

Fruit and Vegetable Quality Perspectives from Producers and Consumers at a Local University in Western Pennsylvania

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Abstract

Educating the campus community about the benefits of consuming locally grown foods plays an important role in the philosophical approach to education embraced by Slippery Rock University. In an effort to support also small-scale producers in the region, the institution provided between June and August 2002 its employees with the opportunity of eating locally grown foods, in one dining hall on campus. A purposefully designed survey was administered to a sample (n=120) of regular diners and to a second sample (n=20) of local farmers, in order to investigate quality issues related to fresh fruit and vegetables consumption and production. The data were recorded on a Likert-scale to learn about priorities and concerns when fruit and vegetable quality is considered as a reliable indication of consumer's satisfaction. Ten indicators were proposed by the survey to define food quality (seasonality, taste, freshness, salubrity, price, ethics, locally grown, organic, shelf life, agronomic practices). A cumulative Pearson's correlation index of quality attribute scores identified by the survey ($r=+0.93$), allowed the researcher for comparisons among the subjects' perspectives on produce quality. The analysis of the data suggests that consumers at the university are particularly concerned with food taste, price, freshness, salubrity and shelf-life, whereas taste, freshness, seasonality, salubrity and foods that are locally grown appear to be the priority quality attributes of choice by food producers. An analysis of the remaining indicators is provided and limitations of this preliminary study are addressed with recommendations for further research needs. Despite the logistic and economic barriers that still impact the decentralization of modern food systems, there is a compelling necessity to embrace a more sustainable approach in food production and consumption by fulfilling market niches that are available at the local level. This *modus operandi* appears to be geared optimally also to insure food quality.

INTRODUCTION

Under the impetus of a growing interest in food quality issues, especially when related to school meals in the U.S., the state of Pennsylvania has been demonstrating its attention and support to such initiatives with the intent of improving also the livelihood of local farmers (Harmon et al., 2002). Consequently, seeking the establishment of stronger links with farmers while educating the campus community on food quality issues has become an emphasis approach in dining hall management at Slippery Rock University. This ambitious goal has been achieved also through a renovated food purchasing policy that has facilitated consumption of locally grown fruit and vegetables. Despite the crisis of modern farming, agriculture remains a primary economic activity for the state of Pennsylvania (B. Snyder, pers. commun., 2002). Therefore, in accordance with its educational mission, and in support of a local food system and a philosophy of sustainability, SRU food services decided to purchase a 10% of locally grown food (fruit and vegetables) from area farmers, for one of its dining halls, during the growing season (summer) 2002. The purpose of the study was to evaluate fruit and vegetable quality

attitudes and perspectives, from a selected sample of producers and consumers, when lunch menus included produce that was procured through local farmers. This ongoing initiative educates the whole campus community on food issues, while providing opportunities to area growers to market their produce, in an attempt to establish a long-term relationship between the university and the surrounding agricultural community.

MATERIALS AND METHODS

The research instrument consisted in a purposefully designed survey which proposed ten construct related attributes to identify fruit and vegetables quality. The survey design was initiated with the construction of a preliminary list of fruit and vegetable quality attributes that the investigator proposed to a panel of five experts in the field of nutrition, agriculture and food science, from Pennsylvania State University. Such a jury panel system was conceived in order to fulfill reliability and validity issues of the proposed research instrument. The attributes were grouped in three different categories according both to the choice and priorities attributed to quality by each one of the five panelists. The category with the most significant attributes comprised words that were chosen at least by four panelists. A second category of significant constructs included terms that were chosen at least by three panelists, while a third category contained new attributes (Table 1). Several communications occurred between researcher and panelists until a consensus was reached in order to identify the ten quality attributes to be considered for the study.

The Subjects

The subjects (consumers) were employees (n=120) of Slippery Rock University who regularly dine at the cafeteria where locally grown food had been purchased for the summer term (June to August) 2002. The producers (n=20) were farmers operating in the region (Butler, Mercer, Beaver and Venango county, western Pennsylvania). Among these, six had committed to sell their produce directly to the university and thus, formed a cooperative to assure the demanded quantity of produce during the three months purchasing trial. Every respondent was asked individually how important any of the quality attribute was, using a descriptor phrase in a 5-point Likert-scale. The descriptors were “very unimportant”, “unimportant”, “neutral”, “important” and “very important” (Fig. 1). The survey was administered to university employees at the end of July 2002, with the collaboration of staff members at the dining hall, on campus. The farmers’ sample (n=20) was contacted via E-mail by the investigator and the survey was administered electronically, at the same time. Permission to conduct the research was granted by SRU Institutional Review Board (IRB).

Respondents’ anonymity was an important characteristic of the research, which eliminated also possible threats to the validity of the study.

RESULTS AND DISCUSSION

A cumulative, positive correlation ($r=+0.93$) among the mean percentages for the ten quality attributes under study indicates the general interest about fruit and vegetable quality by consumers and producers at Slippery Rock University. However, significant mean differences (>2 points on the 5 point Likert-scale) substantiate a greater variability of knowledge and concerns among the two subject groups when quality attributes are analyzed individually (Table 2). Taste, seasonality, salubrity, freshness and locally grown foods appear to be quality attributes of priority importance expressed by farmers. Consumers prioritized taste, freshness, salubrity, price and shelf-life when fruit and vegetable quality was evaluated. Quality attributes such as: seasonality, ethics, locally grown and agronomic practices appeared to be great points of concerns for farmers but not for consumers. This discrepancy is reflected also by mean differences among these constructs, between the two categories of respondents (>2.22 points). Although the consumers identified by the survey (52% men and 48% women; 22% administrator, 63% faculty, 15% staff, older than 26) are well educated professionals, they may not be

sufficiently knowledgeable about food production systems and practices. Therefore, agronomic practices and the importance of purchasing locally grown foods, while respecting their availability according to the season and a production ethics, may constitute concepts hard to comprehend by these subjects when food quality is evaluated. A primary reason to explain such a discrepancy could be attributed to the disconnection with food systems that most consumers experience due to the relentless extirpation of agrarian cultures, in lieu of large-scale food production systems. Thus, many experts contend that severing links with rural contexts affects consumers' perceptions and values when foods quality is studied (Fjeld and Sommer, 1982; Gopalkrishnan and Jukti, 1997; Brooker et al., 1987). However, there has been an increasing, mutual interest among producers and consumers in valuing fruit and vegetable quality when the produce is organically grown (Lockeretz, 1986). An increasing interest for foods that are certified organic substantiates consistently consumers' interests in food quality issues. Produce shelf-life appeared to be another quality criterion to be shared in more equal proportions by all the subjects involved in the study. Finally, consumers and producers considered highly quality indicators such as: taste, freshness, salubrity (mean differences <0.63 points). These reiterate a growing interest in food health and nutrition that is exerting pressures to produce foods of value, while maintaining high standards of quality and safety (Busch, 1997). Although price did not represent a top attribute of concern expressed by growers, its mean score was high (4.25 points). However, its mean difference when compared to the mean consumers' score was minimal (0.54 points) suggesting that consumers are becoming more sensitive about the unrealistic price paid by the general public for food, in the U.S. Consequently, more consumers appear to be willing to pay more money for foods when quality, referring particularly to: taste, salubrity and freshness, can be guaranteed by producers.

CONCLUSION

Despite its unavoidable constraints and limitations the study conducted at Slippery Rock University of Pennsylvania demonstrated a tangible approach toward an appreciation of food quality, when this refers directly to fruits and vegetables. We are all consumers of agricultural products and thus, launching such an initiative within an institution of higher education has generated interest and enthusiasm among different constituencies within the university, while consolidating the needs for establishing a local food system, for the benefit of the entire community. Locally grown food assures quality because the produce is harvested no later than the day before of being purchased, or even consumed. On the other hand, most produce travels long distances (1300 miles) on average in the U.S. before reaching the consumer's dinner table (Pirog et al., 2001). Therefore, in such a global foods market in which yields and profits remain primary production goals, the quality indicators considered in this study may become superseded by compelling priorities of extending shelf-life and improving produce appearance. There are significant benefits for promoting fruit and vegetable quality in western Pennsylvania for the primary role that agriculture plays in the economy of the state. Thus, establishing a food purchasing policy at Slippery Rock University which contemplates direct purchase from local growers while enhancing produce quality, contributes to more money being recycled within local communities, rather than food corporations. It is commonly known that consumers are capable of exerting strong pressures upon legislators when they become better informed and convinced of preserving quality through regionally grown foods (Tregear et al., 1998). Additionally, an enhancement of quality for locally grown fruits and vegetables decreases reliance upon distant and uncontrollable food sources. This approach becomes supportive of a philosophy of sustainability as it reduces significantly the energy and environmental costs of food production (Pirog et al., 2001). Finally, food quality preservation practices offer extraordinary educational opportunities for educating youth about nutrition (Ryan et al., 1995). Curricula become enriched by the employment of food quality issues while enhancing the viability of multidisciplinary study approaches that culminate in the maximization of excellence in teaching and

learning. The maintenance and an amplification of this initial project offer foreseeable, positive outcomes upon every learner, within the institution and beyond. Future studies aimed at substantiating knowledge and issues about food quality in institutions of higher education should consider students as viable research subjects, to validate a step further these initial findings. There is a need to better educate youth in food production, quality and consumption. There is also a need for growers to be more aware of what is wanted by consumers. Thus, students become the primary beneficiaries of such an effort as they develop awareness toward food systems, while reconnecting with a local, agrarian culture (Lacy, 1997). A renovated sensibility toward personal and environmental health, resource management, ethics, social justice and ultimately, stewardship is predicated under the benevolent auspices of a thriving school/local foods program. This initial effort from Slippery Rock University proved to be of great efficacy in approaching fruits and vegetable quality studies from many perspectives. A more holistic approach in food quality investigations, as demonstrated by this study, substantiates also the driving force of an institution of higher education in rural Pennsylvania in reconciling market goals with a philosophy of stewardship and sustainability in the region.

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Literature Cited

- Brooker, J., Eastwood, D.B. and Orr, R.H. 1987. Consumers' perceptions of locally grown produce at retail outlets. *J. Food Distr. Res.* (Feb.):99-107.
- Busch, L. 1997. Grades and standards in the social construction of safe food. Invited paper presented at a conference on the "Social Construction of Safe Food" at the Norwegian technical University in Trondheim, Norway, April.
- Fjeld, C.R. and Sommer, R. 1982. Regional-seasonal patterns in produce consumption at farmers' markets and supermarkets. *Ecology of Food and Nutrition.* 12:109-115.
- Gopalkrishnan, R.I. and Jukti, K.K. 1997. The Impact of country-of-origin and country-of-manufacture cues on consumer perceptions of quality and value. *J. Global Marketing.* 11(1):7-28.
- Harmon, A., Kalb, M., Bordi, P. and Devitis, C. 2002. *Farm to School. A Guide for Food Service Professionals.* National Farm to School Program. USDA, Washington D.C.
- Lacy, W.B. 1997. Educating Lifelong learners for the American Food System. p. 219-230. In: W. Lockeretz (eds.), *Visions of American Agriculture.* Iowa State University Press, Ames.
- Lockeretz, W. 1986. Urban consumers' attitudes towards locally grown produce. *Am. J. Alt. Ag.* 1(2):83-88.
- Pirog, R., Van Pelt, T., Enshayan, K. and Cook, E. 2001. Food, Fuel and Freeways: An Iowa perspective on how far food travels, fuel usage, and greenhouse gas emissions. Leopold center for Sustainable Agriculture, Iowa.
- Ryan, L., Anderson, J. and Sherman, B.M. 1995. The effect of nutrition education on improving fruit and vegetable consumption of youth. *J. of Extension.* 33(5). Available at: <http://www.joe.org/joe/1995october/a3.html>
- Tackie, N.O., Baharanyi, N. and Findlay, H.J. 1996. Marketing fruits and vegetables in south central Alabama: The diffusion approach. *J. of Extension.* 34(5). Available at: <http://www.joe.org/joe/1996october/a4.html>
- Tregear, A., Kuznesof, S. and Moxey, A. 1998. Policy initiatives for regional foods: some insights from consumer research. *Food Policy.* 23(5):383-394.

Tables

Table 1. List of quality attributes that were used for the construction of the survey.

Most significant attribute	Significant	New attribute
Locally grown Taste Freshness Price Shelf-life Seasonality	Ethics Salubrity Agronomic practices	Organic

Table 2. Mean scores on a 5 point Likert-scale for the ten quality attributes under study among consumers and producers at Slippery Rock University of Pennsylvania, USA.

	Consumer	Producer	Mean differences ¹
Seasonality	1.98	4.96	+ 2.98
Taste	4.45	5.00	+ 0.55
Freshness	4.43	4.68	+ 0.25
Salubrity	4.2	4.83	+ 0.63
Price	3.71	4.25	+ 0.54
Ethics	2.1	4.32	+ 2.22
Locally grown	1.99	4.76	+ 2.77
Organic	2.26	3.92	+ 1.66
Shelf-life	2.5	4.1	+ 1.60
Agronomic practices	1.23	3.79	+ 2.56

¹Mean difference scores between producers and consumers.

Figures

FOOD QUALITY SURVEY

The purpose of this survey is to collect data about fruit and vegetables, with the aim of evaluating their quality.

Please fill out this form anonymously.

Demographic data:

Age: under 25 ____, 26-35 ____, 36-45 ____, 45 and over ____

Sex: Male ____ Female ____

Occupation: Administrator ____, Faculty ____, Staff ____, Farmer ____

a) When consuming fruit and vegetables, how important is each of the following?

	Very important	Important	Neutral	Unimportant	Very unimportant
Seasonality					
Taste					
Freshness					
Salubrity					
Price					

b) When purchasing/growing fruit and vegetables, how important is each of the following?

	Very important	Important	Neutral	Unimportant	Very unimportant
Ethics					
Locally grown					
Organic					
Shelf-life					
Agronomic practices					

Thank you for completing this survey!

Fig. 1. Research instrument designed for the study.