GMOs: A primer

In the early 1800s, faced with automation and industrialization in the English textile industry, a group of traditional weavers and lacemakers banded together to protest. They were called “Luddites.”

The Luddites demonstrated at new mass-production factories, and even sometimes rampaged, smashing the newfangled machines. The problem was so bad that Parliament drafted legislation, the Frame Breaking Act and the Malicious Damage Act, making vandalism a crime punishable by death.

Some would draw parallels with the contemporary movement to halt the proliferation of GMOs (Genetically Modified Organisms). I am no Luddite, and my scientific background gives me an appreciation of all the societal benefits of modern innovations.

Therefore I have been cautious, up until now, about reflexively bashing GMOs. Those who follow me will recall that early on, in the 1980s, I warned of the dangers of “Frankenfoods” and even drew upon the classic B movie *Attack of the Killer Tomatoes* to make my point.

But I also recognize that human civilization is predicated on domesticated agriculture wherein man has “fooled with” wild plant and animal breeds to achieve greater productivity. I also am not deaf to pleas for improved techniques of food cultivation to stave off economic disaster for the burgeoning populations of developing countries.

I like the idea of cheap food for the masses, and I am repelled by elitist food snobs who say, “Let them eat organic arugula at $4.98 a bunch at Whole Foods.”

Nevertheless I’ve always had a deep suspicion of GMO foods because they represent a quantum leap in altering our foodstuffs. I feel that the book and movie *Jurassic Park* is an apt metaphor for the advent of GMO technology: Just when you think you’ve got Mother Nature by the tail, unforeseen consequences lurk.

Just now the state legislature of Connecticut has taken the unprecedented step of requiring labeling of GMO foods. I congratulate them, but why has it taken so long for government to acknowledge that people have a right to know from whence their food originated?

The answer lies in politics and the money-fueled collaboration between government regulators and the multibillion dollar trans-national biotech industry.

But plausible as they are, let’s leave conspiracy theories aside for a moment.

Two new very disconcerting lines of evidence have now propelled me solidly into the ranks of GMO opponents.

GMO supporters have long derided studies showing GMO harms as “junk science.” But I’m not sure how they’re going to refute a new one from Australia entitled “A long-term toxicology study on pigs fed a combined genetically modified (GM) soy and GM maize diet.”

In this study they divided 184 newly weaned pigs into two groups. One group of 84 was fed a diet composed of genetically modified corn and soy; the other pigs were fed a comparable diet of non-GMO corn and soy. After five months they were sacrificed and autopsies were performed by veterinary pathologists who were blinded

to the diets of the pigs.

The results were stark. Those pigs that ate a GMO diet had a higher rate of stomach inflammation—32 percent of GMO-fed pigs versus just 12 percent of non-GMO-fed pigs. The degree of inflammation was FOUR TIMES WORSE in the male pigs fed GMOs (for females it was twice as bad). http://www.reuters.com/article/2013/06/11/us-gmo-pigs-study-idUSBRE95A14K20130611.

No one knows precisely why this occurs, but the results confirm previous observations that livestock fed GMOs have more gastrointestinal ailments than those fed conventional diets. Humans are not rodents, pigs, sheep or cows, but our mammalian biology is basically the same. It prompts one to seriously question whether our modern epidemics of GERD, Crohn's disease, ulcerative colitis, and irritable bowel syndrome might not be attributable at least in part to the ubiquity of GMOs in our diets?

One theory is that GMO plants are made bug-resistant by insertion of a gene from Bacillus thuringiensis, or Bt.

Let's stipulate up front that Bt has been used for decades as a natural pesticide that selectively kills bad insects while not harming beneficial ones. It's even used on organic crops. It dissipates quickly in sunlight and doesn't leave harmful residues like artificial chemical pesticides do. Fine so far.

Bt has been tested in humans, but the testing has been limited to consumption of Bt for just a few days in experimental settings. The subjects apparently weren't harmed.

But here's the problem with Bt-potentiated GMOs: They have a gene inserted into their cells that turns them into factories for Bt. Bacteria in the intestinal tract have shown a resourceful propensity for borrowing genes from other cells via bacterial translocation; theoretically then, the bacteria might turn the GI tract into a fermenting vat for more Bt synthesis, which then disturbs the intestinal flora or even damages the walls of the intestines.

This theory hasn't been proven, but it's thought by some scientists to be at the root of GMO intestinal toxicity. But whatever the mechanism, shouldn't studies like the pig study above give GMO proponents pause?

OK, second big reveal about GMOs this month: Genetic modification to make crops Roundup-resistant allows farmers to spray their fields with thousands of tons of Roundup, killing weeds while not harming the crops. A win for agriculture, and a double windfall for Monsanto that makes the patented seeds as well as the Roundup.

I don't' know about you, but I confess: I used to LOVE Roundup. Sprayed it on my gravel driveway, and within 24 hours the weeds were wilted and brown. Perfect gratification!

But I always took precautions to wear gloves and keep downwind of the spray. And then I would wash my hands, REAL good.

It's been several seasons since I've used Roundup, and now my suspicions have been confirmed by a new study. Roundup's active ingredient is something called glyphosate. According to new research, glyphosate is a very powerful xenoestrogen, which means it mimics the effects of estrogen.

Cleared by the EPA for massive introduction into our environment, it now appears

that glyphosate’s xenoestrogenic effects occur at parts-per-TRILLION! That means that it can enhance the growth of breast cancer cells in very tiny doses—and many other cancers may be promoted by xenoestrogens, including prostate, uterine and even colon cancer. Along with the many plastic by-products released into our ecosystem, glyphosate may be contributing to our deadliest epidemics.

Water supplies and food often contain traces of glyphosate. Is there any evidence that glyphosate survives breakdown and can enter our bodies? A recent survey of volunteers from 18 European countries revealed traces of glyphosate in 44 percent of urine samples.

So this brings up a new question: What if I choose to avoid GMOs (and current restrictions on labeling, although changing, make it tough to do so)? Even if I’m the most astute shopper and disciplined eater, the very PRESENCE of GMOs in our agriculture promotes a cavalier dispersal of Roundup into our environment.

Thus, GMOs can be analogized to smoking. Even NON-smokers are exposed to the hazards of PASSIVE cigarette smoke, now proven deleterious to our health.

And there’s lots more not to like about GMOs that I can’t even get into here for sake of brevity. I suggest you educate yourself and make up your own mind.

Folks, it’s time to rethink our headlong plunge into GMO technology.