

Genetically Engineered Food Could Be Lifeline for Developing World

WASHINGTON, D.C. - In the developed world, societies enjoy abundant diets more varied now than at any other time in history. That's in stark contrast to the developing world where millions of people confront profound food insecurity every day.

Part of the solution to righting this imbalance might involve something that is increasingly controversial in the developed world: genetically engineered food.

Cornell University's Susan McCouch, associate professor of plant breeding, asks if it is ethical for well-fed people in the United States, Canada, and Europe to ignore the potential of biotechnology to improve the nutritional status of hungry people around the world, particularly when the same technology is being used to extend life expectancy by producing pharmaceuticals. McCouch made her observations in her talk, "Is

Biotechnology the Answer?" at the annual meeting of the American Association for the Advancement of Science in Washington, D.C.

If used appropriately, agricultural biotechnology can help alleviate world hunger and malnutrition, said McCouch, noting the development of genetically engineered rice to produce iron or provitamin A (beta carotene) as an example of a product that has the potential directly to improve the quality of life for millions.

"People who suffer from malnutrition generally lack essential levels of micronutrients because they lack the purchasing power to obtain sufficient diversity in their diet," said McCouch. The impact of delivering those essential micronutrients through food products such as enriched yellow rice is parallel [in the United States] to fortifying milk with vitamin D, salt

with iodine or orange juice with calcium." Transgenic rice, she noted, offers immediate assistance as a staple food to people in need.

McCouch said she believes there is evidence of public support for the use of genetic engineering to improve diet and nutrition in the developing world. In her view, people support the technology when they see societal benefits, not just corporate benefits. Some opinion surveys show that people initially are uncomfortable with the idea of using biotechnology to transfer genes between organisms, she said, but those reservations can be overcome if people perceive a particular ethically or morally persuasive benefit.

McCouch said that careful consideration must be given to different kinds of agricultural systems around the world, and the risks weighed against the benefits to those different sys-

tems. "Clearly, not all people have the same choices nor will they have the same preferences," she said.

While the term biotechnology was originally coined during the industrial revolution, it has evolved into its contemporary meaning only in the last 25 years, which McCouch defined as modifying living things to suit human needs and preferences. "According to this definition, humans have practiced biotechnology for about 10,000 years, or as long as they have practiced agriculture," she said.

"Most of our domesticated food and fiber species have been altered through traditional crossing and selection to such an extent that they are no longer capable of surviving in the wild," said McCouch. Instead they prosper when nurtured and cultivated by human beings. The interaction of natural processes and human activity has given

rise to novel agro-ecosystems and is responsible for generating and sustaining a vast array of genetic and ecological diversity on the planet.

Today, most people associate biotechnology with genetic manipulation at the DNA level, said McCouch. But not all biotechnology involves genetic engineering. "A large part of what biotechnology represents today is new knowledge about the natural processes of DNA replication, breakage, ligation and repair that has paved the way for a much deeper understanding of the mechanics of cell biology and the hereditary process itself."

This new knowledge, she said, has brought us to the edge of an ethical dilemma. While the ability to manipulate the hereditary process is not new, the depth of our understanding of this process has changed and the knowledge we have gained has opened up an endless array of possibilities for affecting future evolutionary trajectories.

"How the potential of the human imagination and creative spirit should be nurtured, guided, interpreted and ultimately directed and controlled with respect to biotechnology is a question of profound social, economical and ethical dimensions," said McCouch. "It deserves to be discussed, contemplated and digested at all levels of society."



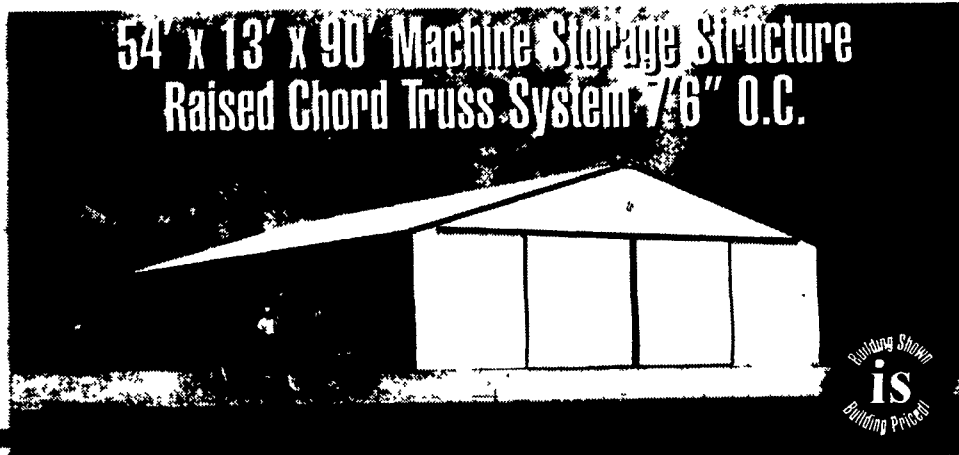
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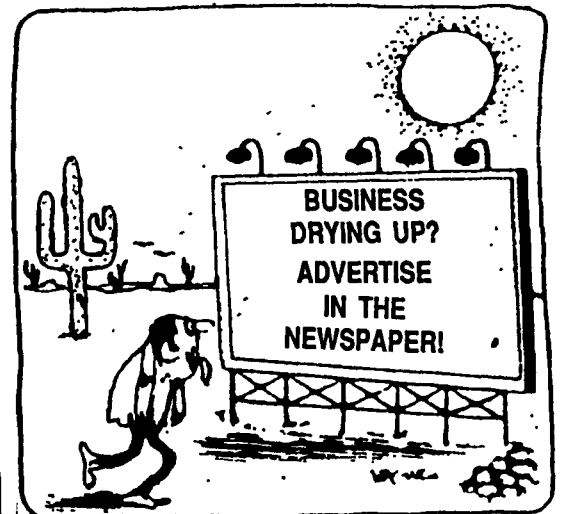
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