

Bt corn is a controversial issue in Europe, where governments are cracking down on genetically engineered (GE) foods. "Concern over genetically engineered corn has stopped almost all exports of US corn to Europe."¹ European concerns include antibiotic_resistant bacteria, insufficient food_safety testing, product labeling, and Bt_resistant insects.² Long_term effects on agriculture and the environment are beyond the scope of this newsletter. The key question for ONE VOICE, is: What effect does Bt corn have on those who eat it?

WHAT IS Bt CORN?

Bacillus thuringiensis is a variety of soil bacteria which produces a substance toxic to moths and butterflies, including the European corn borer. Organic farmers use Bt toxin as a natural pesticide spray.³ Bt corn is any variety of corn genetically engineered by the insertion of a transgene to produce Bt toxin.

VARIETIES OF Bt CORN

GE corn is second only to GE soybeans in the number of acres of genetically_engineered crops currently in cultivation. Earlier this year, US GE corn acreage was estimated at 40% of total corn acreage up from 25% of the 1998 crop.⁴ Bt corn is produced by more than one company, so there may be some variation in the particular ingredients and methodology. One company (Novartis) has produced a variety of Bt corn which is also genetically engineered for herbicide_tolerance.

HOW MUCH Bt TOXIN ARE WE EATING?

No research has been done on the safety of Bt toxin in the human diet.⁵ Consider these facts:

1. The FDA does not require labeling of foods with genetically_engineered ingredients. Even wholesalers and food processors do not know how much Bt toxin is in the food they buy.
2. EPA recommendations that plants containing Bt toxin be tested as pesticides has not been enacted into law.⁶
3. More Bt potatoes are harvested in this country every year.
4. Oil from Bt cotton is used in processed foods and blended vegetable oils.
5. Bt varieties of other foods are being field tested for future release into the market.

When Bt toxin is produced by a plant, it is present in all parts of the plant. Fortunately for consumers, the amount of Bt toxin in corn decreases before harvest,⁷ because you can't just wash it off.

IS GENETIC ENGINEERING SAFE?

The FDA position is that genetically_engineered foods are "substantially equivalent" to their non_GE counterparts.⁸ FDA Approval of new GE varieties is based on summaries of scientific tests submitted with the application.⁹ Biotech companies defend their products by saying it's up to the FDA to determine safety.¹⁰ According to Dr. John B. Fagan, "It is a scientific fact that the process of genetic engineering often gives rise to unexpected side_effects. These can and have been shown to introduce unforeseen allergens and toxins into foods and unexpectedly reduce nutritional value."¹¹

WHAT'S IN A TRANSGENE?

A transgene combines the genes to be inserted, plus a promoter virus and an antibiotic_resistance marker gene.

PROMOTER VIRUS

The purpose of the promoter virus is to splice the *Bacillus thuringiensis* gene sequence into the corn DNA and turn it on so that the Bt gene will be "expressed" in the growing plant. One of the viruses used for this purpose is the Cauliflower Mosaic virus.¹²

ANTIBIOTIC RESISTENCE

The purpose of the antibiotic resistance marker gene is to sort modified DNA strands from the ones missed by the gene gun.¹³ Scientists in a California lab are working on a genetically modified tool for snipping out marker genes afterward. Meanwhile, Bt corn will be planted, harvested, fed to livestock, and sold to food processors and grocers with the marker gene intact.

Many Europeans are opposed to the use of the ampicillin resistance gene in GE corn. The ampicillin_resistance gene in Bt corn also confers resistance to other similar antibiotics, including penicillin. There has never been a better time to build up our immune systems and avoid antibiotics!

HOW DIGESTIBLE IS GE FOOD?

Producers and defenders of genetic engineering argue that the DNA in GE foods is broken down by stomach acid.

However, doctors, scientists, and health professionals are concerned about long_term toxic or other adverse effects for those with low stomach acidity, such as the elderly, or individuals using antacid medications.¹⁴

Even if the novel DNA is reduced to little snippets, that still leaves the question of whether the immune system accepts them as food or resists them as toxins. The more toxins we consume, the more vulnerable we are to infections.¹⁵

Evidence that GE foods can harm consumers is slowly emerging:

1. Dr. Walter Doefler (Institute of Genetics, University of Cologne) found fragments of artificial genes in the brain cells of baby mice. Dr Doefler commented: "The consequences of foreign DNA uptake for mutagenesis and oncogenesis have not yet been investigated."¹⁶

2. In England, a surgeon's 2_year old daughter recovered rapidly from chronic herpes_related cold sores, when GE soy milk intake was cut from 4 cups to ½ cup per day.¹⁷

3. ". . .breathing pollen from genetically modified crops. . . is known to cause allergy . . ."¹⁸

4. Multi_national baby food manufacturers, including Gerbers which is owned by Novartis have announced that they will stop using genetically_engineered ingredients in their cereals. This

doesn't prove GE corn and soy aren't safe for babies, only that the producers are concerned about their market share.¹⁹

The more consumers learn about genetic engineering, the more they insist that they have the right to know what they're eating. Genetically engineered foods can not be proven safe without long term testing. Producers of GE foods are opposed to consumer rights. We intend to provide more information on the testing of GE foods in the Autumn, 1999 issue of ONE VOICE (now The Patients' Voice).

NOTES:

1 Wilson, Steve "Europeans aren't hungry for gene_ altered food," THE ARIZONA REPUBLIC 5/19/99, <http://www.azcentral.com/news.cols/0519wilson.shtml>

2 Fagan, John, PhD; "Importation of Ciba_Geigy's Bt Maize Is Scientifically Indefensible," Natural Law Party web site: <http://www.netlink.,de/gen/BTCorn.htm>

3. Pollan, Michel; "Playing God in the Garden" THE NEW YORK TIMES SUNDAY MAGAZINE Copyright 1999 The New York Times Company 10/25/98

4. "Transgenic revolution..." THE STATE JOURNAL_REGISTER, Springfield, Illinois 7/15/98 http://www.news_real.com/story/19980715/15/30/325922_st.html

5. Pollan, See note 3.

6. Wolfson, Richard; "The new poison plants" ALIVE: CANADIAN JOURNAL OF HEALTH AND NUTRITION 7/97, <http://www.holisticmed.com/ge/poison.html>

7. Pollan, Michael (See note 2)

8. Mokhiber, Russell and Robert Weissman; "A Square Peg into a Round Hole, Biotech Foods and the FDA," WELL BEING JOURNAL, September/October, 1999 See also Cummins, Joe; "Are Genetically Modified Crops Safe? No" THE LONDON FREE PRESS, 6/28/99 page A13, http://www.natural_law.ca/genetic/NewsMay_June99/GEN6_30JoePoorRockef.html

9. Whitmore, Arthur; "FDA evaluation of bioengineered soybean and corn varieties" 10/7/96 <http://vm.cfsan.fda.gov/~1rd/tpbioeng.html> (See also Pollan, note 3)

10. Pollan, Michael (See note 2)

11. John Fagan, PhD, "The failings of the principle of substantial equivalence in regulating transgenic foods" Copyright 1997 http://home1.swipnet.se/~w_18472/jfsubeq.htm. See also FDA/CSAN "Conference on Scientific Issues Related to Potential Allergenicity in Transgenic Food Crops" 4/18_19/94, Annapolis, MD <http://vm.cfsan.fda.gov/~1rd/biocallrg.html>

12. Watson, Clare; "Research Highlights Risk of using Viral Promoter Genes in New Foods" 8/12/98 <http://www.holisticmed.com/ge/brain.html>

13. Dr. Mae_Wan Ho(biologist), "Physicians and Scientists Against Genetically Engineered Food," 12/30/98 http://pharminfo.news_real.com/story/19981930/17/16/643039st.html
14. "Modified corn on sale in UK 'kills' life_saving antibiotics," THE INDEPENDENT, London, 6/8/99, http://www.pharminfo.news_real.com/story/19990607/12/03/4314088_st.htm
15. Pollan, See note 3
16. Watson, see note 12
17. Syal, Rajeev; "GM soya milk gives children herpes, senior surgeon tells the Government" SUNDAY TELEGRAPH, 8/1/99, http://www.eGroups.com_group_ge_news_19.html
18. Cummins, Joe; "Are Genetically Modified Crops Safe? No" THE LONDON FREE PRESS,6/28/99 page A13, http://www.natural_law.ca/genetic/NewsMay_June99/GEN6_30JoePoorRockef.html
19. "Baby Food Maker Cautious on Grain" AP ONLINE 7/30/99 http://www.eGroups.com/group/go_news/18.html?