Another Reason for Schools to Ban Genetically Engineered Foods

By Jeffrey M. Smith, author of *Seeds of Deception*

Before the Appleton Wisconsin high school replaced their cafeteria's processed foods with wholesome, nutritious food, the school was described as out-of-control. There were weapons violations, student disruptions, and a cop on duty full-time. After the change in school meals, the students were calm, focused, and orderly. There were no more weapons violations, and no suicides, expulsions, dropouts, or drug violations. The new diet and improved behavior has lasted for seven years, and now other schools are changing their meal programs with similar results.

Years ago, a science class at Appleton found support for their new diet by conducting a cruel and unusual experiment with three mice. They fed them the junk food that kids in other high schools eat everyday. The mice freaked out. Their behavior was totally different than the three mice in the neighboring cage. The neighboring mice had good karma; they were fed nutritious whole foods and behaved like mice. They slept during the day inside their cardboard tube, played with each other, and acted very mouse-like. The junk food mice, on the other hand, destroyed their cardboard tube, were no longer nocturnal, stopped playing with each other, fought often, and two mice eventually killed the third and ate it. After the three month experiment, the students rehabilitated the two surviving junk food mice with a diet of whole foods. After about three weeks, the mice came around.

Sister Luigi Frigo repeats this experiment every year in her second grade class in Cudahy, Wisconsin, but mercifully, for only four days. Even on the first day of junk food, the mice's behavior "changes drastically." They become lazy, antisocial, and nervous. And it still takes the mice about two to three weeks on unprocessed foods to return to normal. One year, the second graders tried to do the experiment again a few months later with the same mice, but this time the animals refused to eat the junk food.

Across the ocean in Holland, a student fed one group of mice genetically modified (GM) corn and soy, and another group the non-GM variety. The GM mice stopped playing with each other and withdrew into their own parts of the cage. When the student tried to pick them up, unlike their well-behaved neighbors, the GM mice scampered around in apparent fear and tried to climb the walls. One mouse in the GM group was found dead at the end of the experiment.

It's interesting to note that the junk food fed to the mice in the Wisconsin experiments also contained genetically modified ingredients. And although the Appleton school lunch program did not specifically attempt to remove GM foods, it happened anyway. That's because GM foods such as soy and corn and their derivatives are largely found in processed foods. So when the school switched to unprocessed alternatives, almost all ingredients derived from GM crops were taken out automatically.

Does this mean that GM foods negatively affect the behavior of humans or animals? It would certainly be irresponsible to say so on the basis of a single student mice experiment and the results at Appleton. On the other hand, it is equally irresponsible to say that it doesn't.

We are just beginning to understand the influence of food on behavior. A study in *Science* in December 2002 concluded that "food molecules act like hormones, regulating body functioning and triggering cell division. The molecules can cause mental imbalances ranging from attention-deficit and hyperactivity disorder to serious mental illness." The problem is we do not know which food molecules have what effect. The bigger problem is that the composition of GM foods can change radically without our knowledge.

Genetically modified foods have genes inserted into their DNA. But genes are not Legos; they don't just snap into place. Gene insertion creates unpredicted, irreversible changes. In one study, for example, a gene chip monitored the DNA before and after a single foreign gene was inserted. As much as 5 percent of the DNA's genes changed the amount of protein they were producing. Not only is that huge in itself, but these changes can multiply through complex interactions down the line.

In spite of the potential for dramatic changes in the composition of GM foods, they are typically measured for only a small number of known nutrient levels. But even if we *could* identify all the changed compounds, at

this point we wouldn't know which might be responsible for the antisocial nature of mice or humans. Likewise, we are only beginning to identify the medicinal compounds in food. We now know, for example, that the pigment in blueberries may revive the brain's neural communication system, and the antioxidant found in grape skins may fight cancer and reduce heart disease. But what about other valuable compounds we don't know about that might change or disappear in GM varieties?

Consider GM soy. In July 1999, years after it was on the market, independent researchers published a study showing that it contains 12-14 percent less cancer-fighting phytoestrogens. What else has changed that we don't know about? [Monsanto responded with its own study, which concluded that soy's phytoestrogen levels vary too much to even carry out a statistical analysis. They failed to disclose, however, that the laboratory that conducted Monsanto's experiment had been instructed to use an obsolete method to detect phytoestrogens—one that had been replaced due to its highly variable results.]

In 1996, Monsanto published a paper in the *Journal of Nutrition* that concluded in the title, "The composition of glyphosate-tolerant soybean seeds is equivalent to that of conventional soybeans." The study only compared a small number of nutrients and a close look at their charts revealed significant differences in the fat, ash, and carbohydrate content. In addition, GM soy meal contained 27 percent more trypsin inhibitor, a well-known soy allergen. The study also used questionable methods. Nutrient comparisons are routinely conducted on plants grown in identical conditions so that variables such as weather and soil can be ruled out. Otherwise, differences in plant composition could be easily missed. In Monsanto's study, soybeans were planted in widely varying climates and geography.

Although one of their trials *was* a side-by-side comparison between GM and non-GM soy, for some reason the results were left out of the paper altogether. Years later, a medical writer found the missing data in the archives of the *Journal of Nutrition* and made them public. No wonder the scientists left them out. The GM soy showed significantly lower levels of protein, a fatty acid, and phenylalanine, an essential amino acid. Also, toasted GM soy meal contained nearly twice the amount of a lectin that may block the body's ability to assimilate other nutrients. Furthermore, the toasted GM soy contained as much as seven times the amount of trypsin inhibitor, indicating that the allergen may survive cooking more in the GM variety. (This might explain the 50 percent jump in soy allergies in the UK, just after GM soy was introduced.)

We don't know all the changes that occur with genetic engineering, but certainly GM crops are not the same. Ask the animals. Eyewitness reports from all over North America describe how several types of animals, when given a choice, avoided eating GM food. These included cows, pigs, elk, deer, raccoons, squirrels, rats, and mice. In fact, the Dutch student mentioned above first determined that his mice had a two-to-one preference for non-GM before forcing half of them to eat only the engineered variety.

Differences in GM food will likely have a much larger impact on children. They are three to four times more susceptible to allergies. Also, they convert more of the food into body-building material. Altered nutrients or added toxins can result in developmental problems. For this reason, animal nutrition studies are typically conducted on young, developing animals. After the feeding trial, organs are weighed and often studied under magnification. If scientists used mature animals instead of young ones, even severe nutritional problems might not be detected. The Monsanto study used mature animals instead of young ones.

They also diluted their GM soy with non-GM protein 10- or 12–fold before feeding the animals. And they never weighed the organs or examined them under a microscope. The study, which is the only major animal feeding study on GM soy ever published, is dismissed by critics as rigged to avoid finding problems.

Unfortunately, there is a much bigger experiment going on—an uncontrolled one which we are all a part of. We're being fed GM foods daily, without knowing the impact of these foods on our health, our behavior, or our children. Thousands of schools around the world, particularly in Europe, have decided not to let their kids be used as guinea pigs. They have banned GM foods.

The impact of changes in the composition of GM foods is only one of several reasons why these foods may be dangerous. Other reasons may be far worse (see www.seedsofdeception.com). With the epidemic of obesity and diabetes and with the results in Appleton, parents and schools are waking up to the critical role that diet plays. When making changes in what kids eat, removing GM foods should be a priority.

A videotape on changing school meals, including footage from Appleton, will be available in the fall, 2004 at www.seedsofdeception.com. The website also describes how to avoid eating GM foods.