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Pros and Cons of Genetically Modified Organisms

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Genetically modified organisms are organisms whose genetics have been manipulated with genetic engineering. The use of GMOs has become quite popular for a variety of different purposes. Even though there are many chances of using GMOs, there are also many dangers related to them. In this article, the pros and cons of GMOs are examined in detail. While the use of GMOs can give us the opportunity to greatly improve the overall quality of life of millions or even billions of people all over the world, it can also imply serious dangers to humanity and we should be quite careful not to do more harm than good when we use this kind of technology.

GMOs

Pros	Cons
▪ GMOs can help us to increase crop yields	▪ Religious concerns regarding GMOs
▪ Use of genetically modified organisms can reduce the global hunger problem	▪ Humans should not play god
▪ More people may get out of poverty	▪ Spread of serious epidemics or pandemics
▪ GMOs may contain higher amounts of beneficial substances	▪ We may underestimate the risk of GMOs
▪ Can make plants more resistant	▪ Possible safety issues of GMOs
▪ GMOs may help to lower food prices	▪ GMOs may also alter the DNA of natural plants
▪ Efficient land use	▪ Allergic reactions related to GMOs
▪ Easy to cultivate GMOs	▪ GMOs may have the potential to alter our DNA
▪ Less work is needed in agriculture	▪ May make us more vulnerable to serious diseases
▪ Taste of food may be improved through GMOs	▪ Insufficient objectivity related to GMOs
▪ We can save water in agricultural processes	▪ Use of GMOs is not natural
▪ Longer shelf-life of genetically modified food	▪ May lead to antibiotic resistance
	▪ GMO labels are often missing or misleading

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Pros of genetically Modified Organisms(GMOs)

1. GMOs can help us to increase crop yields
2. Use of genetically modified organisms can reduce the global hunger problem
3. More people may get out of poverty
4. GMOs may contain higher amounts of beneficial substances
5. Can make plants more resistant
6. GMOs may help to lower food prices
7. Efficient land use
8. Easy to cultivate GMOs
9. Less work is needed in agriculture
10. Taste of food may be improved through GMOs
11. We can save water in agricultural processes
12. Longer shelf-life of genetically modified food
13. Less need to use large amounts of pesticides
14. GMOs may be important to feed our growing world population

- **GMOs can help us to increase crop yields**

One key advantage of GMOs is that they can greatly help farmers around the world to increase their crop yields. Farmers often have to rely on rather weak plant strains, which are usually quite vulnerable to the spread of diseases. This also implies that these farmers often lose a significant portion of their crop yield to pests. Moreover, also the growth behaviour of plants is often not optimal. Thus, in order to mitigate those issues and to optimize crop yields, GMOs can be used since those types of crops guarantee optimal growth behaviour and higher yields. Especially in countries where agriculture is still done in a rather inefficient manner, the use of GMOs can have a huge impact on crop yields.

- **Use of genetically modified organisms can reduce the global hunger problem**

If crop yields are much higher due to the use of GMOs in agriculture, chances are that also more people will get enough food in order to develop in a healthy manner. Getting enough food is crucial that our body and our brain can work properly. Especially for children, sufficient food is decisive in order to assure proper growth of these children. However, in many poor countries all over the world, the local population still suffers from significant hunger and even starvation.

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- **More people may get out of poverty**

Another benefit of GMOs is that more people will be able to get out of poverty.A proper diet is quite important so that our body and our brain can work in an optimal manner. Thus, if people get more food due to the use of GMOs in agriculture, they will also have more power and better mental capacities to learn and to progress. In turn, more of those people will be able to get proper education and to get out of poverty at one point in time. Moreover, not only the general public, but also many small farmers will greatly profit from GMOs since they will be able to increase their profits and farmers who had been barely able to survive without GMOs may now be able to get out of poverty pretty easily due to much higher yields.

- **GMOs may contain higher amounts of beneficial substances**

The crops that can be produced with the help of genetic engineering can also contain higher amounts of nutrients, vitamins and other beneficial components compared to crops from non-GMO plants. Consequently, GMOs can not only help to increase overall crop yields, they can also help us to supply the general public in poor countries with higher levels of nutrients, which can be quite important to strengthen the immune system of those people and to give them more power so that they can master several difficulties in their daily life.

- **Can make plants more resistant**

Another upside of genetically modified organisms is that they are often also more resistant against certain pests and plant diseases. In many countries all over the world, farmers often lose a significant fraction of their yield due to pests or unwanted insects. However, through the use of GMOs, the plants will be better able to protect themselves against pests and crop losses due to pests may be significantly lower.

- **GMOs may help to lower food prices**

Since farmers may be able to produce more crops if they use GMOs, chances are that also the local food prices will decrease over time. In many cases, especially in poor countries of our planet, the local population will suffer from serious unemployment and many people will not be able to afford to buy basic food in order to survive. Even people who work quite hard often only earn quite poor wages and are also often not afford too much food. Hence, in order to improve the conditions for those people, GMOs can greatly help since through a

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reduction in food prices, poor people will be able to afford more food, which is crucial to stay healthy and full of energy in order to manage their harsh daily life.

- **Efficient land use**

It is also crucial that we as humanity as a whole use our land as efficiently as possible in order to solve several environmental problems. However, in many countries, agriculture is still done in a rather inefficient manner and the crop yields per square foot are quite low. This is due to the fact that many farmers still don't use sufficient amounts of fertilizer. It is also due to the fact that farmers often use strains that are quite vulnerable. Therefore, a significant fraction of crop yields is lost each year, which also implies serious levels of inefficiencies in agricultural processes. Therefore, GMOs can also be used in order to optimize the efficiency of agricultural processes.

- **Easy to cultivate GMOs**

Another upside of GMOs is that they are also quite easy to use. Since they are often more resistant compared to strains that have not been genetically modified, farmers will also have quite an easy time cultivating those plants since they are designed to protect themselves against many adverse outside influences and farmers cannot mess it up too much anymore. Hence, GMOs can also greatly facilitate agricultural processes, which can be quite beneficial, especially for young farmers who often do not have sufficient knowledge in agriculture yet.

- **Less work is needed in agriculture**

In general, through the use of GMOs in agriculture, farmers will also have less work since plants are often more resistant and farmers don't have to put in too much manual effort anymore. This is quite important since it gives farmers all over the world more time to do whatever they want to do. Those farmers may even be able to invest time in a side-hustle, which may turn into a serious job in the future or can make at least some additional money. In turn, more farmers may be able to get out of poverty thanks to the additional time they have to invest in projects that are not linked to agriculture.

- **Taste of food may be improved through GMOs**

Plant genetics also determine how our food will taste. Therefore, if we are able to modify plant and crop genetics, chances are that we will also learn to alter the taste of vegetables and fruits over time. In the long run, this can also lead to a state where our food

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may taste much better, which in turn can greatly improve our overall quality of life. However, it is not yet clear to what extent this will ever be possible.

- **We can save water in agricultural processes**

Another important chance of GMOs is that we can also save plenty of water in agriculture over time. Many people all over the world think that water is an endless resource and that we don't have to save water due to that. Moreover, in many countries, tap water is quite cheap and therefore, many people also don't value this resource in the way it should be valued. In fact, water is vital for all life on earth and in the near future, it will become a quite scarce resource due to global warming. In fact, many millions of people, especially in the Southern hemisphere of our planet, will suffer from serious water scarcity in the future. Therefore, it is crucial that we save as much water as possible in various parts of our daily life. One opportunity to save water in agriculture is to use genetically modified organisms since they often need far less water compared to conventional crops.

- **Longer shelf-life of genetically modified food**

The genetics of crops can also be modified in a way that those crops will have a much longer shelf-life compared to crops that have not been modified. Many grocery stores and also private persons throw away plenty of food every day and in order to reduce our food waste, it is crucial that we rely on crops that have a longer shelf-life. Thus, genetic engineering also has the potential to reduce our overall food waste.

- **Less need to use large amounts of pesticides**

Since GMOs are often designed to have pest-resistant characteristics, there will also be less need to use excessive amounts of pesticides in agricultural processes. The use of pesticides can be quite harmful to our environment since it pollutes the soil and it also attacks many other living organisms. Hence, in order to prevent those adverse effects, GMOs can be used so that there will be less need for pesticide use.

- **GMOs may be important to feed our growing world population**

Our world population is growing at a rapid speed and overpopulation will become a serious problem over the next decades. In order to feed all those people on our planet, we have to significantly increase our crop yields. GMOs can also greatly help us in this regard since agricultural processes can be optimized and also the yields will be much higher on

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average. Hence, GMOs can also help to mitigate the adverse effects of the overpopulation problem to a certain extent.

Cons of genetically modified organisms (GMOs)

1. Religious concerns regarding GMOs
2. Humans should not play god
3. Spread of serious epidemics or pandemics
4. We may underestimate the risk of GMOs
5. Possible safety issues of GMOs
6. GMOs may also alter the DNA of natural plants
7. Allergic reactions related to GMOs
8. GMOs may have the potential to alter our DNA
9. May make us more vulnerable to serious diseases
10. Insufficient objectivity related to GMOs
11. Use of GMOs is not natural
12. May lead to antibiotic resistance
13. GMO labels are often missing or misleading
14. Many people just don't even know that they eat genetically modified food

1. Religious concerns regarding GMOs

Apart from the various important advantages of GMOs, there are also many issues related to those genetically modified organisms. One problem with GMOs is that they may violate some religious beliefs or other cultural values. Many religious people think that those kinds of genetic manipulation should not be tolerated since they are against human nature and may do more harm than good in the long run.

2. Humans should not play god

Opponents of genetic engineering also often claim that humans should not play god and that the use of GMOs goes way too far. We should not be able to alter the DNA of other living organisms since this is a privilege that only god should have. Hence, especially in regions where the majority of the general public is quite sceptical regarding the concept of GMOs, genetically modified organisms may have not a bright future in those regions.

3. Spread of serious epidemics or pandemics

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Even though GMOs are usually meant to improve the living conditions of millions or even billions of people on our planet, quite the opposite can happen if genetic engineering gets out of control and genetically modified bacteria can spread. In turn, this can lead to serious epidemics or even pandemics.

4. **We may underestimate the risk of GMOs**

In general, many researchers seem to greatly underestimate the risks that are implied by the use of GMOs on a global scale. In fact, genetic engineering is a rather new concept and in many cases, we will actually have no idea about the real consequences of GMO usage. Therefore, humanity should take great care in order not to underestimate the risks that are implied by the use of genetically modified organisms.

5. **Possible safety issues of GMOs**

It is also yet rather unclear how big the safety issues of GMOs really are. However, it should be clear that the use of those genetically modified organisms will pose some risk and in order to minimize the risk for catastrophic outcomes, governments all over the world should spend large amounts of money on R&D subsidies related to GMOs.

6. **GMOs may also alter the DNA of natural plants**

Another disadvantage of GMOs is that not only the DNA of one plant species is altered also the DNA of wild natural plant species could be altered in the long run. Insects will eat parts of the GMOs and will therefore alter their own DNA. Moreover, also the DNA of natural plant species will get altered over time since those plants may get pollinated with the pollen from GMOs and as a result, hybrids will be borne that carry both the natural and the GMO DNA inside them. This can greatly alter the natural fauna and the long-term effects of the spread of those hybrids are still unclear.

7. **Allergic reactions related to GMOs**

Researchers also found that GMOs can also increase the risk of allergic reactions of people. However, quite little is known about how GMOs can cause allergic reactions and how those reactions can be prevented. Thus, in order to make GMOs safer for human use, plenty of research has still to be done in order to minimize the risk of those allergic reactions.

8. **GMOs may have the potential to alter our DNA**

Our DNA evolved over many thousands of years and for a good reason. We as humanity have adapted too many different circumstances and our body and our brain

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developed in order to solve problems as best as possible. Therefore, our DNA can be considered to be optimized as best as possible up to this point. However, through the consumption of GMOs, chances are that our genetics will get modified over time.

9. May make us more vulnerable to serious diseases

Even though genetic engineering is meant to do the opposite, it can also make us much more vulnerable to new diseases which we might even not be aware of yet.Our genetics are quite complicated and if we alter them, we will improve in some parts while getting weaker in other parts. Hence, we may make us also much more vulnerable to certain diseases if we use genetic engineering in an excessive manner.

10. Insufficient objectivity related to GMOs

Researchers in the field of GMOs may also be quite biased in their risk evaluation. This is due to the fact that many corporations who currently engage in the field of genetic engineering are owned by private shareholders and the research results from those companies may neglect many of the risks that might be associated with the use of those GMOs. Therefore, insufficient objectivity regarding the research related to GMOs can be another serious danger to humanity.

11. Use of GMOs is not natural

Opponents of GMOs also often claim that the use of genetically modified organisms is not natural at all. In fact, genetics evolved over millions of years in a natural manner without humans ever be involved in this process. Hence, it may seem rather questionable whether it is a good idea to actively manipulate genes in an unnatural manner.

12. May lead to antibiotic resistance

Another downside of GMOs is that the excessive use of modified organisms can also lead to antibiotic résistance. Antibiotic resistance already is a significant problem and many people die each year due to that. However, this problem can become much bigger through the use of GMOs on a large scale. Therefore, in order to avoid a further increase in the antibiotic resistance issue, we might rather want to rely on conventional plants instead of using GMOs.

13. GMO labels are often missing or misleading

There are also some labels that aim to show people which foods have been produced with the help of GMOs. However, in many regions, those labels are still missing or are just

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misleading. Thus, in many cases, customers will not be able to recognize whether their food had been produced with GMOs or not.

14. Many people just don't even know that they eat genetically modified food

Many people are also not aware at all that they might eat GMO-food on a regular basis.This is simply due to the fact that the awareness of the general public is still missing on this important topic since it will not often be discussed on our TV channels. Hence, also the education of the general public about GMOs and their potential dangers should be improved quite a lot so that people will be able to better evaluate possible risks related to GMOs.

Top 10 Gmos Pros & Cons – Summary List

GMOs Pros	GMOs Cons
GMOs can help to mitigate poverty	Long-term effects of GMOs are still unclear
Can improve overall quality of life of people	Humans should not play god
GMOs can reduce global hunger and starvation	May harm the local flora and fauna
More efficient land use	Spread of epidemics or pandemics
Quite easy to cultivate	GMOs can cause allergic reactions
GMOs can be more resistant against pests	Research regarding GMOs may be biased
Farmers may have more leisure time	GMOs can lead to antibiotic resistance
Better supply of the local population with food	GMO labels can be misleading
Lower need to use pesticides	Technology behind GMOs not mature yet
May be crucial to feed our growing population	Genetically modified organisms are not natural

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Benefits of GMOs
Nutritional value of foods could be improved (e.g. by introducing proteins, vitamins or vaccines)
Crops can be produced that lack known allergens
Crops can grow in arid conditions for better yield (e.g. by introducing drought resistant genes)
GM crops can produce herbicides to kill pests
Improve food supply / agriculture in poor countries (GM crops can be engineered for improved yields)
GM crops may have longer shelf lives (less spoil)
Reduces economic costs and carbon footprint – less need for land clearing and pesticide usage

Risks of GMOs
New traits could cause adverse health reactions (e.g. new proteins may cause allergic responses)
Removal of traits could have unknown effects
Crops may limit biodiversity of local environment (increased competition with native species)
Cross pollination could lead to 'super weeds'
Patents restrict farmers from accessing GM seeds (biotech companies hold monopolies over crop use)
Foods with GM components may not be labeled
Different governments may have conflicting regulatory standards concerning safe usage

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