



## Genetically Modified Foods

There has been much concern recently about GM foods, some of which are being tested and some of which are already used as ingredients in the food we eat. GM stands for 'genetically-modified', and describes the process by which scientists are able to pinpoint the individual gene which produces a desired outcome, extract it, copy it and insert it into another organism.

To some extent, humans have been involved in genetic modification for centuries. For example, larger cattle which gave more milk were bred to produce even larger offspring. Seeds from cereals and other crops that were hardier and grew better were selected for planting the following year to produce better yields. With genetically modified organisms however, the modifications involved are often of a kind that could not possibly occur naturally. For example, adding cow growth hormone to the embryo of a broiler chicken to produce a larger, faster growing chicken, or adding genes from a virus to a plant to allow it to become resistant to the virus.

There are many reasons why GM foods could be advantageous. For example, a crop could be made to grow quicker, with increased protein and vitamin levels, or with less fat. An often-used argument in favour of GM crops is that drought-resistant crops could help to alleviate famine in developing countries, where low rainfall often leads to food shortages. Techniques have also been developed to make fresh produce last longer, so that it can ripen on the plant and be transported more easily with less wastage.

The first GM food products - a tomato puree and a vegetarian cheese - appeared in British supermarkets in 1996. The puree was made from tomatoes which were designed to stay firmer for longer, leading to less waste in harvesting. The tomatoes also held less water, meaning that less water was required to grow them and less energy was used removing water from them to turn them into puree. This in turn made the puree cheaper for the consumer.

The first GM soya was planted in the US in the same year, and up to 60% of all products on supermarket shelves could now contain some GM soya. Monsanto, a major GM manufacturer has developed a strain of GM soya which is resistant to Roundup, its own brand of herbicide. This allows weeds to be controlled even after the soya has started to grow, saving an estimated 33% on the amount of herbicide used. Roundup Ready<sup>a</sup> soya amounted to 15% of the 1997 US soya crop.

GM foods have been largely accepted by the Americans, with nearly 70% of them saying that they would buy GM foods even if they were simply engineered to stay fresh for longer. Even more would purchase foods modified to resist insect pests, resulting in less use of pesticides.

In the UK, we are being far more cautious, possibly with good reason. Lessons learned during the BSE crisis are still very much in people's minds. Can we trust what we are eating, and what could be the long-term effects?

We have potentially more to lose by the introduction of GM crops. In America, farming takes place on an industrial scale, with millions of acres used exclusively for growing crops. Intensive use of pesticides has virtually wiped out wild animals and plants in the huge crop fields of the US. The Americans can afford to do this, as they also have many huge wilderness conservation areas often the size of several English counties, which are havens for all their native wildlife. Here however, farms are an integral part of the countryside. The use of herbicide- or insect-resistant crops could potentially have severe effects on our biodiversity, by virtually wiping out wild flowers and consequently the insects that feed on them, and further up the food chain, the predators that eat the insects.

Some crops are being developed to improve soil quality, by removing heavy metals from the soil, for example, so that they can be harvested and destroyed. An excellent idea, but what about the animals that eat the contaminated plants? Others are being developed for salt resistance, so that they can be grown in previously unusable areas. But what if their seeds were to be carried to a saltmarsh? Would they be a threat to wild species that have lived there naturally for years?

So far, there is no evidence of GM food being harmful to humans, but the rules governing their testing are less strict than with medicines, and after BSE, we know that "no scientific evidence of harm" is not the same as "safe to eat". A report published last year by Dr Arpad Pusztai sparked off public fears about GM foods. He claimed that his experiments, which involved feeding rats with potatoes genetically modified with a lectin gene from a snowdrop, caused stunted growth and immune system problems for the rats.

Though his report has been heavily criticised by other scientists, the Royal Society, Britain's oldest and most prestigious scientific body, has recommended that more research is needed. Each new genetic modification needs to be extensively tested for its safety, for not only humans but also animals and plants. No single test taken in isolation can either legitimate or condemn all GM food, or indeed any single genetically-modified organism.

Laboratory tests have shown that pollen from GM maize in the US damaged the caterpillars of the Monarch butterfly. This is a case of damage to a single species, but it does show that genetically-modified organisms could have the potential to do unexpected harm to other plants and animals. In the end, this could lead to a loss of biodiversity and to certain animal and wild plant species effectively being rendered extinct.

Where test crops have been planted in this country, there is a definite danger of cross-contamination with wild or non-GM plant strains. Even with very strict controls in place, it is impossible to prevent pollen from travelling on the wind from GM crops to other, possibly organic versions of the same crop being grown nearby. Pollen could also be carried by insects. This could mean that in the end, all our food crops could contain a proportion of genetically-modified elements, and we as consumers would lose our right to choose whether to eat GM foods or not.

The countries most affected by drought and famine, which are purported to be potentially the greatest beneficiaries of GM foods, are not showing great enthusiasm for the newly developed crops. In fact, 20 African countries including Ethiopia have published a statement in which they claim that gene technologies will not help their farmers, but would 'destroy the diversity, the local knowledge and the sustainable agricultural systems....and undermine our capacity to feed ourselves'. Some new strains of crop being developed by biotech companies have a 'terminator' gene built in to them to prevent farmers from keeping seeds produced by their crops for the following year. This could lead to complete dependence on the biotech company year on year, a very worrying development for farmers in poorer countries.

Whatever the potential gains for humanity, GM crops are being developed for profit. There may well be huge benefits to be had, but huge sums of money - currently billions of dollars - would not be invested in gene research if there were not the possibility of huge financial gains for the producers of GM crop strains in the future.

We quite simply do not know enough about the consequences for human, animal and plant life throughout the world of planting GM crops at the moment. More testing needs to be carried out, preferably by independent research bodies rather than biotech companies, before genetically-modified organisms should be released into the world.

GM foods are not necessarily bad, but permitting the expansion of GM crop planting and use in our food without proper knowledge as to the effects, both short- and long-term is at best unwise and at worst highly dangerous. It's not just we humans who could suffer, but ultimately many animal and plant species as well. Can biotech companies really be sure that their products will have no undue effects on biodiversity and food chains, and indeed on people's health? Until they are, the mass introduction of GM crops should not be permitted. We must proceed down the route of genetic modification with extreme caution, without denying that in some cases there could be great benefits to be had.

All content copyright of YPTE.

