

Relationship between sensory attributes, hidden attributes and price in influencing consumer perception of organic foods

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ABSTRACT

Consumer attitudes to foods are mainly influenced by quality attributes. Ethical factors are important in some cases, but they may be overstated. The relationships between consumers' awareness of organic food, price and perceived quality of food were investigated by tests involving series of consumer panels and sensory evaluation. Sensory responses were also matched to instrumental analysis data. Results indicated that overall there was no relation between panellist's views about organic foods and their sensory perceptions. Eighty percent of the panellists felt that organic products were too expensive, but would buy them if they were cheaper. However the study showed that most of the people would not be likely to change their preference once they had made a product choice based upon sensory attributes. This has important implications, indicating that not only price, but also sensory quality of organic food must be considered in order to maintain repeated purchases by most consumers.

Keywords: organic food, consumer attitudes, sensory analysis, repeated purchase, price

INTRODUCTION

Food related health scares during the last 15 years have heightened consumer concerns in relation to the safety of foods (Wandel 1984) and contributed to changes in consumer purchasing patterns (Mitchell 1998). People are particularly concerned about food poisoning in general and GM food (Mintel 1999). Market surveys have shown that consumers perceive organic food products as being less harmful to the environment and containing less chemical contamination, but their reactions to the quality of organic foods are not very well established.

It is widely accepted that consumer acceptance of foods is mainly determined by their sensory perception, while choice is strongly influenced by the perceived value for money. Ethical factors are important in some cases, but they may be overstated. Although comparisons between organic and conventional foods have been reported for a range of attributes, measures of the quality of organic foods as perceived by consumers using objective sensory evaluation methods, or the relevance of any preconceptions in perception have not been studied. This study aimed to investigate the relationship of objective quality measurements including sensory attributes and consumer perception of organically and conventionally produced food products.

APPROACH

A range of non-seasonal products were assessed and selected according to availability and similarities of ingredients and processing methods between organic and conventional foods. Tests were designed to measure the extent to which the 'organic' status and price brings bias into the sensory perception of foods and purchase intent. Sensory profiling was carried out by a group of semi-trained assessors according to the British Standards methods of sensory analysis of foods (BS 5929: Part 4, 1986). Organic and conventional products with equivalent quality attributes were then selected. Consumer perceptions and attitudes toward organic foods were assessed using a questionnaire. A series of paired comparison tests were conducted using pan-fried crisps and UHT orange juice. Comparisons were made between organic product, premium brand product (non-organic), and own brand product (non-organic). Three paired comparison tests were applied:

- a) Test 1 'Blind Test' of organic and non-organic food where sample identity was unknown to consumers.
- b) Test 2 'Preference Test' where identities were revealed.
- c) Test 3 'Price Test' where the costs of the samples used in test 2 were revealed.

Additionally, organic and conventional carrot samples were assessed by sensory analysis of colour, brightness, crunchiness, juiciness and sweetness for both intensity and preference using two consecutive double blind ranking tests and a paired comparison test for preference using a non-expert panel.

In order to support the profiling results, instrumental analysis was applied to triplicate food samples:

Orange juice: colour (Minolta Colorimeter, Japan), pH, total sucrose solids (TSS) (0-28% sugar refractometer).

Crisps: hardness and fracturability (Texture Analyser, Stable Micro Systems, UK)

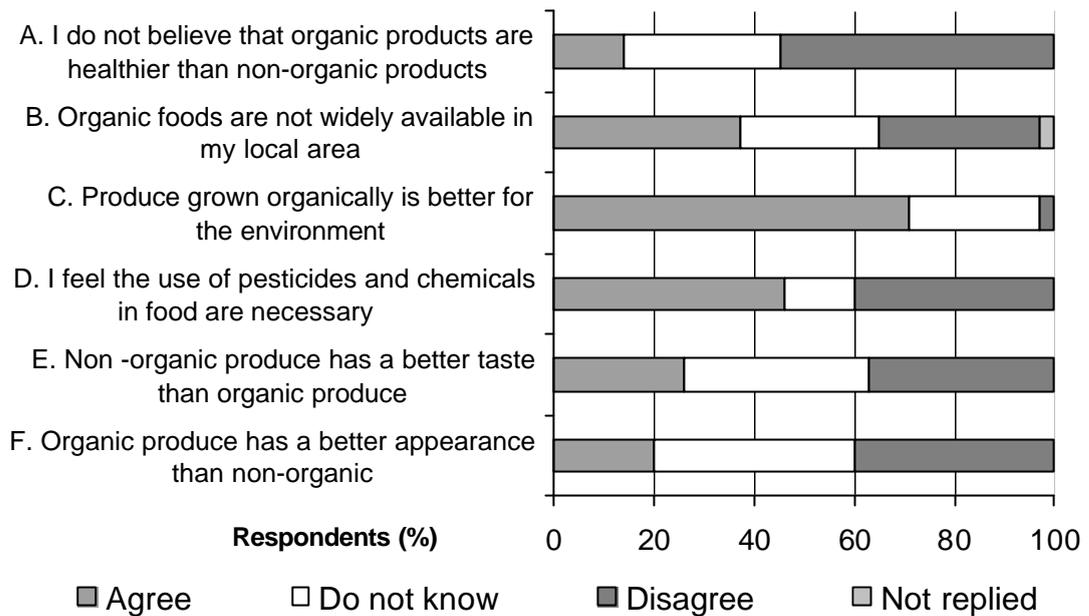
Carrots: crunchiness and cutting profile (Texture Analyser, as above)

Statistical analysis was carried out using ANOVA for the questionnaire and instrumental data, Chi-Squared for contingency comparisons, sign test analysis for the ranking tests and two sided T-test for the paired comparison analysis.

RESULTS AND DISCUSSION

About two thirds of the consumers that participated in the survey believed that growing food organically is better for the environment, and 55% thought that organic food is healthier (Figure 1). However there was some confusion relating to the use of pesticides and chemicals in food. Few consumers distinguished organic food by appearance or taste. Buyers of organic foods were more likely to indicate that the appearance and taste are better, but environmental protection was still the dominant perceived benefit. Buyers who believe that organic food is better also think that it is expensive ($p < 0.05$). In this study, 80% of the consumers perceived organic foods to be too expensive (49% were non-buyers and 31% buyers).

Figure 1. Consumer perceptions and attitudes towards organic foods



Quality attribute differences (Table 1) can be attributed to a wide variety of factors such as variety, origin, time from harvest, postharvest handling. Sample carrots on retail at the time of sampling showed differences in colour, texture, moisture and sweetness as shown in Table 2. In a blind test the consumer panel was unable to detect differences in organic and conventional carrots in for most of the tested attributes (Table 2), with the exception of brightness ($p=0.0129$). When the identity of the carrots was revealed, the sweetness was ranked differently. In a third test, they were given similar unidentified organic and conventional samples and asked to identify which were organic. 50% of the panellists identified one organic and one conventional for colour, crunchiness and sweetness and 65% identified one of each for brightness and juiciness.

In the paired comparison sensory evaluation there was no association (Chi squared $p>0.05$) between positive attitudes towards organic foods and sensory perceptions; the proportion of panellists that change their choice after learning the identity of the product was also non-significant. This indicates that beliefs were not related to product choice which was based on eating quality. In the sequential test 77% of the panellists did not change their opinion about their preferred sample (for both crisps and orange juice) even when they learnt the non-organic identity or the price.

Table 1. Comparison of average (n=6) and standard deviation of quality attributes for 6 organic and conventional carrot samples evaluated instrumentally

Attribute	Organic		Conventional	
	(mean)	Std.dev.	(mean,)	Std.dev.
L(brightness)	59.81	2.49	62.41	2.82
a (redness)	25.62	3.70	28.29	4.36
b (yellowness)	30.48	2.75	34.07	3.76
Crunchiness (g s)	16132	1372	12706	1838
Moisture (%)	87.11	2.12	90.66	1.00
Sweetness (%)	35.67	0.52	38.00	0.63

Table 2. Comparison of average (n=20) ranking scores (1-4) for organic (O) and conventional (C) carrot samples evaluated for sensory attributes

Attribute	Intensity (O, C)		Post- identification ^b (O, C)	
	Colour	2.37,	2.60	2.50,
Brightness	2.10,	2.93 ^a	2.77,	2.72
Crunchiness	2.32,	2.73	2.67,	2.32
Juiciness	2.55,	2.45	2.62,	2.38
Sweetness	2.27,	2.22	2.90,	2.10 ^a

^a Significantly different ($p < 0.05$) sign test

^b When the identity of the samples were disclosed

These results have important consequences for organic food marketing where price, product presentation and eating quality have been shown to be the most important factors influencing consumer choice. Besides branding, eating quality seems to be particularly important for achieving repeated purchases.

ACKNOWLEDGEMENTS

Thanks to Karen Linton and Liz Folland for the technical support. Denise Twomey, Samantha Gilbert, and Catherine Harris contributed to the studies.

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From: Powell et al. (eds), *UK Organic Research 2002: Proceedings of the COR Conference, 26-28th March 2002, Aberystwyth*, pp. 65-68.