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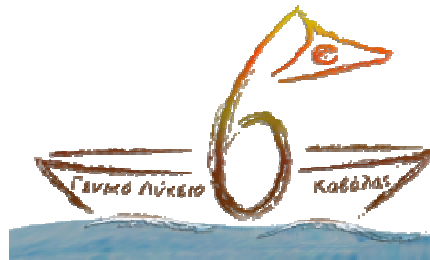
“Destination: Happiness!”

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6th Senior High School of Kavala

**Module III: Research
Genetically modified food**



Genetically Modified Food

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Genetically Modified Food

- [1] Genetically modified (GM) foods are foods derived from organisms whose genetic material (DNA) has been modified in a way that does not occur naturally.
- Currently available GM foods stem mostly from plants, but in the future foods derived from GM microorganisms or GM animals are likely to be introduced on the market.
- GM foods can also allow for reductions in food prices through improved yields and reliability.
- In the future, genetic modification could be aimed at altering the nutrient content of food, reducing its allergenic potential or improving the efficiency of food production systems.

Genetically Modified Food

[3]

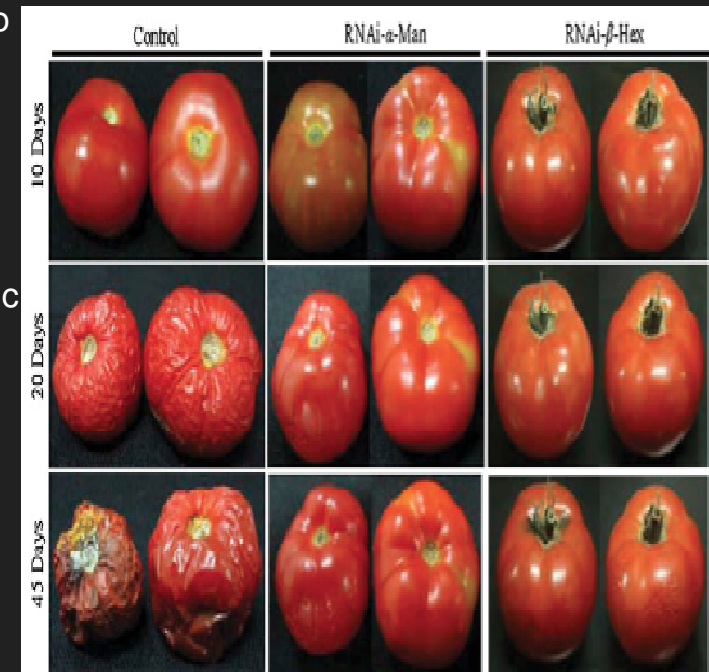
- All genetically modified foods currently available on the international market have passed safety assessments and no effects on human health have been shown as a result of consuming GM foods.
- No allergic effects have been found relative to GM foods currently on the market
- Several countries have developed preventative strategies, including clear separation of GM and non-GM food crops. Each GM organism uses different genes and is used in different ways.
- Therefore, each GM food should be tested and their safety assessed on a case-by-case basis using international guidelines.



Genetically modified tomato

- [3] A genetically modified tomato, or transgenic tomato, is a tomato that has had its genes modified, using genetic engineering.
- The first trial genetically modified food was a tomato engineered to have a longer shelf life (the Flavr Sac), but never made it to market. The first direct consumption tomato was approved in Japan in 2021. Primary work is focused on developing tomatoes with new traits like increased resistance to pests or environmental stresses.
- Agrobacterium-mediated genetic engineering techniques were developed in the late 1980s that could successfully transfer genetic material into the nuclear genome of tomatoes.
- Genetic material can also be inserted into a tomato cell's chloroplast and chromoplast plastomes using biolistics.
- Tomatoes were the first food crop with an edible fruit where this was possible.

[4]



Genetically modified soy

- [5]The major development in soybean agriculture over the last decade has been genetically modified (GM) soybeans.
- Genetically engineered organisms are produced by using high-tech methods to insert one or more genes from one species (plant, animal or microbe) into another species (soybeans in this case).
- In crop plants the inserted genes are usually ones that give herbicide resistance or pest resistance to the GM variety, thus, according to the marketing hype, the farmer can use less herbicide or insecticide, with cost savings and less environmental pollution.
- The promoters of GM crops have claimed that the technology is entirely safe—safe as food and safe for the earth.
- Actually, they haven't really turned out that great, and now are undergoing lawsuits around the world because of how they, and the pesticides they depend on, work to destroy ecosystems.
- Not to mention, surveys of GM-using farms have found either very slight reductions in herbicide/pesticide use, or in the case of GM soybeans, considerably higher herbicide use.

[6]



Genetically Modified Oats

- [7]No oats (regardless of their country of origin) are genetically modified.
- Well there simply isn't enough oats grown in the world to warrant the expense of the research and development of oat GM varieties. On the global scene, oats are considered as a minor crop.
- Another reason is that oats have 6 chromosomes so their genome is massive. That means that developing GM varieties would be very expensive and tricky.
- So the humble oat is left out in the cold when it comes to research – from a consumers point of view this means that oats are going to remain in their traditional form for a long time to come.

[8]



Genetically Modified Food

[10]

- [9]In 1989 we initiated a research program aiming at the stable transformation of barley. To achieve this, the availability of efficient procedures to regenerate barley plants from cells and/or tissues is essential.
- The current protocol enables us to regenerate 50-100 green fertile barley plants from a single anther.
- The use of microspore cultures in studies on cell differentiation will be described.
- Finally, the use of transformation technologies to improve malting quality of barley will be discussed.



Genetically Modified

- [12] Genetically modified (GM) salmon were patented by Canadian scientists who took a gene that regulates growth hormones in Pacific Chinook salmon and a promoter—the equivalent of a genetic 'on-off' switch—from an ocean pout and introduced them into the genetic structure of an Atlantic salmon.
- This modification gave the Atlantic salmon a year-round appetite enabling it to reach market size faster than other farmed salmon.
- A company called AquaBounty now plans to use these GM fish to produce salmon eggs at its research hatchery on Prince Edward Island, Canada. The company wants to ship the commercially produced eggs to Panama, where the fish will be grown in a land-based facility and, if approved by the U.S.
- Food and Drug Administration (FDA), sold as table-ready GM salmon in the U.S. marketplace.

[11]



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- [11] [AquaBounty GE 'super' salmon on verge of approval--Should it be feared or welcomed? | Genetic Literacy Project](#)
- [12] [Genetically modified salmon | Living Oceans](#)