

## Genetically Modified Food II

*Editor's Note: In last month's column, I presented a brief summary and review on the subject of genetically modified food. In this month's column, we will further review the subject specifically look at the controversies surrounding the introduction and use of these foods. In 2005, the total surface area of land cultivated with GMOs had increased by a factor of 50, from 17,000 km<sup>2</sup> (4.2 million acres) to 900,000 km<sup>2</sup> (222 million acres), of which 55% were in the United States.*

The GM food controversy is a dispute over the advantages and disadvantages of genetically modified food crops. Although no major health hazards have come to light since GM food was introduced 13 years ago, and more than 150 studies are published to attest their safety. Consumer rights groups such as the Organic Consumers Association and Greenpeace emphasize the long term health risks which GM could pose, or that the risks of GM have not yet been adequately investigated. Opponents of genetically modified food often refer to it as "Frankenfood," after Mary Shelley's character Frankenstein and the monster he creates, in her novel of the same name. The term was coined in 1992 by Paul Lewis, an English professor at Boston College who used the word in a letter he wrote to the New York Times in response to the decision of the US Food and Drug Administration to allow companies to market genetically modified food. The term "Frankenfood" has become a battle cry of the European side in the US-EU agricultural trade war.

On the other hand proponents argue that unnecessary delays to GM crop use by farmers pose another kind of risk. Agricultural scientist and economists express concern about the harm delaying welfare and environmental improvements, for instance by pro-vitamin A enriched Golden rice which has the potential to prevent much childhood death from infectious disease, and insect protected Bt rice which can reduce exposure of farmers to synthetic insecticides.

Proponents say that genetically-engineered crops are not significantly different from those modified by nature or humans in the past, and are as safe or even safer than such methods. There is gene transfer between unicellular eukaryotes and prokaryotes. There have been no known genetic catastrophes as a result of this. They argue that animal husbandry and crop breeding are also forms of genetic engineering that use artificial selection instead of modern genetic modification techniques. It is politics, they argue, not economics or science, that causes their work to be closely investigated, and for different standards to

apply to it than those applied to other forms of agricultural technology.

Proponents also note that species or genera barriers have been crossed in nature in the past. An oft-cited example is today's modern red wheat variety, which is the result of two natural crossings made long ago. It is made up of three groups of seven chromosomes. Each of those three groups came from a different wild wheat grass. First, a cross between two of the grasses occurred, creating the durum wheats, which were the commercial grains of the first civilizations up through the Roman Republic. Then a cross occurred between that 14-chromosome durum wheat and another wild grass to create what became modern red wheat at the time of the Roman Empire.

### Public Perception

Research by the Pew Initiative on Food and Biotechnology has shown that in 2005 Americans' knowledge of genetically modified foods and animals continues to remain low, and their opinions reflect that they are particularly uncomfortable with animal cloning. The Pew survey also showed that despite continuing concerns about GM foods, American consumers do not support banning new uses of the technology, but rather seek an active role from regulators to ensure that new products are safe.

Interestingly, about 550 Amish farmers in Pennsylvania have adopted GM crops, because they allow for less intensive farming (less pesticides, etc.), are more productive (under these specific conditions), and do not conflict with the Amish lifestyle.

Many agricultural scientists and food policy specialists view GM crops as an important element in sustainable food security and environmental management. This point of view has been summarised in the ABIC Manifesto:

On our planet, 18% of the land mass is used for agricultural production. This fraction cannot be increased substantially. It is absolutely essential that the yield per unit of land increases beyond current levels given that: The human population is still growing, and will reach about nine billion by 2040; 70,000 km<sup>2</sup> of agricultural land (equivalent to 60% of the German agricultural area) are lost annually to growth of cities and other non-agricultural uses; Consumer diets in developing countries are increasingly changing from plant-based proteins to animal protein, a trend that requires a greater amount of crop-based feed.

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