

GENETICALLY MODIFIED FOODS- A FOCUS

S.M.Prasad¹, CissieTheeblyn David², RijiHari³

1 Assistant Professor, Department of Nutrition and Dietetics, SadakathullahAppa College, Tirunelveli, Tamil Nadu.

2 Assistant Professor in Food Science and Nutrition, Tamil Nadu Agricultural University, Madurai, Tamil Nadu.

3 Assistant Professor, Department of Food Science and Technology, University of Calicut, Kerala.

INTRODUCTION:

Genetically modified foods have made a big splash in the news lately. Now-a-days genetically modified crops and food are being grown and consumed by public without knowing that these plant's genes are altered. Everything is due to the emerging of biotechnology industry. The biotechnology industry is a booming one, having experienced significant growth over the last several decades.

DEFINITION:

Genetically modified foods are defined as those foods derived from genetically modified organisms that may have specific changes introduced into their DNA by Genetic Engineering Techniques.

HISTORY OF GM FOODS:

History of GM foods was started in the year 1980. Later in 1983, antibiotic resistant tobacco plant and in 1990 cotton was successfully genetically modified. In 1994 tomato was genetically modified for number of consumption, followed by Soya Bean, Potato, Canola and Alfalfa.

FOOD THAT HAVE BEEN MODIFIED:

Some of the Foods which have been modified to make them resistant against insects, viruses and able to tolerate

herbicides include Maize, Brinjal, Rice, Wheat, Rape Seed Oil Cotton, Soya bean, Alfalfa, Potato

Soya Bean, Corn and Tomatoes are commonly modified food. One type of "Monsanto" Soya Bean is resistance to herbicides. The herbicide resistant gene is removed from the bacteria and then inserted in the Soya Bean.

Tomatoes are frequently modified types of food. GM tomatoes will generally be engineered to maintain their quality for longer period of time. Sugarcane is another GM food that is resistant to some pesticides. Sweet Corn is one of the GM foods those produce toxins that kills insects, which serves to reduce problems with pests. Rice has been called "Golden rice" due to it being modified to contain high levels of vitamin A.

GM food is Genetically Modified Foods using biotechnology include Maize, Soya Bean, OilSeed, Chicory, Squash, Potato, Pineapple, Sugarcane, Brinjal And Strawberry. GM Foods provide greater resistance to pests and viruses, higher nutritional value and longer shelf life. Now ever their safety, potential risks and ethical concerns are still being debated. Laws to regulate labeling of GM Foods also vary.

BENEFITS OF GENETICALLY MODIFIED FOODS:

There are numerous benefits from genetically modified foods. Some are listed below.

1. Nutritional Enhancement:

Genetic Engineering can also be used to increase the amount of particular nutrients (like vitamins) in food crops. For example, GM golden rice is deficient in vitamin A content, so vitamin A gene from daffodil plant is inserted and the golden rice is nutritionally enriched. This change in colour and vitamin can be utilized for people residing in malnourished area.

2. Shelf Life:

GM foods provide a greater shelf life. They can be able to withstand extreme weather, unfavorable climatic condition.

3. Better Quality Food:

They also provide better quality foods and gives higher nutritional value products.

4. Better Taste:

GM Food may alter taste in tomatoes, wheat, corn, and dairy products.

5. Deliver Vaccines:

Bananas that produce hepatitis B vaccines can be produced by genetic engineering method.

6. Crop Resistance:

Crop resistance to disease and insects and produce that requires less chemical application, Such as pesticides and herbicides resistant plants, (eg) canola by using genetically engineered crops that are resistant to attack by pests or disease (insect resistant). Farmers do not have to apply large amounts of pesticides and chemicals to the surrounding environment.

7. Faster Growth:

It is evident that genetically modified foods grow faster than the foods that are grown in the traditional manner. Due to this productivity increases providing the population with more food. Apart from this, it is claimed that genetically modified foods are a boon in places which experience frequent droughts or where the soil is incompetent for agriculture, due to which it is difficult to grow normal crops.

8. Inexpensive and Nutrition Food:

Carrots with more antioxidants can be obtained by genetic engineering methods.

9. Foods with Medicinal Benefits:

Foods with medicinal (Nutraceuticals) benefits such as edible vaccines, for example, bananas with bacterial or rotavirus antigens.

10. Providing Nutrients:

Genetically modified foods are said to be high in nutrients and contain more minerals and vitamins than those found in traditionally grown foods.

11. Bio – Diversity:

Growing GM crops on a large scale may also have implications for bio-diversity, the balance of wildlife and the environment.

12. Diseases Resistance:

Certain diseases affected area can use genetically modified crops. This helps the farmers ensure that don't lose crops to diseases.

13. Allergy Control:

Allergens which causes allergy are able to be eliminated through genetic engineering which helps more people enjoy the great variety of foods.

14. Drought Resistance:

Genetically modified foods are often felt to be healthier and more resistant to things like drought than regular crops. This gives them the ability to ensure things that other crops cannot.

15. Improve Financial Gain:

It reduces the man powder needed to successfully grow the crops, which should transform in to improved financial gains.

16. Built In Pesticides:

GM corn and cotton are engineered to produce their own built in pesticides in every cell. When bugs bite the plant, the poison splits open their stomach and kills them. Bt produced from soil bacteria *Bacillus thuringiensis* has history of safe use, since organic farmers and others used

Bt bacteria spray for natural insect control. Genetic engineers insert Bt genes into corn and cotton, so the plants do killing.

DEMERITS OF GMFOODS

Genetically modified foods are believed to possess some unhealthy and deadly effects also. They were listed below

1. Unknown Side Effects in Humans

Many genetically modified foods seem to react in negative ways. Studies have proved that GM foods may cause certain types of cancer and other illness. Consumptions of GM foods form significant organ disruptions, especially in the liver and kidneys. Other cases reported were infertility, immune problems, accelerated aging, insulin regulation and changes in major organs and the gastrointestinal systems.

2. Side Effects in Animals

A Study in 2003 proved that GM soy fed to pregnant female rats killed most of their babies within three weeks. Investigations in some countries revealed that most of the buffaloes that ate GM cotton seeds have complications such as premature deliveries, abortions, and infertility and many calves died. About two dozen farmers reported that thousands of their pigs became sterile after consuming certain GM crop varieties followed by infertility in cows and bulls. When male rats were fed GM soy,

their testicles actually changed colour from the normal pink to dark blue.

CONCLUSION

Genetically engineered foods saturate our diet today. Others include grains like vegetable and fruits, dairy products including Eggs, Meat, Chicken, Pork and other animal products, infant formula and an array of hidden additives and ingredients in processed foods. Consumers don't know what they are eating. Yet the danger is clear. In the modern world, the question of genetically modified food is becoming more and more urgent, and the pros and cons of this issue must be weighed in order for nations to make educated decisions in the

future. Genetically modified foods present a very real threat to the genetic integrity of both mankind and the environment and requires long term research before being unleashed to the public. Genetic foods are sounds frightening and unnatural, but while consider the positive effects genetically, modified crops would have on health, farming methods and the environment, people focus more on this without knowing the hazards. This is the reason newly many nations are against GM foods even though they provide positive health benefits, any way we need more and better testing methods before making GM foods available for human consumption.