

The Disadvantages of Biotechnological Products

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Biotechnology ranges from brewing beer to genetically engineering crops to making enzymes into cleaning products. Wherever science manipulates nature for human ends, biotechnology is there. Its benefits are considerable, but so are the negatives of biotechnology.

Breeding plants and animals and using yeast to make bread are ancient forms of biotechnology. Newer versions involving genetic manipulation raise more questions for many people. Does using herbicide-resistant farm crops increase immunity in weeds? Do we know enough about human beings to manipulate our genetics safely?

Biotechnology in History

"Biotechnology" is a new word stuck on a very old concept: the idea of **manipulating natural processes** for our own benefit. Beer brewing is millennia old and relies on mixing natural ingredients with yeast to cause fermentation. Cheesemaking, using natural substances to transform milk, goes back at least 4,000 years.

By the end of the 19th century, science had made huge strides in genetics and chemistry, which made biotechnology much more precise. Beer brewing and cheesemaking today can be controlled much more precisely, and scientists have developed entirely new fields of biotech.

- Synthetic insulin has replaced animal insulin as the primary treatment for diabetics.
- As we learn more about the human genome, it makes genetic treatments possible for human diseases such as hemophilia.
- By manipulating plant genomes, scientists can create plants that are resistant to insecticide or herbicide or have greater yields.

Pros and Cons of Biotechnology in Agriculture

If most people had to list the 10 disadvantages of biotechnology, agricultural uses would rank high. Just look at how many foods proudly advertise as having no genetically modified ingredients. Countless articles and scientific papers have debated the pros and cons of biotechnology in agriculture.

Consider the pros of biotechnology:

- Genetically engineering crops can make them resistant to disease and insect attacks.
- Inserting genes that make crops immune to herbicide allows farmers to eliminate weeds without hurting crops.
- There's less need to till the soil to kill weeds, which reduces erosion.
- Plants can produce toxic chemicals that kill off insect predators.
- Genetic engineering can make plants produce more food or improve their nutritional profile.
- Biotechnology can keep plant foods shelf-stable for longer periods.

Consider the cons of biotechnology:

- As farmers use herbicides more regularly, it accelerates the development of immunity in weeds.
- Genetically modified organisms are covered by patents. Farmers who replant seeds from a patented crop as they would with ordinary plants have faced lawsuits.
- Relying on GMOs reduces the natural genetic diversity found in agriculture. If, say, all corn or soybeans have the same genetic profile, there's a greater chance of some fungus or parasite wiping out the entire national crop.
- GMO seed is more expensive, though it can also lead to greater profits from a larger yield.

Risks of Biotechnology in Humans

Many people are uneasy about having products from GMOs in their food. Genetic engineering in human beings raises even more concern about the negative aspects of biotechnology. Monstrous experiments on humans have been a staple of horror movies, and for many people, the real thing is equally as troubling.

Many diseases stem from genetic problems, so **treating them genetically** can save or transform lives. This is effective if there's a single genetic issue that's easy to identify and treat. It's possible that eventually, we will be able to enhance human

beings: stronger hearts, greater intelligence, more disease resistance. Critics see a downside.

- Much of our bodies and health aren't the product of single genes but complex interactions. It's entirely possible that in trying to improve ourselves, we'll create unwanted, disastrous side effects.
- Some genetic diseases aren't as simple to treat as fixing one rogue gene.
- There are serious ethical issues when science experiments on humans.
- If we're altering genes to "improve" people, does that raise different ethical questions from altering genes to fix verifiable problems?
- Can we regulate human biotechnological treatments to gain benefits while restricting abuse?