

# OMG – Here Come the GMOs

by Panda Kroll



**A new film, a new federal law, a landmark case and a new book all provide something to chew on.**

- *Food Evolution*, documentary narrated by Neil DeGrasse Tyson (2016)
- “National Bioengineered Food Disclosure Standard,” proposed rule, *Federal Register* (May 4, 2018)
- *DeWayne Johnson vs. Monsanto Company, et al.*, San Francisco County Superior Court (July 2018)
- *The Wizard and the Prophet*, book, Charles C. Mann (2018)

*Food Evolution*, a documentary that “explores all the ways science has been used and abused in public discourse surrounding the genetic engineering of food,” premiered on Hulu in the fall of 2017. The film is mandatory viewing for my Biotechnology & Law graduate students. In the debate over Genetically Modified Organisms (GMO)/Genetically Modified (GM) food, both sides claim science is on their side. While Neil deGrasse Tyson, PhD, Astrophysics, may seem an unlikely choice to narrate a film on food science, his folksy appeal makes a polarizing and complex subject more palatable to the scientifically less-than-literate; in fact, the film received

a rare 100% Rotten Tomatoes rating. The film takes on both sides of the debate and “alternative facts,” turning the spotlight from emotion to science. Spoiler alert: No credible evidence to date suggests that GMO ingredients currently on the market are unsafe to eat.

The internationally renowned, non-profit American Association for the Advancement of Sciences (AAAS) has said, “the science is quite clear: crop improvement by the modern molecular techniques of biotechnology is safe.” The AAAS points out that “the World Health Organization, the American Medical Association, the U.S. National Academy of Sciences, the British Royal Society, and every other respected organization that has examined the evidence has come to the same conclusion: consuming foods containing ingredients derived from GM crops is no riskier than consuming the same foods containing ingredients from crop plants modified by conventional plant improvement techniques.”

Not all scientists are persuaded, however. Brian Rasnow, PhD, teaches astronomy, biology, chemistry and physics at California State University, Channel Islands and remains agnostic as to the pros and cons of GMOs, but reminds us of the Loch Ness fallacy, i.e., that the absence of evidence is

not evidence of absence. Dr. Rasnow favors the precautionary principle, which provides that “if an action or policy has a suspected risk of causing severe harm to the public domain (affecting general health or the environment globally), the action should not be taken in the absence of scientific near-certainty about its safety. Under these conditions, the burden of proof about absence of harm falls on those proposing an action, not those opposing it.”

Dr. Rasnow explains that “[t]he risk/benefit equation of GMOs has been skewed by industry. The risks are significantly higher than generally quoted, because large enough, properly controlled, independent studies that would have adequate sensitivity to detect small effects (like smoking a pack of cigarettes a day) have not been done. The data that’s often quoted as ‘proving’ safety doesn’t have the strength of proof that’s claimed. And on the other side, the benefits are often exaggerated beyond what has been demonstrated.” Dr. Rasnow cites to *Nature* magazine, in which the editor states, “Without broader research programmes outside the seed industry, developments will continue to be profit-driven, limiting the chance for many of the advances that were promised 30 years ago – such as feeding the planet’s burgeoning population sustainably, reducing the

environmental footprint of farming and delivering products that amaze and delight.”

Another detractor, Doug Gurian-Sherman, PhD, plant pathology/phytopathology, has been affiliated with the Environmental Protection Agency, the Union of Concerned Scientists, and more recently, the Center for Food Safety, a nationally known non-profit public interest and environmental advocacy organization. Dr. Gurian-Sherman takes issue, *inter alia*, with *Food Evolution's* dismissive approach to a GMO-related product, glyphosate (commonly known as Roundup). Over 80 percent of genetically modified crops grown worldwide are engineered to tolerate being sprayed with glyphosate herbicides. The U.S. Environmental Protection Agency has concluded glyphosate is likely not carcinogenic to humans. But in 2015, the World Health Organization classified glyphosate as a “probable” human carcinogen, touching off a heated debate over evaluation methods. Although California voters passed an initiative requiring glyphosate to be listed on the state’s so-called “Proposition 65 list” as a “chemical known to the state of California to cause cancer,” agricultural industry groups alleged that a warning label on food would violate First Amendment free speech protections by compelling retailers to post “false, misleading and highly controversial statements” on their products. In February a federal judge granted preliminary injunction barring anyone from requiring cancer warnings on food products that contain traces of the herbicide. As this article goes to press, a San Francisco jury is hearing expert testimony in a landmark case – the first of approximately 300 similar trials currently pending against Monsanto, in which the plaintiffs allege that Roundup caused non-Hodgkins lymphoma and that the company suppressed evidence of the risks of using its weed killing products.

Of more direct interest to my graduate students are recent developments in the GMO label debate. Transparency in the labels of foods containing GMO foods has been a long-running goal of the “Right to Know” movement, driven largely by the Center for Food Safety. The debate over labels is another polarizing issue. The AAAS has noted that it is important to distinguish between labeling intended to protect public health – about the presence of allergens, for example – and optional labeling that

aids consumer decision-making, such as “kosher” or “USDA organic,” which reflects verifiable and certifiable standards about production and handling. According to AAAS, GMO labeling initiatives are advanced by “the persistent perception that such foods are somehow ‘unnatural,’ and the false belief that GM crops are untested.”

Nonetheless, GMO labels are finally coming to grocery stores near you and me. A 2015 poll found that 89 percent of likely voters want foods that have been genetically engineered or containing genetically engineered ingredients to be labeled to indicate that. Accordingly, in 2016, Congress directed the USDA to establish a National Bioengineered Food Disclosure Standard for GMO food labels. Food containing bioengineered ingredients will soon be required to contain a QR code directing shoppers to a website with detailed information, or alternatively, sport a label with a USDA seal that reads “BE” (bio-engineered).

USDA’s proposed rule was published in the Federal Register on May 4 and public comments on the rule were accepted through July 3. Although Congress set July 29 as the original deadline for publication of the final rule, the date is likely to be extended. Label icons, exemptions and “regulatory alternatives,” however, are still on the table.

In drafting the rule, the USDA first needed to define terms. “Bioengineering,” with respect to foods, refers to “food that contains genetic material that has been modified through *in vitro* recombinant DNA techniques,” and material that cannot “be obtained through conventional breeding or found in nature.” Foods that “mainly consist” of crops planted primarily in biotech varieties (canola, field corn, soybeans and sugar beets) will be required to be identified with the new label. Note that the more commonly known phrase, “genetically modified,” will not be part of the label.

Exemptions are still under consideration: enzymes, yeast and other everyday foods produced in controlled environments use bioengineering. Ultimately, fermented foods such as bread and yogurt might be excluded from the mandatory disclosure, as well as highly processed foods such as

high-fructose corn syrup, and foods in which GMO ingredients make up only a small percent of the product’s weight.

Ready to rise above polarization and controversy? For a broad vision on technology and agriculture, enjoy a wonderful new book, *The Wizard and The Prophet: Two Remarkable Scientists and Their Dueling Visions to Shape Tomorrow's World*, by Charles C. Mann (2018). This is a biography of two scientific figures who “were largely responsible for the creation of the basic intellectual blueprints that institutions around the world use today for understanding our environmental dilemmas.” GMO crops, *alia*, are discussed in the context of two sides of the century-long dispute between “wizards,” who believe that innovation is the key to survival, and “prophets,” who caution that we must reduce our consumption of scarce resources. Rather than take sides, Mann shows that both theories have both intelligence and shortcomings: the wizards among us – amazing innovators – can be insufficiently prepared for the unintended consequences of their inventions, while the prophets’ promotion of self-sacrifice as panacea may prove impracticable because it is contrary to human nature. We would do well to give those with opposing views as much respect as does Mann to these opposing views of his protagonists. After all, it is only our strategies that divide us into dogmatic warring camps. If we can rise above the fray, the values we share – survival of our progeny, prosperity – are transcendent.



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