

ARE **GMOs 2.0** IN YOUR FOOD AND COSMETICS?

A close-up photograph of a hand holding a bunch of green vanilla beans. The beans are long, slender, and have a slightly curved shape. The hand is positioned on the right side of the frame, with the fingers gently grasping the stems of the beans. The background is blurred, showing more of the vanilla plant and its leaves.

A SHOPPER'S GUIDE TO SYNTHETIC BIOLOGY

WHAT YOU NEED TO KNOW ABOUT GMOs 2.0

Genetically Modified Organisms (GMOs) have been in our food for 20 years, but they have recently been changing. Corporations are now tampering with nature in new and riskier ways. They can change a species by deleting genes, turning genes on or off or even create whole new DNA sequences on a computer.

Some companies are now experimenting with synthetic biology — a new field of genetic engineering that produces artificial compounds that taste or smell like familiar substances but don't actually come from the natural source.

We call this extreme genetic engineering, or GMOs 2.0.

The products of this risky new technology are already making their way into your food and cosmetics, but are not labeled — and they may even be marketed as “natural.”

Synthetic biology ingredients already in products, or on their way, include synthetic versions of vanilla, saffron, stevia, rose oil, patchouli, squalane moisturizer and animal replacement products.

This guide tells you about the concerns and how to avoid synthetic biology products. For updated lists of synthetic biology products and ingredients, see www.synbiowatch.org

Examples of GMOs 2.0 include:

- **Gene Edited Canola Oil:** Deleting a small section of DNA changes the canola plant to resist pesticides. Because it deletes rather than adds DNA, some argue that it is “non-GMO” even though it is engineered.
- **Synthetic Biology Stevia:** Genetically engineered yeast makes a substance found in stevia. This product, called EverSweet, may be sold as “natural” or labeled “fermentation derived.”
- **Gene Silenced Apples:** A gene is turned off in apples so they won't turn brown. These GMO apples have been approved for sale in the U.S. and Canada.



These products contain synthetic biology ingredients:



“We have a right to know if our food is genetically engineered.”

Dana Perls, Friends of the Earth



GMOs 2.0: UNPREDICTABLE, UNTESTED, UNJUST

“Genetic engineering is unpredictable. When you alter the genetics of living things they don’t always behave as you expect.”

Michael Hansen, PhD, Senior Scientist, Consumers Union

Companies are rushing synthetic biology products onto the market — without labeling them, and without understanding the impact on health, the environment, farmers and communities.

Why is this a problem?

Unpredictable: Any change to genes can have unintended impacts on an organism, species or ecosystem. Some first generation GMOs had unexpected effects such as unwanted chemical compounds. GMOs 2.0 may be even more unpredictable.

Untested: Governments require little to no testing to ensure the safety of GMOs, and the same is true for GMOs 2.0. It’s left up to companies to decide what’s safe.

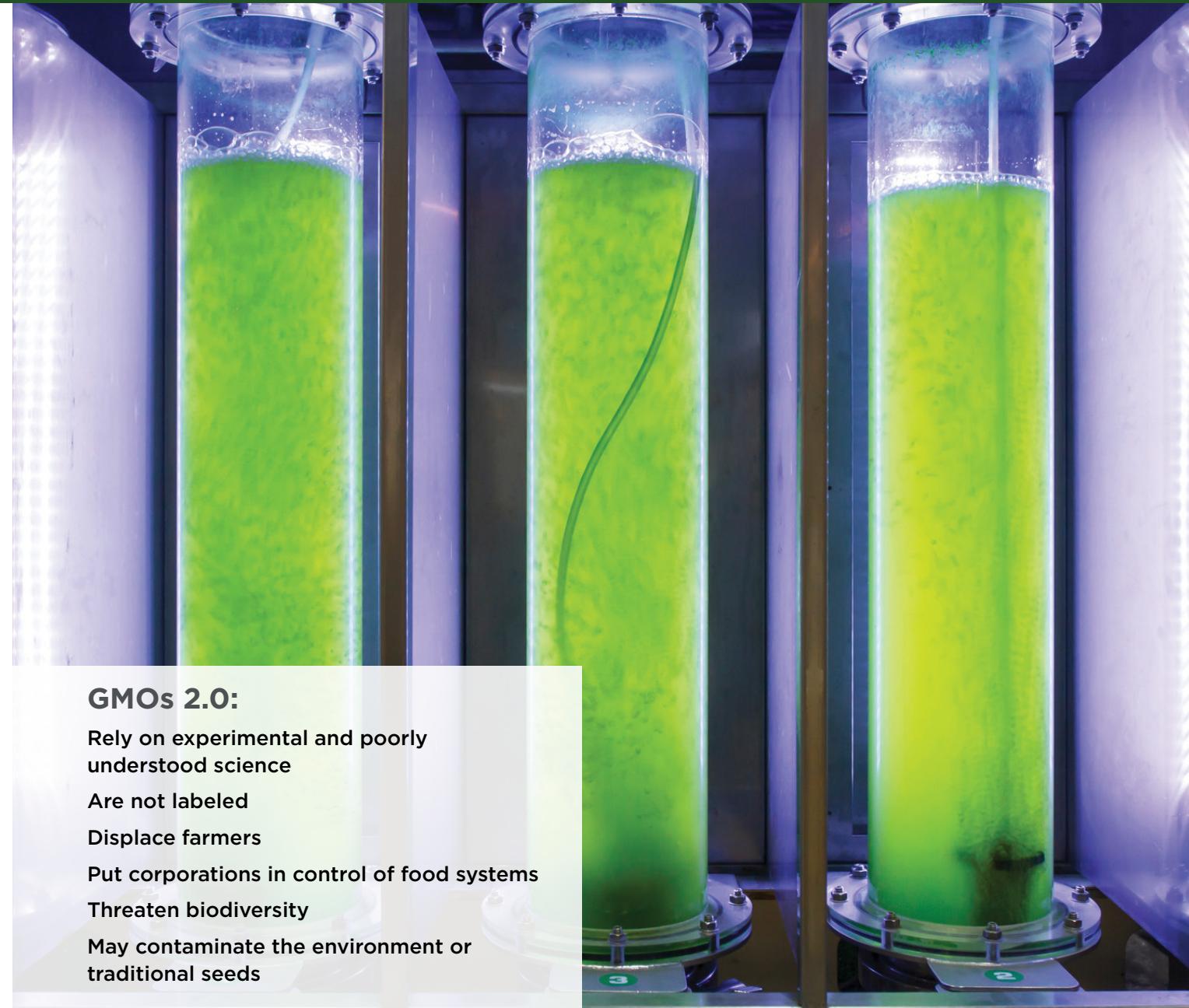
Unfair and Unjust: GMO crops linked to patented seeds or chemicals are already displacing farmers around the world. Now plant-based products may be replaced by synthetic biology that is falsely marketed as natural and sustainable.

Unsustainable: Some companies claim GMOs 2.0 are the solution for sustainability. But many current synthetic biology products depend on sugar from chemical-intensive monocultures or other polluting feedstocks such as fracked gas. GMO 2.0 products such as engineered algae may escape into the environment and become “living pollution.”

How is that sustainable?



Industrial sugar cane production pollutes and degrades the environment and takes up land that could be used by small farmers.



GMOs 2.0:

Rely on experimental and poorly understood science

Are not labeled

Displace farmers

Put corporations in control of food systems

Threaten biodiversity

May contaminate the environment or traditional seeds

TRUSTING FARMERS TO PROTECT THE LAND



For Ann Nduta Kanini, mother of eight in Kenya, cultivating and selling stevia provides income for improving her family's life.



Tens of thousands of vanilla farmers in Mexico and Madagascar have farmed the land sustainably for generations to provide natural and organic vanilla. Now high-tech company Evolva and flavor giant IFF are producing a synthetic biology vanilla flavor and calling it "natural."



Millions of African women are supporting their families by selling shea butter produced in their villages at fair trade prices. Now synthetic biology company TerraVia is genetically engineering algae to replace shea and other cocoa butters.



Indigenous peoples in Paraguay have cultivated stevia over centuries using traditional knowledge. Now agribusiness multinational Cargill is co-opting this cultural wisdom to profit from a synthetic biology sweetener called "EverSweet."

Diverse, resilient, decentralized, local food systems adapted to local climates are the key to world food security.

"Small farmers feed most of the world. If their livelihoods are undercut by artificial synthetic biology ingredients, their families and communities suffer – along with the fields, forests and web of life that they protect."

Silvia Ribeiro, Latin American Director, ETC Group



GMOs: PROFITS OVER PEOPLE AND PLANET

Genetic engineering puts corporations in charge of our food system with patents that allow them to own the seeds of life. Corporations have incentives to use genetic engineering to maximize profits, not protect people and the planet.

For decades, we have been promised that GMOs would solve hunger and protect the environment — yet people still go hungry and farmland is saturated with toxic pesticides.

Today we are hearing new promises that synthetic biology and GMOs 2.0 will combat climate change and decrease pressure on land. But these promises are not backed by evidence, and in many cases are just industry hype to encourage investment.

Instead of relying on false promises that bring in corporate profits, we need to build a food system that supports small farmers, local communities, consumers and the environment.

Do you trust these corporations with the future of our food system?



Artificial genetically engineered vanilla, stevia and saffron are just the beginning. Many new types of unregulated GMO 2.0 products and technologies are also in development:

- **Glowing Plants:** biohackers have said they will mail thousands of glow-in-the-dark weeds and the U.S. government says it can't regulate or stop them.
- **GMO probiotic yogurt** made out of engineered bacteria and other microorganisms that are intended to change your gut bacteria.
- **GMO poop:** engineered probiotics for your pet that make dog poop smell like bananas.

- **Gene deleted mushrooms** that don't rot.
- **Artificial cow milk** made with synthetically engineered yeast (no cows involved).
- **Gene sprays:** genetic material sprayed directly onto crops in the field to manipulate the genetics of pests.
- **Gene drives:** permanently driving a genetic trait through a species to change the entire population forever — for example, making it dependent on chemicals or go extinct.

What could go wrong?

"Decisions about whether to continue and expand the introduction of GM crops and foods should be supported by strong scientific evidence on the long-term safety for human and animal health and the environment, obtained in a manner that is honest, ethical, rigorous, independent and transparent."

Joint statement by 300 scientists, academics and MDs, "No Scientific Consensus on GMO Safety"



CONSUMER POWER FOR REAL FOODS



“It’s pretty simple what people want now: simplicity ... less of the ingredients they can’t actually picture in their head.”

Fortune, 2015

Consumers want real, natural food and cosmetics — not synthetic biology or GMOs. We want authentic ingredients from real farmers, not corporate labs. We want to know what’s in our food with clear understandable labels. We want to make our own informed choices about what we eat and feed our families.

“Trend of the year: Clean labels — people want simple, clean, natural food. They want recognizable ingredients in their food.”

Food Business News, 2015

What consumers can do:

1. **Buy organic:** Organic farmers are not allowed to use genetically engineered crops or synthetic pesticides.
2. **Buy Non-GMO Project Verified:** The Non-GMO Project explicitly excludes synthetic biology and gene-edited ingredients.
3. **Ask food and cosmetics companies if their products are “syn bio free.”** You can contact companies by email, websites or customer care-lines. Ask if all their products come directly from the natural source — for example, vanilla from vanilla beans, not from fermentation vats of genetically engineered organisms.
4. **Learn more:** Keep up to date with the latest developments in synthetic biology at www.synbiowatch.org
5. **Inform others:** Tell your family, friends and colleagues about GMOs 2.0. Share copies of this guide at stores, schools or on social media.



What companies can do: Keep it real!

1. **Give consumers what they want:** Source truly natural, fair trade and organic ingredients.
2. **Gain trust of consumers with full transparency:** If it’s GMO, gene-edited or made from synthetic biology, say so. Better still, remove it.
3. **Commit to going Syn Bio Free.** Download the Syn Bio Free guide for companies at www.synbiowatch.org/synbiofreeguide

KEEPING IT REAL

Avoid synthetic biology and GMOs and keep it real. These ingredients may be synthetic biology (* are definitely synthetic biology):

- Vanillin
- Patchouli
- Steviol Glycosides (Reb M and D)
- EverSweet*
- Squalane and hemisqualane
- Propanediol and propylene glycol
- Rose oil
- Algal butter
- Thrive Oil*
- Sclareol Bio*
- Resveratrol
- Citrus flavors such as grapefruit and orange (Nootkatone, Valencene)
- Clearwood fragrance*



Organic is best because it ensures that food and ingredients are grown in ways that are better for people and the planet.

Organic farmers do not use GMOs.

You can also look for Non-GMO Project Verified or Made Safe as trustworthy certifications that ensure products are not genetically engineered or made with synthetic biology.



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