



HUMAN PRACTICES COLLABORATION

RICE iGEM TEAM

IONIS PARIS TEAM

COLOGNE-DUSSELDORF TEAM

Universidad Politécnica de Valencia
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GMO LEGALITY AND SOCIAL PERCEPTION

RICE UNIVERSITY TEM

- **How is the transgenic regulation in your country? Is it legal to grow, sell and consume them?**

Currently the only FDA approved genetically engineered animals in the food supply are AquAdvantage Salmon (approved in 2015). It is illegal to introduce food from an unapproved GE animal into the food supply without FDA permission. A different type of GE animal, biopharm animals produce substances for pharmaceutical use. In 2009 a GE goat was approved that produces a human biologic in its milk. In 2015 a GE chicken that produces a human biologic in its eggs was approved.

The FDA also regulates genetically engineered plants. Food and food of ingredients from GE plants have been in our food supply since the 1990s. The FDA does not require labeling for foods from genetically engineered plants, but some manufactures voluntarily label. The US is the world's leading producer of GE crops. In 2013, 93% of the soybeans, 90% of the cotton, and 90% of the corn grown in the US were genetically engineered.

Explain your society perception about transgenic consumption.

Anecdotally, I can say that I don't really consider whether there are transgenic animals/plants in the food I buy. I think that this is probably true for most U.S. consumers. Some brands do advertise as being "GMO Free" and most consumers probably think that this is a positive feature, similar to a product being labeled as organic.

Do you think that is viable to grow transgenic plants in your own house or in public spaces?

I would say that it is viable to grow transgenic plants. Since GE crops are such an important part of the US economy lawmakers are fairly accommodating.

FDA information about genetically engineered animals:

<https://www.fda.gov/AnimalVeterinary/DevelopmentApprovalProcess/GeneticEngineering/GeneticallyEngineeredAnimals/ucm113672.htm>

FDA information about food from genetically engineered plants:

<https://www.fda.gov/Food/IngredientsPackagingLabeling/GEPlants/ucm346030.htm>

Legal Report on Restrictions on Genetically Modified Organisms:

<https://www.loc.gov/law/help/restrictions-on-gmos/usa.php#Foodstuffs>

IONIS PARIS

We are making a transgenic situation world study, so we are contacting with different teams to make a Human Practices collaboration. We would like to know current situation of transgenic consumption in your country writing an up to 300 words text. Here you are some ideas as guidelines to write the text.

- **How is the transgenic regulation in your country? Is it legal to grow, sell and consume them?**

- In France, transgenic regulation is very controlled. GMOs are allowed to grow in Europe, but each European country can decide if they accept to cultivate transgenic crops. In 2013, France decided to prohibit the culture of GMO maize (MON810).

We have different organisations that are going to decide what to do when it is related to transgenics. In France we have the Haut conseil des Biotechnologies that provide independent information to the French government on all matters relating to GMOs or any other biotechnology. They study new biotechnologies and write reports to the government in which they explain what is the position of each project depending on the regulation. They also evaluate all the risk link to the use of biotechnology and they analyse all the societal aspects related to biotechnology. If a company or a laboratory want to work with GMOs they have to fill a document from the Haut Conseil des Biotechnologies in order to declare the GMOs that they are using. They also do environmental monitoring reports concerning genetically modified crops authorized in the European Union.

In France most of the feeding of livestock (80%) is GMO imported from South America and USA (yes the feeding is most of the time soybean meal from GMO soybean crops). Nowadays after the MON810 ban the Parliament is opposed to the Commission's plan to authorize the importation of food and feed derived from MON810 resistant to weed killers and pests or containing them. this new opposition was adopted on Wednesday 5 April 2017. In France it is allow to work using transgenesis in the laboratory only if everything has been declared, authorised and confined by the GMO regulation. To sell GMOs

you have to follow several controls by the government and each GMO product has to be labelled before it is sold. GMOs are consumed most of the time by livestock, the only GMO forbidden in France is the transgenic maize, it is allowed to consume GMO but they have to be labeled.

- **Explain your society perception about transgenic consumption.**

- In France the society does not accept GMOs. They are very strict with what GMO means. Here in Paris we see more and more shops that sell organic products to offer an alternative to GMOs and industrial agriculture. One of the reasons that the society perception is not agreed with GMOs is the insufficient and incorrect communication coming most of the time from the media. People is not aware of what GMOs can really do and the only image that they have about GMOs is related to Big companies that cause problems. There are a lot of articles in which they explain what are GMOs and what they can do.

One of the big things to do in order to understand GMOs is to inform properly. The French society has therefore a very negative opinion on GMOs due to lack of proper communication.

- **Do you think that is viable to grow transgenic plants in your own house or in public spaces?**

- Nowadays NO. Scientific as us and startups working in synthetic biology are working in bringing new tools to make the society think differently about GMOs.
- In my opinion it is going to be very complicated to grow transgenic plants in our own house or in public spaces, due to all French regulations or at least you have to do it secretly ;) ! I have faith that in few years the situation will change and we will be able to grow transgenic plants freely - Alicia
- Gabrielle : In France, no it would be impossible. Gene modification is highly regulated in our country, and especially because of ethical issues and in order to avoid gene transfers. In our own houses they are not enough plants to alter biodiversity but it is still an ethical problem. It could have long term effects, for example. However, I think

having genetically engineered plants in my house would not have a real usefulness unless it has a health effect if I am sick. Moreover, growing transgenic plants in public areas would be even more difficult, because of a possible biodiversity alteration, and effects on the public. Even if it is harmless, these technologies are difficult to handle and it has to have a very strong safety aspect.

- Agathe: Fears towards GMOs are closely related to the question of their dissemination in the environment through pollinisation especially, as well as the consumption of “synthetic” food. Growing such plants at home has not the same impacts as in an open field, as you can personally choose which kind of plant you grow, how many, and what for. For example, I would totally accept to have decorative transgenic plants in a close room of my home as I know they won't have any impact on the external plant ecosystems, and it will not have any consumption purpose. Plus, you can choose a lot of funny features that could bring a lot of creativity to public spaces ! Even if they will surely not be welcomed in public places today, GMOs considered as objects rather than food should be less confronted to strong regulations and public fears.
- Paul I would not do it because I do think that GMOs are made to enhance resistance to pests and yield. If I ever have to grow plants in my house, it would be for their kind company and to bring some natural aspect to my house, so I have no reason to rely on GMOs. However if I could buy a glowing GMO plant I would do it because it is cool (even though it is for the moment forbidden in France).

Glossary:

- http://www.lemonde.fr/planete/article/2014/05/28/l-interdiction-des-ogm-en-france-securisee-juridiquement_4428323_3244.html
- <http://www.ogm.org/Tout%20savoir/Historique/historique-des-evenements-relatifs-aux-ogm-en-france-et-dans-le-monde.html>
- <http://www.hautconseildesbiotechnologies.fr/fr/article/missions>
- <http://www.ogm.gouv.fr/spip.php?article51>

COLOGNE – DUSSELDORF

The legislation of growing, selling and consuming genetically modified organisms (GMOs) in Germany is subject to that of the European Union (EU). Even though the laws in the EU regarding GMOs are already quite strict, the laws in Germany are even more so. The regulation regarding liability for accidental contamination and the safety requirements for release of GMOs are stringent.

The cultivation of genetically modified crops is discouraged in Germany. This can be seen in the example of MON810 maize. While it is legal to cultivate it for agriculture purposes in the European Union, in Germany even this is banned.

The German Farmer's Association also disapproves of genetically modified crops as these are not popular among the German population. The label "No genetic engineering" is commonly found on animal products such as milk. On the other hand, some farmers also see the advantages of genetically modified plants and are disappointed because they are not able to plant them.

It is allowed to import the different GMOs which are approved for food or feed by the EU. Mostly these are used for feeding of livestock. To be able to label your product "No genetic engineering" it has to be free of traces of GMOs and for meat products the animals have to be fed a GMO free diet for a certain amount of time.

In case of a contamination of a neighboring field by a grower of genetically modified plants, he is responsible for the damage done by it. As the German population is quite negative regarding the consumption of genetically modified food