



Genetically modified foods, cancer, and diet: myths and reality

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INTRODUCTION

This commentary deconstructs, discredits, and demystifies the paradigm that eating genetically modified foods causes cancer, and appraises the research protocols needed to substantiate claims for cancer therapy.

BACKGROUND

Nutrition and the Cancer Patient covers a wide range of topics that are fully discussed, but without any comment on genetically engineered foods allegedly causing cancer¹.

Plants evolve and survive in changing ecosystems through spontaneous genetic mutation. The ones that are susceptible to the ravages of such destructive processes as infestation or weather excesses perish. From among the survivors, humanity harvests food for survival.

Humans have selectively bred animals and plants since time immemorial, manipulating genes to obtain benefits. The process was slow, taking many generations until recently, when genomics and biotechnology accelerated genetic mutation processes. Understanding speedy gene modification allows for vigorous species propagation, with crop yields increased in quality and quantity through genetic engineering.

Recently, animal research has suggested that genetically modified foods (GMFS) are causally related to carcinogenesis². Among the many implications of that research is the notion that when GMFS are eschewed, no cancer will develop, and a cancer cure is procurable through prophylactic dietary selection.

Alternative medical practices are replete with myths of unproven cures, most promulgated as definitive medicine³. Modern therapy has changed some cancers into chronic diseases, and cancer survival rates have improved over recent decades. And yet some cancers—such as pancreatic and liver cancer—still have short survival durations and poor prognosis. Contrary to established data, some well-documented

aggressive cases of cancer have entered into total remission, confirmed through histopathology of biopsy samples. However, such events are extremely rare.

SCIENTIFIC METHODS, PROTOCOLS, AND RATIONALE

Substantiating any myth is essential for its gist to be elevated to credibility. The provision of evidence is essential, and scientific research results must be reliable, repeatable, and reputable for global acceptance. Published claims should withstand rational scrutiny, not only from the publication and anonymous-referee filter system (which hopefully spots misconceptions and errors), but also from the worldwide scientific community once the publication is released. Vested interests must not be allowed to influence research, from conception to completion.

Novel cures cannot be validated without withstanding the rigorous examination of evidence-based medicine or research. Alternative medicine fosters too many myths about successful cancer treatments. A fundamental foundation of allopathic medicine is the randomized double-blind experiment, with findings secured over an appropriate biologic period. Biased observation and vested interests (financial or otherwise) must not be permitted to warp the experimental protocol. To eliminate inter- and intra-operator bias, neither subjects nor technicians should be aware of the experimental design or know what to expect when a test variable, chemical, or product is researched. Results should be gathered and analyzed objectively by a third person unaware of the purpose or aims of the experiment. To be substantiated as acceptable, validated experiments should be objectively repeatable by other acknowledged experts, should provide equal or similar outcomes, and should, after rigorous statistical analysis, show significance.

Genetically engineered crops have been harvested for millennia. Retaining seeds from bumper crops is a time-honored agricultural tradition. Shoppers demand high-quality, pristine-looking fruits

and vegetables, and wholesalers, distributors, traders, and retail sellers all demand that fresh products have a long shelf-life and spoil slowly. Consumers will not tolerate product blemishes, bruises, or minor defects when purchasing. Genetically modified crops consistently produce such items and improve the quantity and quality of harvests, safely and reliably feeding the public. Consequently, farmers resort to genetically modified seeds for harvests that provide abundant GMF yields.

Most GMFS are not consumed directly by the public; some 90% are targeted to industrial use, from which some food derivatives are made. An example is maize. Most maize is used for the industrial production of ethanol (as gasohol), the rest being diverted to manufacture other edibles such as fructose. Fructose is widely used as a sweetener in many manufactured foods and drinks.

No known deleterious health or ecological effects have emanated from the commercialization of genetically modified crops: “There is broad scientific consensus that genetically engineered crops currently on the market are safe to eat. After 14 years of cultivation and a cumulative total of 2 billion acres planted, *no adverse health or environmental effects have resulted from commercialization of genetically engineered crops* [italics mine]^{7,8}. Millions of people have been eating GMFS, progressing and thriving in health for decades. Genetically engineered foods contribute enormously to the food supply and have stabilized markets while providing ample nutrition for all^{4,5}.

Although some cancers can be prevented because their precipitating factors or triggering agents are known (for example, the human papilloma viruses, asbestos, alcohol, and smoking), most causes of cancer are unknown⁶⁻⁹. Once neoplastic change is established, there is no absolute cure other than total surgical removal or total replacement of the cancerous cells (in leukemias and lymphomas). Chemotherapy and radiation therapy are essentially life-prolonging treatments, but rarely total cures.

PREDISPOSING INFLUENCES AND PRECIPITATING CO-FACTORS

Many predisposing influences are well-defined, and people who allow those co-factors to have a major influence on their lifestyle consistently have higher prevalences of cancer. Smoking and drinking alcohol are two major examples of co-factors^{8,9}. Combined, those factors increase the likelihood of cancer developing by more than each factor would individually. Consequently, to minimize cancer occurrence and to maximize prevention, easy lifestyle changes such as reducing (or better still, quitting) smoking and alcohol intake are embraced and encouraged. Promoting moderation in food and alcohol consumption is indicated in all societies prone to developing cancers.

PALLIATIVE CARE

Any treatment produces advantages and disadvantages. Various therapies reduce pain and suffering from cancer, slow deterioration, prolong life, and improve the quality of survival. But palliation is not a cancer cure. When the point at which damaging negative reactions outweigh positive outcomes, therapy should cease. That principle applies to any chemotherapy, radiation, or metabolic interference. Genetically modified foods sustain health, and no substantiated disadvantages have been reported from their ingestion. These GMFS can be regarded as “palliative,” in that they support metabolism in health and disease.

DISCUSSION

The recent report claiming that GMFS are causally associated with cancer development in rats has been debunked by informed opinion: genetically tumour-prone rats were used; a spurious construct and research protocol was followed; and the statistical approach used did not satisfy confounding factors⁵. The publication was apparently not subject to satisfactory objective refereeing, and certain tainted financial interests were also operative. All the foregoing factors skewed the results, rendering them invalid and not significant^{4,5}.

Eating fresh foods is preferable to eating processed foods, and fresh GMFS (or the nutritional derivatives from GMFS) are regularly and globally eaten in vast quantities without any proven side effects. Industrialized countries have been successful in producing ample sustenance for their populations from GMFS.

All manufactured edibles with a long shelf life—such as canned foods, soda pop, snack food, and other preserved comestibles—may have traces of carcinogenic substances that contribute to or facilitate carcinogenesis. Among the many compounds implicated are bisphenol A in the plastic linings of metal cans, benzopyrenes in barbecue, nitrites in delicatessen meats, carbon dioxide gas in soda pop, and saccharin in diet foods. These molecules are not derived from GMFS. All are dose-related, and all are acknowledged to be cancer promoters in abusively high doses.

Promoting and enhancing vaccination strategies helps to reduce virally induced cancers. Universal screening by health care workers assists in hastening detection, diagnosis, and therapy, with successful outcomes⁸⁻¹⁰.

CONCLUDING REMARKS

Avoiding GMFS will neither stop nor prevent carcinogenesis. Healthy eating from modern mass food production demands informed choice to realize the

full benefits of nutrition and to eschew co-factors for cancer. Vaccination against known causes is desirable, and complementary therapies help to palliate cancer morbidity. Scientists are free to express their ideas, but they bear a responsibility to be objective and to provide a full, open, rational, and transparent account of any research evidence procured to substantiate their views.

That is no myth, it's reality.

CONFLICT OF INTEREST DISCLOSURES

The author has no financial conflicts of interest to declare.

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