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GMO

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A genetically modified organism (GMO) or genetically engineered organism (GEO) is an organism whose genetic material has been altered using genetic engineering techniques. [73] These techniques, generally known as recombinant DNA technology, use DNA molecules from different sources, which are combined into one molecule to create a new set of genes. [73] This DNA is then transferred into an organism, giving it modified or novel genes. [73] Transgenic organisms, a subset of GMOs, are organisms which have inserted DNA that originated in a different species. [73]Genetically modi¢ed (GM) crops are being developed for a variety of reasons, including resistance to herbicides and pests, length of shelf-life in the case of supermarket products, efficiency of processing and improved nutritional value.[57]

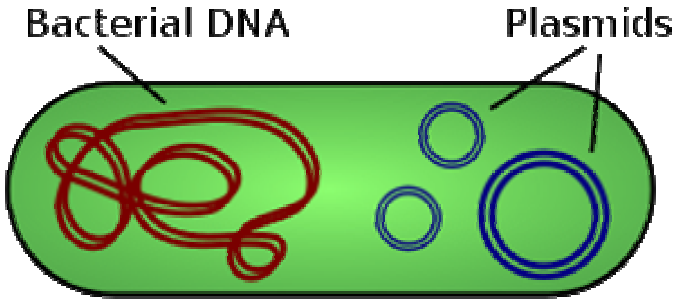
Successful attempts at genetic modification has been made in the 70s of last century, but GM foods commercially produced in the U.S. for the first time in 1996. [55] Although not done enough testing and analysis of the impact that GMOs may have on human health and the environment, companies engaged in genetic engineering, aggressively promote their products, promising higher yields using less pesticides and high resistance of crops. [55] So until 1999. 33% of areas planted with corn, 44% soybean, 55% cotton in the U.S. are now GM. [55]

Genetic modification involves the insertion or deletion of genes. [73] When genes are inserted, they usually come from a different species, which is a form of horizontal gene transfer. In nature this can occur when exogenous DNA penetrates the cell membrane for any reason. [73] To do this artificially may require attaching the genes to a virus or just physically inserting the extra DNA into the nucleus of the intended host with a very small syringe, or with very small particles fired from a gene gun.[1] However, other methods exploit natural forms of gene transfer, such as the ability of Agrobacterium to transfer genetic material to plants, [2] or the ability of lentiviruses to transfer genes to animal cells. [3]

Agrobacterium is a genus of Gram-negative bacteria established by H. J. Conn that uses horizontal gene transfer to cause tumors in plants. [73]

Agrobacterium is well known for its ability to transfer DNA between itself and plants, and for this reason it has become an important tool for genetic engineering. [73] Although generally seen as an infection in plants, Agrobacterium can be responsible for opportunistic infections in humans with weakened immune systems, [4] [5] but has not been shown to be a primary pathogen in otherwise healthy individuals. [73]One of the earliest associations of human disease caused by Agrobacterium radiobacter was reported by Dr. J. R. Cain in Scotland (1988). [6] A later study suggested that Agrobacterium attaches to and genetically transforms several types of human cells by integrating its T-DNA into the human cell genome. [73] The study was conducted using cultured human tissue and did not draw any conclusions regarding related biological activity in nature. [7]

The ability of Agrobacterium to transfer genes to plants and fungi is used in biotechnology, in particular, genetic engineering for plant improvement. [73] A modified Ti or Ri plasmid can be used. [73]



The plasmid is 'disarmed' by deletion of the tumor inducing genes; the only essential parts of the T-DNA are its two small (25 base pair) border repeats, at least one of which is needed for plant transformation.[73] Marc Van Montagu and Jozef Schell at the University of Ghent (Belgium) discovered the gene transfer mechanism between Agrobacterium and plants, which resulted in the development of methods to alter Agrobacterium into an efficient delivery system for gene engineering in plants.[8][9] A team of researchers led by Dr Mary-Dell Chilton were the first to demonstrate that the virulence genes could be removed without adversely affecting the ability of Agrobacterium to insert its own DNA into the plant genome (1983).[73] She and her collaborators produced the first genetically modified plants using Agrobacterium carrying the disarmed Ti plasmid (1983).[73] The genes to be introduced into the plant are cloned into a plant transformation vector that contains the T-DNA region of the disarmed plasmid, together with a selectable marker (such as antibiotic resistance) to enable selection for plants that have been successfully transformed. Agrobacterium is listed as being the original source of genetic material that was transferred to these USA GMO foods [10]:

Soybean

- Cotton
- Corn
- Sugar Beet
- Alfalfa
- Wheat
- Rapeseed Oil (Canola)
- Creeping bentgrass (for animal feed)
- Rice (Golden Rice)

The general principle of producing a GMO is to add new genetic material into an organism's

genome.[73] This is called genetic engineering and was made possible through the discovery of DNA and the creation of the first recombinant bacteria in 1973; an existing bacterium E. coli expressing an exogenic Salmonella gene.[11] This led to concerns in the scientific community about potential risks from genetic engineering, which were first discussed in depth at the Asilomar Conference in 1975.[73] Herbert Boyer then founded the first company to use recombinant DNA technology, Genentech, and in 1978 the company announced creation of an E. coli strain producing the human protein *insulin*.

[14] In the late 1980s and early 1990s guidance on assessing the safety of genetically engineered plants and food emerged from organizations including the Food and Agriculture Organization of the United Nations- продоволствената и селскостопанска организация към оон (FAO) and World Health Organization (WHO). [15][16][17][18] Small scale experimental plantings of genetically modified (GM) plants began in Canada and the U.S. in the late 1980s.[73]The first approvals for large scale, commercial cultivation came in the mid 1990s.[73] Since that time, adoption of GM plants by farmers has increased annually. [73]

GMOs are used in biological and medical research, production of pharmaceutical drugs, experimental medicine (e.g. gene therapy), and agriculture (e.g. golden rice). [73] The term "genetically modified organism" does not always imply, but can include, targeted insertions of genes from one species into another. [73] For example, a gene from a jellyfish, encoding a fluorescent protein called GFP, can be physically linked and thus co-expressed with mammalian genes to identify the location of the protein encoded by the GFP-tagged gene in the mammalian cell. [73] Such methods are useful tools for biologists in many areas of research, including those who study the mechanisms of human and other diseases or fundamental biological processes in eukaryotic or prokaryotic cells. [73]

To date the most controversial but also the most widely adopted application of GMO technology is patent-protected food crops which are resistant to commercial herbicides or are able to produce pesticidal proteins from within the plant, or stacked trait seeds, which do both. [73]

The largest share of the GMO crops planted globally are owned by the US firm *Monsanto*. [19]

To 2005. controls *88%* of areas under GM crops. And depending on the crops Monsanto has between *70* and *100%* market share.

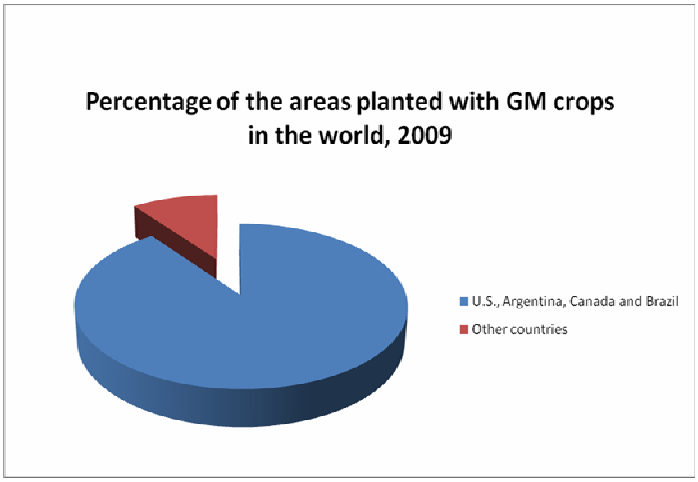
[55] Other producers of GMOs are *DuPont, Syngenta, Bayer, Dow* and several smaller companies. Besides GM seeds these companies produce and pesticides, which is recommended to spray crops. [55]

In 2007, Monsanto's trait technologies were planted on 246 million acres (1,000,000 km2) throughout the world, a growth of 13 percent from 2006.[73]However, patents on the first Monsanto products to enter the marketplace will begin to expire in 2014, democratizing Monsanto products. [73] In addition, a 2007 report from the European Joint Research Commission predicts that by 2015, more than 40 per cent of new GM plants entering the global marketplace will have been developed in Asia. [20]

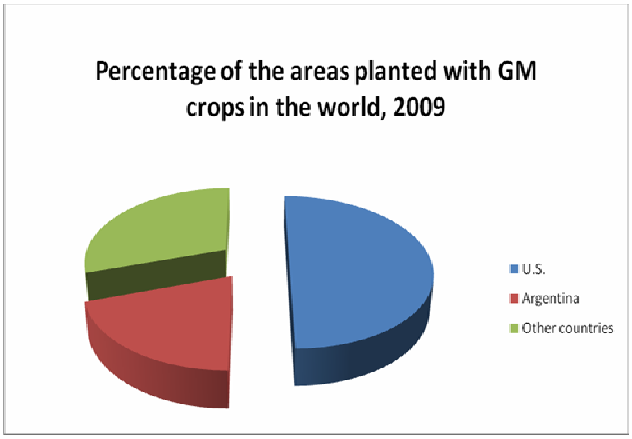
In 2006. - 10 years after its official entry in the market - GM crops are grown now to 102 mln.hektara arable land - an area that is approximately equal to the territories of France and Germany combined. [55]

In *2007*. area of GM plants has increased by 12 million and reached *114 mln.ha.* [55]

Over 90% of the area planted with GM crops are found in only four countries - the U.S., Argentina, Canada and Brazil. [55]



The U.S. produced more than 50% of GM crops offered worldwide, and 20% fall in Argentina. [55]



International Service for achievements in Agri-biotech Applications (ISAAA) classifies 14 countries as *"biotech megacountries"*, each of which have planted over 50,000 hectares of GM crops. [55] In addition to these top four producers (mentioned before) in this list are also India, China, South Africa, Uruguay, Paraguay, Philippines, Mexico, Australia, India and China are going to increasingly expansive front seats for growing GM cotton. [55]

There is increasing in area planted with GM crops in the European Union, which is mainly grown GM maize. [55]
62,000 ha in 2006.
110 000 ha in 2007.
Main producers are Spain, France, Czech Republic. [55]

In Bulgaria in 1999 was harvested the first crop of GM maize resistant to herbicides. [55] According to ISAAA in 2004 and 2005 patents in Bulgaria are not renewed and is not produced GM corn.

The global commercial value of biotech crops grown in 2008 was estimated to be US$130 billion. [73]

Percentage of GM crops compared to untreated (USA) (data from the National Agricultural Statistics Service, 2009.) Percentages are depending on the year. [73]

Crop	Areas planted with GM crops	Areas planted with untreated crops
Maize	81-86%	14-19%
Soy bean	88-90%	10-12%
Cotton	81-93%	7-19%

Each farmer decided to produce GM crops must buy seeds from the company holding the patents. [55] Farmers are prohibited from using left over from last year, GM seeds or those produced by themselves. [55] Every year, Monsanto filed about 500 lawsuits on suspicion of illegally using patented by the company. [55] Common cases are where it is not about improperly used patented seed for a random pollinated and contaminated with GMO crops, but even in this case the company holding the patent may bring to court over crop rights. [55]

Transgenic animals are also becoming useful commercially.

On February 6, 2009 the U.S. Food and Drug Administration approved the first human biological drug produced from such an animal, a goat.

[73] The drug, ATryn, is *an anticoagulant* which reduces the probability of blood clots during surgery or childbirth. It is extracted from the goat's milk. [25]

Bacteria were the first organisms to be modified in the laboratory, due to their simple genetics. [26] These organisms are now used for several purposes, and are particularly important in producing large amounts of pure human proteins for use in medicine. [27] Genetically modified bacteria are used to produce the protein insulin to treat diabetes. [28] Similar bacteria have been used to produce clotting factors to treat haemophilia, [29] and human growth hormone

(somatotropin, refers to the growth hormone 1 produced naturally in animals, whereas the term somatropin refers to growth hormone produced by recombinant DNA technology,[32] and is abbreviated "HGH" in humans.) to treat various forms of dwarfism.[30][31] Many medicines, including insulin and many immunizations are developed in transgenic animals.[33]

Genetically modified mammals are an important category of genetically modified organisms. [73]Transgenic mice are often used to study cellular and tissue-specific responses to disease.[73] In 2009, scientists in Japan announced that they had successfully transferred a gene into a primate species (marmosets) and produced a stable line of breeding transgenic primates for the first time.[34][35] Their first research target for these marmosets was Parkinson's disease, but they were also considering Amyotrophic lateral sclerosis and Huntington's disease. [36]

In 2009 first transgenic primates were produced (marmosets).

In 2011, scientists in China released news that they have introduced human genes into 300 dairy cows to produce milk with the same properties as human breast milk. [37]

Gene therapy

Gene therapy, [38] uses genetically modified viruses to deliver genes that can cure disease into human cells. Although gene therapy is still relatively new, it has had some successes. It has been used to treat genetic disorders such as severe combined immunodeficiency, [39] and treatments are being developed for a range of other currently incurable diseases, such as cystic fibrosis,[40] sickle cell anemia, [41] Parkinson's disease [42][43] and muscular dystrophy. [44] Current gene therapy technology only targets the non-reproductive cells meaning that any changes introduced by the treatment cannot be transmitted to the next generation. Gene therapy targeting the reproductive cells—so-called "Germ line Gene Therapy"—is very controversial and is unlikely to be developed in the near future.

Transgenic plants

Transgenic plants have been engineered to possess several desirable traits, such as resistance to pests, herbicides, or harsh environmental conditions, improved product shelf life, and increased nutritional value. [73]One of the examples include a genetically modified sweet potato, enhanced with protein and other nutrients, while golden rice, developed by the International Rice Research Institute (IRRI), has been discussed as a possible cure for Vitamin A deficiency. [73]

The coexistence of GM plants with conventional and organic crops has raised significant concern in many European countries. [73] Due to relatively high demand from European consumers for the freedom of choice between GM and non-GM foods, EU regulations require measures to avoid mixing of foods and feed produced from GM crops and conventional or organic crops. [73] European research programs such as *Co-Extra, Transcontainer, and SIGMEA* are investigating appropriate tools and rules. [73]At the field level, biological containment methods include isolation distance and pollen barriers. [73]Such measures are generally not used in North America because they are very costly and there are no safety-related reasons to employ them. [47]

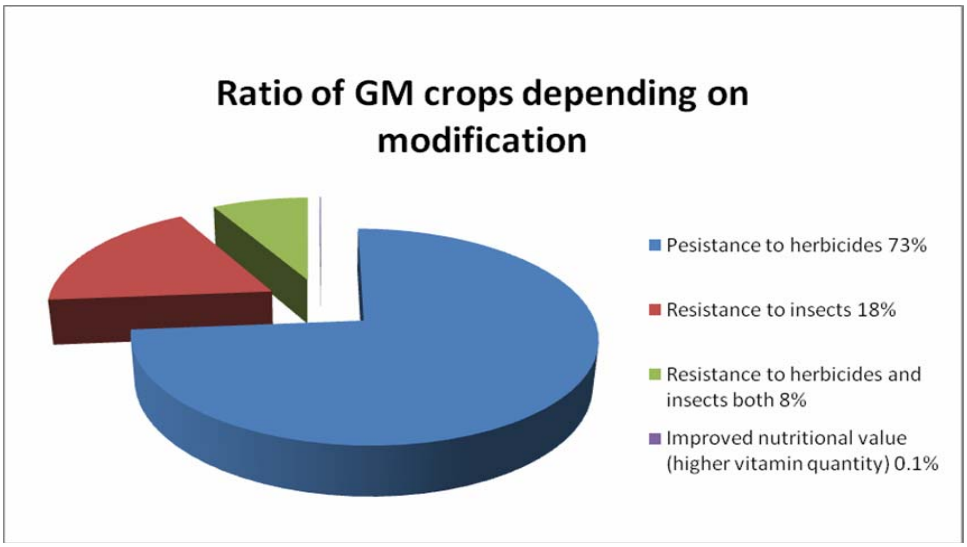
Safety of GMOs in foodchain?

The safety of GMOs in the foodchain has been questioned by some environmental groups, with concerns such as the possibilities that GMOs could introduce new allergens into foods, or contribute to the spread of antibiotic resistance. [49] According to a study published in 1999, there was no current evidence to suggest that the processes used to genetically modify food were inherently harmful.[50] However, a number of more recent studies [51][52] have raised concern, and environmental groups still discourage consumption in many countries, claiming that GM foods are unnatural and therefore unsafe.[53] Such concerns have led to the adoption of laws and regulations that require safety testing of any new organism produced for human consumption. [54]

In the early 90s a study in which mice were fed with GM tomatoes was done. [55]Well, in fact, the mice refuse to eat tomatoes and have them forced for fed. [55] Several mice developed stomach lesions and seven of 40 mice died within 2 weeks. [55] Scientists from the FDA (U.S. Food and administration of medicines) examined the results of the study and concluded that it does not prove that GM products are completely safe. [55] Some scientists from the Agency for the Control of

Food and Drug Administration warned that GM foods in general can lead to unpredictable allergies, accumulation of toxins, diseases resistant to antibiotics, and feeding problems at the cellular level. Internal memoranda of the FDA made available for public inspection during the trial show that government scientists have asked the administration to require long-term tests to demonstrate the safety of the subtle side effects. [55]The administration has its advocates in politics, including former attorney "Monsanto". [55]Warnings of scientists are ignored. FDA does not require safety tests. Instead, FDA assumes that if the producers of GM foods claim that their products are safe, then there is no basis for further questions. [55]

GM tomato was approved in 1994.
[55] According to a report of the American Academy of Sciences(AAS), the current system of full approval of GM foods by the FDA may omit unintended changes in their composition. [55] According AAS process of coupling of genes can lead to unpredictable changes in the body of the host gene. [55]Indian Council of Medical researches (ISMI [Indian Council of Medical Research (ICMR)]), who published their findings a few days earlier, identified a long list of potentially dangerous side effects of GM foods that have not been taken into account. [55] ISMI calls for complete overhaul of existing regulations. [55]



According to ICMR (Indian Council of Medical Research) [56]

Expressing concerns over health safety, ICMR study said “the use of recombinant DNA technology in the production of GM foods involves transfer of genes from different species into food producing organism. [56]Such a transfer is facilitated along with various regulatory elements obtained from bacterial or viral sources that are required to empower to produce the trait in the host organism. [56]The safety of these components of the genetic construct is not clearly known as they have the potential to induce toxicity, transfer to gut flora or produce unintended effects leading to changes that are relevant from toxicological/nutritional perspective. [56] According to ICMR of importance have been the antibiotic resistant genes that are frequently used as selection markers in the genetic modification process. Such genes have the potential to adversely affect the therapeutic efficacy of orally administered antibiotics. [56] The study also expressed concern over the possibility of transfer of GM DNA from plant to gut microflora of humans and animals. Such resistance, if transferred to pathogenic micro-organisms, might exacerbate the problem of resistant strains of bacteria. [57] Already a clinically signifficant resistance to third generation cephalosporins used in the treatment of gonorrhoea and other sexually transmitted diseases has been reported worldwide [59][60][61]. This is of particular relevance when considering GM crops that carry the blaTEM gene from which cephalosporin resistance has evolved.

One particularly important example of this is the case of animal feedstuffs, where material from transgenic plants encounters bacteria in the ruminant gut. It is not clear whether the

transfer of such genes from transgenic plant to microbe can be completely excluded. [57]Moreover, DNA from an M13 mp18 phage ingested by mice was detected in their gastrointestinal tract[64]. It was able to penetrate the intestinal wall into the nuclei of spleen and liver, where it was found to be covalently linked to the host DNA [65]. There is evidence to suggest that foreign DNA originating from daily intake of food may be covalently linked to the host DNA [66]. The likely consequences of such genetic recombinations for mutagenesis have not been investigated. [73]

However, it was observed in a cell-free system that specific patterns of de novo methylation of foreign DNA occur as a result of insertion of foreign DNA into the mammalian genome, thus triggering extensive changes in cellular DNA methylation patterns at sites far away from the locus of insertional recombination [67]. These alterations may contribute to the potential of foreign DNA to induce oncogenesis. [57] Therefore one aspect of the current debate on the safety of GM food is to know what conditions are necessary in installations preparing animal feeds to prevent gene transmission, i.e. what conditions of food processing would ensure suffcient disruption of DNA. [57] It is believed that DNA fragmentation in heat, pressure and other physical and chemical processes can occure so that can be used in the preparation of food (for animal and human both). [57]Treatment of plant tissues at temperatures of 95³C or above for more than a few minutes is su¤cient for degradation of DNA to take place to the extent that it should be incapable of transmitting genetic information. [57] In the case of wet sugar beet pulp, where high temperatures were not incurred, DNA was still intact but when the pulp is dried, DNA was severely fragmented. [57] In 2000 research results clearly show that DNA remained stable in silage and so it would seem sensible not to use ensiled GM crops as animal feed in the event of a signi¢cant risk of transmission of a transgene from GM source to the gut of farm animals being identified. [57]

Most critics believe that the safety tests conducted by the biotech industry are often superficial and avoid problems. [55] Unfortunately, scientists are speaking out against such research, and those certainly found evidence of the dangers of GM foods have been subjected to threats, layoffs, termination of status and money for research. [55] For example, one study in Britain and subsidized by the government shows that rats fed GM potatoes developed tumor cells, suffer from impaired immune systems, partial atrophy of the liver, and delayed development of the brain, liver and testes. [55] When the head of research publicly express their concerns, he was quickly fired after 35 years of service and dissuaded by the trial. [55]

While there are few studies on the safety of consuming GM animals, GM crops harm has mountains of evidence and should be carried out more tests. Rats fed GM corn developed problems with cell division. [55] Those fed GM soy shows division problems in the liver cells and lungs of those fed with rape are becoming more severe. [55] Pigs fattened with GM corn developed pseudopregnancy or infertility. [55] Cows fed GM corn in Germany died mysteriously. [55] In chickens fed GM maize with the number of deaths is 2 times more than in periods when the chickens are fed with unmodified corn. [55] After GM soy entered the British market, soy allergies jumped 50%. [55] Without additional tests can not be sure whether genetic engineering is the basis of the problem, but on the other hand there are many ways genetic changes lead to exacerbation of allergies. [55]

GM corn and most GM crops are enriched with genes resistant to antibiotics. [55] ISMI, the American Medical Association, WHO and other international organizations have already voiced their concerns that these genes could be attached to the bacteria in our digestive system. [55] These concerns have been associated with the possible emergence of new, super-diseases that are not affected by antibiotics. [55] In his defense, biotech companies argue that DNA decays completely in digestion and can not be made such a transfer. [55] described above human study refutes such allegations. [55]

Facts and fallacies

- *GM crop yields are higher.* The first evidence of decreased yield in soybeans are genetically modified in 1999. [69] Average decrease was 5.3% and in some areas of the U.S. and conventional culture gives a 10% greater harvest of genetically modified. [69] A researcher from the University of Nebraska Roger Elmore confirmed the reduced yields by 5-10% in independent studies in 2001 and confirms

that they are the result of genetic intervention. [69] Indirect recognition of yield reductions come from the company Monsanto. [69] With this one of the biggest advantages of genetically modified crops - the economic benefit of keeping them - is refuted, especially given that soy is most grown plant biotechnology products. [69] Cultivation of GMOs (glyphosate-tolerant) soybeans instead of untreated is only costing American farmers $ 11 billion less revenue for the period 2006-2009. [69] As early as 1999 reduced yields were observed. [69]

- *GMOs lead to the use of fewer pesticides.* Herbicide-tolerant plants allow the treatment of crops with powerful chemicals, thus destroying the weeds, but not noble culture. [55] So farmers can spray more often with a herbicide, without leading to destruction of their crops. [55] And weeds become resistant to herbicides. [55] To deal with this resistance, farmers treat their crops with herbicides more intense. [55] So for the period 1994 - 2006, the quantity of glyphosate, which is sprayed every acre GM soybeans in the U.S. increased by more than 150%. [55]
- *GM can solve the problem of hunger.* Even at the dawn of GMOs and big promises of higher yields arose otherwise humane idea that this is a way to combat world hunger and food crisis. [55] Great expectations, however, become even greater disappointments. GM crops not only have coveted a cheap alternative to starvation. [55] An example is the so-called failure of so-called golden rice - rice enriched with vitamin A, for the population of countries like India. [55] Unfortunately, people for whom this is intended rice are unable to buy even plain rice, let alone more expensive "golden" rice. [55]

Influence

Genes that are inserted at random locations may interact with other genes and may even disrupt their activities. [55] In addition to the desired insect-or herbitside resistence, much of GM plants contain marker genes for antibiotic resistance. [55] There is a risk that these genes can be transferred from plants to bacteria, where bacteria will develop resistance to the appropriate antibiotic, which are treated. [55] GM products contain new proteins that we have not eaten before. [55] For example, although not typical for GM maize there can be found proteins of bacteria, in the GM potatoes - proteins of viruses and in the GM tomatoes - fish proteins.[55] Still there are not enough information on what reactions to GM foods could cause the human body for a longer period of time. [55]

Research from 2002 to the company Monsanto itself / classified and made available to the public as a result of leaks in 2005 / showed the direct link between the use of GMO foods and kidney damage and liver, organs that eliminate toxins trapped in body. [70] In varying degrees, however, are found disabled of the heart, endocrine glands, spleen and bloodstream. [70]

A new report published in December 2009 in the International Journal of Biological Sciences has confirmed that GM maize causes cancer and damages the major organs in mammals. [70] The study used three varieties genetically modified corn Monsanto. [70]

In November 2008 the Austrian government published the results of studies showing adverse effects of undoubtedly genetically modified food on the reproductive system. [71] A reduction in the number of successive generations and lower birth weight compared with their parents fed with GMOs.[71] Deviations are statistically significant, ie case of significant deviations from the norm. [71] Published results provide confirmation that still little is known about the nature of genetically modified products and their impact on health in the long run. [71] They also call into serious doubt the system of risk assessment, which currently operates in the European Union. [71]

Risk to human health exists because of the increasing use of herbicides, which are treated with herbicide-tolerant crops. [55] The two main herbicide, which is treated with GM crops are glyphosate (including Roundup of Monsanto) and ammonium tolerance (including Liberty of Bayer). [55] Experiments show that glyphosate causes many chronic diseases. [55] The Swedish government recommends to the EU to ban glyufozinat because of the serious risk to consumers and the environment. [55] In Denmark it is already banned. [55]

GMOs into the environment

GM is spreading dangerously easy.[55] Ordinary plants can be pollinated by pollen

from GM plants. [55] Wind, insects and animals favor the spreading of pollen over long distances, which can lead to cross-pollination and contamination of conventional crops with GMOs. [55] For example, in Mexico corn is national pride and is present in over 100 varieties. [55] In order to protect this traditional culture of GMO contamination, the country has banned the cultivation of GM maize. [55] This happens in 2000. [55] For comparative analysis of GM corn and wild areas of Mexico, in the wild Mexican maize specific to GM crops genes were found. [55]

Some experts say that the massive introduction of GMO crops is the main reason for the disappearance of bees and butterflies.[70] If GM crops destroy insects that pollinate plants, instead of solve the problem of feeding the world population, GM crops doom humanity of total food crisis and will have a disastrous impact on biodiversity.[70]

In August 2010 for the first in the U.S., genetically modified plants that grow around uncontrolled land in South Dakota was discovered. [48]Some were crossed with wild species and so have created new plants resistant to most herbicides. [48] The finding is troubling for several reasons - first, it is clear that GM crops can survive and even dominate in the wild for decades. [48] Second, clear existing regulations are not sufficient to stop the spread of GMOs outside the controlled zones. [48]

In Arkansas hundreds of specimens of modified rapeseed through fields, woods, parks, cemeteries and sidewalks of South Dakota was discovered. [48] After analysis of 406 plants, it became clear that 80% of them have at least one transgene. [48]

GM plants have managed to "escape" from the controlled area before - in Canada and Japan. [48] However there, they were limited to areas of farmland. [48] The successful interception of GMOs into the wild forests and meadows is a worrying sign, because till now modified crops defenders argued that they are too fragile to be able to survive in the wild, not to mention to "colonize" their natural counterparts. [48] However, this is clearly more possible. Furthermore - the combination creates a completely new and uncontrollable mutants. [48]

GMO regulations in the U.S. are much less strict than in Europe, experts soothe. [48] However, total control over nature is hardly possible on any continent - and obviously the consequences are unpredictable. [48]

Europe and GMOs

Europe resisted the growing of GM foods. [55] More than a decade after the commercialization of GMOs only one crop - Bt maize MON810 for Monsanto, is grown for commercial purposes. [55] Although in 2007 there is almost double the area planted with GM maize (up to 110 000 ha), long-term opportunities for the development of GMOs seem weak. [55] Major manufacturers of GM maize in Europe are Spain (70 000 ha) and France (20,000 ha). [55] In late 2007, the French government announced that it suspended all commercial growing of GM maize and French President Nicolas Sarkozy made a statement in which admitted: "The truth is that we have doubts about the benefits of GMOs which are resist to herbicides and insects; truth is that we have doubts about the control the spread of GMOs, the truth is that we have doubts about the health and environmental benefits of GMOs." [55]

Romania also took in the footsteps of France, imposed a ban on the cultivation of the only GM crop cultivation in the EU - maize MON810. [55] Such a step previously taken and Austria, Hungary, Greece, Germany, Poland and Luxembourg. [55] Restrictions in the EU for cultivation of GM crops does not mean that there are no such GM foods in the marketplace. [55] The EU is the largest importer of soybeans and soy products, and they for the most part consist of RR soybeans of Monsanto. [55] So far, more than 30 GMOs and derived products have been approved for distribution in the EU market. [55]

Bulgaria and GMOs

In the spring of 2005 Bulgarian Parliament passed a law on GMOs, which prohibit field trials and the release of important crops such as Bulgaria rose oil, tobacco, grape, cotton, wheat and all kinds of fruits and vegetables. [55] The deliberate release of GMOs into the territories included in the National Ecological Network under the Biological Diversity Act, and in the 30-kilometer buffer zone around them. [55] In Bulgaria has banned the sale of GMOs, containing marker genes for antibiotic resistance. [55]

Otherwise, the Bulgarian legislation allows the market to offer foods containing GMOs, but this must be indicated on the label. [55] However, in most cases the rules are not followed. [55] Although GMOs are not listed on labels, according to a study of the "Mayday" from the end of 2006. GMOs can be found in soy nuts, sauces and chocolate wafers on the Bulgarian market. [55] In March 2010. by an absolute majority, parliament banned the cultivation of GMOs in the country with the adopted final amendments to the Law on Genetically Modified Organisms. [55]

GMOs free areas

At the beginning of 2007. over 4,500 municipalities, 236 region, and thousands of farmers, communities and food producers in Europe have called for a "GMO free" - in other words, they will not allow the use of GMOs for agricultural and nutritional needs of their territory. [55]

In Bulgaria, after the campaign of the Association "Agrolink" There are 6 municipalities, GMO-free - Satovcha, Banite, Ivaylovgrad, Kardjali, Zlataritsa and Borino. [55] During the campaign, "tomato mutant" in the summer of 2007. more than 5,000 people have signed a declaration declaring Bulgaria for country free of genetically modified organisms. [55]

Conclusion

What you need to do today is subject to advocate the teaching material for secondary schools. Information "blackout" creates conflicts that fill the web and beyond. As a topical issue at present, the facts must be presented as they are indeed. So everyone will make conclusions for himself.

Foods that contain transgenes is right to be identified.

Each of us needs to demonstrate active citizenship and a desire for better control over food safety, health and not least the nature that surrounds us. And why not return to the traditional selection, made by generations.

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