

21w.732

October 19, 2006

Formal Paper 2

The GM Debate

Many authors have weighed in on the polarizing issue of genetically modified foods; Indur M Goklany and Jerry Cayford are two of these authors. In “The Future of Food”, Goklany argues that the precautionary principle should be applied to decide the fate of GM foods (2001, p. 59); the precautionary principle is a cost-benefit approach to decision-making. By applying this method, Goklany comes to the conclusion that accelerated GM research and commercialization is not only the best means of solving world hunger, but also an important part of sustainability and decreasing humanity's ecological footprint (2001, p. 64). Cayford writes in “Breeding Sanity into the GM Food Debate” that the issue of the safety of GM foods is simply a side issue that critics of biotechnology must employ to maintain public interest in the debate . According to Cayford, the main issue is over who should own the rights to the public food supply and the effects of the answer to this question on global agriculture (2004, p. 52). In effect, Cayford and Goklany address two facets of the complex issue of GM foods.

Goklany seeks to answer whether the costs of GM foods to public and environmental health outweigh the benefits. He thoroughly analyzes the issues dealing with safety and the environmental impact of GM foods and assures the reader that any potentially negative results of eating GM foods could be reduced or even eradicated through further modifications of plant genes (2001, p. 62). In his cost-benefit analysis, Goklany notes that bioengineered crops could be better adapted to abnormal nutrient and salt levels that have resulted from the massive use of conventional agricultural techniques like fertilization and irrigation. New varieties of food could provide more nutrition with less land devoted to agriculture (2001, p. 60).

These are irrefutable arguments in support of GM foods for the benefits these foods convey, but there are some points where Goklany doesn't provide enough support for his claims. For example, he states that criterion in deciding to apply a new technology should be the irreversibility of the changes that will be made. Although he gives sterile seeds as a method of keeping GM genes from spreading (2001, p. 60), he does not address the issues that would come along with the majority of the world's food crops being sterile. What would happen if the seed crops for some reason failed to grow or were destroyed before harvest? Valuable seeds should

not be destroyed unless there is a large backup supply of seeds in storage and a reasonable method of getting seeds from some other source has been formulated.

Another point that Goklany doesn't thoroughly support comes from the logic that we shouldn't spurn new technology that might solve many of the world's problems when the effects of an action are uncertain (2001, p. 64). He concludes that the "wisest policy would be to go as fast as possible while keeping a sharp lookout, and staying on the track to improvements in human and environmental well-being" (Goklany, 2001, p. 64). Apparently, any possible long-term negative consequences cannot be bad enough to overbalance the great benefits of GM foods.

Goklany addresses the social issue of providing food to growing populations as a national problem that can be solved with GM foods. He declares that "Sufficient food is the first step to a healthy society" (2001, p. 61). If that truly is the case, then there should be few unhealthy people and no social ills in most developed nations. As one can tell from the problems facing America and western Europe, even societies with food surpluses have not yet solved all of their internal problems. Goklany also argues that if it is true that food shortages in the world today are problems of simply distribution and not problems of food supply, then nobody will tell developing nations like India and Bangladesh not to clear more land for agriculture (2001, p. 63); this is how the nations feed their growing populations. The flaw in this argument is that countries do not have to increase their crop acreage; feeding the human population is a global issue that will take international cooperation to solve. Individual nations will not be able to efficiently transport food to or from other nations without an open alliance formed in the best interests of everyone.

Cayford provides another view on this issue; he seeks to define that quality to food availability that has to do with choice and culture. He argues that there is much more to supplying the world with food than a corporation handing out the seeds and everyone benefiting (Cayford, 2004, p. 50). Citing "many biotech advocates", Cayford denies the common perception that genetically modified foods are less safe than conventional varieties that have been bred by farmers over thousands of years. In fact, he concedes breeding a wild plant species into a crop plant brings much more change to the phenotypes of the plant than do the small controlled changes of genetic modification (2004, p. 53). Instead, he argues that GM foods will in effect decrease biodiversity of crop plants and put the control of the global food supply in the hands of

monopolies. He also points out that the danger of seeds not arriving on time or political unrest keeping the seeds from arriving at all should prevent the use of GM foods in politically unstable nations and nations with largely undeveloped distribution infrastructures (Cayford, 2004, p. 54). Unreliable delivery or malicious destruction of seeds would be a major risk taken by farmers who imported seeds instead of saving their own. These and other “social, political, economic, and cultural effects” (Cayford, 2004, p. 49) are the main issues to be addressed when discussing GM foods. He says that biotechnology critics only keep the food safety debate alive to get public awareness about an issue that directly affects people everywhere (Cayford, 2004, p. 52).

Cayford makes another highly effective point that GM food patents will benefit the corporations more than they benefit the farmers. Following to the Green Revolution, global crop productivity expanded but farmers lost money (Cayford, 2004, p. 53). New patents allow international corporations increasing control over the cost of farming inputs like seed and fertilizer; when the control over food production is centralized, farmers get less money and corporations get more money for every dollar that the consumers spend on food.

Another strong argument in opposition to the idea of further industrializing and patenting the seeds of crops is that possession of a patented plant would not necessarily imply theft or purposeful possession. Cayford's comparison of a plant that could theoretically grow almost anywhere without human aid to a steam engine that can't just grow in a garage (2004, p. 52) was not only entertaining, it was thought-provoking and poignant. This analogy showed that patent law must be applied correctly to support inventors while not harming anybody else. In addition, the purpose of patents is to encourage innovation. When large international corporations own the patents to the necessities of life, they control the rate of innovation and will deter attempts by other people with less monetary backing to improve agricultural methods. Cayford analyzes this information and decides that patents have their place but that plants should not be patentable.

A weaker argument made by Cayford is that “GM grain sent as food is inevitably planted” (2004, p. 50). For most grains, this would be true; even if the grain was not planted purposefully, it could spill on the ground and grow. Some companies already sterilize their second or third generation seeds to protect patents. In the future, especially if strong patent protection continues to support the sterilization of seeds, there should be no danger of recipients of food grains planting their gifts. However, this argument does raise the issues of basing global food production on grains that are sterile except for only one source. Not only does this practice

lead to monopolies, but it also leads to a disturbing lack of diversity in food crops. If there are many sources of a food crop, some might fail while others thrive. Allowing most of the world's crops to be grown from seeds in only a few locations would decrease diversity. This practice would also put the means of feeding the world at risk of being destroyed in a single natural disaster. One of the great strengths of agriculture up to now has been in diversity of location and crop genetics.

Both Goklany and Cayford agree on some basic rules that should be followed in food production in general and specifically with GM foods. Both want to help the poor and feel that withholding food is unethical if we know that the food is safe. The two authors agree that GM food probably is safe. They also agree that the smaller amounts of land required to grow GM foods may bring environmental benefits, although Goklany is more optimistic in this area than Cayford.

In general, Cayford's arguments are more persuasive. Goklany convinces one that GM food is safe, but not that the current method of keeping GM methods private and secret is either sustainable or culturally and economically sound. Cayford's discussion about taking GM foods into the social context makes sense and is rarely discussed in conversations about food safety. Care must be taken to prevent power from becoming too concentrated. We don't want the next great tyranny to be one supported by control over a human need so basic as the need to eat.

However, there might be some environmental benefits in pursuing new GM varieties. As Goklany notes, crops that can be grown on less land will free other land as biodiversity reserves. He does not evaluate, however, the ecological costs of producing inputs for the land to be used. If crops can be grown on half as much land but take twice as much land to produce fertilizer there are no net ecological benefits; if the amount of land used to produce inputs shrinks along with the amount of land used to grow crops, there might one day be true environmental benefits from using some varieties of GM foods.

In the end, GM foods should be addressed on many fronts at once and not treated as a single issue. There are three main issues that must be debated and solved. First, foods have to be safe. Not only should the foods be tested, but the test results should be readily available for the public. Since genetic modification over many generations has been in practice for centuries in the breeding of plants, the future guidelines to be developed will have to do more with how to protect consumers from their suppliers than in whether the food source can be modified safely.

Second, patent law must be evaluated and reformed. Changes in patent law should be made to differentiate between inventions that are public property and inventions that are merely for private gain. Third, the relative importance of certain versus uncertain consequences of any decision should be considered and understood as thoroughly as possible. Until we know more about the uncertain consequences, we should take care not to make any more irreversible changes to the genes of our food. The ramifications of genetic modifications of food crops must be carefully considered as a diverse collection of issues to be thoroughly understood. Only then will we be sure that decisions dealing with GM foods will be the best decisions for present and future generations.

References

- Cayford, J. (2004). Breeding sanity into the gm food debate. *Issues in Science and Technology*, 20(2). [Electronic Version] 49-56.
- Goklany, I.M. (2001). The future of food. *Forum for Applied Research and Public Policy* 16(2). [Electronic Version] 59-65.