

# Human Health Risks

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## Legalizing Contamination of our Food Supply with Genetically Engineered Foods that have not been approved for safe eating in Canada.

 Agriculture Canada calls it? [LowLevelPresence?](#) or [LLP](#).

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## Take Action

[/Resources/Topics/Human-Health-Risks/No-Legal-Contamination-from-Unsafe-GMOs](#) [Click here to send your instant letter to the Minister of Health!](#)

- Click here to read CBAN's submission on LLP to Agriculture Canada: [/Resources/Topics/Human-Health-Risks/CBAN-s-submission-on-LLP-to-Agriculture-Canada](#)
- LowLevelPresence Sacrifices Food Safety for Trade Policy: LLP is indefensible from a public health and safety standpoint [/November 29, 2011 - Press Release: /Press/Press-Releases/Federal-Government-Proposes-to-Side-Step-Health-Canada-s-Regulation-of-Genetically-Modified-Foods](#)
- Federal Government Proposes to Side-Step Health Canada's Regulation of Genetically Modified Foods: Trade policy would sacrifice safety, say groups.

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## Summary

The Canadian government wants to allow a percent, 0.1% or higher, of our food to be contaminated with genetically modified (GM) foods that have not been approved by Health Canada for safe human consumption. **The GM food will have been approved for safety in at least one other country but not yet evaluated as safe by our own regulators.** The federal government calls this? [LowLevelPresence?](#) or [LLP](#) and argues that this? [lowlevel?](#) of contamination from an unapproved GM food is not harmful.

LLP is unacceptable and unjustifiable:

- LLP is trade policy at the expense of public health. The goal of LLP is to facilitate the free flow of goods into Canada, without the restriction of safety assessment.
- LLP overthrows public health policy. LLP projects Canada's? science-based? regulation of GMOs because LLP assumes that GM foods are safe before evaluating the available data.
- LLP makes safety regulation irrelevant. LLP establishes an exception to the (already highly criticized and woefully inadequate) process whereby government regulators review scientific data to determine human health safety. The introduction of LLP will further undermine our international reputation for food safety as well as the confidence of Canadians in our food system.
- If LLP is introduced, it will be clear that the Canadian Government has no interest in protecting the health and safety of Canadians.

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## Comments on LLP from Groups

From the Canadian Biotechnology Action Network: [/Resources/Topics/Human-Health-Risks/CBAN-s-submission-on-LLP-to-Agriculture-Canada](#)

- LowLevelPresence Sacrifices Food Safety for Trade Policy: LLP is indefensible from a public health and safety standpoint

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## Government Consultation Documents on LLP

Click on the links below to download the government consultation documents, Agriculture and Agri-food Canada:

- [/Resources/Topics/Human-Health-Risks/LLP-Executive-Summary](#) [Executive Summary: LLP](#)
- [/Resources/Topics/Human-Health-Risks/Consultation-Documents-on-LLP](#) [Full Consultation Document: LLP](#)
- [/Resources/Topics/Human-Health-Risks/LLP-Frequently-Asked-Questions](#) [Frequently Asked Questions: LLP](#)
- [/Resources/Topics/Human-Health-Risks/Glossary](#) [Glossary: LLP](#)

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## More Info on LLP

[/Resources/Topics/Human-Health-Risks/Legalizing-Contamination-from-Unsafe-GM-Foods-Regulation-Who-Needs-it](#) [Click here to read the article on LLP "Legalizing Contamination from Unapproved GM Food: Regulation? Who Needs it!"](#) by Lucy Sharratt, CBAN Coordinator, November 2011

**What is? LowLevelPresence??** [?LowLevelPresence?](#) (LLP) is the proposal to allow our food to be contaminated by a percent of genetically engineered foods that have not been approved for safe eating by Health Canada, but that have been approved for human consumption in at least one other country. LLP would change Canada's? existing? zero-tolerance? policy for such contamination. LLP is different from? [adventitious presence?](#) which is the industry term for contamination of our food by experimental GM crops and animals that have not been approved any

where in the world. **Which other countries have LLP?** Canada would be the first country in the world to adopt LLP for GM foods. Every country has a zero-tolerance for contamination by GM foods that they have not approved as safe. In July 2011, the European Union allowed up to 0.1 percent of animal feed could be contaminated by GM grains that are not approved in the EU. **What is the Canadian government's rationale for LLP?** The grain industry operating in Canada wants other countries to establish LLP so that exports from Canada that are contaminated by GM foods are not rejected. In the industry's view, **Canada could serve as a model to influence countries with trade-restrictive LLP policies by adopting alternative domestic LLP policy approaches.** (Agriculture Canada Power Point on LLP) Agriculture Canada also says that, "The potential for low-level presence to enter Canada is expected to increase in the future." ([FAQp5](/Resources/Topics/Human-Health-Risks/LLP-Frequently-Asked-Questions?target=_self)) As yet, no GM foods have been approved anywhere in the world that are not already approved in the US or Canada. If trace amounts of such unapproved genetically modified products are found in import shipments, in a country where the genetically modified crop is not approved, oftentimes these imports will be rejected. ([FAQp5](/Resources/Topics/Human-Health-Risks/LLP-Frequently-Asked-Questions?target=_self)) The unpredictability of rejection of such imports is a growing concern, given the potential economic impacts low-level presence will have on global trade. ([FAQp5](/Resources/Topics/Human-Health-Risks/LLP-Frequently-Asked-Questions?target=_self))

**What is the consultation process?** On September 7, 2011 Agriculture Canada launched a targeted call for participation of stakeholders in a consultation over three proposals to introduce Low Level Presence. Agriculture Canada invites comments by email to [Kathryn McKinley, Agriculture Canada, \[Kathryn.mckinley@agr.gc.ca\]\(mailto:Kathryn.mckinley@agr.gc.ca\)](mailto:Kathryn.mckinley@agr.gc.ca), by Nov 25, 2011 (this deadline was extended from an Oct deadline). Consultation meetings were held October 11 Ottawa, ON; October 14 Montreal, QC; October 24 Toronto, ON; October 31 Halifax, NS; November 2 Winnipeg, MB; November 3 Saskatoon, SK; November 4 Richmond, BC. CBA and organic farming organizations are participating to share their position that LLP is indefensible. ([eztoc646\\_7](#))

## Background: Human Health Risks

We do not know what, if any, impact eating genetically engineered foods will have on our health. There are many indications that we do not know enough to be integrating GE foods into our diets. Additionally, there is no mandatory labelling of GE ingredients in Canada and there is no post-market surveillance to help us determine if there are already impacts. In the interests of public health, the precautionary principle needs to be applied in relation to introducing GE foods. *"We are performing a massive experiment. The results will only be known after millions of people have been exposed to (these foods) for decades. Any politician or scientist who tells you these products are safe is either very stupid or lying. The hazards of these foods are uncertain. In view of our enormous ignorance, the premature application of biotechnology is downright dangerous."* ([David Suzuki](#) quoted in *The Globe and Mail*, October 20, 1999.) GE foods are approved for human consumption based on industry-produced science that is not peer-reviewed and cannot be accessed by the public or independent scientists. Peer review is the process where by independent scientists assess the work of others; it is a fundamental and defining practice of science. As the Royal Society of Canada Expert Panel on the Future of Food Biotechnology states, "peer review and independent corroboration of research findings are axioms of the scientific method, and part of the very meaning of the objectivity and neutrality of science." (p. 214) Without peer review, the data used to approve products cannot be assumed to be good science, or indeed science at all. There is only one independent human health safety assessment of a GM food (a potato that is not on the market) that has been published in a peer-reviewed journal. This is the study by Arpad Pusztai of the Rowett Research Institute in Aberdeen that was eventually published in *The Lancet*. In 1998, Pusztai found that the genetically engineered potato he was testing severely damaged the immune system and organs of rats, showing these potatoes were significantly different from non-GE potatoes and indicating that they may be toxic. After being interviewed on British television saying that it was very, very unfair to use our fellow citizens as guinea pigs, he was suspended and was silenced with a lawsuit. There are many scenarios for risk to human health given the lack of certainty involved in the sci-

ence of genetic engineering. Genetic engineers continually encounter unintended side effects-- plants create toxins, react to weather differently, contain too much or too little nutrients, become diseased or malfunction and die.

- See [http://www.seeds ofdeception.com/Public/GeneticRoulette/index.cfm?target=\\_self](http://www.seeds ofdeception.com/Public/GeneticRoulette/index.cfm?target=_self) Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods by Jeffrey Smith for a summary of studies thus far. 2007.
- For an introduction to the issue involved see [/Resources/Topics/Human-Health-Risks/Genetically-Engineered-Food-and-Child-Health?target=\\_self](/Resources/Topics/Human-Health-Risks/Genetically-Engineered-Food-and-Child-Health?target=_self) Genetically Engineered Food and Child Health, Lucy Sharratt, 2003

### Recent Studies

A report reviewing 19 studies of mammals fed with commercialized GM soybean and maize (which represent more than 80% of all GMOs grown on a large scale) indicates liver and kidney signs of toxicity in mammals fed on a GM diet. The report by Gilles-Eric S eralini is published in *Environmental Sciences Europe* (2011, 23, 10-20).

The authors studied data from biotech companies from 90-day-long feeding tests on rats that include biochemical blood and urine parameters of mammals eating GMOs modified for herbicide tolerance and insecticide production. The tests were conducted as a result of court action or official requests and the authors reviewed the studies in the scientific literature.

Though the tests may not point to chronic toxicity of GMOs since the 90 day period is too short, the authors nonetheless cautioned that the signs highlighted in the kidneys and livers could spell the onset of chronic diseases: on a total of 9% of disturbed parameters, 43% are concentrated in the kidneys of the male rats. The researchers suggested that more detailed and prolonged studies should be conducted. They underlined that since in a minimal length for the tests is yet compulsory for any of the GMOs cultivated on a large scale, it was socially unacceptable in terms of consumer health.

The authors also suggested an alternative to conventional feeding trials, to understand the biological significance of statistical differences. This approach will make it possible to avoid both false negative and false positive results, in order to improve safety assessments of agricultural GMOs before their commercialization for cultivation for food and feed as well as for imports. This is the most comprehensive review on this topic to date.

## Other Studies

**December 2009:** Researchers have linked consumption of three of [/Resources/Topics/Monsanto?target=\\_self](/Resources/Topics/Monsanto?target=_self) Monsanto's GM corn with organ damage in the most comprehensive study of the effects of genetically modified food on mammalian health. All three varieties of GM corn? Mon810, Mon863 and NK603? were approved for consumption in Canada, the US and Europe. The Committee of Research and Information on Genetic Engineering (CRIIGEN) and Universities of Caen and Rouen studied Monsanto's 90-day feeding trials data of insecticide-producing Mon810, Mon863 and Roundup@ herbicide absorbing NK603 varieties of GM maize.

Although different levels of adverse impact on vital organs were noticed between the three GMO's, the 2009 research shows specific effects associated with consumption of each GMO, differentiated by sex and dose. The data "clearly underlines adverse impacts on kidneys and liver, the dietary detoxifying organs, as well as different levels of damage to heart, adrenal glands, spleen and haematopoietic system," reported Gilles-Eric S eralini, a molecular biologist at the University of Caen.

Their December 2009 study appears in the *International Journal of Biological Sciences* (IJBS). This latest study conforms with a 2007 analysis by CRIIGEN on Mon863, published in *Environmental Contamination and Toxicology*, using the same data.

**February 2009:** A recent article published in the journal *Critical Reviews in Food Science and Nutrition*, reviews the results of toxicity studies on GM food that are available in the literature and discusses the significance of these findings on human and animal health as well as the limitations of the procedures adopted in the evaluation of the safety of the GMOs.

The results of most studies with GM foods indicate that they may cause some common toxic effects such as hepatic, pancreatic, renal, or reproductive effects and may alter the hematological, biochemical, and immunologic parameters. As such, the authors suggest that further long-term studies should be conducted in order to understand deeper the mechanisms at work and the possible consequences on health.

In the meantime, it was pointed out that the lack of evidence that GM food is unsafe cannot be interpreted as proof that it is safe.

**Health Risks of Genetically Modified Food**

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**Abstract**

Asgenetically modified (GM) foods are starting to intrude in our diet concerns have been expressed regarding GM food safety. These concerns as well as the limitations of the procedures followed in the evaluation of their safety are presented. Animal toxicity studies with certain GM foods have shown that they may toxically affect several organs and systems. The review of these studies should not be conducted separately for each GM food, but according to the effects exerted on certain organs it may help us create a better picture of the possible health effects on human beings. The results of most studies with GM foods indicate that they may cause some common toxic effects such as hepatic, pancreatic, renal, or reproductive effects and may alter the hematological, biochemical, and immunologic parameters. However, many years of research with animals and clinical trials are required for this assessment. The use of recombinant GH in animals should be re-examined since it has been shown that it increases IGF-1 which may promote cancer.

**Keywords:** Allergenicity; antibiotic resistance; food safety; genetically modified; health risks; recombinant growth hormone; toxicity

**Conclusions:** From the review of the toxicity studies concerning GM foods one might see that although toxicity can be assessed, the duration of exposure is too short in order to fully evaluate any potential disruptions in biochemical parameters and to evidence possible signs of pathology within the limited subchronic exposure of animals. Moreover, a larger number of animals should be used in the toxicity tests. The toxicity tests should comply with the guidelines for toxicity testing of drugs. It should be emphasized that since these GM foods are going to be consumed by every human being they should be tested even more thoroughly than drugs and more experiments are required in order to study the possible toxicity and make any conclusions. Tests to determine how a GM food affects mutagenesis and carcinogenesis should be conducted as well. Finally, postmarketing surveillance should be part of the overall safety strategy for allergies, especially of high-risk groups such as infants and individuals in atopic families. Evaluation of protein allergenicity in man should also include studies in individuals not only with a history of allergy but with immunodeficiency as well. The use of recombinant GH in animals, such as cows or the expression of GH in animals such as salmon should be re-examined since it may promote cancer. The results of most of the rather few studies conducted with GM foods indicate that they may cause hepatic, pancreatic, renal, and reproductive effects and may alter hematological, biochemical, and immunologic parameters the significance of which remains unknown. The above results indicate that many GM foods have some common toxic effects. Therefore, further studies should be conducted in order to elucidate the mechanism dominating this action. Small amounts of ingested DNA may not be broken down under digestive processes and there is a possibility that this DNA may either enter the bloodstream or be excreted, especially in individuals with abnormal digestion as a result of chronic gastrointestinal disease or with immunodeficiency.

Although intensive scientific effort is currently in progress to thoroughly understand and forecast possible consequences on humans, animals, and the environment, it is anticipated that many years of careful, independent research with animals and clinical trials will be needed in order to accomplish this assessment.