), 634-641. http://dx.doi.org/10.1111/ijcs.12049

[10] Monroe, K. B. (2003). *Pricing: Making profitable decision*. Boston, MA: McGraw Hill.

[11] Ohio Department of Development. (2007). *Ohio Asian Americans*. Columbus, OH: Ohio Department of Development.

[12] Ohio State University Extension. (2009). Asian vegetables. In Ohio State University Extension (Ed.). *2009 Ohio vegetable production guide* (pp. 80-84). Columbus, OH: Ohio State University Extension.

[13] Parker, S., Pinto, V., Kennedy, T., Phelps, J. A., & Hermann, J. R. (2007). Food choices and coping strategies during periods of perceived food shortage: Perspectives from four racial/ethnic groups. *Journal of Extension* [On-line], *45*Article 5FEA6. URL http://www.joe.org/joe/2007october/a6.php (accessed on October 1st, 2010).

[14] Salant, P., and Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley & Sons.

[15] Sweeny, J. C., Soutar, G. N., and Johnson, L. W. (1999). The role of perceived risk in the quality-value relationship: A study in a retail environment. *Journal of Retailing, 75*: 77-105. http://dx.doi.org/10.1016/S0022-4359(99)80005-0

[16] Tran, T. V., Vatcher, R., Lee, H. N., Phan, P. T., and Nguyen, T. N. (2013). Household income and vegetable consumption among White, Chinese, Korean, and Vietnamese Americans. *International Journal of Social Science Studies, 1*(2), 31-43. http://dx.doi.org/10.11114/ijsss.v1i2.111

[17] Tsiotsou, R. (2005). Perceived quality levels and their relation to involvement, satisfaction, and purchase intentions. *Marketing Bulletin, 16*,1-10.

[18] Tubene, S. (2002). *Agricultural and demographic changes in the Mid-Atlantic region: Implications for ethnic and specialty produce*. Maryland Cooperative Extension fact sheet 793.

[19] United States Census Bureau. (2010). *U.S. Census*. Washington D.C.: United States Department of Commerce.

[20] United States Census Bureau. (2000). *U.S. Census*. Washington D.C.: United States Department of Commerce.

[21] University of Kentucky Cooperative Extension Service. (2010). *Ethnic vegetables: Asian*. University of Kentucky Cooperative Extension Service, College of Agriculture, Lexington.

[22] Volckner, F., & Hofmann, J. (2007). The price-perceived quality relationship: A meta-analytic review and assessment of its determinants. *Marketing Letters, 18*, 181-196. http://dx.doi.org/10.1007/s11002-007-9013-2