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Like ships in the night?

Consumers and genetically modified foods: adrift in a sea of misinformation

Written by Dr. Cami Ryan, PhD



Key Messages

- Most people today are generationally and geographically removed from the food production system.
- In our information-rich environment, it can be very difficult to discern fact from fiction.
- Genetically engineered crops and foods are the most heavily tested and regulated foodstuffs in the history of agriculture.
- Every major international scientific body and regulatory agency has reviewed the research and attest to the safety of genetically engineered crops currently on the market.
- Public opinion and perceptions are greatly influenced by misinformation and this misinformation carries social costs.

The 2014 Nutrition File® Seminar for health professionals and educators held this past February explored issues of food integrity and trust in our food system. One of our speakers was Dr. Cami Ryan, an outspoken advocate for agriculture, science and consumers who enjoys dialogue about food and food production. This article is a summary of her presentation that looked at misinformation surrounding genetically modified organisms (GMOs).

Introduction

Food and food consumption is inherently personal and a very important part of our social fabric. We often gather, as families and friends, around the dinner table to socialize and share our stories. The problem is that most people today are generationally and geographically removed from the food production system. This urban-rural divide, in combination with rapid technological advancements in farm production practices – like the use of genetically engineered crop varieties – has created an unusual information vacuum for the public. This complex environment, where social media has quickly become a fundamental tool for human-to-human connection and interaction, sets the stage for the circulation of misinformation about our food

production system – including GMOs. Such misinformation has shown to be persistent and extremely difficult to mitigate.¹ In the mind of the consumer, this brings into question the safety and efficacy of GMOs and modern agricultural practices more broadly. In our information-rich environment, it can be very difficult to discern fact from fiction. For health care professionals or clinicians, it is particularly challenging to not only keep pace with the science and evidence surrounding GMOs but to also ensure that clients and patients are making informed choices about what they consume.^{1,2}

What are GMOs?

First, there is no universal definition for the term GMO. It is one that has evolved into more of a political idiom and, often, carries a negative connotation. Scientists generally do not use the term when communicating with one another and they never refer to themselves as “genetic engineers.” Rather, a scientist – based upon expertise, knowledge and education – will self-identify (for example) as a molecular geneticist and he or she may use genetic engineering as a research tool. Genetic engineering is a collection of many scientific techniques including molecular identification and analysis of genes, the extraction, isolation then



multiplication of DNA fragments and the cutting and pulling of DNA fragments from different sources.³ It is the application of these techniques that results in a genetically transformed organism. Crop scientists use genetic engineering techniques to develop crop varieties that are pest-, disease- or drought-resistant; crops that would be time-onerous or impossible to develop through traditional plant breeding techniques alone. Genetic engineering is very precise. While traditional plant breeding may involve the (often unintended) transfer of hundreds of thousands of genes, the process of genetic engineering can facilitate the specific transfer of one or only a few genes that code for desired traits (Figure 1).^{4,5}

Genetically engineered crops and foods are the most heavily tested and regulated foodstuffs in the history of agriculture. In Canada, the regulation of GMOs fall under the category of “novel foods” and are overseen by Health Canada⁶, the Canadian Food Inspection Agency⁷ and Environment Canada. There is no credible example that GMO foods pose harm to animals or humans. Every major international scientific body and regulatory agency has reviewed the research and they all attest to the safety of genetically engineered crops currently on the market.⁸ Safety is no longer in question.

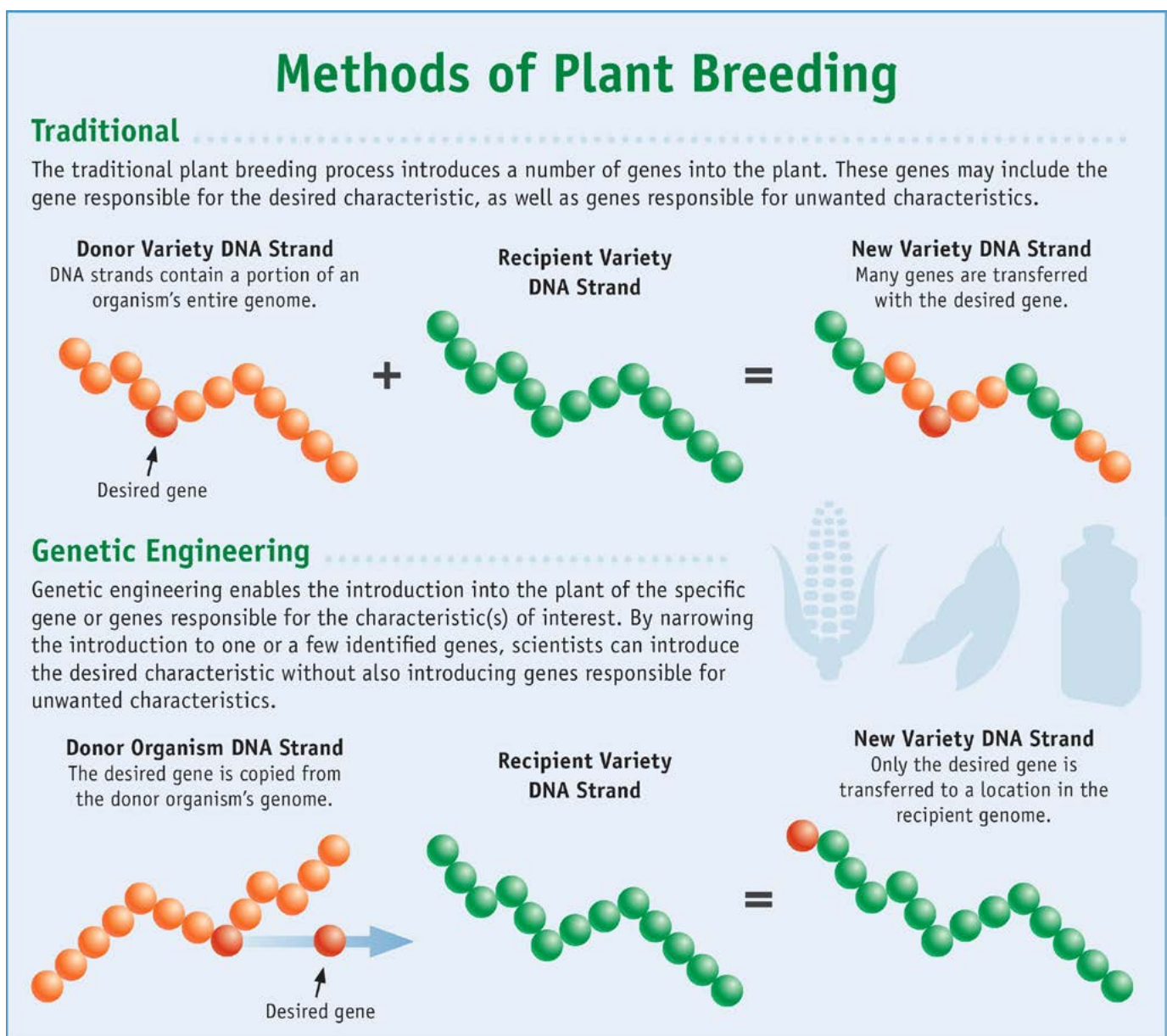


Figure 1: Methods of Plant Breeding

Source: United States Food and Drug Administration



[The Regulation of Genetically Modified Foods in Canada](#)

Safety of GMOs

[American Association for the Advancement of Science](#)

[European Commission](#)

[Health Canada](#)

[World Health Organization](#)

[United States Food and Drug Administration](#)

[Top 10 Consumer Questions about GMOs Answered](#)

Factors that Influence Public Perceptions of GMOs

Despite the evidence supporting the safety and benefits of genetic engineering and GMO foods, consumers are still wary. Public opinion and perceptions are, of course, greatly influenced by misinformation and this misinformation carries social costs.¹

It is the habit of individuals (and special interest groups and organizations) to pass along information that will evoke an emotional response in people, regardless of whether that information is accurate or not.¹⁹ We share this information in our personal networks and we are highly influenced by those

people with whom we are closest.¹⁰ But false beliefs can arise from misinformation and these beliefs can be often held with “infectious conviction”.¹

We are witnessing a time where knowledge, science and rationality is rejected which further complicates things. According to Harvard professor, Tom Nichols, we are entering an era he refers to as the “death of expertise”.¹¹ Celebrities and other non-subject-matter experts have been artificially elevated by the media. They have considerable influence over public opinion and consumption patterns.^{12,13} While the media cannot really tell people how to think, it can certainly influence what people think about.¹⁴

Unfortunately, the media has played a significant role in framing the GMO debate over the past several years.¹⁵ The reality is that in order to meet the increased global demand for food in 2030, we will need to produce 50 per cent more food on the current land base we now farm in the world. Genetically engineered crops are an important tool in the food security toolbox as we try to meet this demand, with diminishing resources, in an environmentally sustainable way.^{16,17}

Concluding Thoughts

More and more consumers are seeking out health-related information on the internet and through social media. While there is broad scientific consensus that genetically engineered crops and foods currently on the market are safe to eat^{18,19,20}, misinformation about the safety of GMOs continues to circulate unchecked in our information-rich online environment. Health care professionals and clinicians recognize that the quality and credibility of online information is often in question and that there is potential harm from inaccurate information.²¹ This creates challenges for those in the health care field tasked with facilitating the consultative process and in ensuring that clients are making informed choices about the food that they eat and their personal health choices. The controversies around GMOs just adds to an already complex environment.

Health care professionals need science-based information about genetically engineered crops and GMO foods that is readily accessible, credible

and communicated in such a way that it is easy to understand. Consumers need to make informed decisions about what they consume and clinicians need to facilitate that informed choice. The key is to work with clients to help them to navigate the information so that they can make informed decisions. While health care professionals continue to facilitate informed food choices, they will still always have to deal with deeply held beliefs or ideologies regarding food and food choices.

How to evaluate health/science information on the internet

[MedlinePlus Guide to Healthy Web Surfing](#)

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Cami is an outspoken advocate for agriculture, science and consumers and has worked in agriculture for over 20 years. She provides critical insights into how 'bad science' can get 'good legs' in the media, propelling misinformation onto the public radar through weak or non-existent peer review. Cami's [self-titled blog](#) provides a platform for discourse around current agriculture and food controversies.

Follow on Twitter [@DocCamiRyan](#)

References and recent issues of NFFHE can be found on our website [here](#).

Archived issues of NFFHE can be found [here](#).



Credible web sources for information on genetic engineering/GMOs

[Biofortified](#)

[Genetic Literacy Project](#)

[GMO Answers](#)

[Cami Ryan blog](#)

Credible web sources for consumers for information on GMOs, farming and food

[Farm Food Care](#)

[Best Food Facts](#)

[Find Our Common Ground](#)

[Safe Fruits and Veggies](#)

Great blogs (science/farming)

[Steve Savage's Applied Mythology](#)
agricultural scientist

[Kevin Folta's Illumination](#)
University of Florida horticultural science expert

[Jennifer Schmidt "The Foodie Farmer"](#)
farmer and registered dietitian

[Rob Wallbridge "The Fanning Mill"](#)
organic farmer and blogger

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