

# EVALUATION OF ACTUAL DIFFERENCE IN ORGANOLEPTIC QUALITIES OF ORGANIC AND CONVENTIONAL GROUNDNUTS AMONGST B SCHOOL STUDENTS OF MUMBAI – AN EXPERIMENTAL APPROACH

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**Abstract:** Consumption of organic food is following a secular rising trend. The reason for this consumption may be for self benefit (egoistic) and/or for benefits of others (altruistic). The egoistic reason may again either for health, nutrition or sensory benefits (organoleptic). There are contradictory findings as to many aspects of organic food consumption and the organoleptic qualities are one of the dimension on which there is contradictory finding. A blind taste appearance and smell experiment was conducted to find out whether there is difference in organic and conventional groundnuts. 90 B school graduates were invited to a blind taste experiment using organic and conventional groundnut. The results showed there is no significant difference in the taste appearance and smell between organic and conventional groundnuts.

**IndexTerms :** Sensory variables, Taste, Smell, Appearance, Organic fruits and vegetables, Wilcoxon Signed Ranks Test, Normality testing, Mann–Whitney test

## I. INTRODUCTION

Presently, organic food consumers seem to pay more attention to “egoistic” motives for purchasing organic food, such as health, taste, and wellness, rather than to “altruistic” purchasing motives, such as environmental protection and animal welfare. Organic practitioners are starting to take into account sensory properties, such as taste, smell, appearance, touch, odor, etc. as important elements to be considered in food product development and marketing communication strategies in order to quickly respond to the new consumers’ needs and to shifted expectations. Organic groundnut has been taken as proxy for organic food and a blind taste, appearance and smell experiment is conducted to evaluate whether there is significant difference. Belief may override actual organoleptic qualities if it is known that the food is organic. This effect may be established with a controlled experiment. Organoleptic experiment may be done by letting the respondents know that they are sensing organic food and also a similar kind of group should do a blind sensory test. This research evaluates the organoleptic qualities of conventional and organic groundnuts.

## II SIGNIFICANCE OF THE STUDY:

India has a strong tradition and strength in organic farming. The traditional knowledge on sustainable farming practices still exists. In remote areas of the country, chemical-free agriculture is still being practiced by default. While higher revenues are currently achieved by exporting certified organic produce, the future growth of the organic segment will be influenced most significantly by developments in domestic markets within India. Effective marketing of organic products in local, regional and national markets could make a major contribution to securing the livelihoods of smallholder producers, and sustainable development of the country’s organic food sector. A true finding of whether there is actual difference in the organoleptic qualities of organic groundnut will help the industry in promoting the true value of organic food to the consumer.

## III LITERATURE REVIEW:

Sensory attributes are gaining importance in food choices (Shepherd, Magnusson, and Sjoden 2005). Research on organic consumers’ sensory analysis has not been explored widely in the literature. Some studies showed that taste and other sensory attributes represent important product features for specific consumers segments who approach the purchase of organic food products pragmatically (Pellegrini and Farinello 2009) and tend to evaluate them according to the same parameters applied to conventional products (Berardini et al. 2006). Other studies revealed that taste and appearance are among the most important criteria in organic food purchase (Castellini et al. 2008; Kuhar and Juvancic 2010; Magnusson et al. 2001; Roddy, Cowan, and Hutchinson 1994). These findings were confirmed by Luth and Spiller (2005), who reported that consumers are willing to pay higher prices for organic products solely if they feature aspects beyond the fact of being organically produced, such as a unique taste or smell. Finally, some scientists pointed out that sensory attributes are important elements that should be taken into account in the marketing strategies by organic food operators (Brennan and Kuri 2002; Padel and Foster 2005).

To our knowledge, few studies focused specifically on consumers’ sensory experiences and preferences for organic food have been conducted in Italy (Stolz et al. 2010). Some authors explored consumers’ sensory experiences and preferences concerning organic extra-virgin olive oil (Bracco et al. 2009; Midmore et al. 2005), while other contributions focused on Pecorino cheese (Napolitano et al. 2009) and organic vegetable baby food (Vairo and Zanolini 2009).

### **Organic fruits and vegetables look superior to non- organic fruits and vegetables:**

People shop with their eyes. There is a clear relationship between willingness to accept blemishes and organic purchasing behavior (Goldman & Clancy, 1991). Eighteen percent of shoppers who are concerned about pesticides would be willing to buy blemished produce whereas only 6 percent of shoppers who are unconcerned about pesticides would be willing to buy blemished produce. (Ott, 1990) However, when it is made known that the blemished produce is "organic," consumers are more likely buy blemished organic produce. Other studies show the negative effect on consumer demand of blemished produce is only slight (Goldman & Clancy, 1991; Sparling and McKenzie, 1992; Estes et al., 1994; Tregear et al., 1994). Bad looking or poor appearance compared to conventional products can be reason not to buy organic food. If appearance of an organic product is not satisfying for consumers, they can feel cheated and additionally they can think that also has low quality (Radman, 2005; Zanolli et al., 2004). Some studies show that consumers have a strong resistance to blemishes. Ott (1990) found that sixty two percent of consumers would be unwilling to accept any decrease in appearance quality when purchasing organic produce and 88 percent would be unwilling to accept insect-damage on pesticide residue-free produce. A previous review of literature (Beharrell & MacFiem, 1991) found that people estimate a food's quality by appearance. The degree to which blemishes cause people, who would otherwise buy organic produce to choose not to, is ambiguous, but it is important that organic foods be as visually appealing as possible or people are less likely to buy them.

Lin et al. (1986) shows that the more organic or pesticide-free produce is preferred, the less appearance is important. Jolly & Norris (1991) found that eleven out of twelve supermarket chains surveyed rated organic produce appearance as worse than non-organic produce and believed that their customers held the same view. Anecdotal evidence indicates that, while the appearance of organic produce was inferior to conventional produce in the 1980's, the quality of what is for sale now has improved greatly. In one study, Conklin et al. (1991) actually found that organic apples had fewer defects than non-organic apples.

### **Organic fruits and vegetables are tastier than non-organic fruits and vegetables.**

Eating tasty food is a general motive for everybody to satisfy your needs. Most organic consumers think that organic products taste more natural, intense and rich in flavor. German occasional buyers are mostly affected from the taste of the organic products. (Zanolli et al.,2004) On the other side, frequent buyers and elder people find organic products tastier and this is the one of the main reason for Croatians to purchase organic food. Also Croatian women find organic products tastier than men. (Radman, 2005) However, some western European studies showed that, taste is one of the main buying motives for men. (Hofmann, 2006).Taste is another basic attribute of organic food that affects food purchasing decisions. Jolly & Dhesi (1989), Jolly & Norris (1991), and Sparling et al. (1992) found consumers perceived no difference in taste between conventionally grown and organic produce. Morgan et al. (1990), Estes et al. (1994), and The Packer (1996) found that consumers believed that organic produce tastes better than conventional produce. Sparling et al. (1992) found that non-organic produce consumers do not view organic produce as tasting better than conventional produce, but organic produce consumers do believe organic produce taste better than conventional. Estes et al. (1994) found that survey respondents cite "better taste" as the primary reason for buying organic produce. In only one reviewed study consumers rate the taste of conventionally-grown produce as superior to organic produce.

### **Organic fruits and vegetables look fresher than non-organic fruits and vegetables.**

Freshness is another factor that influences consumers' produce decisions. Consumers rate in-store freshness as the same between conventional and organic produce (Sparling et al., 1992). Retail produce buyers say organic produce tend to have a shorter shelf life than conventional produce and that this characteristic decreases consumers' demand for organic produce. However, the frequency of this response was very weak. Estes et al. (1994) found that the third most frequently mentioned reason for purchasing organic produce is freshness. The Packer (1996) found that 17 percent of organic produce consumers cite increased freshness as a major reason for purchasing organic produce.

A characteristic related to freshness is shelf life, i.e., how long organic fruit and vegetables will keep. Jolly & Norris (1991) and Morgan et al. (1990) find the majority of produce managers rate organic produce's keeping qualities as worse than that of conventionally-grown produce. Sparling et al. (1992) finds that consumers see no difference in the keeping quality of organic produce versus conventional produce. Other consumers cited organic produce's longer shelf life as a reason for purchasing organic produce (Morgan et al. 1990). There seems to be no consensus regarding organic produce's keeping qualities as compared to the keeping qualities of conventionally-grown produce.

### **Organic fruits and vegetables smell goods as compared to non organic fruits and vegetables.**

The first defined group of sensory attributes involves the physical features such as taste, smell, color and appearance (Wierenga, 1983; Peattie, 1995). Several studies have found that sensory aspects of foods like taste, smell, look and texture to be among the important criteria in organic food purchases (Roddy et al,1996; Schifferstein and Ophuis, 1998; Magnusson et al, 2001; McEachern (2002). Krystallis and Chryssohoidis (2005) stated that taste, nutritional value, environmental benefit had also influenced the purchase of organic food.

## **IV OBJECTIVE**

- To find out whether there is difference in the taste of organic and conventional groundnut
- To find out whether there is difference in the appearance of organic and conventional groundnut
- To find out whether there is difference in the smell of organic and conventional groundnut
- Use gender as variable in the above studies.

## **V HYPOTHESIS**

1. There is a significant difference in the taste of organic and conventional groundnut
2. There is a significant difference in the appearance of organic and conventional groundnut

3. There is a significant difference in the smell of organic and conventional groundnut
4. There is a significant difference among male and female in the above organoleptic qualities

**VI METHODOLOGY:** The research design is quantitative in nature. Sample size, methodology of experiment and data analysis is narrated below.

#### VII DATA COLLECTION:

A blind taste experiment was done using the two types of groundnuts amongst B School graduates in Mumbai. The experiment was conducted with 90 student's s participants. Organic groundnut and conventional groundnut were kept in two bowls marked as Bowl A and Bowl B. The participants did not know about the type of the groundnuts type. The participants were invited to taste smell and observe the appearance of both type of the groundnuts and then were asked to indicate their choice on the attributes on Likert type questions.

#### VIII DATA ANALYSIS:

Data analysis was carried out on SPSS 23. The variables were subjected to normality testing using Shapiro- Wilk test and Kilmogorov\_Smirnov test. The P value is less than 0.05 hence the alternative gets accepted which states that data is not normally distributed. Since the data is not normally distributed non parametric equivalent of Paired and Independent t test is used to do the comparison.

**IX INTERPRETATION:** Based on the test done for hypothesis testing the null hypothesis is getting accepted

Null Hypothesis	Test used	Status
• There is no significant difference in taste perception between male and female of organic and conventional groundnuts	Mann-Whitney test	Accepted Null
• There is no significant difference in appearance perception between male and female of organic and conventional groundnuts	Mann-Whitney test	Accepted Null
• There is no significant difference in smell perception between male and female of organic and conventional groundnuts	Mann-Whitney test	Accepted Null
• There is no significant difference in taste between organic and non organic groundnuts	Wilcoxon Signed Ranks Test	Accepted Null
• There is no significant difference in appearance between organic and non organic groundnuts	Wilcoxon Signed Ranks Test	Accepted Null
• There is no significant difference in smell between organic and non organic groundnuts	Wilcoxon Signed Ranks Test	Accepted Null

#### X CONCLUSION

From the above table it is clear that nonparametric equality-of-medians test implied no significant difference between gender for either organic or conventional groundnuts and across all respondents between organic and conventional groundnuts

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## Annexure

## Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between V5 The groundnut from the bowl A was very good in appearance and V6 The groundnut from the bowl B was very good in appearance equals 0.	Related-Samples Wilcoxon Signed Rank Test	.398	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

## Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between V7 The groundnut from the bowl A was smelling very good and V8 The groundnut from the bowl B was smelling very good equals 0.	Related-Samples Wilcoxon Signed Rank Test	.282	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

## Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of V1 How much did you like or dislike the groundnut from Bowl A? is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.132	Retain the null hypothesis.
2	The distribution of V2 How much did you like or dislike the groundnut from Bowl B? is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.791	Retain the null hypothesis.
3	The distribution of V3 The groundnut from the bowl A was very tasty is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.705	Retain the null hypothesis.
4	The distribution of V4 The groundnut from the bowl B was very tasty is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.398	Retain the null hypothesis.
5	The distribution of V5 The groundnut from the bowl A was very good in appearance is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.099	Retain the null hypothesis.
6	The distribution of V6 The groundnut from the bowl B was very good in appearance is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.832	Retain the null hypothesis.
7	The distribution of V7 The groundnut from the bowl A was smelling very good is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.629	Retain the null hypothesis.
8	The distribution of V8 The groundnut from the bowl B was smelling very good is the same across categories of Gender .	Independent-Samples Mann-Whitney U Test	.122	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

## Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
V1 How much did you like or dislike the groundnut from Bowl A?	.176	89	.000	.914	89	.000
V2 How much did you like or dislike the groundnut from Bowl B?	.190	89	.000	.898	89	.000
V3 The groundnut from the bowl A was very tasty	.240	89	.000	.881	89	.000
V4 The groundnut from the bowl B was very tasty	.234	89	.000	.882	89	.000
V5 The groundnut from the bowl A was very good in appearance	.163	89	.000	.914	89	.000
V6 The groundnut from the bowl B was very good in appearance	.275	89	.000	.866	89	.000
V7 The groundnut from the bowl A was smelling very good	.258	89	.000	.883	89	.000
V8 The groundnut from the bowl B was smelling very good	.243	89	.000	.894	89	.000

a. Lilliefors Significance Correction