



Lesson Plan 080105

Genetically Modified Foods (Target: Grades 8-12)

Objectives:

1. Create awareness for the technology and potential risks of genetically modified organisms (GMOs) being introduced into the environment and incorporated into food ingredients.
2. Create awareness for various web sites where information is available relating to genetically modified foods and other controversial technologies.
3. Challenge students to proactively communicate their concerns through contact with parents and others.

Materials/Sources:

1. Poster: "5 THINGS EVERYONE SHOULD KNOW ABOUT GENETICALLY MODIFIED FOOD". Available as separate download (.pdf document) in both color and black and white, 11 x 17" size.
2. "GMO Web Site Links" page (part of this document)
3. Classroom Comic (part of this document)

Methods:

1. Hand out copies (letter size) of the "5 THINGS" poster, as well as the classroom comic to each student.
2. In class, explain the differences between hybrid and GMO technologies (see lesson information and links that follow).
3. Online: visit three or four of the web site links related to GMO issues. Read some of the narrative about the science, the risks, the opposing viewpoints about GMO foods.
4. Discussion: Ask students to share their thoughts about the potential risks and rewards of genetically modified organisms.
5. Activity: Ask students to take the poster and classroom comic home and discuss their thoughts with parents, siblings, etc. during the dinner hour.

Lesson Information: 5 Things Everyone Should Know About GMO (Genetically Modified) Foods...

1. GMO technology is not being accurately explained to the general public. Pick up a microbiology textbook and you may be surprised to discover that genetically modified (GMO) food is being presented--not as an unproven new frontier raising both hopes and questions--but as a 'done-deal' hi-tech solution to the world's hunger and health problems. You'll read about corn plants that are genetically altered to carry life-saving vaccines to remote Third-World villages, and grains that can be engineered to produce their own pesticides! Conspicuously absent is the test data showing how lab rats being fed GMO corn developed mutations in their kidneys and ended up with altered blood chemistry. There is a disturbing side to the science; it's not being presented to most of us.

2. Genetically Modified Food is NOT 'just the same as' Natural Food.

Here's some sobering information from the Mothers for Natural Law web site: "Genetic engineering is the largest food experiment in the history of the world. There are about 40 varieties of genetically engineered crops approved for marketing in the U.S. As a result, 60-70% of the foods on your grocery shelves contain genetically engineered components. Genetic engineering uses material from organisms that have never been part of the human food supply to change the fundamental nature of the food we eat. They are not subjected to rigorous pre-market safety testing. And THEY ARE NOT LABELED. Without long-term testing no one knows if these foods are safe." The Union of Concerned Scientists web site puts it this way: "Contrary to the arguments made by some proponents, genetic engineering is far from being a minor extension of existing breeding technologies. It is a radically new technology for altering the traits of living organisms by inserting genetic material that has been manipulated by artificial means." Whatever else may be communicated about genetically modified foods, it can be stated with absolute certainty that GMO foods are not 'the same' as naturally-occurring foods. The fact that many GMO proponents casually dismiss the differences raises both serious questions—and serious concerns.

3. In the USA, GMO (Genetically Modified) food ingredients are not identified on food labels.

Fat, calories, vitamins, minerals and more are disclosed on foods sold in the US, but not genetically modified ingredients. Yet the vast majority of American consumers WANT to have GMO ingredients disclosed. Richard Caplan of the U.S. Public Interest Research Group wrote the following in a May, 2000 article: "Public opinion in support of mandatory labeling for genetically engineered foods has been consistent and unwavering. A Harris Poll from June 2000 found that 86% of Americans think the government should require the labeling of all packaged and other food products that include corn, soy, or other products that have come from genetically modified crops. The International Communications Research and Les Dames d'Escoffier, a prestigious international women's culinary organization, both released poll results in March that also found that 86% of Americans want labels on genetically engineered food." If consumers feel so strongly about GMO disclosure, why isn't the FDA taking action? An article from November 2002, written by Tim Christie for the Eugene, Oregon Register-Gard, put it this way: "Food industry and biotech giants such



as Monsanto, General Mills, Kellogg and CropLife International are contributing millions of dollars to defeat Measure 27 [an Oregon bill that would have required GMO labeling on food]. As of Sept. 20, the 'Coalition Against the Costly Labeling Law' had raised \$4.6 million from industry." There's a reason for their disclosure-blocking efforts. In Western Europe, where mandatory labeling of GMO food has been required for years, consumer reaction to GMO disclosures forced food manufacturers to abandon the use of GMO food ingredients or watch their brands and products become extinct. Is it time for the US government mandate disclosure of GMO food ingredients? Many think the US government should let the market--a fully informed market--vote with its wallet.

4. Genetically Modified (GMO) Food is not adequately tested by its own producers or industry. Unlike the considerable safety testing procedures required of drug companies, GMO-producing companies have alarmingly few testing regulations and are not required to comprehensively prove that their products are safe prior to introduction. One recent example of this scenario is the Safety Assessment Application for a GMO soybean submitted by Monsanto to the Japanese Health Ministry. According to the account of this incident as reported on the web site of The Organic Consumers Association, the Monsanto effort was called 'inadequate and incomplete.' Quoting the report: 'For example, in rat experiments, raw and toasted soybeans both genetically modified and non-modified were fed to only 10 rats in each group and the feeding period was only 28 days. Toxicity across generations or chronic toxicity will not be measured by such limited experiments.' But inadequate testing is not the only problem. In some cases, GMO producers have misrepresented test results when writing their reports. From the Organic Consumers article: 'Japanese researchers found clearly intentional misinterpretation in the Monsanto assessment.' Both in the US and around the world, the people who are profiting from GMO foods are the very ones entrusted with adequately testing them and accurately reporting the results. It's a frightening conflict of interest that needs to be changed--and quickly.

5. Non-GMO crops and wild plant species are being contaminated by air-borne pollen from neighboring GMO crops. Earth's ancient, unspoiled genetic stock of naturally occurring food plants may soon be a thing of the past. As winds carry their genetically-'juiced' pollen into neighboring farmland, genetically modified (GMO) plants contaminate non-GMO and organic crops, and often overrun indigenous species. It's the exact opposite of natural selection. The Organic Consumers Association's web site posted an article from The Barre-Montpelier Times-Argus (Vermont) about this growing problem. Here's part of what reporter Brian Tokar revealed: "The problem of transgenic contamination of organic and other non-engineered crops has become increasingly widespread. In Canada, farmers have detected varieties of canola that are simultaneously resistant to three different chemical herbicides, as a result of cross-pollination of different varieties genetically manipulated to be herbicide tolerant. These have come to be viewed as 'superweeds,' requiring increasingly virulent weed killers to remove them." The contamination problem is becoming so widespread that a web site has been launched specifically to track the occurrences of GMO encroachment on non-GMO and organic crop lands.



Web Links / Online Resources

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The Union of Concerned Scientists Web Site, GMO Links

http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=340

http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=341

http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=337

http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=1219#research_env

http://www.ucsusa.org/food_and_environment/biotechnology/page.cfm?pageID=1339#2

The Organic Consumers Association Web Site

<http://www.organicconsumers.org/geresources.htm>

<http://www.organicconsumers.org/ge/corn-study.cfm>

<http://www.organicconsumers.org/ge/flaws051905.cfm>

<http://www.organicconsumers.org/ge/german041905.cfm>

<http://www.organicconsumers.org/gefood/inadequate022402.cfm>

<http://www.organicconsumers.org/gefood/starlink061702.cfm>

<http://www.organicconsumers.org/ge/threat32805.cfm>

<http://www.organicconsumers.org/ge/contamination050305.cfm>

<http://www.organicconsumers.org/biod/highcosts30305.cfm>

<http://www.organicconsumers.org/ge/bigmoney.cfm>

The Center for Food Safety Web Site

<http://www.centerforfoodsafety.org/genetical17.cfm>

<http://www.centerforfoodsafety.org/genetical2.cfm>

http://www.centerforfoodsafety.org/other_reso.cfm

http://www.centerforfoodsafety.org/press_room.cfm

Other Sites / Links

<http://www.gmwatch.org/p1temp.asp?pid=1&page=1>

<http://www.safe-food.org/-issue/dangers.html>

<http://www.netlink.de/gen/home.html>

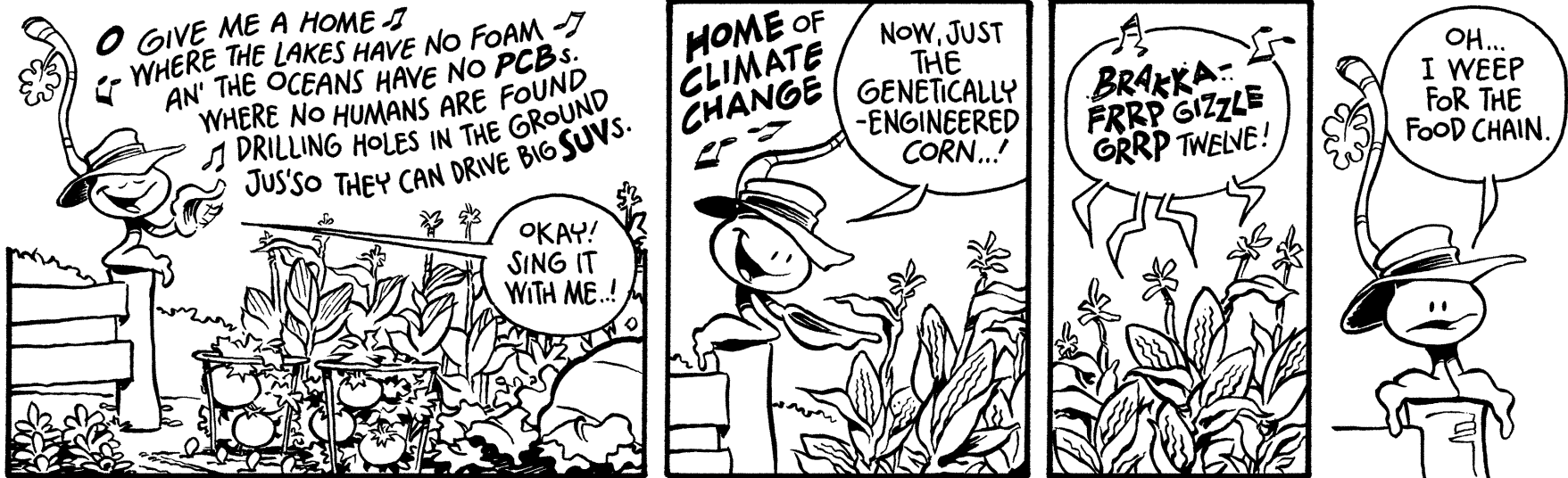
<http://www.sierraclub.org/biotech/kraft.asp>

<http://www.krafty.org/>

RUSTLE THE LEAF™

BY PONCÉ & WRIGHT

CLASSROOM COMIC



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A WORD ABOUT "RUSTLE THE LEAF"

Rustle the Leaf is an online outreach that uses syndication-quality, weekly comic strips and other creative tools to communicate essential environmental themes and truths. Our goals are to encourage environmentalists, to facilitate the sharing of environmental views in an engaging, nonconfrontational manner, and to introduce and reinforce environmental education with people ages 6 to 106. Here's a comment about Rustle the Leaf from an informed reader...

"I like it!!!!!! Great idea. Only problem I see is the fact that most of our environmental problems have their roots in politics. The technological solutions are already here--it's just the will to adopt them." Dr. Robert Bruck, Professor of plant pathology, forestry and environmental technology, North Carolina State University

To read more and find out more, visit: <http://www.rustletheleaf.com>