

GM FOOD – GOOD OR BAD?

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So, why do we need to know about genes as they relate to food choices? Once you begin to look at this problem and think about it, it all becomes very important. Possibly, some of the developments that are happening in this field will affect us and our offspring for generations to come.

Genetic engineering of food, animals, and even bacteria has been ongoing for a number of years. This “engineering” involves insertion of a different gene into a strand of DNA in a chromosome which will alter the subsequent generations of plants or animals. What are genes and chromosomes, and how do they work? A chromosome is a long chain of deoxyribonucleic acid (DNA) molecules which may have as many as 10,000 molecules in a sequence. Chromosomes carry genetic coding in their sequence and also in attached proteins and RNA. Each animal, organism, or plant has a different number; a human has 46 chromosomes while fruit fly has 8, bread wheat has 42, and chimps (who are the closest to us genetically) have 48.

A gene is defined as a locatable region of “genomic significance” in a chain of DNA chromosome that makes up certain characteristics. This could be eye color, blood type, the ability to produce larger ears of corn, resistance to a beetle or plant virus, or thousands of other characteristics of plants or animals. The gene directs production of RNA and certain proteins which create the individual characteristics of plants or animals.

DNA was discovered in Oxford, England in 1953 and was found to contain the genetic code for life. It was found at that time that certain portions of a chromosome could be snipped out or copied to change the inherited characteristic of the following generation after reproduction. This is called genetic engineering. By the mid-1970s, there were only a few research labs that were working to discover more about this new-found technology, but by the 1980s this was a multi-billion dollar global industry involving the genetic modification of certain plants to improve resistance to viruses and parasites and change other characteristics of these.

Applications of this technology could increase world food production, improving production and quality, allowing feeding of poor countries which have difficult climate and soil conditions. Food biotechnology can improve the flavor and nutrient content of fruits and vegetables, increase plant production to produce more sugars, more oils, or pharmaceutically active chemicals.

The basic goals of the food biotechnology industry are to benefit the public by solving problems in agriculture including food shortages and to benefit the food industry itself by allowing marketing of a higher volume of sophisticated food products (for a profit). However, these potentially useful applications of gene technology have elicited a great level of controversy in the United States and everywhere. The safety of genetically engineered food products is supported by some science, but there remains some problems with this. In

1985 the FDA authorized sales of meat and milk from cows treated with bovine somatotrophin (growth hormone) and issued statements that these foods are safe. In 1994 new varieties of tomatoes, canola oil, cottonseed oil, squash, potatoes, and soybeans were included. Attempts to market soybeans and corn encountered consumer resistance in Europe, and this resistance has continued to this day. Every food sold in Europe must be labeled as to whether it is GM (genetically modified) or not. There has been much resistance from the US food industry to the labeling of GM foods, and Monsanto and other large corporations have had many legal battles about this and the marketing of GM foods. Despite this controversy, approval of GM tomatoes, milk from cows treated with growth hormone, a GM squash, an insect-resistant potato, an herbicide-resistant cotton, and soybeans have been approved for marketing. If labeled as GM, most Americans and Europeans simply will not purchase them.

Some consumer groups concerned with food safety, one of which is the Center for Food Safety (CFS) has a web site and has issued a non-GMO shopping guide. They note that GM foods result from artificially inserting genes into the DNA of food crops or animals. They give tips for avoiding GM foods which include buying organic, looking for “non-GM” labels on food, looking for no rBGH dairy products. The “big four” GM ingredients are corn, soybeans, canola oil, and cottonseed oil, which are used in many processed foods in the US. This includes high fructose corn syrup, soy flour and soy protein, and hydrogenated vegetable oil. Very few fresh fruits and vegetables for sale in the US are GM, but more than one-half of the papaya export from Hawaii is GM. When you buy organic foods or meat products, they are not allowed to contain any GM sources. However, only 70% of the ingredients of organic foods are required to be truly organic, but 100% must be non-GM.

Just how safe are GM foods? This is a tough question to answer, but it is something that possibly may affect all of us. Some studies show that there are threats to human fertility and health safety, problems of allergies secondary to genetic modification of foods, and disturbance of the immune system in laboratory animals. Sources say that it is not possible to make general statement on the safety of all GM foods. However, continued risk assessments based on large studies should be made to evaluate the safety of GM foods.

Some of the groups who are against development of GM foods have an emotional bias as well as an objective one. They note that the immune system of some laboratory animals is damaged by GM foods. The “super-pig” engineered with a growth hormone gene was arthritic, blind, and impotent. The FlavrSavr tomato which was genetically modified was a commercial disaster because it did not live up to expectations, and soybean infused with a Brazil nut gene contains a protein fatal to those with nut allergy. Other unusual occurrences have been noted, including the fact that a bee’s ability to recognize flower aromas can be destroyed by GM canola oil. Although there are scientific publications which are against the introduction of GM foods into our diet and agriculture, the huge population in the US which has been eating these foods have seemingly had no difficulties with them.

All of this being said, however, whenever possible use non-GM organic foods and use cow’s milk that does not have bovine growth hormone. Obtain the non-GMO shopping guide and follow some of its guidelines to avoid a diet made up mostly of GM food. What you put into your body is the single most important thing you do every day. Also, as a consumer you should push for accurate labeling of all GM foods so that you can make informed decisions about what you eat.