

# 7 Students' Awareness and Perception About Genetically Modified Food

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**ABSTRACT-** Genetic engineering and Biotechnology are the promising discipline of study in the global market. Genetic alterations are carried in indigenous species with increased sophisticated strategies and techniques to yield hybrid varieties. In Food biotechnology, Genetically Modified Foods have become new, revolutionary and emerging concepts to fulfil the food crisis encountered by developing countries such as India. Genetically Modified foods are produced from the native species by genetically modifying the genes and the modifications are created in accordance to the requirement of the end users. Different indigenous ancient species have been merged to produce new hybrid varieties that are healthy and offers many benefits. Many GM food products are accessible in the markets like grain hemp, honey, tomato, sweet potato, sweet corn, meat, essential oils etc. Developed countries possess a wide understanding about GM foods, its labelling and traceability. However in Developing countries like India, the individuals are unaware about GM foods and they ingest the food without knowing that it is genetically altered. Since awareness about GM foods are less amongst the population, Government need to take necessary measures to analyse about impacts caused by GM foods on human population and implement legislations in order to label the GM food items. As students are definitely the asset and the back bone in developing country they must be conscious of what they consume. The current study is in order to know about students' awareness on genetically modified food products and their perception towards GM foods. The Sample involves 163 college students of arts and science in and around Chennai metropolis.

**Key words:** Genetically modified foods, Biotechnology, Genetic Engineering, Hybrid.

## I. INTRODUCTION

Genetically modified foods are varieties which are attained by modifying the genetic characteristics in native species by using latest molecular techniques. The hybrid varieties which are obtained may possess enhanced characteristics such as resistance to pesticides, insecticides, disease and drought resistance, high nutritional content and yield. Genetically customized foods are introduced in the market in early 1990's. The genetic modifications are carried out either interspecifically or intraspecifically. GM food items has gained its significance in developed countries and yet to gain its importance in Developing countries. Knowingly or unknowingly, Indian population are consuming GM food like sweet potato, sweet corn, tomato,

soybean, meat, oil, cotton, grain hemp etc . Genetically Modified Cotton is produced by India on a mass basis.

In Developing countries like India presently there is an enormous increase in population, and to provide food towards the growing population we adopt alternate technology. Genetically Modified Foods have turned into a promising solution to satisfy the food crisis. India has developed modern technological methods to improve GM food production and have gained importance in global food marketing from the year 2002. Typically the marketers have to seek out for permission and approval from the government to grow and enhance marketing of GM products. They ought to get approval for labeling and to export the products to international food markets. Genetic Engineering Authorization Committee (GEAC) has to approve that the GM food products are safe for the human consumption. Many online marketers fail to get endorsement from the concerned expert that will lead to negative influence on the health of the consumer. In Developed countries labeling has been made obligatory for selling the GM products where as in India labeling of GM foods are not carried out in an effective way. It need to be strictly made mandatory and stringent legislations need to be implemented. The key advantages of genetically altered foods include reduction in usage of manures and chemical products, boost in the yield, very long time of storage, production of new varieties, Elimination of intolerance and easily affordable.

## II. REVIEW OF LITERATURE

Kyrre Rickertsen Norwegian, et al., (2017):- Consumer resistance against GM crops is still substantial in the United States and Europe. We conducted an internet survey in the United States and Norway with more than 1,000 respondents in each country to estimate consumers' willingness to pay (WTP) for GM soybean oil, farmed salmon fed with GM soy and GM salmon. The differences in WTP for the conventional as compared with the GM alternatives are relatively small.

Mürsel Tas et al., (2015):-The results of the survey showed that consumers generally know what genetically modified organisms (GMOs) are, but they do not have enough information about the genetic modification process. The main concerns of consumers about GMFs are their carcinogenic effects to human. In addition, corn was found to be the most concerned GMF. The usage of GMOs in health sector and in preventing environmental pollution

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were the most approved areas by the consumers, whereas the majority of consumers disapproved the use of genetic modifications in food applications.

### **III. OBJECTIVES OF THE STUDY**

1. To study the socio economic profile of the respondents.
2. To find out the students awareness about Genetically Modified Foods.
3. To know the reason for consuming Genetically Modified Foods.

### **IV. NEED OF THE STUDY**

Genetically Modified Foods is an innovative concept and have become a essential part of the consumers in various places. This concept is very popular in abroad countries. The popularity among the Indian consumers is less, but they are knowingly or unknowingly using it in recent times. Many people associate GM food products with convenient goods. Students' are the futures of the world. An attempt has been made to focus on the awareness and perception level of students about GM foods. There is a dilemma in using GM foods by the consumers (students) and hence this study gains its importance.

### **V. RESEARCH METHODOLOGY**

The researcher has used descriptive sampling technique. The sample size is 163 and the sample respondents for the study are the students of arts and science students in Chennai city. Researchers have used purposive and simple random sampling technique to collect data. Data was analysed with the help of Statistical packages. The tools used in this analysis were percentage, chi- square, ANOVA, Garatte ranking , cluster analysis and Likert summated scaling techniques.

### **VI. ANALYSIS AND INTERPRETATION RESULTS**

**Table 1. SOCIO ECONOMIC PROFILE OF THE RESPONDENTS**

Attribute	No. of Respondents (163)	Percentage
<b>Age</b>		
17 - 20 years	42	26
20- 24 years	95	58
24 - 27 years	17	10
27 - 30 years	05	4
Above 30 years	04	2
<b>Gender</b>		
Male	71	44
Female	92	56
<b>Location of College</b>		
North Chennai	28	18
Central Chennai	43	26
South Chennai	92	56
<b>Status of College</b>		
Autonomous	85	52
Non Autonomous	78	48
<b>Types of College</b>		
Co- education	98	60
Men	00	00
Women	65	40
<b>Stream</b>		
Arts	80	49

<b>Science</b>	83	51
<b>Level of Study</b>		
UG	50	31
PG	87	53
M.Phil	21	13
Ph.D	05	03
<b>Family Monthly Income</b>		
Below Rs. 10,000	08	05
Rs. 10,000 – Rs. 40,000	57	35
Rs. 40,000 – Rs. 50,000	58	36
Above 50,000	40	24
<b>Knowledge about GMO</b>		
Yes	119	73
No	31	19
Not Sure	13	08
<b>Sources of Information</b>		
Documentary films	36	30
Televisions	06	05
Internet	65	55
Family	02	01
Friends	10	09

Source Field Survey - August 2019

*Chi -Square:*

$H_0$ : The level of understanding about GM foods was independent on gender, age, stream, level of study and type of college.

$H_a$ : The level of understanding about GM foods was dependent on gender, age, stream, level of study and type of college.

The calculated  $\chi^2$  values were given in the following table 2

**TABLE 2  
ASSOCIATION BETWEEN LEVELS OF  
UNDERSTANDING ABOUT GM FOOD WITH  
SELECTED SOCIAL FACTORS**

Source Field Survey – August 2019

S.No	Variable	Calculated $\chi^2$ values	Degrees of freedom	$\chi^2_{0.05}$	Inference
1	Age	24.169	4	5.99	Reject $H_0$
2	Gender	17.60	8	10.99	Reject $H_0$
3	Stream	23.12	2	9.30	Reject $H_0$
4	Level of Study	10.48	2	5.99	Reject $H_0$
5	Type of College	9.30	4	9.61	Accept $H_0$

Comparing the calculated values  $\chi^2$  with the table values of  $\chi^2_{0.05}$ , it was inferred that the level of understanding about GM foods was dependent on Age, gender, stream and level of study and independent on type of college.

**ANOVA**

HO: There is no significant difference between department of study and students opinion about GM foods in future.

H1: There is a significant difference between department of study and students opinion about GM foods in future.

**TABLE 3**

Variables	F value	DF	Sig.
Department of study and opinion about GM foods in future	.025	1	.875

Source Field Survey – August 2019



Table 3 shows since the p-value (0.875) is greater than the Level of Significance (0.05) the null Hypothesis ( $H_0$ ) is accepted. Hence there is no significant difference between department of study and students perception about GM foods in future

**TABLE 4: REASON FOR CONSUMING GM FOODS**

S. No	Variables	Score Value	Rank
1	Widely available	59.75	II
2	Tasty	62.49	I
3	Inexpensive	52.53	III
4	Unawareness	44.04	IV
5	Ignorance of its effects	42.19	V

Source Field Survey – August 2019

Table 4 shows the reasons for consuming GM foods and their Garrett values. Rank 1 Tasty, rank 2 widely available, rank 3 Inexpensive, rank 4 Unawareness and rank 5 Ignorance of its effects.

## VII. K-MEANS CLUSTER

The k-means method will produce the exact k different clusters demanded of greatest possible distinction. Very frequently, both the hierarchical and the k-means techniques are used successively.

**TABLE 5  
FINAL CLUSTER CENTER**

SOCIAL FACTOR	Cluster		
	1	2	4
Do you think that gm foods will reduces food starvation	3.151	3.154	2.091
Is GM fruits and vegetables have better taste and nutrition	3.806	3.615	2.545
Genetically modified food will benefit many people	3.914	3.629	2.318
Is it necessary to advertise about gm foods in TV and media?	1.763	3.577	2.364
If a majority of people were in favour of genetically modified food, it should be permitted	4.194	3.885	2.250
Genetically modified food presents no danger for future generations	3.817	4.154	2.227

**TABLE 5.1  
THE CLASSIFICATION OF STUDENTS BASED ON "CONSCIOUS"**

SOCIAL FACTOR	Cluster		
	1	2	4
Do you think that gm foods will reduces food starvation	Moderate	Strong	Weak
Is GM fruits and vegetables have better taste and nutrition	Strong	Moderate	Weak
Genetically modified food will benefit many people	Strong	Moderate	Weak
Is it necessary to advertise about gm foods in TV and media?	Weak	Strong	Moderate
If a majority of people were in favour of genetically modified food, it should be permitted	Strong	Moderate	Weak
Genetically modified food presents no danger for future generations	Moderate	Strong	Weak

Table 5.1 depicts that the students are classified as "CONSCIOUS RESPONDENTS" as they mainly focus on their individual safety. In this, Group I are strongly conscious on these factors, Group II are moderately conscious and Group III are weakly conscious.

Frequency Loading of Clusters of "Conscious respondents":-

The respondents have been categorized into three groups based on their conscious level.

They are given in the table below:-

**Table no 5.2  
Frequency Loading of Cluster of Conscious respondents Number of Cases in each Cluster**

S.No:	Cluster	No. of respondents	Percentage
1	Strongly conscious	93.000	57%
2	Moderately conscious	26.000	16%
4	Weakly conscious	44.000	27%
	Valid	163.000	100

Source Field Survey - August 2019

**TABLE 6: ATTITUDE OF THE STUDENTS - MEAN SCORE**

S. No	Attitude of the students	Score Value	Rank
1	I will buy gm foods as it available in the market easily	3.301	4
2	I do not bother about paying more for gm foods	2.779	6
3	I am reluctant to consume gm foods once I come to know about its serious issues	3.988	3
4	I buy gm foods because its price is reasonable	2.890	5
5	I can say that gm foods may cause some allergic outbreaks	4.129	1
6	If gm foods are offered with a brand name, I will purchase	2.411	7
7	I will suggest gm foods to others	2.153	8
8	I can say that gm foods are not environmentally safe	4.074	2
	Mean Score	3.216	

Source Field Survey - August 2019

Table 6 shows the ranking of student's attitude by using Likert summated scaling technique. Their attitude has been ranked from 1-8 with the help of their highest mean value to lowest mean value. The Average mean score is 3.216. Their attitude towards GM foods is strong in the factors like "I can say that gm foods may cause some allergic outbreaks", "I can say that GM foods are not environmentally safe", "I am reluctant to consume GM foods once I come to know about its serious issues", and "I will buy GM foods as it available in the market easily".

## VIII. SUGGESTIONS

- ❖ Students should be encouraged to read more articles regarding Genetically Modified Foods.
- ❖ College should organize seminars and conference related to GM foods in order to create more awareness about consumption of GM foods.
- ❖ Effective laws regarding GM should be introduced by the Government.
- ❖ Strict Labeling of GM food products should be made mandatory to the marketers.
- ❖ Procedure for getting approval from the Government to market GM foods must be made easily accessible.
- ❖ Government should involve themselves in the determination of the pricing of GM products.



## **IX. CONCLUSION**

Genetically Modified Foods have the potential to solve many of the world's hunger and malnutrition problems. It also helps to protect and preserve the environment by increasing yield and reducing reliance upon chemical pesticides and herbicides. It is inferred that students are aware about the GM foods and they are consuming GM foods without knowing its effects. The negative impact is still debatable and still many research is going on about its impact on health and its safety. There are many new challenges for the government in the areas like safety, healthy, nutritional, labelling, fixing standards etc.

## **X. REFERENCES**

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