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English 110

13 October 2020

Genetically Modified Organisms

Do you know how lab-created DNA changes to your fruits and vegetables could adversely affect your body? A genetically modified organism, according to Britannica, is any organism whose DNA has been modified to favor specific traits (Britannica). GMOs are in much of the produce that we eat. The vast majority of soybeans, corn, sugar beets, canola, and cotton are GMO crops. Although many scientists and big agricultural companies vouch for GMOs' safety, they have done no long-term studies to prove it. The only long term study has shown that GMOs could cause tumors, and instead of either fixing the problem or removing the GMO, scientists and big companies tried to ruin the credibility of the study's author, Séralini. GMOs are advancements in technology but may be detrimental to our health, and although many are against GMOs, few know why and should conduct their own research.

Few studies claim that GMOs are dangerous or cause any abnormalities. Most of the leading scientists think that GMOs are not dangerous and that people are worried simply because GMOs are new and do not want scientists "to play God." GMOs could be a cure for hunger all over the world, particularly in third world countries, because GMO crops produce more yield and are more cost-effective. Many short-term, government-funded GMO studies have shown no sign of negative effects. It may be something to think about if the vast majority of scientists agree that genetically modified organisms have little or no adverse effects when in foods. Without a doubt,

most scientists would say that GMOs have only positive or neutral effects and that there is no proof of harmful consequences.

Many of the general public are against GM food, but half of them do not know why they are against them or say it is because of a "gut feeling. (Pew)" Each person should research GMOs because most educated people think GMOs are either good or neutral. Only 6 percent watch GMO news closely, but 38 percent are against genetically modified organisms. If someone has an opinion against most of those who are better educated, they should have good supporting evidence, not a "gut-feeling."

Genetically modified organisms have made great leaps for science. Without GMOs, we would not have Insulin, which has saved countless lives. Insulin is made by first removing a plasmid from a bacterium. They then cut out a DNA section from the plasmid and replace the section of DNA with insulin DNA. After returning the edited plasmid to the bacterium, the bacterium is then placed in a fermentation tank to replicate. After fermenting, the bacteria produce insulin, which can be harvested to give to diabetes patients (National Institution of Health). Other medicines are made using GM Tech, including Factor VIII for hemophiliacs, the Hepatitis B vaccine, tissue plasminogen activator for heart attack, and stroke patients (Britannica). Insulin is a great and necessary use of GM-Technology, all GMOs are not harmful, but they should not be in everyone's food either through produce or animals eating GMO produce.

GMOs are a new field in science since the first GMO experiment was in 1973. In 1973 the first GMO was created by taking the DNA from one bacteria and injecting it into another by Biochemists Herbert Boyer and Stanley Cohen. In 1984 the FDA approved the first GMO consumer product, insulin. In 1994 the first GMO produce was created, a tomato deemed safe as

traditional tomatoes by the FDA. During the 1990s, genetically modified summer squash, soybeans, cotton, corn, papayas, tomatoes, potatoes, and canola were approved by the FDA and made available to consumers. It is not until 2024 that labels will be required to show which food items contain GMOs (FDA). GMOs may have advanced technology and medicine but have they improved nutrition?

GMOs have been a profitable industry for big agricultural companies. It seems that these companies tend to care more about profit than the well-being of their customers. They will only do what the customer wants to keep the customer buying whatever the company is selling. Most GMO seeds are made to where they can not reproduce, meaning the farmers will come back and buy more seed every year. Most of the scientific studies that have been done on genetically modified organisms have either been government-funded or funded by big agricultural companies who stand to make a profit. These companies who profit from GMOs should not get a say whether they are safe or not, nor should they fund and influence the studies done on genetically modified organisms.

Many are worried about GMOs' effects. The biggest worry is that there has not been enough long-term testing. According to a study done in 2012, where rats were tested with food that had been genetically modified to be RoundUp resistant, the only long-term study at this time has had some disturbing results. The Seralini study was retracted, then republished two years later in 2014, more on that later.

Seralini's study results should not be taken lightly as he shows that the majority of the rats tested showed dangerous side effects from the GM maize and RoundUp that they were fed. Seralini showed in his results that there was a "confirmed very significant chronic deficiencies, for all treatments and both sexes." Kidney problems were the most common "altered parameters"

at 76 percent. Liver congestion and necrosis were 2.5 to 5.5 times higher in males. Also, marked and severe nephropathies were about 1.3 to 2.3 times greater. The female rats had an increase in mortality rates, about two to threefold, and their average life span was significantly decreased. Males fed with GM maize also were found to have much shorter life spans. Females were more likely to develop "large mammary tumors more frequently and before controls." Also, the female second most "disabled" organ was the pituitary. There were also noted hormonal changes due to the consumption of GM maize and RoundUp. Males had a massive increase in "large palpable" tumors, found six hundred days before the control group had any, in which the control group only had one noted tumor. Seralini finished by writing that "These results may be explained by not only the non-linear endocrine-disrupting effects of Roundup but also by the overexpression of the EPSPS transgene or other mutational effects in the GM maize and their metabolic consequences. (Séralini)"

The study found that 80 percent of rats that were fed food with the GMO developed between one and three tumors. The average life span of rats given GM food was one-third of the control group; not a single rat with GM food lived more than half of the control group's average life span. There have been no further studies on this particular GMO or any similar ones on other GM foods. Even though the conclusion of the study was that "Our findings imply that long-term (2 year) feeding trials need to be conducted to thoroughly evaluate the safety of GM foods and pesticides in their full commercial formulations," no more studies have been done on the GM food.

How is there a significant increase in diseases, especially with the kidneys, and this still be allowed by the FDA? The GM used in the maize that the rats were fed was NK603; NK603 is still GM-approved by the FDA. Twenty-nine countries, at different levels, have approved the use

of NK603. Not a single one of those 29 countries have stopped to consider why every one of the rats used in the study lived less than half of a rat's expected life span. The study finished in 2012; in the eight years since the study, it has been ignored instead of being taken seriously. At the very least, NK603 should be temporarily banned until further studies can be done. It is scary to think that the produce we buy from stores may contain genetically modified DNA that, according to the study, causes kidney, liver, and other various problems. Why could scientists and agricultural companies want to ignore the Séralini other than it would ruin the profit they are making off the GM seeds. We should be worried about these dangers. This study should be all over major news networks, not swept under the rug.

The lack of long-term studies on GMOs is worrisome. The Séralini study is the most comprehensive GMO study to date. Is it possible that scientists are worried about what they may find if they conduct long-term studies on GMOs? There are about a hundred studies on GMOs that are ninety days. The Séralini study is the only one longer than ninety days. Every GM food should be required to go through more rigorous and long term testing before human consumption.

There has been much debate on the Seralini study. It was initially published in 2012, but there were so many complaints to the publisher that the publisher removed it from his journal. Although the publisher removed the paper from his journal, he said that he found no evidence of fraud or purposeful misrepresentation of data. There were hundreds of letters to the publisher complaining about Séralini's paper, most of which seemed angrier with the result than actually pointing out flaws with his research. The largest complaints were fraud, the specific type of rat used, the number of rats used, and the misrepresentation of data. The lawsuit settled the accusation of fraud and misrepresentation of data. The strain of rat that Serelini used was the

most commonly used rat strain for toxicology studies. Séralini used fewer rats than he should, but when there is a considerable increase in tumors, it does not matter how many rats he used. Séralini then republished his article in 2014. Séralini was taken to court for fraud after the first publishing, and in 2015, the court decided in Séralini's favor and fined the journalist who sued him and the editor for retracting the article unnecessarily. The amount of flak that Séralini got was not because of flaws in his research but because of scientists not wanting to accept or consider that GMOs may be dangerous.

It is worth noting that RoundUp has been proven to cause cancer. If a plant is RoundUp resistant, than RoundUp weed killer can be sprayed on the plants. If RoundUp is on our plants, that means we are ingesting it. How much worse for people is RoundUp if ingested if it causes cancer, just spraying it around people? Monsanto, the owner of RoundUp, paid more than ten billion dollars between the tens of thousands of court claims. They estimate that there will be ninety-five thousand cases between the tens of thousands of current cases as well as the future cases. Thirty-thousand of the plaintiffs have not agreed to the RoundUp company's settlement, and those court cases are still open. The first case after Monsanto bought the RoundUp company came just weeks after his purchase, and over the last two years, they have received nearly a hundred thousand court cases, which has cost his company billions of dollars (Cohen). RoundUp should be banned, not sprayed on plants that we will eventually eat.

The technology of GMOs is astounding, but they should not be in our food. GM Tech should be studied for medicines, not food that people or animals will eat. The only long-term study suggests that there may be dire consequences from consuming GM foods. Long-term studies should be conducted to either confirm or repudiate Serilini's study. The studies that are done should not be conducted by people who stand to profit from their discoveries. If GMOs,

after long term studies are proven to be safe, genetically modified foods would have economic and worldwide benefits.

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