

Genetically Engineered Foods Accepted By Regulatory Agencies

UNIVERSITY PARK (Centre Co.)—Genetically engineered foods, which have been the target of protests by special interest groups over the past five years, are gaining acceptance by the public at a surprisingly rapid rate, says a plant geneticist in Penn State's College of Agricultural Sciences.

"Genetic engineering has been in the news every day, and the public understands the issue better now than a decade ago," says Mark Guiltinan, assistant professor of plant molecular biology. "Genetic engineering has occurred in nature for millions of years. Mother Nature has probably done just about any experiment we can think of—most of which have failed—but now genetic engineers can develop plants at will rather than depending on nature."

In 1994, the first genetically engineered food product, the Flavr Savr tomato, was approved by the Food and Drug Administration. Guiltinan says several other products are on the verge of approval, including potatoes resistant to the Colorado potato beetle; cotton resistant to herbicides and bollworm; and herbicide-resistant

soybeans.

While media stories and special interest groups often have emphasized that genetically altered plants are not "natural," Guiltinan points out that plants have always been subject to various forms of natural genetic engineering. He also notes that Flavr Savr tomatoes are selling consistently well at supermarkets across the country.

"Plants have been genetically manipulated by plant breeding for more than 10,000 years. Plant breeding as a science goes back to the 1800s and genetic engineering is the next step," Guiltinan says. "Recombinant DNA technology represents a quantum leap in our ability to produce better plants much more consistently. We now can transfer genes between virtually any two organisms and we are no longer limited by sexual compatibility barriers."

Plant breeding and selection have given the world a plentiful, high-quality food supply. Biotechnology research offers a more sophisticated set of tools for scientists interested in developing new plants.

"I think any skepticism comes

from a gut-level fear of tinkering with genes—in other words, playing God," Guiltinan says. "I think of genetic research not as entering into some mysterious and unknowable force but as similar to working on a car engine to find out how it works. We just haven't taken the entire engine apart yet, but it is a finite and ultimately understandable system."

"There are up to 50,000 genes in a plant cell. We've looked at perhaps 1,000 at the most," he adds.

Guiltinan says genetically engineered plants offer benefits for both farmers and consumers. For example, a potato engineered to resist pests such as the Colorado potato beetle reduces a farmer's dependence on pesticides, protecting both the potatoes and the environment.

Transgenic plants often are altered only slightly to improve their natural traits. For example, to slow the ripening process, researchers working on the Flavr Savr tomato altered a single gene that makes the tomato soften. The genetic alteration allows the tomato to remain on the vine longer—improving flavor—while retain-

ing firmness during storage and shipping.

Guiltinan cited other possible benefits of genetic engineering such as developing fruit that produces natural vaccines in doses large enough to improve health in developing countries; supplementing grains, such as soybeans and maize, with vitamins; improving the quality of food; and engineering easily produced and deliverable pharmaceuticals to developing countries.

"Developing a plant that produces a vaccine could solve a huge problem in developing countries—distribution," Guiltinan explains. "If the vaccine comes in seed form, it's cheap to buy and transport, and it won't spoil. Best of all, it's self replicating."

Guiltinan says genetic research has proven invaluable as a scientific tool. "We can use DNA fingerprinting to track a gene throughout an experiment," he says. Plant breeders can use this technology to speed up the process of traditional breeding, at the same time making it more precise.

The potential affect of transgenic plants on natural ecosystems has long been a concern of environmentalists, who fear that engineered species could expand rapidly, crowding out wild plant species. They also are concerned

that genes might be transferred to wild plant species. Environmental groups also warn against engineering plants that might select for strains of super-resistance pathogens.

Guiltinan agrees these are legitimate concerns, but he points out that transgenic plants are subject to extensive testing before the product is allowed to be marketed. "Flavr Savr tomatoes underwent testing that went well beyond what is normally required for a food product," he says.

Guiltinan says these concerns must be addressed on a case-by-case basis and field testing must be performed to measure the actual potential for problems. "Careful planning, monitoring and agricultural practices will all but eliminate most of the potential problems without much trouble," he says.

Regulations for transgenic food products are stringent as well, requiring approval by the FDA and the U.S. Department of Agriculture. "Scientists are being extremely careful about what they are doing," Guiltinan says. "The promise of genetically engineered food is nearly unlimited, and in my mind at least, this promise far outweighs any potential problems."

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Extra Special Puppy Club
The Roundup meeting was held on Sept. 21. The club began the meeting with dog training and pledge to the flags. Ten members were present and they gave out the awards. Three members were recognized by the Seeing Eye: Andrea Leunberger,

Becky Ulrich, and Brian Horst. Some of the activities the dogs participated in this summer were: adventure sports, Lebanon Fair, and E.C.C. Home. The new puppy is a Black Lab and Golden mix. He is a male puppy named Norman, raised by Jimmy St. Clair.

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