

## **Satisfaction analysis of consumers towards Select Organic Products**

Dr.M.Umamaheswari  
Associate Professor and Head,  
Department of Management,  
Dr. SNS Rajalakshmi College of Arts & Science (Autonomous)  
Coimbatore – 641 049  
[dr.umamaheswari.m@gmail.com](mailto:dr.umamaheswari.m@gmail.com)  
+91 98422 50838

Dr. D.Chandrasekar  
Head i/c, Department of Management,  
Bharathiar University Arts & Science College,  
Pollachi, Coimbatore

## **Abstract**

India is an Agrarian country with around 60 per cent of its people directly or indirectly depending upon Agriculture. In ancient times the practice of agriculture is considered to be the greatest service to the society and this practice is inter-twined in their tradition and culture. Agriculture is an uncomplicated endeavor comprising of technical and practical processes that helps in the maintenance of the ecological balance and protects human resources; and most importantly it is a viable food production system. After the Green revolution and use of chemical fertilizers, people started realizing the adverse effects of these chemical fertilizers on earth and started organic agriculture in India. The identification of market potentials for organic products is an important task.

**Keywords:** Organic Products, Agriculture, Ecological products, Green Revolution, Organic Agriculture.

## **Introduction**

Traditional food practices are gained momentum in the food practices of present culture. Twentieth century has been the witness of most technological agricultural revolutionary changes leaving remarks on degradation of population and environment. The simultaneous growth of world population, life expectancies and economies created increasing demand for food supplies. Organic agriculture is a system of many environmental activities that emphasizes environmental protection using natural farming techniques. It is concerned not only with the end-product, but with the entire system used to produce and deliver the agricultural product. To this end, the entire farm cycle, from production and processing, to handling and delivery, excludes the use of artificial products such as genetically modified organisms (GMOs) and certain external agricultural inputs such as pesticides, veterinary drugs, additives and fertilizers.

## **Scope of the Study**

In Tamilnadu western districts has been selected as area of the study owing to main reason that the researcher belongs to the region and he is from agrarian family and more ever familiar with all the places which links with organic products. Consumers are becoming more health conscious and they are moving eagerly towards natural greener products like organic products because of their increasing economic status. In order to make it easy for the people to switch over to organic products, during past two years many new organic specialty shops have been opened and in many retail outlets there is availability of organic products in the western Districts of Tamilnadu. It has almost all fruits vegetables and grocery items available under one roof. Institutions like Tamilnadu Agriculture University, Tamilnadu Department of organic certification and Indian society for certification of organic products (ISCOP) related to organic farming and its products are situated in the western districts is an added advantage. The Western Ghats includes the areas of Palani, Karur, Dharpuram, Thiruchengodu, Erode, Pollachi, Nammakkal, Salem, Dharmapuri, Nilgiris, Avinashi, Satyamangalam, Coimbatore and Udumalpet.

## **Analysis and discussion**

**Objective 1:** *To analyze the factors related to level of satisfaction in respect of organic products*

## **Discriminant Function Analysis**

Respondent's opinion towards factors related to level of satisfaction about Select Organic products in the western Districts of Tamilnadu. In the study area out of seven hundred and fifty respondents were divided into two groups .ie., low level of satisfaction about Select Organic products in the western Districts of Tamilnadu and the high level of level of satisfaction about Select Organic products in the western Districts of Tamilnadu For the purpose of the study, the following variables were selected.

1. Age (in Years)
2. Gender
3. Educational Qualification
4. Present Position
5. Family Monthly Income
6. Area of Residence
7. Marital Status
8. Size of Family
9. Mode of payment
10. How long you are using organic Products

The discriminant function analysis attempts to construct a function with these and other variables so that the respondents belonging to these two groups are differentiated at the maximum. The linear combination of variables is known as discriminant function and its parameters are called discriminant function coefficients. In constructing this discriminant function all the variables which contribute to differentiate these three groups are examined.

Mahalanobis minimum  $D^2$  method is based on the generalized squared Euclidean distance that adjusts for unequal variances in the variables. The major advantage of this procedure is that it is computed in the original space of the predictor (independent) variables rather than as a collapsed version which is used in the other method.

Generally, all the variables selected will not contribute to explain the maximum discriminatory power of the function. So a selection rule is applied based on certain criteria to include those variables which best discriminate. Stepwise selection method was applied in constructing discriminate function which selects one variable at a time to include in the function. Before entering into the function the variables are examined for inclusion in the function.

The variables which could have maximum  $D^2$  value, if entered into the function is selected for inclusion in the function. Once entered any variable already in the equation is again considered for removal based on certain removal criteria. Likewise, at each step the next best discriminating variable is selected and included in the function and any variable already included in the function is considered for removal based on the selection and removal criteria respectively.

### **Discriminant Analysis**

Discriminant function analysis involved classification problem also to ascertain the efficiency of the discriminant function analysis all the variables which satisfy the entry and removal criteria were entered into the function. Normally the criteria used to select the variables for inclusion in the function is minimum  $F$  to enter into the equation (i.e)  $F$  statistic calculated for the qualified variable to enter into the function is fixed as  $\approx 1$ . Similarly any variable entered in the equation will be removed from the function if  $F$  statistic for the variable calculated is  $< 1$ . The two groups are defined as

- |         |   |            |
|---------|---|------------|
| Group 1 | - | Low level  |
| Group 2 | - | High level |

The mean and standard deviation for these groups and for the entire samples are given for each variable considered in the analysis.

**Table 1: Group Means (Between Low and High Groups)**

S.No.	Factor	Low		High		Total	
		Mean	SD	Mean	SD	Mean	SD
1	Age (in Years)	2.50	.501	2.75	.650	2.63	.596
2	Gender	1.16	.364	1.70	.458	1.44	.497
3	Educational Qualification	3.35	.612	2.72	.953	3.02	.868
4	Present Position	2.03	.747	3.46	1.249	2.78	1.260
5	Family Monthly Income	2.03	1.022	2.21	1.046	2.13	1.037
6	Area of Residence	2.05	.973	2.15	.892	2.10	.932
7	Marital Status	1.54	.499	1.26	.442	1.39	.489
8	Size of Family	2.21	.596	2.44	.648	2.33	.634
9	Mode of payment	2.27	.811	1.95	.989	2.10	.921
10	How long you are using organic Products	2.47	.944	2.24	1.272	2.35	1.133

Source: Computed Data

The group statistics gives the distribution of observations into different groups. Since, in the present research we have categorized into two groups viz High impact as '2' and Low impact as '1', the results has grouped the data into two groups. The total numbers of 750 observations group, which represent 100 per cent of the observations, have been grouped for the Discriminant Analysis.

**Table 2: Canonical Discriminant Function Coefficients**

	Function
	1
Age (in Years)	.368
Gender	3.173
Educational Qualification	-.374
Present Position	.371
Family Monthly Income	-.737
Area of Residence	.117
Marital Status	1.075
Size of Family	.562
Mode of payment	-.519
How long you are using organic Products	.274
(Constant)	-6.487

**Unstandardized coefficients**

Source: Computed Data

The 'Canonical Discriminant Function Coefficients' indicate the unstandardized scores concerning the independent variables. It is the list of coefficients of the unstandardized discriminant equation. Each subject's discriminant score would be computed by entering his or her variable values (raw data) for each of the variables in the equation.

**Objective 2:** *To study the consumer buying behavior and level of satisfaction towards organic products*

### **Discriminant Function Analysis**

Respondent's opinion towards factors related to level of satisfaction about Select Organic products in the western Districts of Tamilnadu. In the study area out of seven hundred and fifty respondents were divided into two groups .ie., low level of satisfaction about Select Organic products in the western Districts of Tamilnadu and the high level of level of satisfaction about Select Organic products in the western Districts of Tamilnadu. The difference of opinion of the respondents in one group from the other is studied with the help of discriminant function analysis. For the purpose of the study, the following variables were selected.

1. Age (in Years)
2. Gender
3. Educational Qualification
4. Present Position
5. Family Monthly Income
6. Area of Residence
7. Marital Status
8. Size of Family
9. Mode of payment
10. How long you are using organic Products

The discriminant function analysis attempts to construct a function with these and other variables so that the respondents belonging to these two groups are differentiated at the maximum. The linear combination of variables is known as discriminant function and its parameters are called discriminant function coefficients. In constructing this discriminant function all the variables which contribute to differentiate these three groups are examined.

Mahalanobis minimum  $D^2$  method is based on the generalized squared Euclidean distance that adjusts for unequal variances in the variables. The major advantage of this procedure is that it is computed in the original space of the predictor (independent) variables rather than as a collapsed version which is used in the other method.

Generally, all the variables selected will not contribute to explain the maximum discriminatory power of the function. So a selection rule is applied based on certain criteria to include those variables which best discriminate. Stepwise selection method was applied in constructing discriminant function which selects one variable at a time to include in the function. Before entering into the function the variables are examined for inclusion in the function.

The variables which could have maximum  $D^2$  value, if entered into the function is selected for inclusion in the function. Once entered any variable already in the equation is again considered for removal based on certain removal criteria. Likewise, at each step the next best discriminating variable is selected and included in the function and any variable already included in the function is considered for removal based on the selection and removal criteria respectively.

**Discriminant Analysis**

Discriminant function analysis involved classification problem also to ascertain the efficiency of the discriminant function analysis all the variables which satisfy the entry and removal criteria were entered into the function. Normally the criteria used to select the variables for inclusion in the function is minimum F to enter into the equation (i.e) F statistic calculated for the qualified variable to enter into the function is fixed as 1. Similarly any variable entered in the equation will be removed from the function if F statistic for the variable calculated is < 1. The two groups are defined as

- Group 1 - Low level
- Group 2 - High level

The mean and standard deviation for these groups and for the entire samples are given for each variable considered in the analysis.

**Table 3: Group Means (Between Low and High Groups)**

S.No.	Factor	Low		High		Total	
		Mean	SD	Mean	SD	Mean	SD
1	Age (in Years)	2.50	.501	2.75	.650	2.63	.596
2	Gender	1.16	.364	1.70	.458	1.44	.497
3	Educational Qualification	3.35	.612	2.72	.953	3.02	.868
4	Present Position	2.03	.747	3.46	1.249	2.78	1.260
5	Family Monthly Income	2.03	1.022	2.21	1.046	2.13	1.037
6	Area of Residence	2.05	.973	2.15	.892	2.10	.932
7	Marital Status	1.54	.499	1.26	.442	1.39	.489
8	Size of Family	2.21	.596	2.44	.648	2.33	.634
9	Mode of payment	2.27	.811	1.95	.989	2.10	.921
10	How long you are using organic Products	2.47	.944	2.24	1.272	2.35	1.133

Source: Computed Data

The group statistics gives the distribution of observations into different groups. Since, in the present research we have categorized into two groups viz High impact as '2' and Low impact as '1', the results has grouped the data into two groups. The total numbers of 750 observations group, which represent 100 per cent of the observations, have been grouped for the Discriminant Analysis.

**Table 4: ANOVA Tests**

Tests of Equality of Group Means			
Factors	Wilks' Lambda	F	Sig.
Age (in Years)	.956	34.112	.000**
Gender	.699	321.733	.000**
Educational Qualification	.866	115.480	.000**
Present Position	.681	350.564	.000**

Family Monthly Income	.993	5.356	.021**
Area of Residence	.997	2.143	.144
Marital Status	.922	63.206	.000**
Size of Family	.968	24.938	.000**
Mode of payment	.971	22.448	.000**
How long you are using organic Products	.990	7.532	.006**

Source: Computed Data\*\*P<0.05 S-Significant

Table 4.61 obtained by ticking the Univariate ANOVAs tests which factors influencing the level of satisfaction about select organic products is statistically different between the two groups. A key assumption of DA is that the independent variables should be from a multivariate normal distribution. Thus, it is necessary to check the normality of the variables before using DA. In the table 'Tests of Equality of Group Means' the results of univariate ANOVA's, carried out for each independent variable, are presented. Here, only Age (in Years), Gender, Educational Qualification, Present Position, Family Monthly Income, Marital Status, Size of Family, Mode of payment and How long you are using organic Products(Variable) differ (Sig. =, 000) for the two groups. Hence, The summary table indicates that variable Age (in Years), Gender, Educational Qualification, Present Position, Family Monthly Income, Marital Status, Size of Family, Mode of payment and How long you are using organic Products entered in step by step. The variables such as Age (in Years), Gender, Educational Qualification, Present Position, Family Monthly Income, Marital Status, Size of Family, Mode of payment and How long you are using organic Products are significant at one and five per cent significance level. All the variables are significant discriminators based on their Wilk's lambda and D<sup>2</sup> value.

**Checking for relative importance of each independent variable**

On comparing the standardized coefficient, it is possible to identify which independent variable is more discriminating than the other variables. The higher the discriminating powers the higher the standardized discriminant coefficient. The results of the Standardized Canonical discriminant function coefficient is given in the below table. The variable "Gender" and "Marital Status" has the highest discriminating power due to the highest discriminant coefficient of 3.173 and 1.075 followed by other factors. This indicates that the "Gender" and "Marital Status" has a best predictor of whether the impact will be a high impact or a low impact.

**Table 5: Canonical Discriminant Function Coefficients**

	Function
	1
Age (in Years)	.368
Gender	3.173
Educational Qualification	-.374
Present Position	.371
Family Monthly Income	-.737
Area of Residence	.117
Marital Status	1.075
Size of Family	.562
Mode of payment	-.519

How long you are using organic Products	.274
(Constant)	-6.487

**Unstandardized coefficients**

Source: Computed Data

The 'Canonical Discriminant Function Coefficients' indicate the Unstandardized scores concerning the independent variables. It is the list of coefficients of the unstandardized discriminant equation. Each subject's discriminant score would be computed by entering his or her variable values (raw data) for each of the variables in the equation. Unstandardized canonical discriminant function coefficients (Table -3) where

$$\text{Discriminant score} = -6.487 - 0.368 (X1) + 3.173(X2) - 0.374(X3) + 0.371(X4) - 0.737 (X5) + 0.117 (X6) + 1.075 (X7) + 0.562(X8) - 0.519(X9) + 0.274(X10).$$

**Table 6: Canonical correlation**

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	1.449	98	98	.769

a. First 1 canonical discriminant functions were used in the analysis.

Source: Computed Data

For a 4-group analysis, an eigenvalue indicates the proportion of variance explained. (Between-groups sums of squares divided by within-groups sums of squares). A large eigenvalue is associated with a strong function. Only one function is needed to discriminate, thus 1 eigenvalue (which will explain 100 per cent of the variance, Table 4) is given. The Canonical correlation measures the association between the Discriminant scores and the groups; a high correlation value (near 1) shows that the function discriminates well. The present correlation of 0.769 is not extremely high (1.00 is perfect).

The multivariate aspect of this model is given in the following table.

**Table 7: Canonical Discriminant Function (Between Low and High Groups)**

Canonical correlation	Wilks Lamda	Chi -square	D.F	p-value
0.769	.408	665.523	10	.000**

Source: Computed Data\*\* P < 0.01\*P<0.05 S-Significant, NS-Not Significant

From the above table clear that, Wilk's Lambda shows the proportion of the total variance (98 per cent) in the discriminant scores not explained by differences among groups. A small Lambda value (near 0) indicates that the group's mean Discriminant scores differ. The Sig (p<0.001) is for the Chi-square test which indicates that there is a highly significant difference between the groups' centroids. Here 0.000 < 0.01, therefore we reject null Hypothesis H0 and accept alternate Hypothesis H1 and conclude that based on the sample data, there may be a statistically significant discriminating power in the variables included in the model. Hence, we can proceed to develop the Discriminant Equation. Tables 2 give an indication on how discriminating this DA model is but provides little information regarding the accuracy. The canonical correlation in the discriminant group can be accounted for by this model, Wilks lamda and chi square value suggest that D.F is significant at one per cent level.

The variables given above are identified finally by the D.F.A as the eligible discriminating variables. Based on the selected variables the corresponding D.F coefficients are calculated. They are given in the following table.

**Table 8: Discriminant Function Coefficient (Between Low Level and High Level)**

Age (in Years)	.368
Gender	3.173
Educational Qualification	-.374
Present Position	.371
Family Monthly Income	-.737
Marital Status	1.075
Size of Family	.562
Mode of payment	-.519
How long you are using organic Products	.274
(Constant)	-6.487

Source: Computed Data

$$Z = -6.487$$

$$\begin{aligned}
 &+0.368 \text{ (Age (in Years))} \\
 &+3.173 \text{ (Gender)} \\
 &-0.374 \text{ (Educational Qualification)} \\
 &0.371 \text{ (Present Position)} \\
 &-0.737 \text{ (Family Monthly Income)} \\
 &+1.075 \text{ (Marital Status)} \\
 &+0.562 \text{ (Size of Family)} \\
 &-0.519 \text{ (Mode of payment)} \\
 &+0.274 \text{ (How long you are using organic Products)}
 \end{aligned}$$

Using this D.F coefficients and variables discriminating scores for two groups are found out and are called group centroids or group means

**Table 9: Functions at Group Centroids**

Functions at Group Centroids	
ImpactDis	Function
	1
Low	-1.261
High	1.146
Unstandardized canonical discriminant functions evaluated at group means	

Source: Computed Data

$$\text{For low Group } (Z_1) = -1.261$$

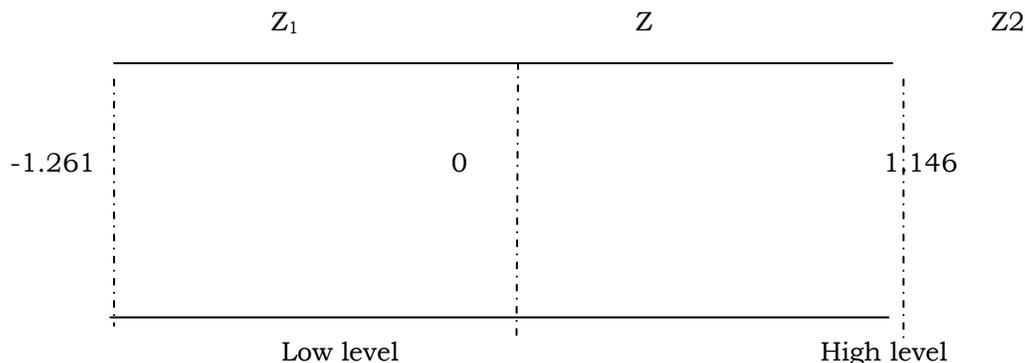
$$\text{For High Group } (Z_2) = 1.146$$

Discriminating factor is the weighted average of  $Z_1, Z_2$

$$(357x Z_1) + (393xZ_2)$$

$$(.i.e) Z = \frac{(357x Z_1) + (393xZ_2)}{357+393}$$

It is represented diagrammatically



Thus to classify any respondent as to low or high user the Z score for the respondent is found out by using the equation. If the score found out for any respondent is  $Z_0$  and if the value is  $> Z$  (i.e.  $Z_0 > Z$ ) then it is classified into high user and if  $Z_0 < Z$  then (i.e.  $Z_0 < Z$ ) it is classified into low user.

Now the questions remain to be answered are

1. How efficient are the discriminating variables in the D.F.A?
2. How efficient the D.F itself is?

The first equation cannot be answered directly however the discriminating power or the contribution of each variable to the function can sufficiently answer the question. For this consider the following table.

**Table 10: Relative Discriminating Index  
(Between Low Level Group and High Level Group)**

Particulars	Group I Mean $X_1$	Group II Mean $X_2$	Unstandarised coefficient	$I_j = \text{ABS}(K_j)$ Mean $(X_{j0} - X_{ji})$	$R_j = I_j / \text{sum}$ $I_{ij} * 100$
Age (in Years)	2.50	2.75	.368	1.488	12.208
Gender	1.16	1.70	3.173	-4.23	-34.74
Educational Qualification	3.35	2.72	-.374	4.367	35.83
Present Position	2.03	3.46	.371	0.746	6.1232
Family Monthly Income	2.03	2.21	-.737	3.659	30.017
Marital Status	1.54	1.26	1.075	0.186	1.5219
Size of Family	2.21	2.44	.562	0.839	6.8811

Mode of payment	2.27	1.95	-.519	3.282	26.927
How long you are using organic Products	2.47	2.24	.274	1.856	15.229
<b>TOTAL</b>				12.19	100

Source: Computed Data

### Relative Discriminating Index

For each variable the respective D.F coefficient its mean for each group and  $R_j$  are given.  $R_j$  called relative discriminating index is calculated from the discriminant function coefficient and group means.  $R_j$  tells how much each variable is contributing (%) to the function.

The second question is answered by reclassifying the already grouped individuals into low or high level using the D.F (Z) defined in the equation. This classification is called predictor group membership .In short the efficiency of the D.F is called predictor group membership. In short the efficiency of the D.F. is how correctly it predicts the respondents into distinct groups.

**Table 11: Classification Results (Between Low Level Group and High Level Group)**

Actual group	No. of cases	Predicted group membership	
		Group I	Group II
<b>Group I</b>	469	435 92.7 %	34 7.2%
<b>Group II</b>	281	58 20.6%	223 79.3%

Source: Computed Data. Per cent of grouped case correctly classified: 92.7 per cent

The above table gives the results of the re classification. The function using the variables selected in the analysis classified 92.7per cent of the cases correctly in the respective groups. It is found that the Discriminant function analysis was applied to the respondents on low user and high user. The following factors significantly discriminate the two users. They are Age (in Years), Gender, Educational Qualification, Present Position, Family Monthly Income, Marital Status, Size of Family, Mode of payment and How long you are using organic Products at one and five level of significance.

### Conclusion

The organic products and its importance started creating awareness and helps for the sustainable development, which is required for the future generation. With the threat of global warming looming large, it is extremely important that organic product becomes the norm rather than an exception or just a fad. Consumer satisfaction plays a major role in organic food products segment. As results of environmental sustainability, importance is shifted towards organic food products rather than conventional farming. The study brought out the fact that the people were well aware of images and availability, but not loyal entirely too organic food products without any doubt. The respondent got attracted towards organic food products without any doubts. So the marketers must create promotions which are both realistic and moral and the product availability in terms of volume and variety are required to become successful in marketing the organic food products. Thus, the study says that there are sufficient opportunities for organic products in the study area, but it may also face lot of challenges. If the present study helps the policy maker of the organic growers to educate the organic products and to make optimum use of them, the researcher would feel immensely rewarded.

**References**

1. Dhanalakshmi, R. (2011). Viability of Organic products' business among the non-organic product consumers- A Descriptive study. *International journal of research in Commerce, IT, Management*1, 75-78.
2. Kumar, Sushil and Ali Jabir (2011). Analyzing the factors affecting consumer awareness on Organic foods in India. Paper presented at 21<sup>st</sup> Annual IFAMA world forum and symposium on the road to 2050:sustainability as a business opportunity, Frankfurt, Germany
3. John Paull (2011). Organics Olympiad 2011; Global indices of leadership in organic agriculture. *Journal of Social and development sciences*, 1,144-150.
4. Briz,T. and Ward,R.W, (2009). Consumer awareness of Organic products in Spain: An application of multi nominal logit models. *Food Policy*, 34, 295-304.
5. Molly J.Dahm,Aurelia V.Samonte & Amy R.Shows (2009). "Organic Foods: do eco- friendly attitudes predict eco-friendly behaviors? *Journal of American college of Health*, 58,195-202.
6. Rupesh M Mervin and Velmurugan, R.(2013). Consumer's attitude towards organic food products. *Journal Discovery*, 3, 15-18.
7. Ragavan. N. and Mageh, R. (2013). A study on Consumers' purchase intention towards Organic products. *Paripex-Indian Journal of Research*, 2,111-114.
8. Gordana Tomica, Maja Duricaa and Nenad Dokich (2012).Education as a factor of awareness Development of organic product Consumers. *Applied studies in Agribusiness and Commerce*, 6,39-42