



Know the facts about genetic engineering

Fear of the unknown is a logical human survival trait. To many people, new advances in agricultural biotechnology, especially genetic engineering, generate this fear of the unknown.

It is not a new fear. In 1906, horticulturist Luther Burbank said: "We have recently advanced our knowledge of genetics to the point where we can manipulate life in a way never intended by nature. We must proceed with the utmost caution in the application of this newfound knowledge."

Was he referring to actually changing the genetic makeup of edible plants? Absolutely. However, the selective breeding practices used by Burbank take time, and it is not always possible to develop new plants with the specific beneficial traits desired.

Through advances in molecular biology, however, we are now able to make rather precise changes in genes to alter very specific traits of plants in a relatively short pe-

riod of time. This process is called genetic engineering, genetic modification, genetic enhancement or bioengineering.

Question: How does genetic engineering work?

Answer: Bioengineering first involves identifying the segment of DNA that contains the code (gene) for a desirable trait. That DNA segment is then inserted into the DNA of a plant to give it a desired trait. Since a gene has been transferred from one organism to another, the altered organism is said to be transgenic.

Q: What happens when genetically modified food is eaten?

A: Since DNA is a code for the formation of protein in a cell, changes in DNA will produce a structurally modified protein. In other words, the 20 amino acids that make up protein will be put together in a different order than previously found in that plant.

When a person eats any source of protein, the protein is broken down into amino acids

that pass into the blood and are taken up by cells that use the amino acids for a variety of functions. The process is the same for all types of foods.

Q: Are we protected from the possibility of allergic responses to the new proteins found in bioengineered foods?

A: Before a bioengineered food can be marketed, it must be thoroughly evaluated by three government organizations. The U.S. Department of Agriculture must be convinced that the plant is safe to grow; the Environmental Protection Agency evaluates potential environmental impacts; and the Food and Drug Administration determines risks related to eating modified foods.

For an in-depth and balanced review of this topic, see "Use of Biotechnology in Agriculture -- Benefits and Risks," by Dr. Ania Wiczorek, College of Tropical Agriculture and Human Resources, available online at www.ctahr.hawaii.edu.

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