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**Willingness to Pay for Niche Fresh Produce across the States:
Why Are Consumers Willing to Pay More for the Less
Favorite?**

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Willingness to Pay for Niche Fresh Produce across the States: Why Are Consumers Willing to Pay More for the Less Favorite?

Abstract

Willingness to pay (WTP) has been one of the most widely used methodologies to reveal consumer preference. In this study, we assess the consumer's preference for several types of fresh strawberry, including organic, locally produced, naturally grown, GMO-free, and estimate the corresponding WTP through the method of open-ended contingent valuation (CV). Results showed that although consumers generally preferred locally produced and naturally grown over organic, however, WTP for organic was oppositely higher than locally produced and naturally grown. Furthermore, this disparity was indicated not to be homogenous across all regions based on our national survey.

Keywords: *WTP, preference, disparity, locally produce, organic, region.*

Introduction

In the past few decades, with the advancing technology and easier access of international market, the crop yield has been increased steadily and food trade has been expanded. Both phenomenon were associated with the possibility of a decline in the crop unit price, which forced the farmers to think out more ways to develop value-added agricultural products. On the other hand, with people's ever increasing awareness and desire to eat and drink health, food produced using conventional techniques with massive usage of chemical fertilizer and pesticide seem no longer fully satisfying consumers various needs for food safety, dieting and nutrition. On this regard, to develop a new niche market with value-added, high quality food product seems to be promising for both producers and consumers. However, to build a sustainable suitable market is a difficult job, as consumers in different countries, with different beliefs and background may have significant different preference for food attributes. Therefore, previous researchers have conducted a vast of studies to deal with the relationship between consumers' social-demographics and their preference for different attributes of various food commodities.

The subject of this study is fresh strawberry, one representative fresh produce in the U.S. market. The United States is one of the world's largest producers of fresh strawberry, with a production of 29.4 million CWT in 2011, accounting for over 40 percent of the total global production (FAOStat). Within the states, strawberry was one of the major fruit crop grown in California and Florida. Primarily, California has been the nation's leading strawberry producer with a close eighty percent production of the national total. In certain year like 2012, this percentage even reached to over ninety (USDA). Worldwide, U.S. strawberry industry exported 3.55 million CWT (about 11.8% of its own production) to the world while nearly 86 percent reached Canada. Mexico was the second largest receiver of the U.S. exports. The United States was not only the leading strawberry producer country, but also the fourth largest importer of fresh strawberries (Naeve et al. 2014). Strawberry is one of most popular fresh fruits in the United States (Diane Huntrods 2013).

Although fresh strawberry was favored in the country, American consumers were no longer satisfied by purely those large deep red strawberries in good shape, though these were still important attributes when purchasing. They paid more attention to those intangible attributes such as whether the berries were more nutritious, used non-chemical cultivation method, or with less

fertilizer. These innovative demands were commensurate with consumers' ever enhanced awareness for healthy eating habits. Currently, the fresh strawberry in the U.S. market can be categorized using different criterion. One important method of classifying is by the certification of cultivation method. More specifically, berry can be classified as organic¹, locally produced², naturally grown³, and conventional (also known as GMO-free⁴). Different strawberry may have different strengths and short comings. There were no quick conclusions that which one is the best one, since different consumers may have different opinions of importance on the attributes, especially when price is included for consideration. Furthermore, the distinct geographical difference and intricacy of consumers' background even within the same region further aggravate the difficulty to decide the winner product for the entire nation.

The objective of the project is to elicit American consumers' preference and WTP for strawberries labeled as organic, locally produced, naturally grown, and GMO-free. We intend to find out whether the preference for some certain products was consistence among all the regions where we collected data from. Since the preference was studied across lands, local produced becomes a changing concept and may have interesting results depending on where the participants originally came from. It would be reasonable if consumers in California showed stronger preference for locally produced than these from New York, since California is famous for producing most of the nation's fresh strawberry while New York may never produce such crop. On this regard, the comparison of locally produced and other types of strawberry become another focus of the study. If a disparity in preference was found, the reasons which we tried to explore may be helpful to the U.S. strawberry and fresh produce industries for making adaptable strategy in the national market.

¹ Organic strawberry is produced using methods of organic farming-with limited modern synthetic inputs such as synthetic pesticides and chemical fertilizers, through organic pesticides, such as Bt toxin, are still used.

² Locally produced strawberry has different meanings while usually is defined as strawberries produced within 400 miles as it is marketed.

³ Naturally grown strawberry is certified by a non-profit alternate farm assurance certification program, created for small-scale organic farmers, and striving to strengthen the organic movement by preserving high organic standards and removing financial barriers that tend to exclude smaller farms that are selling locally and directly to their customers.

⁴ GMO-free strawberry is produced without GMO technology, which is defined as produced from organisms that have had specific changes introduced into their DNA using the methods of genetic engineering. These techniques have allowed for the introduction of new crop traits as well as a far greater control over a food's genetic structure than previously afforded by methods such as selective breeding and mutation breeding.

Literature Review

To reveal consumers preference, contingent valuation (CV) and WTP estimators have been one of the most popular methods in this area, although they have been doubted and challenged by many economists (Cummings et al. 1986; Dwyer, Kelly, and Bowes 1977). Previous studies have pointed out that in addition to the hypothetical bias associated with open-ended WTP; there exists disparity between WTP and willingness to accept (WTA) (Coursey, Hovis, Schulze 1987; Dubourg, Jones-Lee, and Loomes 1994). However, due to the characteristics of simplicity and easiness to apply to the online and mail survey, many researchers still preferred this method (Brookshire 1983; Cummings et al. 1986; Hanemann 1994). Kealy and Turner (1993) confirmed that there were no significant difference in WTP estimators between close-ended and open-ended context. Besides, researchers thus, thought out way to minimize the WTP estimators in order to better reveal true preference, like using Vickrey auction (Sayman and Onculer 2005), providing consumers with real incentives (Dubourg et al. 1994), and sequential bid (Loureiro McCluskey 2002; Lusk 2003). In addition, cheap talk was also applied to minimize the hypothetical bias (Carlsson and Martinsson 2006; Lusk 2003; Murphy et al. 2005). In this study, we decided to employ the open-ended CV, WTP to as one method to examine the preference, and use reference prices as a cheap talk, after giving the participants clear definition of the strawberry. On the other hand, based on the methods of some other researchers (Bouyssou 1992; Cook and Kress 1985; Furnkranz and Hullermeier 2003; Pierro et al. 2007), we let the participants rank the commodities based on their true preference as another way to reveal consumer preference. If disparity existed between the WTP estimators and preference ranking, we intended to look into the commodity to explore whether the discordance came from the bias or some other reasonable factors behind.

The subject of niche market has been a heated topic on recent studies and literature in this field. Many of them dealt with consumer social-demographics and their WTP for fresh produce with value-added labels. Among them, a vast of literature has focused on the comparison of local versus organic (Adams and Salois 2009; James and Rickard 2009; Yue and Tong 2009). Some studies extended the results and made more comparisons including GMO-free and natural (Bellows, Alcaraz and Hallman 2010; Onken and Bernard 2011). Previous literature has suggested that people bought organic and natural fresh produce mainly because they perceived the products to be healthier and more nutritious (Batte et al. 2007; de Magistris and Gracia 2008; Hughner et al.

2007). Consumers also claimed supporting local economy as one of the reasons to purchase local food, in addition for health (Feenstra 1997; Hinrichs et al. 2000; Winter 2003). Noticeably, local food were not all necessarily to be produced organically. Locally produced food could be grown with conventional production method (Yue and Tong 2009). However, research has also stated there existed a wrong perception of “all local food were organic” among some consumers (Born and Purcell 2006). These consumers mistakenly thought that all local food must be produced with organic cultivation method, and thus preferred local food since there were other benefits associated with it such like supporting the local economy and easy accessibility.

In addition, researchers also found that routine demographics such like age, income and education significant in affecting WTP for value-added food (Loureiro and Hine 2002; Yue and Tong 2009). However, it seems that studies were mostly focused on consumers from one region, or some regions, and failed to pay attention to the possible effect of region on the consumer's preference. Although, in some studies (Groote et al. 2010; Stefani et al. 2006), it has been indicated that consumers from different places/regions/states, may have distinct various preference, the researchers failed to explore how the region affected consumers' preference. In this study, we are going to put region on the table and investigate the preference among different regions across the United States.

Data

A national representative sample of about two thousand four hundred valid participants in the United States was collected via online survey during June and July of 2014. A valid participant must be elder than 17 years old in age, be the primary shopper of food for the family, and have purchased fresh strawberry in the past six months. The survey was made up by four major parts. Part I mainly concerned about the social-demographics of the participants. Part II concerned about the general purchasing habit and behavior towards fresh strawberry. Part III explored consumers' knowledge and perception of different fresh strawberry. Part IV examined the preference and WTP for these berries.

The social-demographics of the sample were concluded in Table 1. Around 56.1% of the total participants were female and participants distributed relatively evenly in every age category. Over

74.2% of the total sample was Caucasians, which was consistent with the whole U.S. population distribution⁵. Over half (around 52.7%) of the participants were married or remarried while about 28.3% remained single. Full-time employment accounted for the most part of the participants in the sample (42.0%), with 21.6% retired and 12.8% par-time employed. The median of education level of participants in our study fell in some college (or equivalent) and the average household income was about \$59,276. Over half (around 64.1%) of the family currently did not have kids in the household.

As in all survey, researchers always concerned about whether the sample was sufficient or representative enough. Based on the results of general demographics, and the comparison with the national census data, the sample may exist some bias since we wanted to focus on the primary shoppers of the family and those consumers who at least bought fresh strawberries in the past six months. However, as for the purpose of this study, the sample was perfectly fit though it is noticeable that the results may not necessarily suit to apply to the whole population of the United States.

Methodology and Model Specification

To explore the preference for four types of strawberries: organic, locally produced, naturally grown, and GMO-free, participants were asked to indicate the ranking of the berries based on their level of likeness. Prior to the questions, the consumers were informed about the clear definition of each kind and still had the access to the definition when they ranked the berries. After the ranking, open-ended contingent valuation method (CVM) was used to estimate consumer willingness to pay for a 16oz clamshell package of the four types of berries. The berries were presented randomly to reduce the order effect that may associate with fixed ordering. To reduce hypothetical bias and the difficulty related to the “name your own price” task, a cheap talk script was used and the reference price of conventional fresh strawberries was also provided.

To compare the preference and WTP of each state is a difficult task since we had participants from 52 states across the country. Considering states that were close in geography and similar in

⁵ Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2012 and 2013 Current Population Survey (CPS: Annual Social and Economic Supplements).

economy may have similar preference, we employ the Bureau of Economic Analysis (BEA Regions 2004) regions to divide the whole countries into eight parts including New England, Mideast, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, Far West (Table 2). Eight dummy variables were correspondingly created to represent the origin of each participant.

A system equation of WTP for four types of strawberries with different certifications was estimated. These equations were estimated with multinomial tobit model to take account the potential correlations in the error terms of equations and adjust the censored WTP if a large number of zero WTP exist. Particularly, the WTP for the organic strawberry can be defined as:

$$WTP_{i,Organic} = \alpha_i + \beta_i \cdot X_i + \delta_i \text{Preference}_{i,Organic} + \theta_i \text{Region}_i + \partial_i \text{Preference}_{i,Organic} * \text{Region}_i + \varepsilon_i$$

where X_i is a vector of knowledge, purchase habit/behavior, and demographic variables, $\text{Preference}_{i,Organic}$ is a vector variable indicating the ranking of organic strawberry, and Region_i is a dummy variable indicating the region where the consumer came from. The effects of preference can be measured by δ_i , the influence of region can be measured by θ_i , and ∂_i indicates whether there were interaction effects between preference and region.

Results

Preference and WTP estimates

Preference for the four types of fresh strawberries was indicated in Figure 1. The percentage was the total probability that consumers ranked the corresponding product as the most favored and second favored one. From the figure, it is obvious that consumers generally preferred locally produced and naturally grown over organic, followed by GMO-free across all the regions. Although there was discrepancy of preference between locally produced and naturally grown depending on which region was the target, they both have overwhelming advantages over organic and GMO-free across all regions.

However, as for the WTP estimates across the regions showed in Figure 2, the WTP were not very consistent with the preference of ranking. As it was indicated by the figure that the total average WTP for organic was the highest among the four as of \$3.14, followed by naturally grown with \$3.10, and followed by locally produced (\$3.04) and GMO-free (\$2.91). Across the regions,

notice that in New England, locally produced exceeded organic in the WTP, and it was the only region that showed such consistency with the ranking of preference. Southeast, similar as New England, where consumers showed strong preference towards local and natural strawberry according to the ranking, on the opposite, had the highest WTP for organic among all the regions (\$3.25), which was relatively much higher than their WTP for locally produced (\$3.09).

Regression of WTP estimates

The significant variables of regression of WTP for GMO-free berries included employment, income, knowledge, preference for locally produced and naturally grown (Table 3). None of the region factors were significant on this regard. Consumers with higher income and better knowledge about fresh strawberry were generally willing to pay more for the GMO-free strawberry. Notice that consumers who ranked higher of locally produced and naturally grown would generally willing to pay less for the GMO-free strawberry.

For the regression of WTP for Organic, significant variables were age, income, strawberry expenditure, knowledge, and preference for organic and locally produced. Consumers with more income, higher strawberry expenditure and better knowledge about fresh strawberry were generally willing to pay more for the organic strawberry. Notice in addition to the preference for organic strawberry, which has a positive significant effect on the WTP, the preference for locally produced has a negative effect. It indicated that people who preferred locally produced and ranked it higher in preference, would be significantly willing to pay less for the organic counterpart.

For the WTP for locally produced, it has most number of significant variables. They included age, income, strawberry expenditure, knowledge, and preference for organic and locally produced, as well as two region factors. Similar as previous results, consumers with higher income, better knowledge and higher fresh strawberry expenditure would have higher WTP for locally produced strawberry. Interestingly, on the contrary to the results of WTP for organic ones, the preference for both organic and locally produced had positive effects on the WTP for locally produced. It is also indicated that consumers in Southwest and Far West area would have significant lower WTP for locally produced strawberry. As mentioned before, the largest fresh strawberry producer was California, which belongs to Far West region and about 68.2% of the sample in that region came from California. It is reasonable that people in California were willing to pay a little lower for the

locally produced, since they knew that “locally produced” strawberry was very easy to access and thought it should be lower in price due to lower transportation and storage cost. In the region of Southwest, around 65.7% of the sample in that region came from Texas. However, there was no clear reason why consumers from Southwest also had lower WTP for locally produced strawberry. Maybe the consumers came from Texas had get used to purchasing food products at a relatively lower price since Texas is famous for farming of food products, like corn and soybean.

For the WTP for naturally produced, significant variables included age, marital status, and preference for naturally grown. The higher one consumer ranked naturally grown, the higher the WTP for this product the consumers were willing to pay.

Conclusions and Implications

Across all states, consumers showed stronger preference for the locally produced and naturally grown over organic, following by GMO-free. In some regions, locally produced was even more preferred than natural while the opposite results existed in some other regions. Organic seemed to always rank third place across all the regions and GMO-free was the least favored one.

The WTP was not as homogenous as preference across the states. In most regions, except for New England and Great Lakes, organic had the highest WTP. GMO-free had the lowest WTP except in Southwest. Locally produced and naturally grown were not strictly dominating one the other, with each had higher in some regions while lower in some other regions, as the preference case. People with higher income, higher expenditure for fresh strawberry and better knowledge about the fresh strawberry would generally be willing to pay more for most of the four types of fresh strawberries (only not significant for natural grown).

The preference for each type of strawberry usually turned out to be significant in affecting the WTP for the corresponding product, with only the exception of preference for GMO-free. Interestingly, there were also cross-effect of preference on the WTP. GMO-free, one of the inferior products compared with the other three, suffered from consumers’ preference for locally produced and naturally grown. Naturally grown, much more like a bystander, neither did not have the benefits of free rider of the preference for other berries, nor suffered from such preference. Organic and locally grown, were like friends and enemies. In this study, it was indicated that WTP

for locally produced took advantage of the preference for organic, while the preference of locally produced hurt the WTP for the organic. The reason behind was probably consistent with the conclusions of Born and Purcell (2006), that some consumers mistakenly perceived that locally produced were all organic. Thus, the preference for organic would facilitate the WTP for locally produced as in our study. Meanwhile, if assuming locally produced were all organic, there would be no reasons to offer a higher a price for organic, since it had fewer advantages like helping the local economy etc. On this regard, the preference for local food would inhibit consumers' WTP for organic, which was also consistent with the results of this study. Therefore, the wrong perception that all local food were organic was probably the reason of this opposite-directed cross-effect of preference between organic and locally produced.

Region, in this study failed to play a very important role in WTP for four types of strawberry, even for locally produced, which should have stronger association with the region factor. Although in some regions like Southwest and Far West, the significant effects were only limited to certain type of strawberry (locally produced). One major reason is probably because fresh strawberry industry was higher dominated by California in the United States, especially during the summer⁶ when the survey was conducted. One disadvantages is that most participants in sample (except for the California residents) would have little concept for the locally produced fresh strawberry, since their state may never grow this crop. In further research, it may be a better idea to use more common, widely grown/raised commodity like potato or beef as the subject when studying the preference for local and organic across the country. Also, a different method of dividing regions or classifying consumers might also be helpful in obtaining more significant results.

Combining the average WTP and preference for organic and locally produced, we may also have some explanations and implications for the further study. The organic has left the impression of high quality, safer, and high cost superior food products in consumers' mind (Krystallis and Chryssohoidis 2005). People also believe that locally grown food products were also decent quality food products, with some even perceived them to be organic as well. Besides, supporting the local community economy is another privilege of purchasing local food which organic product could not guarantee. In most cases, people preferred organic food most because they wanted to eat

⁶ During the winter season, the U.S. fresh strawberry was provided by Florida and depending on imports.

healthier. With this awareness and wrong perception, they probably would just choose local food instead since it just sacrificed so little food quality (or even none) but repaid by huge other benefits (like lower price, supporting local economy). Thus, WTP for organic would still suffer from consumers' preference for locally produced unless they were distinguished strictly different from local food in cultivation methods and healthy benefits. As long as being recognized the superior quality and the irreplaceable certification procession of qualified cultivation, organic food could receive an even higher price premium from more consumers. For the local food, instead of relying on the temporary wrong perception, it might be wise to continue advertising for its unique benefits. In addition, if also certificated as organic, the value added to the "local organic food" might be more beneficial, which may exceed the regular organic food in the market.

Table 1 Demographics

Variable	Variable Description	Sample % (N=2454)
Gender	Female	56.1
	Male	43.9
Age	18-24	9.2
	25-39	26.8
	40-59	37.4
	>=60	26.6
Race	Caucasian	74.2
	Black/African	9.7
	Hispanic	8.2
	Asian	5.1
	Others	2.8
Marital Status	Married/Remarried	52.7
	Single	28.3
	Divorced/Widowed	16.1
	Others	3.0
Kids in Family	No	64.1
	One	17.9
	Two	11.6
	>=Three	6.4
Education	Less than some college	22.6
	Some college	35.5
	College and more	41.9
Employment	Student	3.5
	Full time	42.0
	Part time	12.8
	Retired	21.6
	Others	20.1

Household Income	Less than \$14,999	10.0
	\$15,000-24,999	12.0
	\$25,000-34,999	13.7
	\$35,000-49,999	15.1
	\$50,000-74,999	21.7
	\$75,000-99,999	12.5
	\$100,000-149,999	9.9
	\$150,000-199,999	3.0
	\$200,000 or above	2.1
Weekly Food Expenditure	Less than \$49	10.0
	\$50-99	31.8
	\$100-149	28.5
	\$150-199	13.6
	\$200-249	5.7
	\$250-299	3.2
	\$300 or above	7.2
Expenditure on Fresh Strawberry (Last Month)	\$1.5-5.4	28.8
	\$5.5-16.9	22.7
	\$17.0-30	21.6
	\$30.1-60	17.8
	\$ 60.1 or above	9.2

Table 2 Participants Distribution among Regions

Variable	Frequency (N=2454)
New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont)	112
Mideast (Delaware, District of Columbia, Maryland, New Jersey, New York, and Pennsylvania)	468
Great Lakes (Illinois, Indiana, Michigan, Ohio, and Wisconsin)	415
Plains (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota)	152
Southeast (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia)	598
Southwest (Arizona, New Mexico, Oklahoma, and Texas)	230
Rocky Mountain (Colorado, Idaho, Montana, Utah, and Wyoming)	84
Far West (Alaska, California, Hawaii, Nevada, Oregon, and Washington)	393

Table 3 Regression Results for GMO-free Strawberry

Parameter Estimates					
Parameter	DF	Estimate	Standard Error	t Value	Approx
					Pr > t
Intercept	1	3.635	0.134	27.23	<.0001
Employment	1	-0.042	0.011	-3.95	<.0001
Income	1	0.062	0.013	4.76	<.0001
Knowledge	1	0.051	0.016	3.21	0.0013
Pref_Local	1	-0.188	0.023	-8.03	<.0001
Pref_Natural	1	-0.130	0.028	-4.69	<.0001
_Sigma	1	1.247	0.019	67.38	<.0001

* $p < .10$; ** $p < .05$.

Table 4 Regression Results for Organic Strawberry

Parameter Estimates					
Parameter	DF	Estimate	Standard Error	t Value	Approx
					Pr > t
Intercept	1	2.553	0.155	16.47	<.0001
Age	1	-0.028	0.009	-3.15	0.0016
Income	1	0.065	0.014	4.64	<.0001
Straw_Expen	1	0.001	0.001	1.78	0.0756
Knowledge	1	0.059	0.017	3.35	0.0008
Pref_Organic	1	0.272	0.029	9.29	<.0001
Pref_Local	1	-0.082	0.029	-2.81	0.005
_Sigma	1	1.363	0.020	67.62	<.0001

* $p < .10$; ** $p < .05$.

Table 5 Regression Results for Locally Produced

Parameter Estimates					
Parameter	DF	Estimate	Standard Error	t Value	Approx
					Pr > t
Intercept	1	2.601	0.125	20.78	<.0001
Age	1	-0.025	0.007	-3.5	0.0005
Income	1	0.064	0.011	5.66	<.0001
Straw_Expen	1	0.001	0.001	1.9	0.0568
Knowledge	1	0.028	0.014	1.98	0.0472
Pref_Organic	1	0.065	0.023	2.77	0.0057
Pref_Local	1	0.057	0.023	2.43	0.0149
Southwest	1	-0.189	0.077	-2.46	0.0138
Farwest	1	-0.199	0.061	-3.24	0.0012
_Sigma	1	1.091	0.016	69.43	<.0001

* $p < .10$; ** $p < .05$.

Table 6 Regression Results for Naturally Grown

Parameter Estimates					
Parameter	DF	Estimate	Standard Error	t Value	Approx
					Pr > t
Intercept	1	2.892	0.202	14.34	<.0001
Age	1	-0.044	0.016	-2.72	0.0066
Marital_Status	1	0.104	0.049	2.09	0.0363
Pref_Natural	1	0.100	0.053	1.91	0.0565
_Sigma	1	2.373	0.034	69.44	<.0001

* $p < .10$; ** $p < .05$.

Figure 1: Consumer Preference across Regions

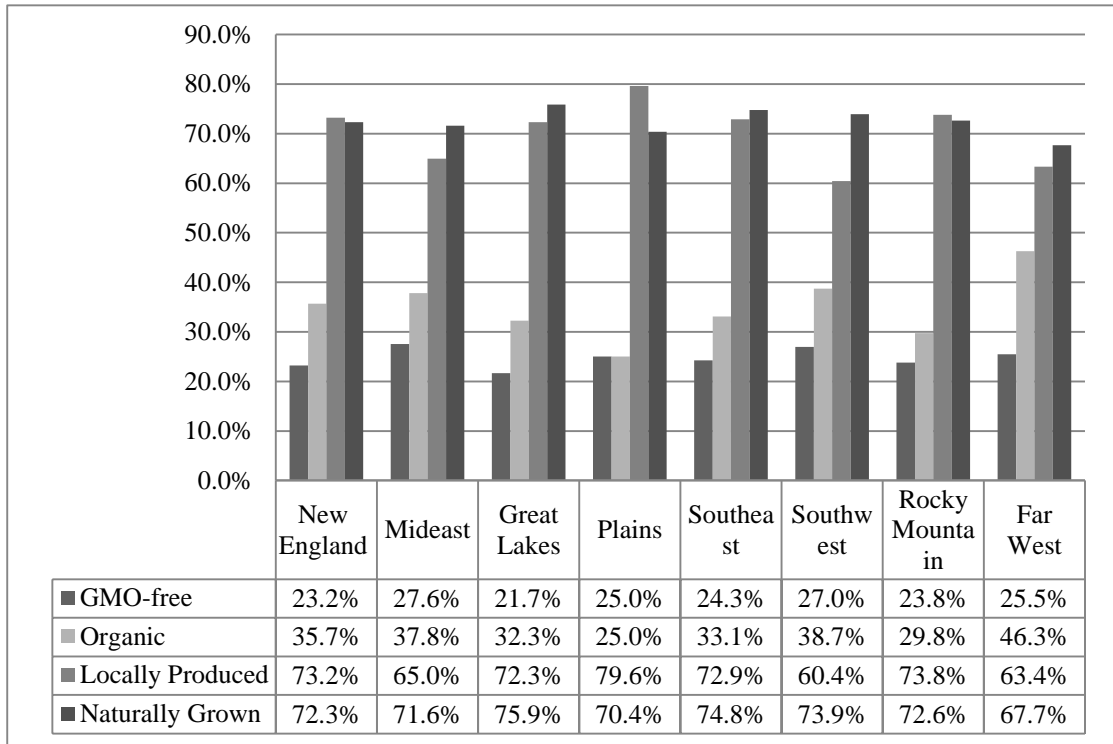
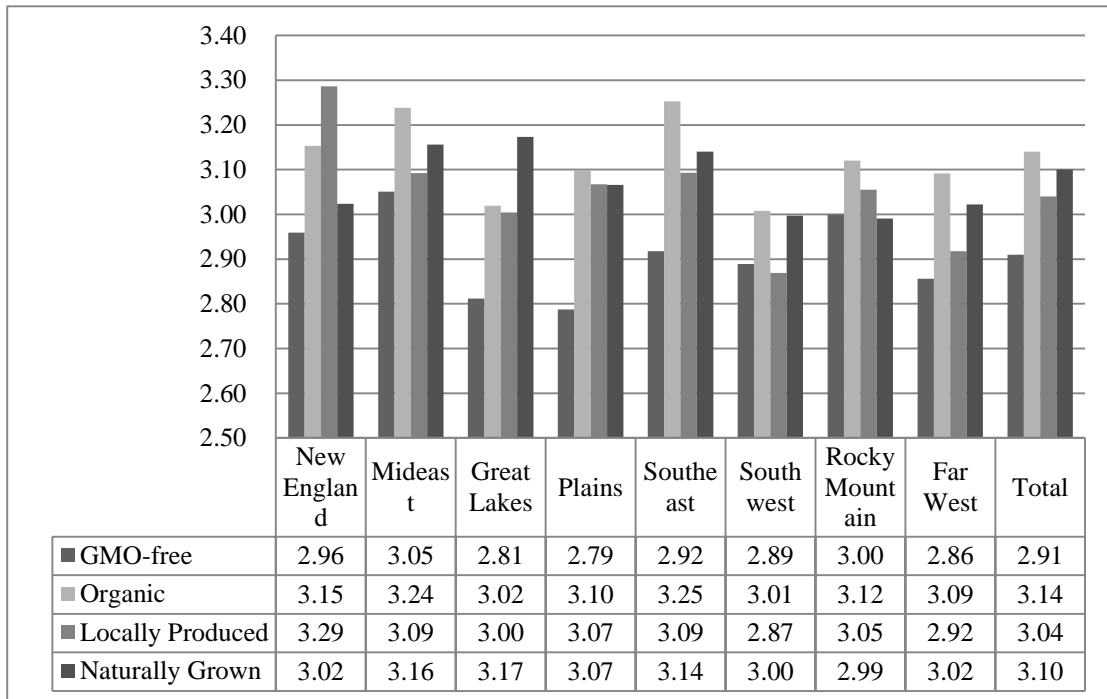


Figure 2 WTP for Four Types of Fresh Strawberries across Regions



References

- Adams, D. C., & Salois, M. J. (2010). Local versus organic: A turn in consumer preferences and willingness-to-pay. *Renewable Agriculture and Food Systems*, 25(04), 331-341.
- Batte, M. T., Hooker, N. H., Haab, T. C., & Beaverson, J. (2007). Putting their money where their mouths are: Consumer willingness to pay for multi-ingredient, processed organic food products. *Food Policy*, 32(2), 145-159.
- Bellows, A. C., Alcaraz V, G., & Hallman, W. K. (2010). Gender and food, a study of attitudes in the USA towards organic, local, US grown, and GM-free foods. *Appetite*, 55(3), 540-550.
- Born, B., & Purcell, M. (2006). Avoiding the local trap scale and food systems in planning research. *Journal of Planning Education and Research*, 26(2), 195-207.
- Bouyssou, D. (1992). Ranking methods based on valued preference relations: A characterization of the net flow method. *European Journal of Operational Research*, 60(1), 61-67.
- Brookshire, D. S., Eubanks, L. S., & Randall, A. (1983). Estimating option prices and existence values for wildlife resources. *Land Economics*, 1-15.
- Bureau of Economic Analysis. February 18, 2004. Retrieved December 27, 2012.
- Carlsson, F., & Martinsson, P. (2006). Do experience and cheap talk influence willingness to pay in an open-ended contingent valuation survey?.
- Commodity Strawberry Profile Hayley Boriss, Henrich Brunke, and Marcia Kreith, Agricultural Issues Center, University of California, March 2006. Updated May 2014 by Linda Naeve, Program Specialist, Iowa State University Extension and Outreach. Available at: http://www.agmrc.org/commodities_products/fruits/strawberries/commodity-strawberry-profile/
- Cook, W. D., & Kress, M. (1985). Ordinal ranking with intensity of preference. *Management science*, 31(1), 26-32.
- Coursey, D. L., Hovis, J. L., & Schulze, W. D. (1987). The disparity between willingness to accept and willingness to pay measures of value. *The Quarterly Journal of Economics*, 679-690.
- Cummings, R.G., Brookshire, D.S., Schulze, W.D., Bishop, R.C., Arrow, K.J., 1986. Valuing environmental goods: An assessment of the contingent valuation method. Rowman & Allanheld Publishing, Totowa, New Jersey.
- De Groote, H., Tomlins, K., Haleegoah, J., Awool, M., Frimpong, B., Banerji, A., ... & Meenakshi, J. V. (2010, September). Assessing rural consumers' WTP for orange, biofortified maize in Ghana with experimental auctions and a simulated radio message. In *CIMMYT. Paper prepared for submission to the African Agricultural Economics Association Meetings--Cape Town* (pp. 19-23).

de Magistris, T., & Gracia, A. (2008). The decision to buy organic food products in Southern Italy. *British Food Journal*, 110(9), 929-947.

di Pierro, F., Khu, S. T., & Savic, D. A. (2007). An investigation on preference order ranking scheme for multiobjective evolutionary optimization. *Evolutionary Computation, IEEE Transactions on*, 11(1), 17-45.

Dubourg, W. R., Jones-Lee, M. W., & Loomes, G. (1994). Imprecise preferences and the WTP-WTA disparity. *Journal of Risk and Uncertainty*, 9(2), 115-133.

Dwyer, J. F., Kelly, J. R., & Bowes, M. D. (1977). Improved Procedures for Valuation of the Contribution of Recreation to National Economic Development. *WRC Research Report*, (128).

FAOStat, Food and Agriculture Organization, United Nations

Feenstra, G. W. (1997). Local food systems and sustainable communities. *American journal of alternative agriculture*, 12(01), 28-36.

Fürnkranz, J., & Hüllermeier, E. (2003). Pairwise preference learning and ranking. In *Machine Learning: ECML 2003* (pp. 145-156). Springer Berlin Heidelberg.

Hanemann, W. M. (1994). Valuing the environment through contingent valuation. *The Journal of Economic Perspectives*, 19-43.

Hinrichs, C. C. (2000). Embeddedness and local food systems: notes on two types of direct agricultural market. *Journal of rural studies*, 16(3), 295-303.

Hughner, R. S., McDonagh, P., Prothero, A., Shultz, C. J., & Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *Journal of consumer behaviour*, 6(2-3), 94-110.

James, J. S., Rickard, B. J., & Rossman, W. J. (2009). Product differentiation and market segmentation in applesauce: Using a choice experiment to assess the value of organic, local, and nutrition attributes. *Agricultural & Resource Economics Review*, 38(3), 357.

Kealy, M.o, Turner, R.W., 1993. A test of the equality of closed-ended and open-ended contingent valuations. *American Journal of Agricultural Economics* 75(2), 321-331.

Krystallis, A., & Chryssohoidis, G. (2005). Consumers' willingness to pay for organic food: factors that affect it and variation per organic product type. *British Food Journal*, 107(5), 320-343.

Loureiro, M. L., & Hine, S. (2002). Discovering niche markets: A comparison of consumer willingness to pay for local (Colorado grown), organic, and GMO-free products. *Journal of*

Agricultural and Applied Economics, 34(3), 477-488.

Loureiro, M. L., McCluskey, J. J., & Mittelhammer, R. C. (2002). Will Consumers Pay a Premium for Eco - labeled Apples?. *Journal of Consumer Affairs*, 36(2), 203-219.

Lusk, J. L. (2003). Effects of cheap talk on consumer willingness-to-pay for golden rice. *American Journal of Agricultural Economics*, 85(4), 840-856.

Murphy, J. J., Stevens, T., & Weatherhead, D. (2005). Is cheap talk effective at eliminating hypothetical bias in a provision point mechanism?. *Environmental and Resource Economics*, 30(3), 327-343.

Sayman, S., & Öncüler, A. (2005). Effects of study design characteristics on the WTA–WTP disparity: A meta analytical framework. *Journal of economic psychology*, 26(2), 289-312.

Stefani, G., Romano, D., & Cavicchi, A. (2006). Consumer expectations, liking and willingness to pay for specialty foods: do sensory characteristics tell the whole story?. *Food Quality and Preference*, 17(1), 53-62.

Onken, K. A., Bernard, J. C., & Pesek Jr, J. D. (2011). Comparing willingness to pay for organic, natural, locally grown, and state marketing program promoted foods in the mid-Atlantic region. *Agricultural and Resource Economics Review*, 40(1), 33.

USDA, National Agricultural Statistics Service, Noncitrus Fruits and Nuts Summary, various issues

Winter, M. (2003). Embeddedness, the new food economy and defensive localism. *Journal of rural studies*, 19(1), 23-32.

Yue, C., & Tong, C. (2009). Organic or local? Investigating consumer preference for fresh produce using a choice experiment with real economic incentives. *HortScience*, 44(2), 366-371.