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**Fifth Joint Conference on
Agriculture, Food, and the Environment**

Proceedings of a Conference Sponsored by
University of Minnesota
Center for International Food and Agricultural Policy

Università degli Studi di Padova
Dipartimento Territorio e Sistemi Agro-forestali

Agricultural Development Agency - Veneto Region

University of Perugia

University of Bologna - CNR

SESSION IV: FOOD MARKETING AND THE ENVIRONMENT

**PAPER 2: BRAND NAME AND ADDED VALUE IN HORTICULTURAL
PRODUCTS: ANALYSIS OF CONSUMER PERCPETION**

Gian Luca Bagnara

Center for International Food and Agricultural Policy

University of Minnesota
1994 Buford Avenue, 332 C.O.B.
St. Paul, Minnesota 55108-6040 U.S.A.
Phone: (612) 625-8713
FAX: (612) 625-6245

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FOREWORD

This volume contains the papers presented at the Fifth Joint Minnesota/Padova Conference on Food, Agriculture, and the Environment held at Abano Terme, near Padova in Italy, June 17-18, 1996. This conference was organized by the Center for International Food and Agricultural Policy at the University of Minnesota and the Dipartimento Territorio e Sistemi Agro-forestali at the Università degli Studi di Padova (University of Padova) under their international collaborative agreement, along with the Agricultural Development Agency - Veneto Region, the University of Perugia, and the University of Bologna - CNR. The first Joint Conference was held in Motta di Livenza, Italy in June 1989, the second in Lake Itasca, Minnesota in September 1990, and the third in Motta di Livenza in June 1992. The Fourth Joint Conference was held in September 1994 at the Spring Hill Center in Minnesota.

This conference focused on topics of mutual interest in the areas of (1) agricultural and resource policy, (2) land markets, (3) the food and agricultural industry, (4) agriculture and the environment, and (5) agricultural production and environmental quality and sustainability. Although the conference was not intended to provide a comprehensive coverage of all the issues, this volume hopefully represents a useful contribution to current understanding and debate in the areas of food, agriculture, and the environment.

Judy Berdahl, secretary for the Center for International Food and Agricultural Policy at the University of Minnesota, assisted with these Proceedings.

Benjamin Senauer
University of Minnesota

Danilo Agostini
University of Padova

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BRAND NAME AND ADDED VALUE IN HORTICULTURAL PRODUCTS: ANALYSIS OF CONSUMER PERCEPTION

Gian Luca Bagnara¹

Abstract

The objective of this study is to evaluate consumer willingness to pay for a brand that guarantees peaches produced by integrated pest management techniques. Contingent evaluation has been applied to a survey of consumers at the retail level.

The econometric model of contingent evaluation shows the significant impact of socio-economic variables and consumer food style with respect to product characteristics. In other words, the variables affecting perception are more important than actual characteristics of product in determining its added value.

Indeed, consumers are more willing to penalise unbranded peaches than to pay for a branded and guaranteed product. Consequently, a brand to guarantee food safety in peaches is not sufficient to increase added value but it is important in keeping market share.

1. Introduction

Marketing strategies for new product development requires specific quantitative information regarding benefits of the improvement made. This is particularly important for food safety problems.

In actual fact, food safety could represent a new opportunity for fruit-growers to differentiate their products². Fruits that are produced by *integrated pest management* (IPM) can have a higher added value if a proper marketing strategy is adopted. In this case, a brand is a guarantee of the product for the consumer, and it is applied to increase the added value for the producer.

¹Dr. Gian Luca Bagnara is currently an external collaborator of the Department of Territory of the University of Padua and collaborator of the Istituto Sperimentale per la Frutticoltura (tel:+39-543-402256; fax: +39-543-554554; email: g.bagnara@mbox.queen.it).
Comments about this paper are welcome.

² Market differentiation is the consumer's perception of the difference between a brand and its competition (Boulding *et al.*, 1994). The measure of differentiation is thus the degree to which a firm is able to obtain high margins. Specifically, the degree of differentiation is as follows:

$$D = \frac{P-MC}{P}$$

where P is price and MC is marginal cost. Thus, higher values of D imply a greater ability to obtain higher margins and therefore profits, all else being equal. The measure of differentiation is thus equal to the inverse of the absolute value of its price elasticity, that is:

$$D = \frac{1}{|\epsilon|}$$

where $\epsilon = \partial Q / \partial P \cdot P / Q$ and Q is quantity.

The objective of this study is to evaluate consumer willingness to pay for a brand that guarantees IPM peaches.

2. Methods

2.1 The model

According to Loehman (1991) and McConnel (1990), willingness to pay (WTP) should satisfy a theoretical structure not unlike demand theory; that is, it can be measured as a functional relationship. For this survey, willingness to pay was modelled directly as a random variable applying the Weibull model proposed by Loehman and Park (1993):

$$WTP = f(M, s; H, I, s^0)\epsilon$$

where: M= budget constraint; s= level of food safety; H= health level required by the consumer; I= consumer information level; s^0 = base level of food safety; ϵ = error that has a Weibull distribution so that:

$$\text{Prob}(WTP \leq w) = 1 - \exp[-(w/f(M,s; H,I,s^0))^c]$$

where c is a scale parameter. Such a function can be restated as follows:

$$\text{Prob}(WTP > w) = \exp[-(w/f(M,s; H,I,s^0))^c]$$

and the mean of this distribution is:

$$E(WTP) = \Gamma((c+1)/c) f(M,s; H,I,s^0)$$

namely, determining the mean does not require numerical integration.

2.2 Empirical analysis

A survey at retail level was conducted using a questionnaire defined by Bagnara (1994). This questionnaire included about 150 variables that were organised in 5 groups: economic-demographic aspects; cultural characteristics; food style; shopping habits; and characteristics of product perception.

Respondents were also asked to state their willingness to pay more (percentage ranking from 0% to 100%) for a brand that guarantees the safety of peaches obtained by IPM techniques. At the same time, respondents were asked to state their willingness to pay less for a product which was not guaranteed (from -0% to -100%).

The sample was sized according to the power curves at $\alpha=0.05$ and $\beta=0.10$. The answers included in the questionnaire were based on a scale ranging from 1 to 7, so that the design sensitivity was 1. The sample was stratified by retail point; in other words, it was stratified on the basis of the consumer's shopping habits. The sample size (total $n=280$) was 70 consumers (representing their respective households) randomly stratified per 3 supermarkets (which were differentiated by different positioning and products) and the farmer's market. The consumers were interviewed directly in the store facing the product they were purchasing.

The WTP function was combined with the geometric plan of the consumer's perception of product characteristics, estimated from principal component analysis, in order to relate added value to quality of product in a simulation model.

3. Results

3.1 Consumer preferences

Consumers seem to prefer to purchase peaches frequently to better appreciate their freshness: about 27 percent of respondents purchased peaches every 2 days while 38% purchased every 3 days. Indeed, freshness is the most important quality characteristics for peaches, and is estimated on the basis of the appearance of fruit and how it is displayed (figure 1). These factors are combined with the consumer's trust of the store. However, these features are not proper characteristics of fruits but of their interaction with the perceived quality of the store. The characteristics of fruit quality (knowledge of the production technique and of the producer's name) are secondary aspects affecting the decision to purchase (figure 1).

Consumers choose the store on the basis of freshness (figure 2), which is actually a characteristic of the products. In this way, characteristics of products interact with characteristics of the store thus affecting the perception of quality and, consequently, consumer awareness of the store.

Peaches are eaten when ripe by 66 percent of consumers and when unripe by 26 percent. These data show the contrast between the consumer's preference for ripe juicy fruit and the retailer who sells unripe peaches to extend their shelf life.

3.2. Willingness to pay

Consumers are more willing to penalize unbranded peaches than to pay for a branded and guaranteed product (fig. 3). Indeed, to the question "*How willing are you to pay for a safe product, obtained by integrated pest management techniques, which reduces the chemical residues by 50% with respect to legal limits?*", about 58 percent of consumers answered they would pay from 10 to 20 percent more; 8.5 percent said that they would pay nothing more and just 31 percent of respondent said they would pay more than 20 percent. As regards the lower value of an unbranded product, most consumers (54.6 percent) said that such a product would be worth 30-40 percent less.

The econometric model of contingent evaluation (table 1) shows the important role of socio-economic variables and consumer food style with respect to product characteristics. In other words, the variables affecting perception are more important than the actual characteristics of the product in determining its added value. In particular, the consumer who prefers branded and guaranteed peaches has a middle-high education and is interested in cultural topics. Breakfast is a very important meal which can be considered an index of consumer awareness about nutrition and health. Indeed, the structure of the other meals, lunch and dinner, is often influenced by job constraints and household organisation. Willingness to pay for branded peaches is negatively affected by guarantees offered by the State. In actual fact, such a guarantee is associated with the consumer's indifference to product risk (this is estimated by the willingness to pay less for an unbranded product). Guarantees by external agencies or by the producer are more appreciated and thus valued by consumers. Consumers are more willing to pay for this kind of brand since they have a higher perception of risk of an unbranded product.

Guarantee and product characteristic variables were evaluated by principal component analysis (table 2). The geometric plan of component 1 and 2 (figure 4) was related to the willingness to pay function and the risk function of peach brands, in quadratic form, in order to estimate a simulation model as shown in figure 5. The WTP was higher when the perception of risk was higher, which is located in the right hand corner of the model (figure 5). Such an area was dominated by the following variables: guarantee by agency; fruit-grower guarantee; characteristics of product (variety, area and technique of

production). However, the right-hand-corner of the model (figure 5) does not reveal a high WTP, which is limited to 25-30%, but it does show a vertical distance between the values of branded and unbranded peaches. From a marketing viewpoint, the model shows a limited possibility for increasing the added value of peaches but a high potential for enlarging the marketing margin through proper market segmentation and communication.

4. Conclusions

A brand to guarantee food safety in peaches is not sufficient to increase the fruit's added value but is a necessary to sell the product and to keep market share. Consumers are quite aware of the risks of an unbranded product so they tend to attribute it with a lower value. However, there is room to exploit branded fruit such as IPM peaches through marketing strategies of consumer segmentation and promotion.

This research highlights the importance of socio-economic characteristics and consumer food style on perception of value. This means that the added value is positive when the perceived quality is higher than actual quality.

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Table 1. Contingent evaluation of willingness to pay for the brand of IPM peaches.

	Willingness to pay for branded product	Willingness to pay less for unbranded product
Date		-0.28
Sex: female		0.46
Household organisation		
	widowed	-0.79
Job of respondent		
	student	0.51
Job of household leader		
	teacher	0.81
Cultural profile		
	cultural topics	0.18
	fashion	-0.44
Food style of household:		
	eat alone	0.28
Most important meal		
	breakfast	0.13
Structure of meals		
	breakfast with fruits	-0.16
	breakfast with cereals	-0.44
	breakfast with fruit juice	0.69
Percentage of food cost on household income		
Shopping of food products at		
	supermarket	-0.79
Preference for the retail point is due to		
	freshness of products	-0.37
	customer	-0.23
	quality/price ratio	-0.30
	quality	0.69
	convenience	-0.36
Who should guarantee quality		
	State	-0.16
	agency	
	producer	0.31
Frequency of purchase of peaches		-0.47
Choice of peaches is based on		
	colour	-0.34
	variety	0.15
	yellow flesh	-0.43
R²- adj.	0.92	0.91

Figure 1

The purchase of peaches is based on:

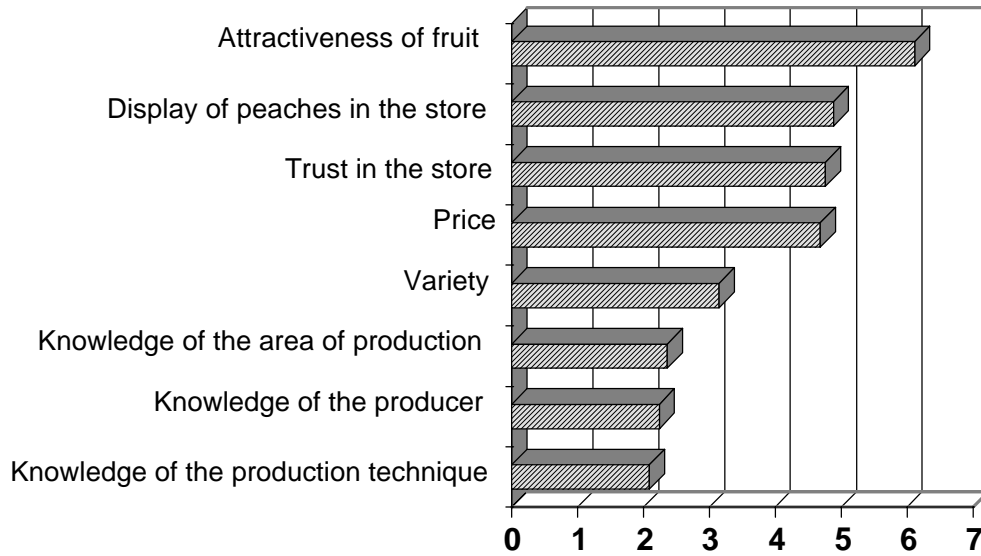


Figure 2.

Your preference for the store is based on:

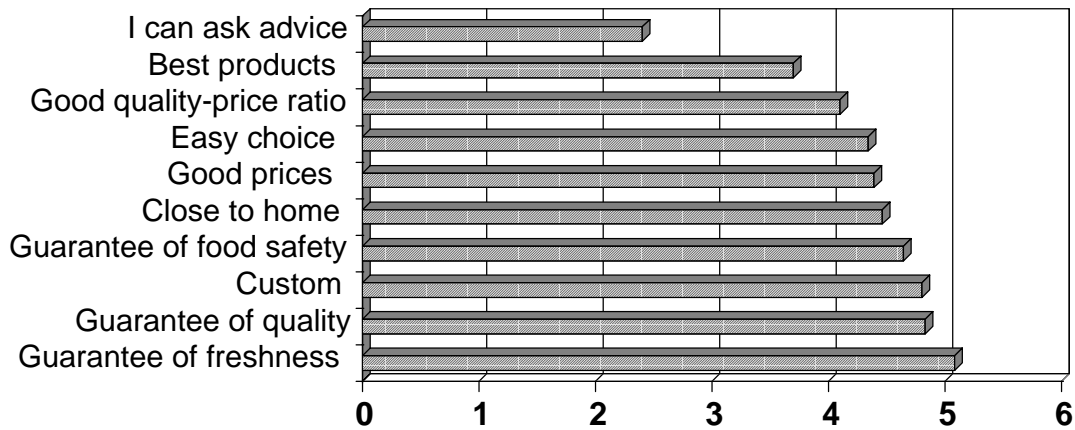


Figure 3

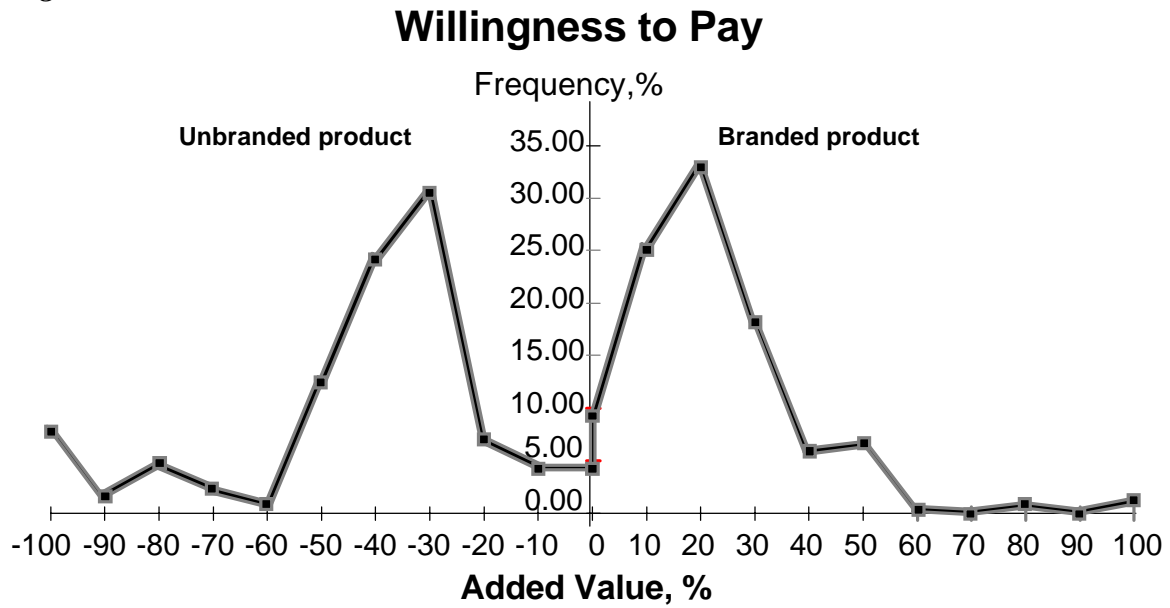


Table 2. Principal component analysis of quality characteristics

Variable	Component 1	Component 2	Component 3
Guarantee of fruit-grower	0.37	-0.28	0.08
Guarantee of co-operative or packing-house	0.20	0.01	0.28
Guarantee of retailer	-0.05	0.24	0.34
guarantee of State	0.09	0.88	-0.21
Guarantee of agency	0.51	0.09	0.12
Frequency of purchase of peaches	0.12	0.04	0.06
Purchase of peaches based on: production technique	0.26	-0.03	-0.20
Purchase of peaches based on: producer's name	0.27	0.01	-0.31
Purchase of peaches based on: awareness on retailer	0.07	0.11	0.61
Purchase of peaches based on: name of production area	0.31	0.04	-0.21
Purchase of peaches based on: price	0.03	0.18	-0.03
Purchase of peaches based on: colour	-0.04	0.11	0.30
Purchase of peaches based on: variety	0.53	-0.05	0.11
Purchase of peaches based on: display	-0.003	0.08	0.26
<i>Variance</i>	<i>29%</i>	<i>13%</i>	<i>9%</i>

Figure 4. Principal components analysis: projection of component 1 and 2.

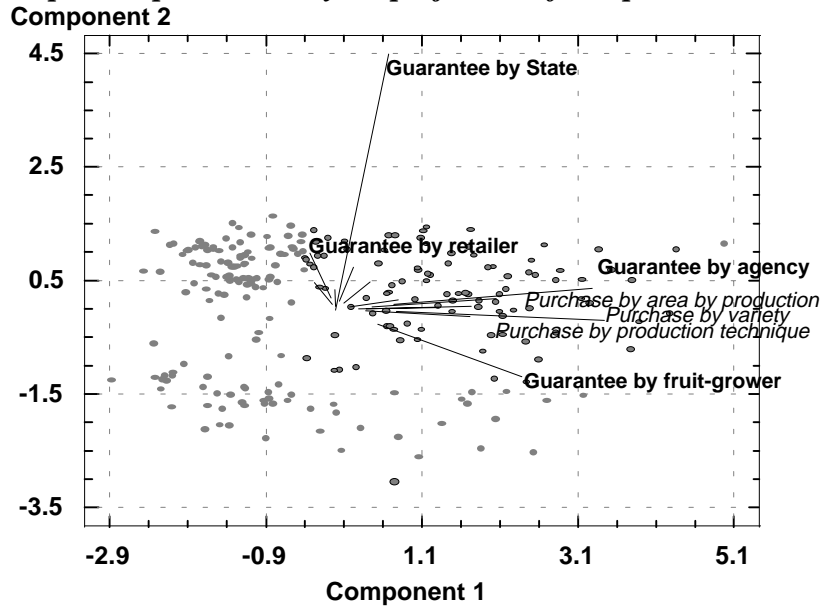


Figure 5. Simulation model of willingness to pay on geometric plan of principal components from variables of guarantee and product characteristics.

