

Purchasing Locally Produced Fresh Vegetables: National Franchise vs. Locally
Owned and Operated Restaurants

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Abstract

The objective of this study is to examine purchasing practices of locally produced fresh vegetables among restaurants and food service institutions. The sample for the study included managers of 75 restaurants and dining centers out of a total of nearly 600 food service outlets in a mid-size metropolitan city in Midwest with a population of about 400,000. The study findings show differential preferences between national/regional chains and the local independently owned restaurants. Although managers across the board expressed willingness to buy local, actual purchasing decisions were largely driven by freshness, quality and availability. Price was not as critical a factor as others including variety and selection. The results suggest that local vegetable producers should use regularity, quality, and freshness to differentiate themselves. As a producer of small volume of fresh vegetables local farmers have much higher probability of success if they supply to locally and independently owned restaurants. These restaurants use small volume of vegetables in broader variety. Additionally, small variety growers may need to recast their business models as the industry seem to be moving towards fewer vegetables delivered round the year. These producers should consider investments in greenhouse to gain a competitive edge.

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Introduction

The fresh produce market in the United States, particularly fresh vegetables, has been experiencing significant changes, nationally, driven primarily by consumer demand and the availability of the products. The national per capita consumption of fresh vegetables has risen at an increasing rate, up a total of 9.8% between 1990 and 2007 (164 lbs. in 1990 to 180 lbs in 2007 at the retail level). Although in 2008 the per capita consumption shrunk a little bit, the consumption level has been at 180 lbs per capita throughout the past 10 years. More variety of fresh vegetable items and increased share of branded items are some of other factors behind the increasing trend in the fresh vegetable consumption (Govindasamy and Thornbury, 2006.) Per capita expenditures on fresh vegetables in 2009 were more than 6% higher than that in 2005. The estimated per capita expenditure on fresh vegetables bought at grocery stores in 2009 was \$209 (Bureau of Labor, 2010). The retail side of fresh produce market including fresh vegetables is dominated by general line grocery stores such as Wal-Mart, Price Cutter, and Dillon's, and other independently owned stores. The other significant retail sector includes food service sector comprising local and national chain restaurants, dining halls at educational institutions and hospitals. Farmers' markets and other direct sales account for a very small portion of the total fresh vegetables sold. Local production of fresh fruits and vegetables sold directly to the grocery stores and food service sector is a recently emerging phenomenon.

Increasing gasoline and food prices, the demand for organically produced food, the demand for fresher and higher quality foods, the desire to support local farming economies, the

environmental movement and trends in horticulture research have led to growing popularity of direct marketing of locally produced fruits and vegetables (Roth, 1999; Andreatta and Wickliffe, 2002; Brown, 2002). By eliminating the middleman, the goal of the direct marketing is to increase farmers' share in consumers' dollar. According to the USDA 2007 Census of Agriculture, direct marketing had increased by 17% in the last 5 years (over 136,000 farms utilized the marketing strategy), and direct marketing sales value increased by almost 50%. The influence of current food shopping trends - local food, support for local farmers and agribusinesses, and fresh quality produce and meat - are considered to be behind the strong surge of farmers who utilize direct marketing. (LeRoux et al., 2009; Mark et al., 2009) In addition to farmers markets, road-side markets and u-pick markets, producers have found direct sales to the local restaurants, food service institutions, and schools profitable marketing strategies (USDA, 2001). In various studies, buyers of fresh fruits and vegetables have also reported a favorable attitude toward local production.

While examining the perceived attitude of food service directors in Midwest schools, Gregoire and Strohbehn (2002) have reported several perceived benefits to purchasing locally including ability to purchase smaller quantities and fresher food, support to local economy, and good public relation. Similarly, the barriers to local purchases were reported as year round supply, adequate quantity, and consistent quality (Gregoire and Strohbehn, 2002; Cottingham et al., 2000). Perceived benefits and obstacles to buying locally produced food, however, are likely to vary across types of food service institutions. There are many sub-sectors within the broad sector of hotel, restaurant and institutional (HRI) market, including fast food to fine dining restaurants, health care, schools, and business. Vendor selection decisions vary across these sub-sectors depending on ownership type, menu, capacity of the restaurant, and compliance with

Federal and State agencies. For example, locally owned and operated restaurants may have a different set of purchase practices and programs regarding locally produced food compared to a restaurant owned and operated under national franchise.

Objectives and Method

The objective of this study is to examine purchasing practices of locally produced fresh vegetables among restaurants and food service institutions. Samples will be drawn from restaurants belonging to national or regional chains, and the locally and independent owned restaurants. A comparative analysis will be conducted to highlight key differences between these two types of restaurants. The study will examine 1) factors affecting the purchase decisions of locally grown fresh vegetables; 2) willingness to buy locally grown produce; 3) key attributes desired while supplying locally grown produce to these restaurants; and 4) perceived attitude toward locally produced food. The study was sponsored by Missouri Department of Natural Resources (MDNR) to support Renewable Energy-Sustainable Food Feasibility Project. The sample for the study included managers of 75 restaurants and dining centers out of a total of nearly 700 food service outlets in a mid-size metropolitan city in Midwest with a population of about 200,000. The questionnaire consisted of five sections: 1) Characteristics of food service facilities including ownership (independent locally owned and operated vs. national franchise); capacity in terms of seats and customer served 2) Usage of fresh vegetables, sources of supply and prices paid 3) Existing practices of purchasing locally produced fresh vegetables 4) attributes desired while selecting vendors to supply locally produced food 5) perception and attitude of restaurant managers toward locally produced food. Samples were drawn from a large metro area in Midwest with a population of more than 400,000 covering five counties. Approximately 600 restaurants and dining within the five county areas were divided into chain and independent

restaurants. Initial list of the restaurants were obtained from Missouri Restaurant Association. The list was augmented with the information from Restaurant db.net (2010). A random sample of 100 independent restaurants and 100 chain restaurants were contacted by telephone and requested for a personal interview.

Results

A total of 75 completed surveys by managers at restaurants and dining facilities in a metro area in Midwest were the basis of examining purchase of locally produced fresh vegetables at food service sectors. Completed surveys included 47 from independent and locally owned restaurants, and 28 from national franchises or chain restaurants. The self reported categories of the surveyed restaurants included fast food and carryout (21); casual dining (43); fine dining (10) and ethnic restaurants (10). Other self reported categories were Italian, bar and grill, pizza, etc.

The capacity of the surveyed restaurants in terms of number of seats and customers served per week varied across two types of restaurants. More than half (52%) of the chain restaurants had more than 200 seats while only 22% of the independently owned restaurants had more than 200 seats. The average overall capacity was 100 to 150 seats (Table 1). Similarly, over 2/3rd (69%) of the chain restaurants served more than 2000 customers per week compared to only 31% for independent locally owned restaurants. Overall, only 37% of the restaurants served more than 2000 customers per week. The average meal served per week was 2792 (Table 1)

Fresh vegetables accounted for more than 80% of the total vegetable usage for about 2/3rd of the restaurants. This percentage was higher for independent locally owned restaurants (54%) than that for chain restaurants (46 %.) While basic salad mix, iceberg lettuce, tomatoes, onion,

romaine lettuce and cabbage were leading fresh vegetables in terms of average use per week, tomatoes, bell peppers, romaine lettuce, and cucumbers were leaders in terms of number of restaurants using at least once a week. There was a significant difference between chain and independent restaurants in terms of variety of vegetables used. The chain restaurants were more likely to use few vegetables in larger quantity such as lettuce, tomatoes, and basic salad mix. The independent and locally owned restaurants used more variety. Nearly 65% of the restaurants did not use any organic fresh vegetable and only 7% used organic vegetables to meet more than 75% of their fresh vegetables requirements.

None of the chain restaurants used farmers markets and local grocery stores as suppliers of their fresh vegetables compared to independent and locally owned restaurants who reported to have used farmers markets and local grocery stores for 28 and 26 different items of fresh vegetables, respectively. Nearly 100% of the chain restaurants were supplied fresh vegetables by distributors such as Sysco compared to only 75% of independent restaurants. Further, only a quarter of the restaurants reported to have bought fresh vegetables locally. Only 4% of the chain restaurants bought fresh vegetables locally while 37% of independent restaurants bought locally.

Predicted probability of purchasing locally produced fresh vegetables: A logit model (Long 1997; Green 1995) was used to estimate the probability of restaurants purchasing locally produced fresh vegetables. The model is defined as

$$Y^*_i = X_i + \epsilon_i \quad (1)$$

Values for Y^* are 0 and 1. Value of 0 indicates that the surveyed restaurants do not purchase locally produced fresh vegetables and 1 indicates otherwise. The parameters for the model were estimated using maximum likelihood estimation via LIMDEP (Greene, 1995). The

descriptive statistics of variables used in the models including the mean and standard deviation are shown in Table 1.

The explanatory variables included type of the restaurants surveyed (*RES_TYPE*), location of the restaurants (*RES_LOC*), capacity of restaurants in terms of seats (*SEATS*), capacity of restaurants in terms of meals served per week (*MEALS*), fresh vegetables as a percentage of total vegetables used (*FRESH_VEG*), and variety of fresh vegetables used (*FREQ_VEG*).

Estimated coefficients are reported in Table 2. The overall significance level of the model was 99% with a chi-square value of 23.36. The predictability of the model was at approximately 80% and with MCFadden R squared value of 27%. Also, two independent variables were individually significant at 95% or more. Independently and locally owned restaurants were more likely to buy locally produced fresh vegetables than those belonging to national or regional chain ($\beta=3.009$; p-value = 0.0065). The higher the proportion of the fresh vegetables in the total vegetable usage in a restaurant higher was the probably of buying locally ($\beta=0.0271$; p-value=0.0461).

Important attributes desired while purchasing fresh vegetables: Restaurant managers were asked to evaluate five important attributes in making fresh vegetable purchase decisions including store location and availability in season; selection and variety; freshness; quality; and price. They responded by selecting one of the three different levels of importance: very, somewhat, and not important (Table 3). Freshness and quality were more important attributes for both chain and independent restaurants compared to variety and price. While nearly 70% of

chain restaurant managers reported price to be “very important”, only 56% of the independent and local restaurants reported so.

Willing to buy fresh vegetables produced locally: Managers of the sample restaurants were asked whether they were “more willing,” “indifferent,” “less willing,” or “unsure” about buying locally produced fresh vegetables. A little more than half of the restaurants were “more willing” to buy fresh vegetables sold in local farmers markets or grown in local farms or greenhouse (Table 4). This percentage was significantly higher for independent restaurants than for chain restaurants. More than half of the independent restaurants were “more willing” to buy organically grown fresh vegetables, while more than half of the chain restaurants were either indifferent or less willing. The difference between chain and independent restaurants was even more apparent when the respondents were asked about buying fresh vegetables grown using sustainable practices.

Attitude toward locally produced fresh vegetables: Restaurant managers’ attitude toward local purchase is likely to be influenced by their perception of locally grown fresh vegetables such as taste, safety, environmental impact, and promotion of local economy and local farmers (Table 5). Managers were asked as to how they perceived various aspects of locally produced fresh vegetables including taste, impact on the environment and contribution to local economy using a five-scale measurement of attitude. Independent and locally owned restaurants were more likely to “agree” or “strongly agree” than the managers of chain restaurants that locally grown fresh vegetables were generally taste better and safe to eat. Additionally, managers of independent restaurants tended to “agree” or “strongly agree” that locally produced fresh vegetables were favorable to environment and local economy.

Conclusions and implications

The study findings show differential preferences between national/regional chains and the local independently owned restaurants for the locally produced fresh vegetables. Although managers across the board expressed willingness to buy local, actual purchasing decisions were largely driven by freshness, quality and availability. Price was not as critical a factor as others including variety and selection.

The results suggest that local vegetable producers should use regularity, quality, and freshness to differentiate themselves. As a producer of small volume of fresh vegetables local farmers have much higher probability of success if they supply to locally and independently owned restaurants. These restaurants use small volume of vegetables in broader variety. Additionally, small variety growers may need to recast their business models as the industry seem to be moving towards fewer vegetables delivered round the year. These producers should consider investments in greenhouse to gain a competitive edge.

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Table 1: Descriptive Statistics of Variables Used in the Logit Model

<i>Variable</i>	<i>Description of Variable</i>	<i>Mean</i>	<i>Std. Dev</i>
<i>BUY_LOCAL</i>	<i>1 = buys fresh vegetables produced locally; 0 = otherwise</i>	<i>0.243</i>	<i>0.432</i>
<i>Explanatory Variables:</i>			
<i>RES_TYPE</i>	<i>1 = part of group chain; 0 = otherwise (independent and locally owned)</i>	<i>0.373</i>	<i>0.487</i>
<i>RES_LOC*</i>	<i>1 = located downtown ; 0 = otherwise</i>	<i>0.284</i>	<i>0.454</i>
<i>SEATS*</i>	<i>Number of seats(capacity measure)</i>	<i>183</i>	<i>259</i>
<i>MEALS</i>	<i>Number of meals served per week (capacity measure)</i>	<i>2892</i>	<i>5646</i>
<i>FRES_VEG</i>	<i>Fresh vegetables as percent of total vegetables</i>	<i>74.479</i>	<i>30.756</i>
<i>FREQ_VEG</i>	<i>Varieties of vegetables used</i>	<i>6.466</i>	<i>2.506</i>

Notes: Asterisk implies that the variable was dropped during estimation to avoid multicollinearity

Table 2: Logit Model Estimation: Probability of buying locally produced fresh vegetables

<i>Variables</i>	<i>Coefficient</i>	<i>t-ratio</i>
<i>Constant</i>	-5.6465	-3.511
<i>RES_TYPE*</i>	3.0087	2.723
<i>RES_LOC</i>	0.9342	1.306
<i>MEALS</i>	0.0011	0.792
<i>FRES_VEG*</i>	0.0271	1.994
<i>FREQ_VEG</i>	-0.0373	-1.259
<i>Log Likelihood Function</i>		-30.763
<i>Restricted Log Likelihood</i>		-42.448
<i>Chi Squared*</i>		23.36
<i>McFadden's R²</i>		0.27
<i>Percent of correct Prediction</i>		78.667%

	<i>PREDICTED</i>			
<i>ACTUAL</i>	<i>0</i>	<i>1</i>	<i>TOTAL</i>	
<i>0</i>	53	3	56	
<i>1</i>	13	6	19	
<i>TOTAL</i>	66	89	75	

*indicate significant at less than 5%

Table 3: Important consideration while making fresh vegetable purchase decisions as reported by restaurant managers

	Not Important	Somewhat Important	Very Important	Total
<i>1) Store location and availability in the season (chi-square: 1.84):</i>				
Chain restaurant	6 (23.10%)	7 (26.90%)	13 (50.00%)	26 (100%)
Independent locally owned restaurant	5 (11.10%)	13 (28.90%)	27 (60.00%)	45 (100%)
<i>2) Selection or variety (chi-square: 7.41**):</i>				
Chain restaurant	5 (19.20%)	12 (46.20%)	9 (34.60%)	26 (100%)
Independent locally owned restaurant	2 (4.40%)	14 (31.10%)	29 (64.40%)	45 (100%)
<i>3) Freshness (ripeness/maturity) (chisquare:0.24):</i>				
Chain restaurant	0.00 (0.00%)	1 (3.80%)	25 (96.20%)	26 (100%)
Independent locally owned restaurant	0 (0.00%)	3 (6.70%)	42 (93.30%)	45 (100%)
<i>4) Quality (Chi-square:2.31):</i>				
Chain restaurant	0 (0.00%)	1 (3.80%)	25 (96.20%)	26 (100%)
Independent locally owned restaurant	1 (2.20%)	0 (0.00%)	44 (97.80%)	45 (100%)
<i>5) Price per relative unit (Chi-square:1.65) :</i>				
Chain restaurant	0 (0.00%)	8 (30.80%)	18 (69.20%)	26 (100%)
Independent locally owned restaurant	1 (2.20%)	19 (42.20%)	25 (55.60%)	45 (100%)

**significant at less than 5%

Table 4: Restaurant managers' willingness to buy locally produced fresh vegetables and those produced using organic and sustainable practices

	Unsure	Less willing	Indifferent	More willing	Total
1) Sold in local farmers market (Chi-square: 5.12)					
Chain restaurant	4 15.40%	1 3.80%	11 42.30%	10 38.50%	26 100.00%
Independent locally owned restaurant	6 13.30%	3 6.70%	8 17.80%	28 62.20%	45 100.00%
2) Grown on local farms or greenhouse (Chi-square: 5.81)					
Chain restaurant	4 15.40%	2 7.70%	10 38.50%	10 38.50%	26 100.00%
Independent locally owned restaurant	2 4.40%	5 11.10%	10 22.20%	28 62.20%	45 100.00%
3) Organically grown (Chi-square: 3.01)					
Chain restaurant	4 15.40%	2 7.70%	11 42.30%	9 34.60%	26 100.00%
Independent locally owned restaurant	3 6.70%	2 4.40%	17 37.80%	23 51.10%	45 100.00%
4) Grown using sustainable practices (Chi-square: 1.99)					
Chain restaurant	5 19.20%	2 7.70%	9 34.60%	10 38.50%	26 100.00%
Independent locally owned restaurant	4 8.90%	3 6.70%	15 33.30%	23 51.10%	45 100.00%

Table 5: Restaurant managers' attitude toward locally produced fresh vegetables

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
1) Locally grown fresh vegetables taste better (Chi-square:7.69*)						
Chain restaurant	3 11.50%	2 7.70%	11 42.30%	9 34.60%	1 3.80%	26 100.00%
Independent locally owned restaurant	7 15.90%	5 11.40%	8 18.20%	14 31.80%	10 22.70%	44 100.00%
2) They are safe to eat (Chi-square:7.26)						
Chain restaurant	4 15.40%	2 7.70%	10 38.50%	10 38.50%	0 0.00%	26 100.00%
Independent locally owned restaurant	6 13.60%	7 15.90%	12 27.30%	11 25.00%	8 18.20%	44 100.00%
3) They reduce carbon foot print (Chi-square:2.80)						
Chain restaurant	4 15.40%	3 11.50%	9 34.60%	9 34.60%	1 3.80%	26 100.00%
Independent locally owned restaurant	5 11.40%	8 18.20%	14 31.80%	11 25.00%	6 13.60%	44 100.00%
4) They help sustain the environment (Chi-square:2.05)						
Chain restaurant	5 19.20%	3 11.50%	6 23.10%	9 34.60%	3 11.50%	26 100.00%
Independent locally owned restaurant	4 9.10%	8 18.20%	11 25.00%	14 31.80%	7 15.90%	44 100.00%
5) They promote local farmers (Chi-square:5.09)						
Chain restaurant	9 34.60%	2 7.70%	1 3.80%	5 19.20%	9 34.60%	26 100.00%
Independent locally owned restaurant	14 31.80%	4 9.10%	0 0.00%	3 6.80%	23 52.30%	44 100.00%
6) They promote local economy (Chi-square: 2.99)						
Chain restaurants	9 34.60%	2 7.70%	1 3.80%	6 23.10%	8 30.80%	26 100.00%
Independent locally owned restaurants	15 34.10%	2 4.50%	1 2.30%	5 11.40%	21 47.70%	44 100.00%

*significant at 10%