



What is GM and why does it matter?

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What is GM?

Genetically Modified (GM) organisms have had pieces of DNA artificially added, removed or changed in the lab. GM is also known as genetic engineering. It is not the same as traditional crop breeding and never can be.

Is it safe?

DNA is a bit like a computer programme, but one that doesn't come with instructions. Swapping sections of complex genetic code around is not a simple "cut and paste" process - there is much that can go wrong^{1 2 3 4 5}. Safety tests are usually controlled by the companies that profit from GM. It is incredibly difficult to carry out independent studies but many of those that have been done have found problems^{6 7 8 9}.

The most common type of GM crop is designed to be heavily sprayed with glyphosate, a powerful weed killer which the World Health Organisation recently classified as probably causing cancer¹⁰.

Does it do any harm?

GM crops cause many more problems than they solve. They support some of the most environmentally damaging farming practices in the world. Their use has led to the development of resistant "super-weeds"^{11 12} and they have been proven to reduce biodiversity¹³.

The monarch butterfly has declined by 90% and studies lay the blame on GM farming^{14 15}.

Farmers are not allowed to save GM seed for planting next year. Contracts demand that they buy seed and weed killers from the same company each year. Contamination of non-GM crops is widespread¹⁶ and could wipe out traditional plant varieties. Farmers whose crops have been contaminated not only lose their GM-free status – they have even been sued by GM companies for "stealing" a patented product¹⁷.

Do we need it?

Those promoting GM claim that it can work wonders but the only drought-tolerant crops, blight-resistant potatoes and omega-3 crops available to grow and eat today have been developed through non-GM breeding techniques¹⁸. We need farming and pest management regimes that work **with**, rather than against, nature.

Globally, we produce enough food for 14 billion people – twice the world's population¹⁹.

Hunger and malnourishment are political problems that can only be solved by lifting people out of poverty and giving them control over their own food and farming²⁰.

GM crops are about profits for the few, not sharing the world's resources more fairly²¹.

How can I avoid it?

In the UK, GM ingredients have to appear on the label so read the small print and ask about GM cooking oil when you are eating out (restaurants and takeaways should list this on the menu but many do not).

Most meat, eggs and dairy products on sale in the UK come from animals that have eaten GM feed. This does not have to be listed on the label so unless it's organic (where GM is not allowed), it is very difficult to know what we are eating.

There are no GM crops grown commercially in the UK but political support for GM means that could change very soon. If it does, it will be very difficult to protect non-GM crops from contamination.

We need to stand together and protect our right to grow, produce and eat GM free.

What can I do?

Join the growing community of people who are saying no to GM in their food and on our farms. You can sign up to the free GM Freeze email list, check what you are buying and take action in lots of different ways at www.gmfreeze.org/what&why.

Visit www.gmfreeze.org/what&why to join us, get involved or just find out more.

Twitter: [@GMFreeze](https://twitter.com/GMFreeze) Email: info@gmfreeze.org T: 0845 217 8992 www.gmfreeze.org

GM Freeze is the national umbrella campaign for a moratorium on GM food and farming in the UK. We believe that our food should be produced responsibly, fairly and sustainably. Our members include national charities like Friends of the Earth and the Soil Association, specialist and grassroots campaign groups, scientists, farmers, food producers, retailers and concerned individuals.

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References

- ¹ Wilson A, Latham J and Steinbrecher R, December 2006. "Transformation-induced Mutations in Transgenic Plants: Analysis and biosafety implications". *Biotechnology and Genetic Engineering Reviews*, Vol 23, pp. 209-237
http://www.econexus.info/sites/econexus/files/ENx-BGER_vol23_2006.pdf
- ² Prescott VE, *et al*, November 2005. "Transgenic expression of bean alpha-amylase inhibitor in peas results in altered structure and immunogenicity". *Journal of Agricultural and Food Chemistry* 53:9023-30
<http://www.bioscienceresource.org/documents/Prescott.pdf>
- ³ Wilson A, Latham J and Steinbrecher R, October 2004. "Genome Scrambling – Myth or Reality?: Transformation-induced mutations in transgenic crop plants". EcoNexus
<http://www.econexus.info/sites/econexus/files/ENx-Genome-Scrambling-Report.pdf>
- ⁴ Latham J, Wilson AK and Steinbrecher R, January 2006. "The Mutational Consequences of Plant Transformation". *Journal of Biomedicine and Biotechnology*, Vol 2006, Article ID 25376
- ⁵ Jiao, Z., Si X.X., Li, G.K., Zhang, Z.M., Xu, X.P. (2010). "Unintended Compositional Changes in Transgenic Rice Seeds (*Oryza sativa* L.) Studied by Spectral and Chromatographic Analysis Coupled with Chemometrics Methods", *J. Agric. Food Chem.*, 58, 1746–1754.
<http://www.ncbi.nlm.nih.gov/pubmed/20050687>
- ⁶ El-Shamei et al, 2012, "Histopathological changes in some organs of male rats fed on genetically modified corn (Ajeeb YG)" *Journal of Americal Science*, 8(10)
http://www.academia.edu/3405345/Histopathological_Changes_in_Some_Organs_of_Male_Rats_Fed_on_Genetically_Modified_Corn_Ajeeb_YG
- ⁷ Finamore, A., Roselli, M., Britti, S., Monastra, G., Ambra, R., Turrini, A., Mengheri, E. (2008). "Intestinal and peripheral immune response to MON810 maize ingestion in weaning and old mice." *Journal of Agricultural and Food Chemistry*, 56: 11533–11539.
<http://www.ncbi.nlm.nih.gov/pubmed/19007233>
- ⁸ Malatesta, M., Biggiogera, M., Manuali, F., Rocchi, M.B., Baldelli, B., Gazzanelli, G. (2003) "Fine structural analyses of pancreatic acinar cell nuclei from mice fed on genetically modified soybean." *Eur J Histochem* 47:385–388.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1570979/>
- ⁹ Mesnage R et al, 2013 "Cytotoxicity on human cells of Cry1Ab and Cry1Ac Bt insecticidal toxins alone or with a glyphosate-based herbicide" *Journal of Applied Toxicology* 33(7): 695-9
<http://www.ncbi.nlm.nih.gov/pubmed/22337346>
- ¹⁰ International Agency for Research on Cancer Monographs Volume 112: evaluation of five organophosphate insecticides and herbicides
<http://www.iarc.fr/en/media-centre/iarcnews/pdf/MonographVolume112.pdf>

¹¹ Union of Concerned Scientists policy brief: The Rise of Superweeds –and What to Do About It
http://www.ucsusa.org/sites/default/files/legacy/assets/documents/food_and_agriculture/rise-of-superweeds.pdf

¹² Greenpeace International, 2010: Herbicide resistance forces farmers to weed by hand
<http://www.greenpeace.org/international/Global/international/planet-2/report/2010/1/herbicide-resistance-forces-fa.pdf>

¹³ Defra, 14 May 2007. “The Farm Scale Evaluations”. See
<http://webarchive.nationalarchives.gov.uk/20080306073937/http://www.defra.gov.uk/environment/gm/fse/>

¹⁴ Pleasants JM, Oberhauser KS, 2012. “Milkweed Loss in Agricultural Fields because of Herbicide Use: Effect on the monarch butterfly population”. *Insect Conservation and Diversity* 6(2):135–144 doi:10.1111/j.1752-4598.2012.00196.x
<http://onlinelibrary.wiley.com/doi/10.1111/j.1752-4598.2012.00196.x/abstract>

¹⁵ Monarchs in Peril; Herbicide-Resistant Crops and the Decline of Monarch Butterflies in North America, Center for Food Safety, February 2015
<http://www.centerforfoodsafety.org/reports/3708/monarchs-in-peril-herbicide-resistant-crops-and-the-decline-of-monarch-butterflies-in-north-america#>

¹⁶ GM Freeze: Contamination Matters – Why GM crops can’t be managed at a national level, June 2014
<http://www.gmfreeze.org/publications/briefings/170/>

¹⁷ Monsanto vs US Farmers, GM Watch, August 2009
<http://www.gmwatch.org/index.php/news/archive/2009/11392-monsanto-vs-us-farmers>

¹⁸ <http://www.gmfreeze.org/why-freeze/unnecessary-non-gm-works/>

¹⁹ Professor Hans Herren of the Millenium Institute, Washington and co-chair of the IAASTD (International Assessment of Agricultural Knowledge, Science and Technology for Development)

²⁰ Feeding the World Without GMOs, Environmental Working Group March 2015
<http://www.ewg.org/research/feeding-world-without-gmos>

²¹ Who Benefits from GM Crops? The expansion of agribusiness interests in Africa through biosafety policy, Friends of the Earth International, February 2015
<http://www.foei.org/resources/publications/publications-by-subject/food-sovereignty-publications/who-benefits-2015>

GM Freeze, May 2015
www.gmfreeze.org