Fitness and health expert: 10 science-based reasons why I'm thankful for GMOs

As the founder of Fitness Reloaded, a health and fitness company the most common questions I've received through the years is about food. Should we eat this or that? Vegetarian or Paleo? GMOs safe or not? And what about superfoods?

I always dodged the eating questions and preferred to talk about fitness instead. The reason was that I felt that since the "experts", doctors, dieticians, etc, couldn't agree on what we should really be eating, then how would I expect that I would give a good answer?

When the SciBabe targeted the Food Babe on Gawker in 2015, I got fed up. How can so many different "experts" support completely different things when it comes to food? And what if there was indeed scientific consensus about what we should really be eating, but I was just not aware of it?

That's how I made the decision that I'd no longer wait for questionable "experts' to tell me what I should be eating. Instead, I'd do the work myself and discover the scientific evidence on what we should put on our plates. By dodging the issue I was not helping anyone, neither myself nor my clients or my readers.

One of the first issues that were in high demand from my audience was: **Should we eat GMOs, or not?**

Passionate advocates screamed about how unsafe GMOs are. But then again others were in complete support. Scary claims like this one from Moms Across America would no longer scare me (or my readers), as after doing the research, I'd actually know the truth:

> By feeding our children 31.5 million GMO school meals a DAY, even more hospital and day care center meals, by eating the 160 foods that are contaminated with glyphosate, click here for the list , by eating the 80% of our fast, cheap, easy and tasty food that is GMO and therefore heavily doused in glyphosate and contaminated at levels thousands of times higher than what has been shown to cause breast cancer….*we are creating this.*

After learning more, I'm now in total awe of how food technology can help us fight poverty, malnutrition, climate change, and much more.

All the things that we'll be fighting against as a generation, and our kids we'll be fighting against too – Well, biotechnology will be one of the tools to use to win this fight.

Yet claims like the one from Moms Across America show there's big misinformation that targets the very tool that can save thousands of lives along with the Earth and the environment as a whole.

So if you're wondering whether you should really be eating GMOs or not, let me start with 10 Reasons I'm Thankful For GMOs:

1. I'm thankful for all food. And most, if not all, food *is* actually genetically modified.

What does Neil deGrasse Tyson have to say (Starts at 0:33)?

Neil is right. Did you know wild carrots are not actually orange? We've modified that. Wild bananas? So full of seeds you cannot actually eat them (click here for a pic, yay for selective breeding). We've changed and altered everything to make it match our taste and needs. That's genetic modification known as artificial selection.

Wild Carrots. (credit: Josh Fecteau)

Only in the past, we could do artificial selection but had no control over what exactly would happen. Now, in the lab, we can actually be accurate and select the exact gene we want to transfer with genetic engineering.

It's no wonder that the European Union's biotech report states:

> The main conclusion to be drawn from the efforts of more than 130 research projects, covering a period of more than 25 years of research, and involving more than 500 independent research groups, is that biotechnology, and in particular GMOs, are not per se more risky than e.g.

> conventional plant breeding technologies

But of course they're equally safe! After all, if not all, most food is genetically modified!

So I'm grateful for all food. Because it keeps me and everyone else alive.

2. GMOs increase yield

It's no secret that GMO crops can produce more with less. Talk about being efficient. So your acre will get you more fruit/veggies if it's planted with genetically engineered seeds rather than with conventional ones. A UK report states:

> Between 1996 and 2012, crop biotechnology was responsible for an additional 122 million tonnes of soybeans and 231 million tonnes of corn. The technology has also contributed an extra 18.2 million tonnes of cotton lint and 6.6 million tonnes of canola

And this large study from the National Academy of Sciences, has found that GMOs have significantly increased farm yields while decreasing pesticide use and soil erosion. Which brings me to my next point…

3. GMOs protect the Earth

Because GMOs increase yield, we get to save on land. Think about it: You need less land to produce the same amount of food.

A UK report states:

> GM crops are allowing farmers to grow more without using additional land. If crop biotechnology had not been available to the (17.3 million) farmers using the technology in 2012, maintaining global production levels at the 2012 levels would have required additional plantings of 4.9 million ha of soybeans, 6.9 million ha of corn, 3.1 million ha of cotton and 0.2 million ha of canola. This total area requirement is equivalent to 9% of the arable land in the US, or 24% of the arable land in Brazil or 27% of the cereal area in the EU (28).

Especially now, with our population rising, this is more important than ever.

4. GMOs taste better

Juicy apples, sweeter fruits, yup some of them were genetically modified through artificial selection, what we humans have been doing since forever. Still that is genetic modification and it has resulted in better-tasting fruits and vegetables (or just easier to eat – like seedless bananas!).

Imagine the flavors once we use our new engineering methods to improve taste. Take this example of a modified tomato that produces geraniol, a rose-smelling compound found in fruits and flowers. In a blind

taste test, 60 percent of 37 testers preferred the flavor of the GM tomato, according to a 2007 study published in *Nature Biotechnology*.

The world will be so full of flavors and textures! A foodie's paradise.

5. GMOs use less pesticides

A 2015 study covering the years from 1996 to 2013 discovered that:

> "The adoption of GM insect resistant and herbicide tolerant technology has reduced pesticide spraying by 553 million kg (-8.6%) and, as a result, decreased the environmental impact associated with herbicide and insecticide use on these crops (as measured by the indicator the Environmental Impact Quotient (EIQ)) by19.1%. "

A report by PG Economics, a global expert in agricultural production, states:

> Crop biotechnology has reduced pesticide spraying (1996-2012) by 503 million kg (-8.8%). This is equal to the total amount of pesticide active ingredient applied to arable crops in the EU 27 for nearly two crop years. As a result, this has decreased the environmental impact associated with herbicide and insecticide use on the area planted to biotech crops by 18.7%.

If you too want less pesticide use, then genetically engineered crops are your best bet.

6. GMOs help small farmers

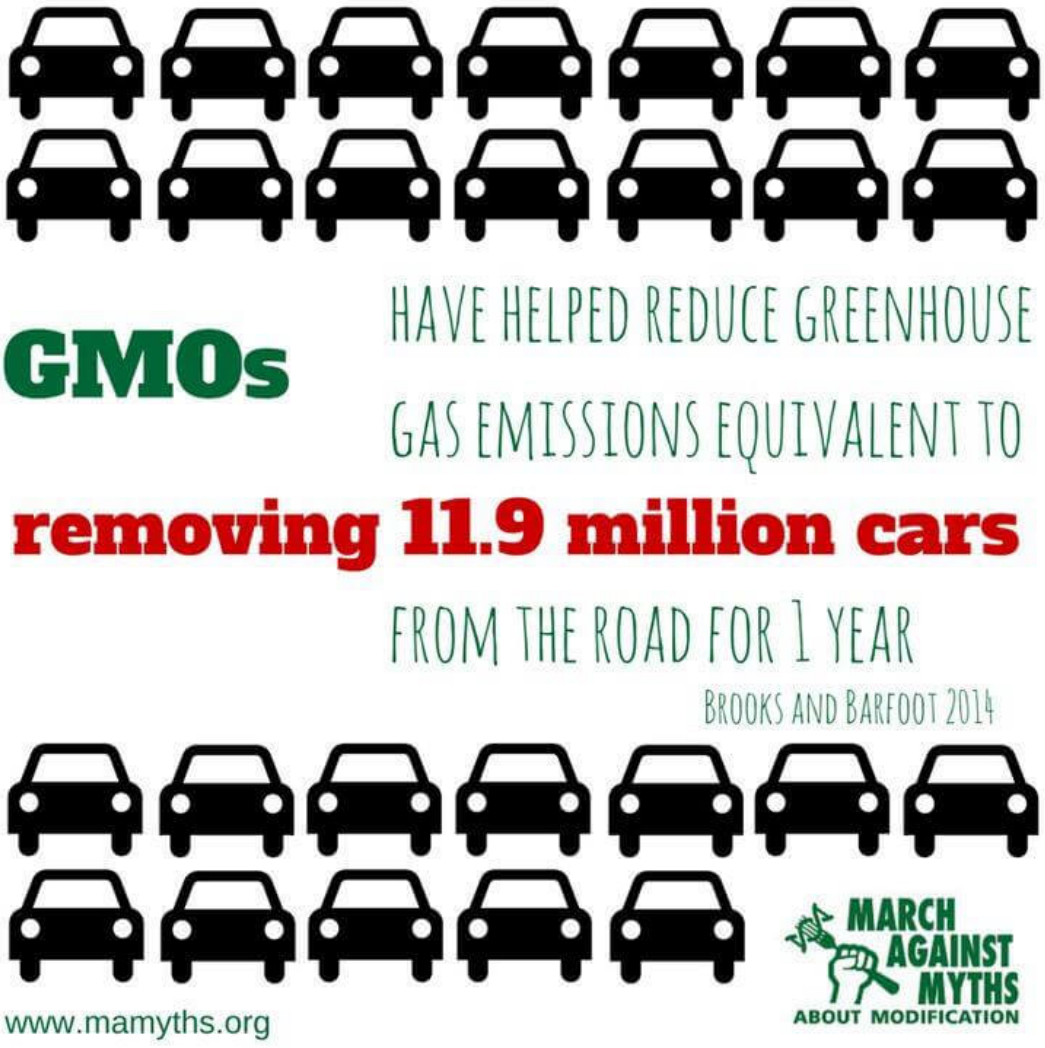
Producing more for less and needing to buy less pesticides genetically engineered crops? Genetically engineered crops help small farmers struggle less.

In fact, a study by the African Development Bank and the International Food Policy Research Institute in 2012 concluded that under ideal conditions, the use of GM crops grown by smallholder farmers could improve gross margins by 114 percent, reduce pesticide costs by 60 to 90 percent, and improve yields by 18 to 29 percent.

The PG Economics report states:

> Crop biotechnology helps farmers earn reasonable incomes for their work. The net economic benefit at the farm level in 2012 was $18.8 billion, equal to an average increase in income of $117/hectare. For the 17 year period (1996-2012), the global farm income gain has been $116.6 billion.

7. GMOs can help us win the fight against climate change



A 2015 study that examined the environmental impacts of genetically modified crops from 1996 to 2013 found:

> The technology has also facilitated important cuts in fuel use and tillage changes, resulting in a significant reduction in the release of greenhouse gas emissions from the GM cropping area. In 2013, this was equivalent to removing 12.4 million cars from the roads.

But it's not just about land use. To quote Amanda, an attorney who blogs at The Farmer's Daughter USA:

> But the non-GMO variety is likely to have lower yields and may require more herbicide or pesticide applications throughout the growing season. The GMO varieties offer higher yields and less applications of herbicide in the fields, which translates to less fuel, less wear and tear on equipment, and less time.

It makes sense. You need less land for the same amount of food, which means that agriculture equipment will need to "travel" less, hence require less fuel. One benefit after another. I love GMOs!

8. GMOs can fight malnutrition

How going blind from Vitamin A deficiency looks like. (credit: Community Eye Health)

A big example of a malnutrition problem is vitamin A deficiency. This alone is responsible for 250,000-500,000 children becoming blind every year, with half of them dying within 12 months of losing their sight.

That's EVERY YEAR!

Now WHO is fighting this with supplementation yet this alone is not enough as its effects are time-limited. Instead food fortification works better and could help eradicate the problem. Let me repeat – that's about half a million children EVERY YEAR.

Biofortification could end this problem. According to the Hellen Keller Institute:

> Biofortification differs from large-scale food fortification because it focuses on growing more

> nutritious plant food, as opposed to adding micronutrients to foods as they are commercially processed.

Now we've already developed the first food that can help save the children. It's known as golden rice. It's a genetically engineered rice that is full of beta-carotene (hence the yellow color) and could be an effective intervention to save lives in areas where white rice is the staple food.

If children in the developing world ate golden rice instead of their conventional rice there would be no children getting blind; there would be no deaths. I'll repeat one more time: that's half a million kids a year. In 10 years time this number could be up to 5 million kids.

Golden rice has been in development for decades, unfortunately, the crop has had some problems in development, most notably there has been a significant amount of pushback from and roadblocks erected by protestors. In July of 2016, 110 Nobel laureates petitioned Greenpeace, a frequent protestor of golden rice, to stop its activism against research into the crop.

9. GMOs help reduce world poverty

Higher yields, less pesticides, healthier people who are better-nourished, healthier soil – people in the developing world are among the first to reap benefits from this technology.

Unfortunately because of the GMO opposition we privileged Western people allow poverty to continue. Mark Lynas, a journalist who was a former GM opponent and is now a GM advocate writes:

> In Tanzania, for example, I met farmers whose families are going hungry because the key food security crop — cassava — has begun to fail under pressure from a new disease called Brown Streak Virus. This virus has already wreaked havoc in Uganda and Kenya.

Scientists have developed a virus-resistant crop, yet farmers may never get to actually use it as anti-GMO advocates hinder their progress. And that's just one of the examples he offers. I will agree with his conclusion:

> The problem with this technology is not that it has been scaled up too fast, but that it has been hampered from being able to fulfil its potential — whole continents, including Europe, Africa and much of Asia, continue to maintain de facto bans on GM crops and seeds without any scientific foundation.

10. GMOs give me faith in the future

The world population is rising. On top of that, global warming is here to make matters worse. Much worse. As Vox reports:

> We recently passed 400 parts per million of CO2 in the atmosphere; the status quo will take us up to 1,000 ppm, raising global average temperature (from a pre-industrial baseline) between 3.2 and 5.4 degrees Celsius. That will mean, according to a 2012 World Bank report, "extreme heat-waves, declining global food stocks, loss of ecosystems and biodiversity, and life-threatening sea level rise," the effects of which will be "tilted against many of the world's poorest regions," stalling or reversing decades of development work. "A 4°C warmer world can, and must be, avoided," said the World Bank president.

Genetically engineered foods will be one of the tools to use to win the fight again climate change. I don't have kids yet, but I know that climate change won't stop at my generation. This is a fight my kids will have to tackle too.

So biotechnology gives me faith in the future. It's not going to be the only tool used to win the fight, but it will certainly be one of the most effective ones. And that's why I'm grateful.

A version of this blog appeared originally at Fitness Reloaded under the title "10 Reasons to Eat GMOs and Feel Grateful For It" part of the What Should We Really Be Eating? series.

Maria Brilaki is a Stanford Engineering grad, a best-selling author, and the founder of Fitness Reloaded. For evidence-based health & fitness advice, plus a dose of humor follow her on Facebook here. Twitter: @FitReloaded