

Genetic Engineering Fact Sheet #1



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13 Myths About Genetic Engineering

Myth No. 1 - Genetic engineering (GE) is not new. It is just the same as speeded-up selective breeding.

FACT: Genetic engineering (GE) and conventional breeding are worlds apart. Breeding does not manipulate genes; it involves crossing of selected parents of the same or closely related species. In contrast, GE involves extracting selected genes from one organism (e.g. animals, plants, insects, bacteria) and/or viruses, or synthesising copies, and artificially inserting them into another completely different organism (eg. food crops). GE usually employs virus genes to smuggle in and promote the inserted genes, and antibiotic resistance genes to act as markers. All these inserted genes are present in every cell of the plant.

Myth No. 2 - Genetic engineering is precise.

FACT: The function of only a small proportion of the DNA in a higher organism is known. Modern genetics has shown that genes do not operate in isolation. Rather they interact in a complicated way, changing their behaviour in response to influences from other genes. Although a gene can be cut out precisely from the DNA of an organism, its insertion into the DNA of another organism is entirely random. This results in the disruption of the order of the genes on the chromosome and may result in random and unexpected changes in the functioning of the cells.

Richard Lewontin, Professor of Genetics at Harvard University, has said of GE: 'We have such a miserably poor understanding of how the organism develops from its DNA that I would be surprised if we don't get one rude shock after another.'

Myth No. 3 - GE foods vary from non-GE foods only in the characteristic that has been modified.

FACT: The random insertion of foreign genes into the genetic material may cause unexpected changes in the functioning of other genes. Existing molecules may be manufactured in incorrect quantities, at the wrong times, or new molecules may be produced. GE foods and food products may therefore contain unexpected toxins or

allergenic molecules that could harm our health or that of our offspring.

Myth No.4 - GE food is extensively tested and the GE food at present on our supermarket shelves is perfectly safe to eat.

FACT: No GE food testing is done in America. We rely almost entirely on the testing carried out by the GE biotechnology companies that have spent billions of dollars developing the food and intend to make a profit selling it to us. There are serious doubts about the adequacy of the testing and the validity of the conclusions drawn from the results. Independent long-term testing is required before we can be sure that GE food is safe to eat. Another health concern is the possible acceleration of the development of bacterial resistance to antibiotics due to the use of antibiotic resistance genes in the production of GE foods.



Myth No. 5 - Genetically engineered food has improved nutritional value.

FACT: No GE food produced to date has been shown to be more nutritious than non-GE food. Most GE crops are only designed to be resistant to specific herbicides, to produce their own insecticides or to have an increased shelf life.

Myth No. 6 - One can always choose not to eat GE food.

FACT: At present most foods on American supermarket shelves containing GE ingredients are not labelled, so there is no way of knowing whether we are eating them. GE products are likely to be found in foods containing the following ingredients:

Soya flour and oil (in many common foods including breads, sausages, etc.) Lecithin (in chocolate, ice cream etc.) Canola oil Corn (maize) extracts.

USEFUL TIPS TO AVOID GM FOODS

1) READ THE PRODUCT LABELS and avoid soya-based ingredients such as soya flour, soya oil, vegetable oil, lecithin and hydrolysed vegetable protein. And avoid maize-based ingredients such as modified starch, cornflour, corn starch, corn oil and polenta. Note: These ingredients are to be avoided simply because there is no way of knowing if they contain GM-soya or GM-maize derivatives (unless of course the product is guaranteed free of "all" GM ingredients and derivatives, or is 'certified' organic).

2) GET YOUR FOOD FROM A RELIABLE SOURCE: Shop organic. Certified organic bread, milk, butter, fruit, vegetables, baby foods, flour, vegetable oils, chocolate, ice-cream and fruit juices, etc. are popular and prices have fallen. Favour organic wholefoods where possible.

3) CUT DOWN ON PROCESSED FOODS because they are more likely to be affected by genetic modification. For example, many brands of dairy products, cereals, jam, fruit juice, cooking oil, sweeteners, slimming foods, beverages, wine and beer etc. are produced with GM-enzymes. If you have any doubts about a particular product, contact the manufacturer for assurance. Or else buy certified organic foods, or wholefood products which are guaranteed GM-free.

4) HOME-MADE MEALS, bread, cakes and cheese etc. are obviously healthier and more nutritious than factory-made equivalents.

Myth No. 7 - Farmers will benefit from growing GE crops.

FACT: Seeds of genetically engineered crops are more expensive than those of conventional crops. Farmers in the UK and USA report that yields are generally no better, the crops are less reliable and overall have not improved profitability. Non-GE crops now receive a premium and as more countries reject GE foods, the opportunities to sell GE produce overseas are diminishing. Because of risks associated with GE crops insurance companies in the USA and UK are now reluctant to insure them. Farmers growing GE crops have to sign binding contracts with the biotechnology producers. These commit them to using only the herbicides produced by that company and prohibit them from the traditional practice of saving seed for the next season. Most third world farmers certainly will not benefit.

Myth No.8 - GE crops will reduce the use of herbicides and pesticides.

FACT: Crops engineered to be resistant to specific herbicides may encourage more liberal use of those herbicides. This has been anticipated by one manufacturer, who has applied to ANZFA (Australia New Zealand Food Authority) to have the allowable residue of the herbicide glyphosate (Roundup=AE) in foods sold in New Zealand increased by 200 times. In areas of the USA where crops engineered to produce their own insecticide are grown, pesticide use has not decreased.

Myth No. 9 - There is no evidence that GE crops are harmful to the environment.

FACT: Insects, birds and the wind carry genetically altered pollen and seeds into neighbouring fields and far beyond. Cross-pollination occurs between GE crops and non-GE crops and their wild relatives. In this way resistance to weed killer, for example, might be transmitted to weeds making them more difficult to control. There is evidence that crops engineered to produce their own insecticide can kill beneficial insects.

Myth No. 10 - GE crops will save the world from famine.

FACT: A major cause of famine is the unequal global distribution of food. Food mountains exist in much of the western world and food is regularly dumped. Poor people have limited ability to buy either GE or non-GE food. There is no evidence that GE crops produce higher yields than conventional crops or that GE products will be cheaper.

“Swapping genes between organisms can produce unknown toxic effects and allergies that are most likely to affect children”

- Dr Vyvyan Howard:
expert in infant
toxico-pathology at
Liverpool University
Hospital, UK

Myth No. 11 - You can trust the scientists that GE food is good for you and the world.

FACT: The money for scientific research on GE here and overseas comes from either the biotechnology companies or the government. Both are committed to the promises of biotechnology. This means that even when scientists

have concerns about the safety or commercial application of the technology, it is often hard for them to risk their careers by being openly critical. One respected scientist in the UK who spoke up about his experimental results showing damaging effects of feeding rats on a type of genetically engineered potato was immediately fired from his job.

Myth No. 12 - You can't stop progress.

FACT: No of course we can't; and why would we want to? Progress implies change for the better. Change for the worse is regression. We must be sure that GE products have benefits for the consumer and are safe if they are to be introduced into our foods. We must not commit ourselves to a dubious technology that cannot be reversed.

Myth No. 13 - There are more important things to worry about than GE foods.

FACT: Many scientists don't think so. For example Joseph Rotblat, the British physicist who won a 1995 Nobel Prize says: "My worry is that other advances in science may result in other means of mass destruction, maybe more readily available even than nuclear weapons. Genetic engineering is quite a possible area, because of these dreadful developments that are taking place there. Genetic engineering is quite a possible area, because of these dreadful developments that are taking place there."

For A GE Free World - Campaigning Tips

- by the Superheros Against Genetix

(adapted from an online document at <http://www.enviroweb.org/shag/>)

The insidious release of genetic pollution into our environment and our diet may have frightening long term consequences but it doesn't have to be this way! Genetically manipulated food has only been around for a few years - It is still very to claim that it can be eliminated before the dangers it presents spiral out of control.

Nonetheless, when campaigning for an end to the release of genetic pollution there are three main blocks worth bearing in mind:

It is Hidden:

Even though Monsanto's soya will affect all of us by infiltrating 60% of processed food, most people are unaware of this huge experiment being carried out on them. Nor is there any real public debate on the genetically manipulated products set to follow. It is for this reason that the biotech industry is insistent set against labelling: It is easier to experiment when nobody is watching.

It is seen as Scientific:

The biotech industry has very successfully labelled the issue of genetic pollution as a scientific issue rather than a moral, environmental or social issue. In this way decisions over the use of genetic manipulation have been abdicated by the democratic processes and left in the hands of industry and its scientists. Many people feel cowed by the cult of the expert in this field which suggests that only the highly trained can have a valid opinion. Many people (including genetic scientists) feel instinctively uneasy at the implications of genetic manipulation but feel somehow 'underqualified' to speak out their fears. This leaves the debate in the hands of a mostly self interested few- a worrying trend in a supposedly democratic society.

It is Profitable:

While there are those who truly believe that genetic manipulation will solve world food problems, create sustainable agriculture and so on, the overriding drive behind the boom in the biotechnology industry is its commercial

potential for profit. It is for this reason that many of the worlds largest corporations such as Shell, Cargill, Monsanto, Ciba-Geigy and Zeneca (formerly part of ICI) are developing the genetically manipulated products beginning to come onto the market now. Some governments are also in a hurry to deregulate, keen as they are to be ahead in the race to unlock the earth's genetic resources, reorder them and claim the cash bonus. So the third major problem that faces campaigners is that of organised

commercial interests who are sinking large amounts of money into their vision of a genetically manipulated future.

However... There are things that you can do.



Campaigning Strategies

A 'Strategy' is the way in which one or a group of people set about trying to bring about change. Change occurs through many different channels: some institutional, others cultural, some indirect (eg raising awareness in the media) others very direct (eg peaceful protest). In any given situation there are probably many strategies for change that could work together to bring about a common end. Here are few possible strategies for preventing the release of genetic pollution.

Xpose the Xperiment!

This huge experiment with nature is occurring secretly, leaching unmarked into our environment and diets. In order to wake people up to the threats that genetic manipulation carries it is important to bring that experiment into the open - to brand it wherever it is happening. It is for this reason that X's are being marked on the fields, the barges, the grain terminals, the ships, the oil mills, the food manufacturers and the supermarkets - to clearly bear witness to who is responsible and who is complicit in this experiment. This strategy is about raising awareness and waking people up to the fact that their environment and their food is about to be contaminated. It

5) AVOID "fast food" restaurants and "low budget" products because GM-foods are being introduced into cheaper brands initially.

6) BAKERY PRODUCTS

When buying bakery products such as bread, avoid "flour improver" and "flour treatment agent", which may be a mixture of GM-enzymes and additives. (The GM enzymes Alpha Amylase is sometimes listed on bakery product labels and is best avoided).

7) AVOID margarine.

Favour organic butter. For dairy-free diets favour GM-free sunflower spreads etc., which are available from some wholefood shops.

8) DAIRY PRODUCTS and meat from animals fed GM soya and maize will not be labelled as such - in spite of evidence that modified DNA can cross the gut wall and enter spleen, liver and white blood cells. Favour organic milk, butter, cream and cheese etc.

9) CHOCOLATE can contain GM-soya lecithin, and "vegetable fat" and "whey" which are affected by GM. So favour organic chocolate. Green & Black's have a policy of using GM-free lecithin and avoiding all GM ingredients. Note: All lecithin is soya lecithin.

10) SHOP WITH CARE because Riboflavin (Vitamin B2) produced from GM-organisms was last year approved for use in the UK. Riboflavin is used in baby foods, breakfast cereals, soft drinks and slimming foods etc.

11) REGARDING HEALTH FOOD SUPPLEMENTS, vitamins and medicines: check with the manufac-

turer, as some ingredients may be produced by biotechnology. In the USA, the GM food supplement Tryptophan killed 37 consumers and permanently disabled 1,500 more. All pharmaceuticals must now be under suspicion: contact the manufacturer to inquire about specific products.

12) IS IT REALLY GM-FREE?

When contacting a manufacturer to enquire if a particular product is GM-free, ask them to confirm that the product contains - "no genetically modified ingredients or derivatives, as was not produced using GM-derived enzymes". Ask for written confirmation rather than relying on a verbal assurance.

13) HONEY. All Canadian honey is now suspect, as traces of oilseed rape DNA have already been detected in several brands. Many brands of honey sold in the UK are a mixture of honeys from various countries, including Canada. So if the label on a jar of honey states: "Imported honey", or: "Product of more than one country", then it is advisable to avoid these, or to contact the manufacturer to enquire as to the country of origin. FAVOUR ORGANIC HONEY as attempts are made to preserve wide margins between hives and GM or agrochemical-sprayed crops.

14) DRIED FRUIT. Many brands of dried fruit, including raisins, sultanas, currants, dates - and even dried fruit in some breakfast cereals - are coated with oil derived from GM soya. Favour organic brands of dried fruit, or brands that don't list "vegetable oil" on the label (available from wholefood stores).

Adapted from : GM Foods and How to Avoid Them

is an essential first step to harnessing 'people power' and unlocking a climate of concern.

Let the people speak!

The power of large interests to carry out this experiment derives partly from the undemocratic way in which our technology is developed. If only the views of so-called 'experts' (corporations, politicians and paid scientists) are allowed to prevail on this issue then the very real moral and practical concerns of ordinary people ('non-experts') is effectively silenced. Many people feel strongly against genetic manipulation of food. It is important that these people feel able to speak (not cowed by science) and are heard. Petitions, letters of concern, arranging public meetings, trials and debates are all ways of ensuring that people are listened to and that their concerns are treated as valid.

Bash the Baddy!

In the end there are certain key players who are keen to profit from the genetic experiment. Jeopardising their profits, their reputation and their activities may be a means of directly intervening to stop the genetically manipulated soya escaping. Since regulatory channels have failed to prevent genetically manipulated food then boycotts, letters of complaint, peaceful protest and non-violent direct action may be necessary if people are to act where companies and governments are failing. By taking action and peaceably confronting the culprits individuals can force an issue into the public's attention, thereby exposing the experiment for what it is as well as trying to prevent it.

Jitter the markets!

All the major players in biotechnology have shareholders and investors who they need to keep sweet. If these investors know that the public will not buy genetically manipulated food then they would be right to withdraw their investments. Monsanto, Unilever, Cargill, Nestle, Cadburys, Sainsbury, Tesco etc. all have shareholders who need to be made aware of how unpopular the activities of their companies are and how much profit they

are set to lose. This is another channel of pressure.

Tell the farmer!

Soya farmers don't benefit much from Monsanto's bean. Many are suspicious of being made dependent on one corporation. Letting them know that there isn't a market for it might encourage them not to plant the soya next year. Animal farmers here in the UK also need to be made aware of the dangers of round-up ready soya since if the soya is successfully kept out of the human diet it may be sold for animal feed. Monsanto have already angered farmers with their defective 'bovine growth hormone' which has been linked to cancer, sickness and reproductive problems. In the wake of BSE we don't need to feed our animals with yet another risky product.

And the politicians?

At present only The Green Party and the Natural Law Party have strong positions against genetic pollution - the main three parties are generally in favour of genetic manipulation (with the exception of some individual politicians). Politicians do have some say over tightening the regulatory processes, putting pressure on companies, food producers and supermarkets and heightening public debate. Asking them to make clear their position and to represent yours is another means of applying pressure alongside other campaigning strategies.

Watch your language!

In the 1970's the biotechnology industry talked of the 'Genetic Revolution' until they realised how scary that sounded. Today genetic manipulation is either referred to as 'Biotechnology' (which sounds skilled, modern and precise) or 'Genetic Modification' (which sounds like only slight changes are taking place). More emphasis has also been put on stressing that these are just 'ordinary' Soybeans with just a couple of add-on genes when in fact they represent a new lifeform. In campaigning it is important to be aware of how language and concepts have been rewritten to allay peoples fears and hide the very real implications of what is going on. Stick to pointing out that these beans are 'genetically manipulated' or at least 'Genetically Engineered' - a term which people recognise.

This fact sheet was compiled from Internet resources by TAO Vancouver. To find out more about TAO or to get involved with the ge-free cookbook project, please contact TAO at vancouver@tao.ca or check out our website at <http://vancouver.tao.ca>.

