



A Study of Consumer's Perception of Genetically Modified Food on Their Health and Wellbeing in Mumbai

KEYWORDS

Genetically Modified Foods, Health and Well-being , Consumers Perception

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ABSTRACT *"We are what we eat". The food that we eat goes on to build the very information that we are. It forms our inner eco niche that resonates with the outer eco niche that surrounds us. Therefore what food one puts into the system and builds the system on is very important. It is also believed that food prepared without the seasoning of 'love' lacks that very special something. Food safety since time immemorial is a matter of intense health concern. The latest introduction outside the awareness of the general Indian consumer of biotechnological advancements as in genetically modified foods also called "Frankenfoods" is a great cause of concern to health and therefore quality of life. The study focuses on the perception of consumers G.M Foods and its affect on their health and well-being.*

INTRODUCTION

Many consumers are wary of eating GMF and are concerned that GMF are a step in the wrong direction. In nature, the fundamental laws that are followed by the respective species prohibit plants from breeding with animals- say the banyan tree will not breed with the goldfish or say the mycobacterium tuberculae. Such combinations or inter species breeding is not naturally seen and therefore an apprehension arises as to the outcome of such a combination. As combinations are not tested thoroughly in vitro, it is assumed that if the two products used for combination are healthy the outcome is presumed to be healthy too. As a result, new allergens may be introduced into common foods, and long-term effects of eating GMOs remain unclear as such it's not just direct consumption of GMF that is a cause of concern.

Caswell, Fuglie, and Klotz (1994) in their paper related to the development of agricultural biotechnology argued that the success of biotech products depends on factors such as public policies, expectations of producers and demands by consumer for biotech products. According to them the demand for the technology had a direct relationship with the profitability of using biotechnology by farmers and food processors in short if the profits were high on the use of biotechnology automatically there will be rise in demand for such products in the farm sector. Grobe, Douthitt, and Zepeda (1996) through nationwide consumer studies in UK, studied consumer risk perception associated with recombinant Bovine growth hormone (rbGH) a GM product, which is used in milk production. The study aimed to understand how consumers reacted to different typologies of risk perceptions toward rbGH, thereby identifying the demographic characteristics at each risk perception typology.

The study showed that self protective active consumers were strongly related to environmentalist concerns. Using conjoint analysis, Gath and Alvensleben (1998) in their study showed that there was no relationship between acceptance of GMFs and brand However it was observed that GMFs were less acceptable by women than men. It was seen that overall, participants' acceptance of GMFs

was low, and there was no significant change in attitudes toward GMF even if information about biotechnology is offered.

LITERATURE REVIEW

Selective breeding, hormonal and genetic engineering are ways of creating designer organisms (1994, Biology). Slow process involving involves the cultivation and selection of animal or plant material displaying the desired phenotype is known as selective breeding. Genetically altered hormones in Animal or plant material causes a change in chemical processes within the organism thereby switching on or off some genes. Technology and machinery by which gene is taken from an organism having the desired traits and transplanted into another organism is Genetic engineering e.g fruit and vegetables made frost resistant so that they can be grown in cooler climates, plants and animals made disease resistant so as to ensure healthy produce, food from plant origin made Herbicide-resistant so as to ensure the farmers use herbicides

According to Windels et al. (2001) European Food Research Technology unexpected and unknown fragments of genetic material were found in commercial genetically modified crops. Recombinant DNA technology is a process by which genes from different organisms are combined resulting in "genetically modified," "genetically engineered," or "transgenic" organism. Some examples of Genetically modified products are medicines and vaccines, foods and food ingredients, feeds, and fibres. Herbicide resistance plants are the most common use of genetic engineering technology whereby farmers use more chemicals without killing the crop. According to Peggy G. Lemaux (1983) tobacco was the first GE plant, reported in 1983 thereafter no plants were commercially grown until the FlavrSavr™ tomato in 1994.

RESEARCH METHODOLOGY

The research design was detailed out for this study using exploratory study to explore the perception of consumers of the effects on their health and wellbeing. The research was conducted using Geoline Model which systematically

divides the geographical region of Mumbai into western, central and Harbour lifelines of Mumbai to ensure validity of the sample of 509 respondents .The study involved several ways of collecting data like Observation Method, conducting Structured Interviews of Expert Opinions apart from filling questionnaires from 509 customers. Later the data was coded in excel and the analysis was carried out by a using Statistical package IBM SPSS version 20 with help of using Suitable Statistical Technique namely Karl Pearsons Correlation .

OBSERVATION METHOD

The researcher observed the buying behaviour of consumers, their food preferences, awareness of rights, and awareness of the kinds of food, quality, their preference in food and awareness of G.M Foods at the super market, farmer’s market, food malls, and coffee shop.

The researcher conducted structured interviews of activists(consumer) ,farmers, NGOs, Lawyers, Businessmen, housewife’s, groceries, doctors – Dr. Chetna N.Shukla, , Medical Representatives, Nutritionists Like Kavita Mukhi , CEO of a Bio-tech company, teachers and the students to find out their level of awareness level and the knowledge and information they had about GMFs and foods preferences.

STUDY OBJECTIVE

To study the relationship if any between the consumers awareness of Genetically Modified Foods and their perception of its effect on their health and well being.

STUDY HYPOTHESIS

NULL HYPOTHESIS H₀

There is no significant relationship between the consumers awareness of GMFs and their perception of its effect on their health and well being.

ALTERNATE HYPOTHESIS H₁

There is a significant relationship between consumer’s awareness of GMFs and their perception of its effect on their health and well being.

Various variables were used to find the correlation between respondents’ awareness of the GMF on their perception of its effect on their health and well being. Awareness of respondents is the independent variable . The dependant variable used was the perception of consumers about the effect of GMFs on their which comprises of i.) GM foods can lower the risk of heart disease and some types of cancer ii.) GM Crops are beneficial to people health since they lead to foods with less chemical residue iii.) GM foods can be harmful to people having allergic reaction to particular foods iv.) GM Crops benefit society because they lower farmers production costs v.) GM foods should be separated from ordinary food to prevent contamination vi.) GM foods can have unforeseen harmful effects on human health vii.) GM Crops benefit consumers because they lower food prices viii.) GM Crops with antibiotic-resistance genes which reduce the effectiveness of beneficial antibiotics pose health risk for humans ix.) As GM foods may have traits that may not be detected through normal testing they pose a health risk as they x.)

GM Crops are beneficial to society because they help solve food shortage. The researcher used Multiple Correlation the results of which are depicted in the table 1 shown below.

Table 1 - Consumers awareness of GMFs and their perception of its effect on Health and Well-being

		Correlations										
		Awareness	Lowers Risk of heart disease and cancer	Beneficial for health Less chemical residue	Harmful to people allergic reaction	Lowers farmer cost	Should be separated from ordinary food prevent contamination	Unforeseen harmful effects on human health	Benefit consumers lower food prices	Anti-biotic resistant pose health risk	Pose health risk as undetectable in normal testing of food	solves food shortage
Awareness	Pearson Correlation	1	0.008	-0.085	-0.047	-0.022	-0.044	-0.002	-.100*	-0.032	-0.05	-0.076
	Sig. (2-tailed)		0.866	0.057	0.293	0.619	0.323	0.96	0.023	0.476	0.264	0.089
	N	509	509	509	509	509	509	509	509	509	509	509
LowersRisk of heart disease and cancer	Pearson Correlation	0.008	1	.810**	.909**	.875**	.907**	-.899**	0.076	.198**	-.291**	.164**
	Sig. (2-tailed)	0.866		0	0	0	0	0	0.086	0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Beneficial for health Less chemical residue	Pearson Correlation	-0.085	.810**	1	.840**	.809**	.845**	-.817**	.176**	.360**	-.265**	.315**
	Sig. (2-tailed)	0.057	0		0	0	0	0	0	0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Harmful to people allergic reaction	Pearson Correlation	-0.047	.909**	.840**	1	.847**	.913**	-.926**	.188**	.305**	-.384**	.317**
	Sig. (2-tailed)	0.293	0	0		0	0	0	0	0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509

Correlations												
		Awareness	Lowers Risk of heart disease and cancer	Beneficial for health Less chemical residue	Harmful to people allergic reaction	Lowers farmer cost	Should be separated from ordinary food prevent contamination	Unforeseen harmful effects on human health	Benefit consumers lower food prices	Anti-biotic resistant pose health risk	Pose health risk as undetectable in normal testing of food	solves food shortage
Lowers farmer cost	Pearson Correlation	-0.022	.875**	.809**	.847**	1	.889**	-.837**	.194**	.288**	-.373**	.329**
	Sig. (2-tailed)	0.619	0	0	0		0	0	0	0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Should be separated from ordinary food prevent contamination	Pearson Correlation	-0.044	.907**	.845**	.913**	.889**	1	-.934**	.156**	.295**	-.374**	.286**
	Sig. (2-tailed)	0.323	0	0	0	0		0	0	0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Unforeseen harmful effects on human health	Pearson Correlation	-0.002	-.899**	-.817**	-.926**	-.837**	-.934**	1	-.143**	-.297**	.377**	-.284**
	Sig. (2-tailed)	0.96	0	0	0	0	0		0.001	0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Benefit consumers lower food prices	Pearson Correlation	-.100*	0.076	.176**	.188**	.194**	.156**	-.143**	1	.812**	-.540**	.829**
	Sig. (2-tailed)	0.023	0.086	0	0	0	0	0.001		0	0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Antibiotic resistant pose health risk	Pearson Correlation	-0.032	.198**	.360**	.305**	.288**	.295**	-.297**	.812**	1	-.627**	.762**
	Sig. (2-tailed)	0.476	0	0	0	0	0	0	0		0	0
	N	509	509	509	509	509	509	509	509	509	509	509
Pose health risk as undetectable in normal testing of food	Pearson Correlation	-0.05	-.291**	-.265**	-.384**	-.373**	-.374**	.377**	-.540**	-.627**	1	-.500**
	Sig. (2-tailed)	0.264	0	0	0	0	0	0	0	0		0
	N	509	509	509	509	509	509	509	509	509	509	509
solves food shortage	Pearson Correlation	-0.076	.164**	.315**	.317**	.329**	.286**	-.284**	.829**	.762**	-.500**	1
	Sig. (2-tailed)	0.089	0	0	0	0	0	0	0	0	0	
	N	509	509	509	509	509	509	509	509	509	509	509

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

ANALYSIS & INTERPRETATION

1. The correlation between the awareness amongst Respondents of GMF on their perception of lowering the risk of heart diseases and cancer turned out to be 0.008 showing a weak positive correlation between the two variables. In other words there is hardly any awareness amongst respondents of GMFs on their perception that GMFs lowers the risk of heart disease and some type of cancers; respondents are by and large unaware of the risks and benefits about GMFs.
2. Awareness of GMFs when correlated with the perception of respondents that GMFs lead to less chemical residue turned out to be -0.085 indicating a weakly negative correlation. There is a low negative impact of the awareness of respondents and the perception of the respondents that GMFs leads to less chemical residue. Concluding that the more the consumers are aware, there is a decrease in their perception that GM

3. Awareness of respondents about GMFs when correlated with their perception that GMFs lead to allergic reaction is -0.047 it was found to be weakly negatively correlated. Thereby showing that there is a very low impact of awareness of GMFs on their perception that GMFs leads to allergic reactions. Concluding that very few respondents are aware that GMFs may lead to allergic reactions to particular foods.
4. Awareness of GMFs amongst respondents when correlated with their perception that GMFs lowers production cost, it turned out to be -0.02 indicating a weakly negative correlation. In other words there is a very low impact of awareness amongst respondents on their perception that GMFs lower production cost.
5. Awareness of GMFs amongst respondents when correlated with their perception that GM foods should

be separated from ordinary food to prevent contamination turned out to be - 0. 044 indicating a weakly positive correlation. In other words there is a very low impact of awareness of GMFs amongst respondents on their perception that GMFs should be separated from ordinary foods to prevent of contamination. Thus showing that very few respondents perceive that GMFs should be separated from ordinary foods to prevent of contamination.

6. Awareness of GMFs amongst respondents when correlated with their perception that GMFs can have unforeseen harmful effects on human health turned out to be -0. 002 which is a weakly positive correlation. In other words there is a very low impact of awareness of GMFs amongst respondents on their perception that GMFs can have unforeseen harmful effects on human health. Thus showing that very few respondents perceive that GMFs can have unforeseen harmful effects on human health.
7. Awareness of GMFs amongst respondents when correlated with their perception that GMFs benefit consumers as they lower food prices ,turned out to be -0.01 a low negative correlation. In other words there is a very low impact of awareness of GMFs amongst respondents on their that GMFs can benefit consumers as they lower food prices.
8. Awareness of GMFs amongst respondents' when correlated with their perception that GM crops with antibiotic resistance genes pose health risk for humans as they reduce the effectiveness of beneficial antibiotics, turned to be -0. 03 a weakly negative correlation. In other words there is a very low practically neutral impact of awareness of GMFs of respondents' on their perception that GM crops with antibiotic resistance genes pose health risk for humans as they reduce the effectiveness of beneficial antibiotics.
9. Awareness of GMFs amongst respondents' when correlated with their perception that GMFs pose a health risk since they have traits that may be undetectable through normal testing of foods turned out to be -0. 050 a weakly negative correlation. In other words there is a very low impact of awareness of GMFs amongst respondents' on their perception that GMFs pose a health risk since they have traits that may be undetectable through normal testing of foods.
10. Awareness of GMFs amongst respondents' when correlated with their that GMFs can be beneficial to society as they help solve food shortage, turned out to be- 0 .076 negative correlation. In other words there is a very low impact of awareness amongst respondents' on their perception that GMFs could be beneficial to society as they help solve food shortage foods can be beneficial to society as they help solve food shortage problem. Conclusions It is determined that due to the

CONCLUSIONS

It is determined that due to the low level of availability of information, knowledge and awareness of Consumers about G. M Foods, risk / benefits of G.M Foods the protection of consumers is very low to negligible making consumers very vulnerable to false advertisements, publicity, branding, lack of transparency and unscrupulous producers, manufacturers and retailers.

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