GM Foods: Gift or Curse?
Category : July/August 2000
Published by Anonymous on Jul. 02, 2000

POINT-COUNTERPOINT

GM Foods: Gift or Curse?

Microbiologist Vatsala Sperling argues that genetic modification of foods is fraught with so much uncertainty and potential for disaster that research should be abandoned. Dr. Manjul Sharma of India's Biotechnology Department defends the research as direly needed

Shut this Pandora's Box Now

For fourteen years I studied, taught and practiced clinical microbiology in India and always used the top-of-the-line technology to help patients in their fight against infectious diseases. I could do so only because of my highly sophisticated technical training. I was aware, however, that the same superior technology that I used as a clinical microbiologist was also being used for production of germ bombs and biological warfare. No matter how much I worshiped technology and earned my livelihood from it, I could never bring myself to support biological warfare. This was technology gone mad and out of control. Genetically modified (GM) food, similarly, is the result of technology gone mad and out of control, so much so that it can't benefit humanity as a whole. Every example of genetically engineered food is paired with a list of unanswerable questions.

Hunger and food shortage: If agribusinesses subscribed to truly lofty ideals, they would engineer drought-resistant crops able to grow in a wide range of soil types without chemical

fertilizers. These miracle crops would have a higher nutritional content, seeds would be inexpensive and viable for the next crop, and the crop would not cause antibiotic resistance or spread toxic herbicide and pesticide residues. Genetically engineered crops do not fulfill any of these requirements.

Long-term health impact: What is the long-term impact of genetically engineered food on the health and wellness of the consumer, especially pregnant and nursing mothers, infants and young adults? Is there any way to quell the fear that eating foods altered with genes from plants, animals and bacteria, many of which are not a regular part of the human diet, will induce changes in our gene pool?

Antibiotic resistance: In order to track genetically engineered traits with ease in the laboratory, the genes to be transferred are tagged with antibiotic resistance genes from bacteria. Antibiotic resistance genes are known to travel freely among many different species. Once antibiotic resistance genes are in the fields, there is no stopping them from reaching the gene pool of nonpathogenic and pathogenic bacteria. Armed with antibiotic resistance genes, when pathogenic bacteria infect a susceptible human or animal host, they no longer respond to antibiotics they were previously sensitive to. Do promoters of genetically engineered foods have any plans for tackling this spread of antibiotic resistance?

Animal or vegetable? In an attempt to create frost-resistant tomatoes, antifreeze-enzyme-producing genes from arctic fish have been incorporated into the gene pool of tomatoes. Is the frost-resistant tomato with a fish gene a vegetable or animal?

Pranic energy of food: Looking at genetically engineered foods from the angle of ancient holistic sciences, it is apparent that these foods are not pure. Their subtle pranic energy fields have been invaded, altered, manipulated and tampered with to give them questionable identities.

There are better solutions: Agribusinesses claim that genetically engineered foods can solve problems--for example, that genetically engineered bananas can provide immunity against diarrhea. Diarrhea could be induced by scores of bacteria, bacterial toxins and viruses, and it is very well known that it can be prevented by providing clean drinking water and educating people about hygiene and hand-washing. If poor countries want to prevent diarrhea, why can't their scarce resources be used to provide clean drinking water? What about the Swiss vitamin A rice soon to be introduced in India (though the Europeans themselves won't eat it)? Why not educate people to eat vitamin A rich vegetables and parboiled, unpolished, brown rice, which is richer in minerals and vitamins as compared to polished white rice? Further, how will vitamin A toxicity be monitored in people who consume large quantities of vitamin A rice as a staple?

Religious requirements of people: Vegetarians of all faiths and people following kosher laws (Jews and Moslems) face a special dilemma with regard to genetically engineered foods; so do devout Hindus who have strict and special dietary laws for festivals and various fasts. The entire concept of eating the right food at the right time, and for the right purpose and meaning, is destroyed when genetically engineered foods containing animal, insect and bacterial genes come into a household that has special dietary requirements. Should

genetic engineering be allowed to cause such a disruption of religious practices? My rejection of GM food is not a wholesale rejection of genetics. Rather, it is a rejection of the specific applications in food technology with its incumbent dangers to the gene pool and the delicate balance of our natural environment. Automobiles, bulldozers, TV and email do not destroy the gene pool. GM food does. Do we accept it because we need to support research and technology? Or, while we support these do we choose to say "No" to GM food because we want to preserve the gene pool, nature and our future?

India Needs this Technology

Dr. (Mrs.) Manju Sharma isSecretary to the Government of India, Department of Biotechnology, Ministry of Science and Technology. As such, she is responsible for the oversight of biotechnology research in India. In offering her opinions here to Hinduism Today, she is speaking on her own behalf and not officially for the Ministry. Dr. Sharma is the granddaughter of the great freedom fighter, Sri Madan Mohan Malviya. She is a strict vegetarian and a deeply religious person, meditating half an hour a day without fail.

We are extremely cautious and scientific when it comes to this technology. Every country has institutional bio-safety committees. In the United States you have the Food and Drug Administration and other agencies, on top of the scientists' own good judgment, protecting the environment and the people. For example, our scientist Ashish Datta has created a potato with lots of protein (potatoes normally have just starch) by inserting a gene from the amaranth grain. He had to go through the committees which examine bio-safety issues. Then we do field trials to see how the new species affects the

environment and other plants, to make sure it is safe. Science is moving very fast. Scientists are human beings. They are intelligent Scientists know what they are doing.

Food production: All the projects we are doing in India are aimed at increasing food productivity. At the moment we are working on improving chana dahl, toor dahl, mung bean and the potato--these are the main crops. We are also trying to increase the bread-making qualities of wheat. All the crops we are working on are under field trials and have not yet been released to the public.

Careful field tests: Not one environment toxicity study conducted has shown any record of adverse environmental impact. China is one country where genetic engineering has been used in a big way, and prior to January, 1999, they had no guidelines on bio-safety. Nothing adverse happened.

Antibiotic resistance: It is correct that at some stages when you are doing experiments, antibiotic genes are used. Now the scientists are using a route by which antibiotics are avoided and have succeeded.

Long-term effects: We have to study the affect on the health of people, especially the long-term impact of the genetically modified food. At an international meeting on biotechnology, which included people from Europe and people opposing genetic engineering of food, not a single case of adverse impact on the health of an individual could be cited in all these years.

Human welfare: Whenever we introduce a new technology which is going to be used for commercial exploitation, I am more concerned about the human welfare than the commercial exploitation. I would like to have a policy where we label all the genetically modified food. I would also like to ensure that each product be tested, like we do drug testing and vaccine testing. We are dealing with living entities, and I am very conscious of that.

Vitamin A rice: The science part of it is totally accepted. The gene has been expressed very well. But there is no proposal that India is to be used as a guinea pig at the moment. Why should we be used as a guinea pig? We may test the material. Right now we are not going for it, but if we do go for it at all, we will select the best variety of rice, introduce it, see the toxicity data and compare it with other data. Then only will it be released in a minimum of three years.

The world food supply: How will India feed our one billion people with our limited arable land? This year's food production is 201 million tons. How else will we increase our productivity per acre, except through biotechnology? If the chemicals and fertilizers are increased then it leads to increase in insecticides. All this then goes into the stomachs of the people. Dr. Anil Agarwal discovered that India has the largest reservoir of pesticides residue in the stomachs of any people.

Vegetable or animal? Now you are scared that some Indian would introduce a fish's gene in a vegetable. Just look at the vegetables that you are currently consuming. I do not want to frighten you, but if you do not wash a cabbage you will find

millions and millions of black and white insects hidden therein. Millions of bacteria are also on all vegetables that we eat. Now bacteria are living beings.We are consuming them. The genes in this vegetable are just protein, and that is all. Vegetarianism has no connection with all this. You take cheese. Even milk has bacteria. The curd that you make is made with the help of bacteria. Now, is curd vegetarian or nonvegetarian? Curd is eaten during religious festivals and fasts. Protein is a chemical entity. It is a molecule.

Money: Bringing research scientists and industry together is one of the main objectives of the 21st century so that new research products get to the market and to the people. If they make money, there is nothing wrong with that. In the US, 60 percent of the research is supported by the industry and 60 percent of the scientists are on the payrolls of the industry. Money will never affect my department's decision.

Risk analysis: You have to clearly understand the advantages of genetic engineered crops and the disadvantages of the genetic engineered crops by making a table and then weighing the advantages and disadvantages. If you do this and study the table, you will find that there would be twenty advantages and two disadvantages. The main disadvantage is that a long-term safety study is required..