

Genetic Modification of Organisms for Human Consumption (Part 2)

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When I was researching genetically modified organisms ([GMO; see Part 1, Nov. 15, 2013 issue](#)), I was struck by how many one-sided information sources insist they are presenting both sides of the debate. Emotion routinely drowns out evidence and the mudslinging is on a level normally reserved for politics. Other impressions I had included the following:

- GMO opponents correctly point out there are no large, independent studies on humans proving GM food is safe – but these won't be done for ethical reasons because if regulators don't believe a product is safe, they will not approve it. ("Safe" refers to not causing acute, short-term illness. If we banned everything that has been proven to cause harm (let alone the mere potential to cause harm) with long-term use, the shelves of your supermarket, drug store, liquor store and home-improvement store would be empty.)
- GMO opponents are also correct when they state studies showing GMO safety are predominately funded by companies in the industry and done by the scientists they employ. However, to dismiss these studies for that reason alone is akin to dismissing positive studies on chiropractic because they were conducted by chiropractors or funded by entities with financial ties to chiropractic.
- GMO supporters are correct when they point out there is a lack of quality peer-reviewed research from opponents.
- Many who trust major scientific organizations on subjects like climate change distrust their positions on GMO.
- Big business (normally against regulation) seems to support regulatory scrutiny ... or at least they keep their complaints private.
- GMO is treated as a single entity when, in fact, each and every modification is unique and requires individual evaluation.

Pros and Cons

The major pros and cons (presented here in no particular order) of GMO remain hotly debated:

Pros

- Improved drought tolerance
- Improved temperature tolerance
- Improved herbicide resistance
- Improved pest resistance
- Increased salinity tolerance
- Increased crop yields
- Increased nutrient content
- Increased shelf life after harvest
- Increased geographic growing ranges

- Reduced requirements for other pesticides and herbicides
- Phytoremediation (plants designed to treat pollution in soil, water or air)

Cons

- Inadvertent creation of allergens, toxins and byproducts harmful to humans, animals and/or the environment
- Environmental gene transfer between modified and non-modified crops
- Adaptation by insects to insecticides, aka "super bugs"
- Adaptation by weeds to herbicides, aka "super weeds"
- Unforeseen soil and/or ecosystem and/or food-chain problems
- Potential reduction of agricultural biodiversity
- Monopoly concerns of the seed market and lack of non-GM seeds

Top Contributors Who Helped Defeat the GM Label Proposition in California	
Monsanto	\$7,100,500
E.I. DuPont DeNemours & Co.	\$4.9 million
DOW Agrisciences	\$2 million
Bayer Cropscience	\$2 million
BASF Plant Science	\$2 million
Pepsico, Inc.	\$1,716,300
Nestle USA	\$1,169,400
Coca-Cola North America	\$1,164,400
Conagra Foods	\$1,076,700
General Mills	\$908,200
Syngenta Corporation	\$821,300
Del Monte Foods	\$674,100
Kellogg Company	\$632,500

A Loss Becomes a Win

In November 2012, I voted for a [ballot measure](#) in California that would have required the disclosure of genetically modified ingredients. It was soundly defeated thanks to massive funding by agribusiness, which outspent the proposition's supporters by a margin of \$34 million to \$4 million. (See table for the top donors.)

The irony of the election defeat is that label changes regarding GMO are appearing anyway. The twist is that instead of coming from companies who use GMO, label changes have appeared from companies who *do not* use GMO. The result is consumers in California who care about this issue know that if an item does not say "no GMOs" or "GMO free," it contains some ingredients from crops grown with genetically modified seeds.

Comment

If you live in America, you have consumed products that included ingredients [grown from GMO](#) ... and you have lived to read about it. I have not seen a single study that used an evidence-based design conclude that a GM crop caused morbidity or mortality in humans by itself or compared to the same non-GM food. However, I do not believe for a second that agribusiness puts my health ahead of their wealth – but I also do not believe they are out to poison me or ruin the planet, either.

Regulation of the GMO industry must continue in a transparent manner and elected officials must ensure separation between regulators and industry is maintained in order to avoid the problems seen in banking and petroleum. Blanket condemnation of GMO products must be replaced by a case-by-case approach. The potential for unintended consequences (negative and positive) as GM technology expands is likely.

Saving the hardest for last, in part 3 of this article I will attempt to sort out the myths and facts surrounding GMO.

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