New GMOs in Virtually Every Grocery Aisle

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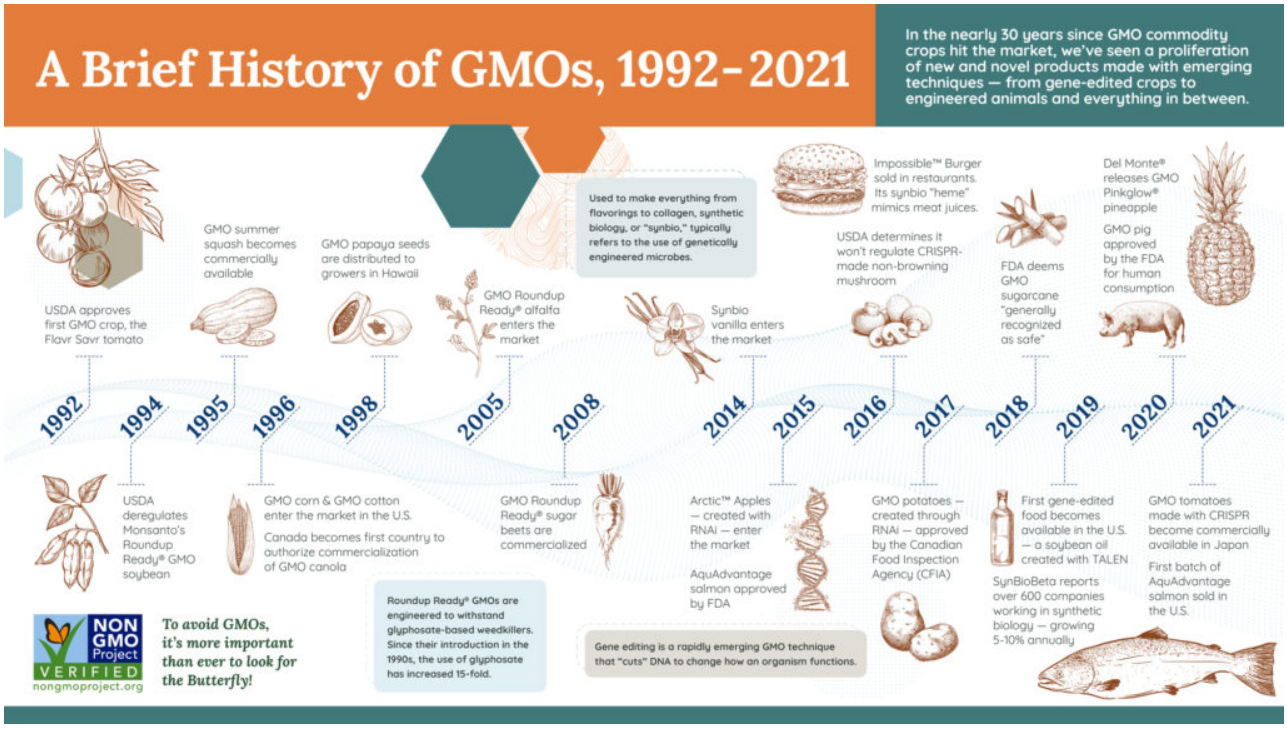

It's been nearly 30 years since the USDA approved the first genetically modified crop. During that time, technology has drastically outpaced regulation — and products made from new GMO techniques are hitting grocery store shelves near you.

When genetically modified organisms first came on the scene in the early 1990s, the cast of characters was limited. A handful of commodity crops — including soy, corn and cotton — were engineered by a few giant agrichemical corporations to withstand weedkillers or to produce their own insecticide. Three decades later, there are countless players on the stage: Biotech startups create new products using emerging techniques. New GMO techniques outpace traditional methods. An array of synthetic biology ingredients and even genetically engineered animal products appear in food and body care. This wild expansion is quickly rendering regulations and labeling requirements for GMOs ineffective and outdated.

Products made from new GMOs are impacting virtually every aisle in the grocery store. These new types of GMOs are engineered for a wide range of traits, and the techniques used to create them are both cheaper and faster. The names of these techniques might look familiar, as headlines trumpet the latest developments in CRISPR and TALEN gene editing, in gene silencing and RNAi, and in the chameleon-like potential of synthetic biology (also known as "synbio").

Some of these new GMOs can take a shorter path to market, too, because regulations applied to traditional genetic modification don't necessarily apply to new GMOs in the same way. The incoming Bioengineered Food labeling law fails to address many products of new techniques, leaving shoppers in the dark about whether or not there are new GMOs in their grocery cart.

What You Need to Know About the BE Labeling Law

From farms to labs: The rise of synbio

Synthetic biology offers cheap and easy access to synthetic flavors, colors or fragrances. News reports from June announced a memorable milestone, with scientists now able to convert plastic waste into vanilla flavoring using synbio. (While we, at the Non-GMO Project, are firm believers in waste reduction, our enthusiasm stops short of eating plastic.) Synbio allows manufacturers to source many familiar aromas by programming genetically engineered microbes to convert a cheap ingredient into a signature flavor or fragrance. It's the ultimate low-rent alchemy.

Synbio scents and colors can be found in many cosmetics and body care products, and the technology can also be used to create compounds for skin care, including synthetic human collagen and spider silk proteins. Some synthetic vitamin compounds used in supplements are also made with synbio.

One of the fastest areas of expansion in new GMOs is in protein alternatives and animal-derived products. Raising livestock is resource-intensive, and industrial livestock farming can be famously destructive to the environment. Synthetic versions of animal-derived foods are all the rage, and the Impossible Burger is one of the best-known GMO products in this category. The Impossible Burger is made with GMO soy and the unique synbio "heme" that gives it blood-like juices and general "meatiness." The regulation and approval of heme has been contentious, with environmental groups advocating for a rigorous evaluation of this novel substance. Regulatory bodies have been accommodating towards Impossible Foods, though: When the Impossible Burger was first offered in restaurants in 2016, the FDA had not yet completed its assessment or approval of the product's safety and neither the company nor the FDA made the public aware of this fact.

New GMO techniques are being used to genetically modify animals, and the meat has been approved for human consumption. A genetically modified pig was engineered by inserting human DNA and deleting a portion of the pig's DNA to create organs and tissue for medical uses that would be more acceptable to a human recipient. The pig has since been approved for both human consumption and for medical uses.

What happens when technology outpaces regulation?

GMOs have traditionally been created by inserting foreign DNA into an organism. The crop containing foreign DNA was now a "transgenic" GMO crop. The foreign DNA included a type of bacteria that is considered a plant pest by the USDA, which led to a department within the USDA regulating GMO crops.

New GMO techniques use different procedures to produce GMOs. The resulting organisms don't necessarily contain foreign DNA. Gene-editing techniques, for example, can modify genetic material within an organism, and synbio uses genetically engineered microbes to create new compounds through fermentation.

Because earlier government regulation was based on the presence of foreign DNA, new GMOs are not subject to sufficient oversight. This is one of the pitfalls of technological development: Technology expands into new areas, beyond the scope of established government bureaucracy. When this happens, new tech can remain unregulated or under regulated until oversight catches up. In the meantime, stuff falls through the cracks. In the case of new GMOs, an entire bull nearly fell through the cracks.

In 2015, a pair of hornless bulls were born, created using the gene editing tool TALEN. A few years later, an FDA bioinformatician found a sequence of non-bovine DNA in the genome of one of the bulls, presumably from contamination during the editing process. It's important to note that the discovery of the non-bovine DNA was entirely accidental. It wasn't detected by the bull's developers, but by an external agency working on a routine data check.

This story illustrates the problem of new technology and not knowing what to look for: Had the FDA scientist not chosen this bull's genetic profile for analysis, the non-bovine DNA would likely not have been discovered (remember, no one was looking for it). It's unknown exactly what impact, if any, that DNA sequence might have had, but that's the point of regulation — to mitigate the risks of new and novel creations. Marching boldly into unknown territory, where guardrails have yet to be built *because it is unknown territory,* is extremely reckless.

Advertising the next generation of GMOs

The gulf between traditional and new GMOs affects more than regulation. Biotech developers are also exploiting it for marketing. The negative public perception of GMOs is widely known — most shoppers are aware of the GMO issue, and many choose to avoid GMOs at the store*. Some brands are trying to distance themselves from those negative associations, marketing new GMOs as "non-GMO," even while relying on biotechnology to create novel products.

For example, Perfect Day — developers of synbio animal whey protein and the vegan ice cream it's made with — poses the question, "Does your protein contain GMOs?" in their FAQs. Their response reads:

“No, animal-free protein does not contain GMOs…. Genetic engineering is part of our process, but genetically modified organisms or any detectable genetic material is not present in our protein.”

That is a carefully crafted answer, focusing on the absence of genetically modified DNA in the finished product while minimizing the role of genetic engineering in the product’s creation.

To avoid GMOs, look for the Butterfly!

New products made with emerging techniques are entering the market across categories, and most new GMOs are unregulated and unlabeled.

The Non-GMO Project monitors new biotech developments as well as their commercial availability — all so you don’t have to. Our dedicated research team has seen a dramatic increase in the number of biotechnology developers — the number of companies we’re monitoring has grown nearly 300% in the last 5 years.

While the incoming Bioengineered Food labeling law requires disclosures on some GMO products, it is not comprehensive. New GMOs in particular risk being overlooked because the law requires *detectible modified genetic material* in the finished product to trigger mandatory labeling. Products made from new techniques don’t necessarily leave modified material behind, and some new GMOs are currently untestable.

In the absence of meaningful regulation and reliable labeling, the work we do at the Non-GMO Project is more important than ever. Through our rigorous and evolving Standard and the continuous research that informs it, we support your right to choose whether or not to consume GMOs.

*Source: *Organic & Beyond © 2020,* The Hartman Group, Inc.

Tags: New GMOs

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