



Can GMO products be Halal certified

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What's a Genetically Modified Organisms

A genetically modified organism (GMO) is an organism whose genetic material has been altered using genetic engineering techniques.



How does Genetic Engineering work?

1. Isolate a gene with a desired trait
2. Change the gene so it will work in plants
3. Prepare plant cells or tissue
4. Transform plant cells using a gene gun or bacteria infection method
5. Re-grow cells to plants via tissue culture (cloning)

Currently commercialized **GM** crops include:

1. Soy beans



2. Corn



3. Cotton



4. Canola



5. Sugar Beets



6. Zucchini



7. Rice



8. Tomato



9. Potato



10. Alfafa



11. Peas



12. Melon



What Ingredients derived from GM **soybeans**?

Soy flour



soy protein



soy isoflavones



soy lecithin



tofu



What Ingredients derived from GM **corn**(Maize)?



Corn flour



corn gluten



corn starch



Corn oil



Corn flakes



High fructose
corn syrup



Some of the Ingredients That May Be Genetically Modified

Vegetable oil



Vegetable fat

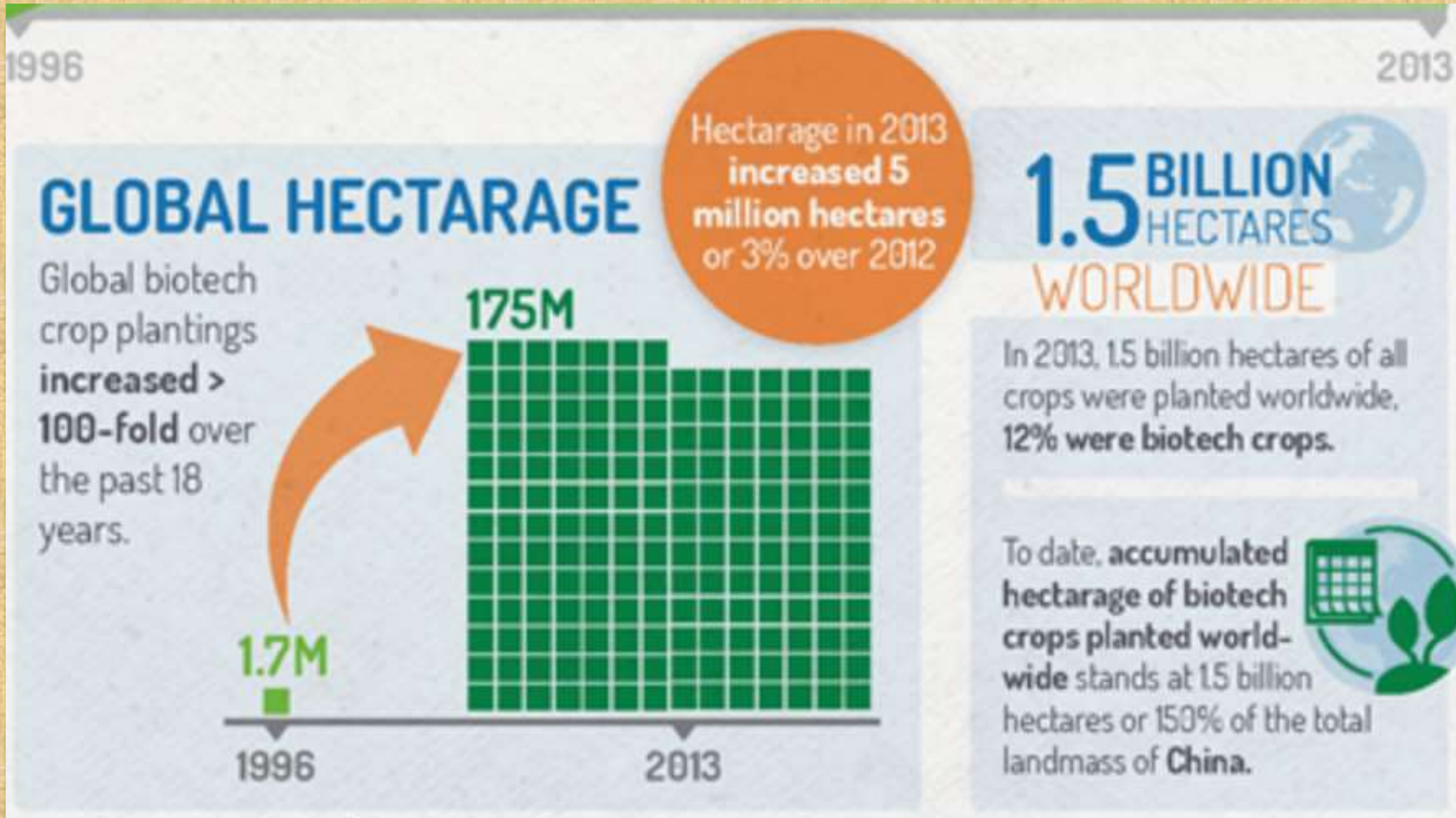


Margarine



(Made with soy, corn, cottonseed, and canola)

Global Status of commercialized GMO crops



GLOBAL STATUS OF COMMERCIALIZED BIOTECH/GM CROPS IN 2013

18 million farmers

in **27** countries planted

175 million hectares of biotech crops

GLOBAL BIOTECH CROP
 HECTARAGE MARKS
18 YEARS
 OF CONTINUED GROWTH



27 COUNTRIES PLANTED BIOTECH CROPS IN 2013

THE 4 MAJOR BIOTECH CROPS ARE: SOYBEAN, COTTON, MAIZE, & CANOLA

CANOLA



8.2 million hectares
grown in **4** countries

MAIZE



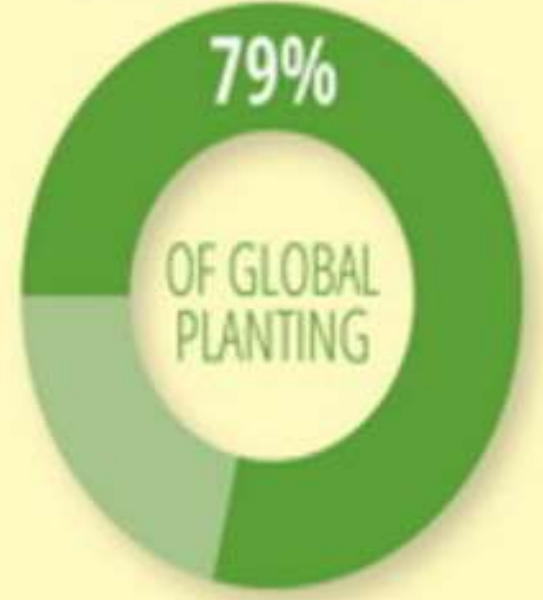
57.4 million hectares
grown in **17** countries

COTTON



23.9 million hectares
grown in **15** countries

SOYBEAN



84.5 million hectares
grown in **11** countries



Benefits of GM Crops



- Pest resistance
- Herbicide tolerance
- Disease resistance
- Cold tolerance
- Drought tolerance
- Salinity tolerance
- Faster maturation
- Vitamin enrichment
- Altered fatty acid composition



FDA declares GMOs no different

“The agency is not aware of any information showing that foods derived by these new methods differ from other foods in any meaningful or uniform way.”





From the FDA
to Monsanto
and back
again... and
again... and...



Michael Taylor

- In charge of FDA policy
- Former Monsanto attorney
- Later Monsanto vice president
- **NOW** he is Deputy Commissioner for Foods, Food and Drug Administration

MONSANTO



**NO FOOD
SHALL BE
GROWN
THAT WE
DON'T OWN**

GREENPEACE



Risk of Genetically Modified Food



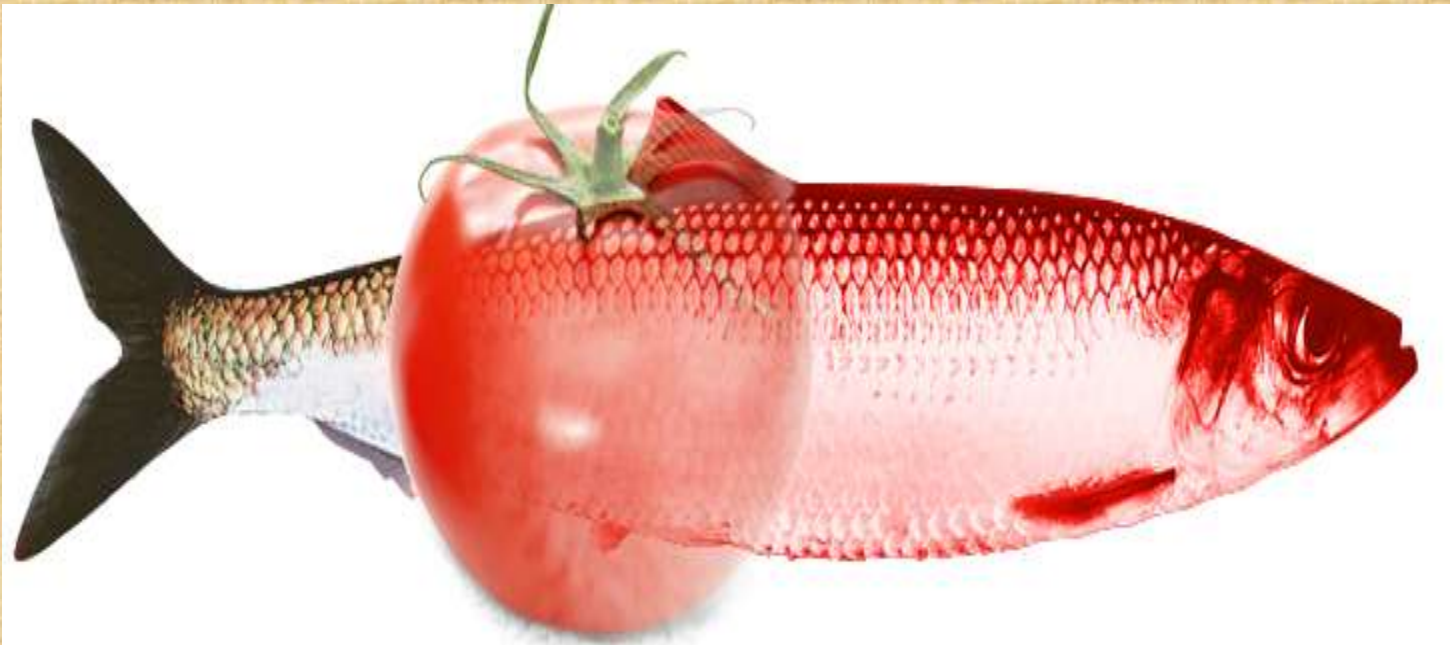
It Is Unnatural, Has Unpredictable Results, and Can Lead to Unexpected and Unintended Side Effects

The organisms resulting from this technology are alive, can mutate, multiply, breed with other living things, and continue breeding for generations to come. This trend has been observed and recorded all around the world. This is an imperfect technology with inherent dangers It is the unpredictability of the outcomes that is most worrying.” The food produced using such unnatural technique is expected to be unnatural too.



Genetic Uncertainties and the Disturbance of Nature's Boundaries

Natural boundaries are violated—crossing animals with plants, strawberries with fish, grains, nuts, seeds, and legumes with bacteria, viruses, and fungi, or like human genes with swine



Unpredictability and the Unknown

Insertion of the genetic material in a host would lead to uncontrolled and erratic behavior in the host. This is because DNA is complex and there is the potential of complex interactions. These interactions can cause gene suppression or over-expression, causing unpredictable and uncommon changes. The potential hazards are difficult to predict with any certainty. The technique of using the “gunshot” to blast DNA fragments through cell membranes is cited as an example, leading to unpredictable consequences. The foreign genetic material is shot in a random, unpredictable way, possibly resulting in unknown products.





The Risks of GMOs

We've got the studies to prove it >

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Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize

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Manuela Malatesta^b, Didier Hennequin^c, Joël Spiroux de Vendômois^a

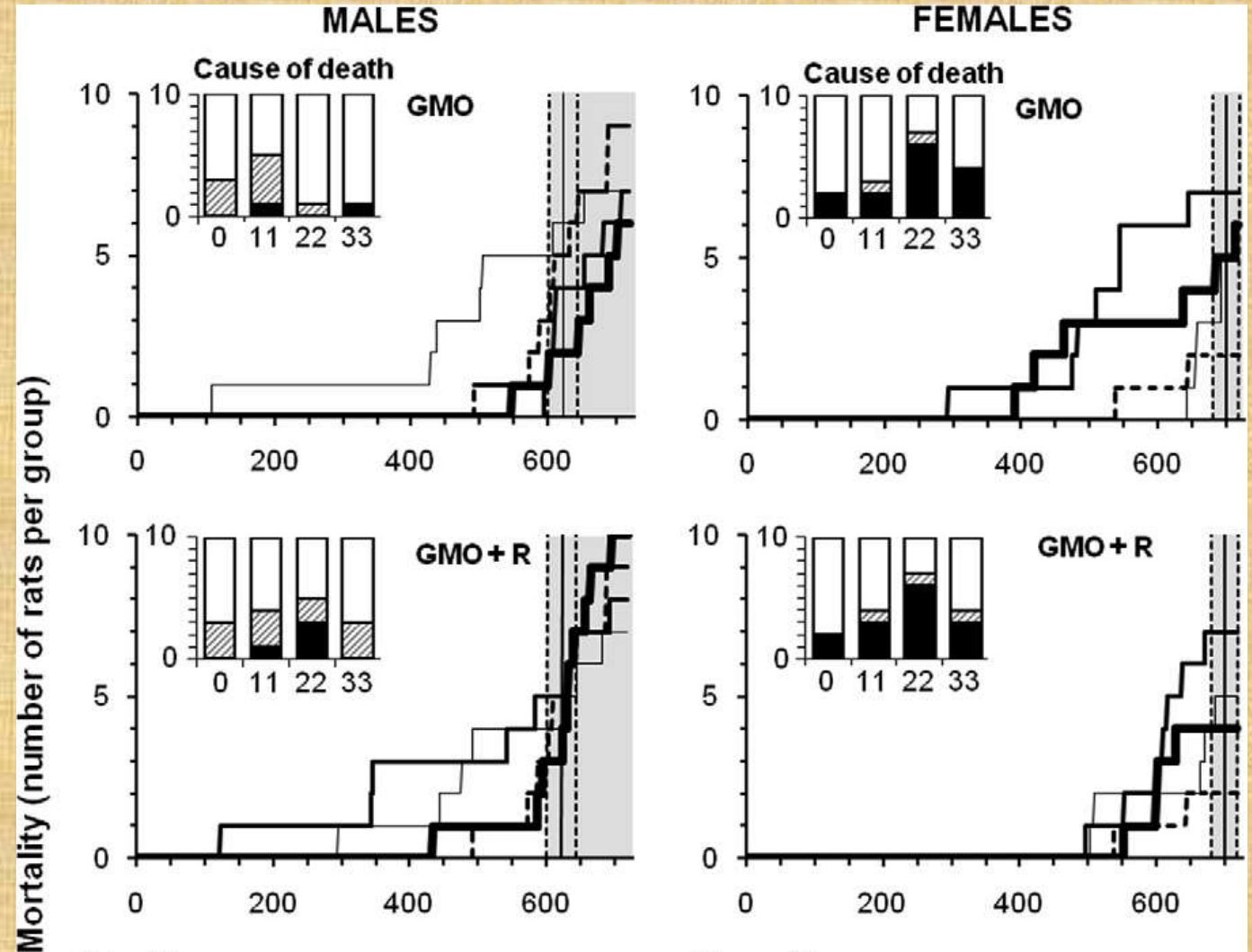
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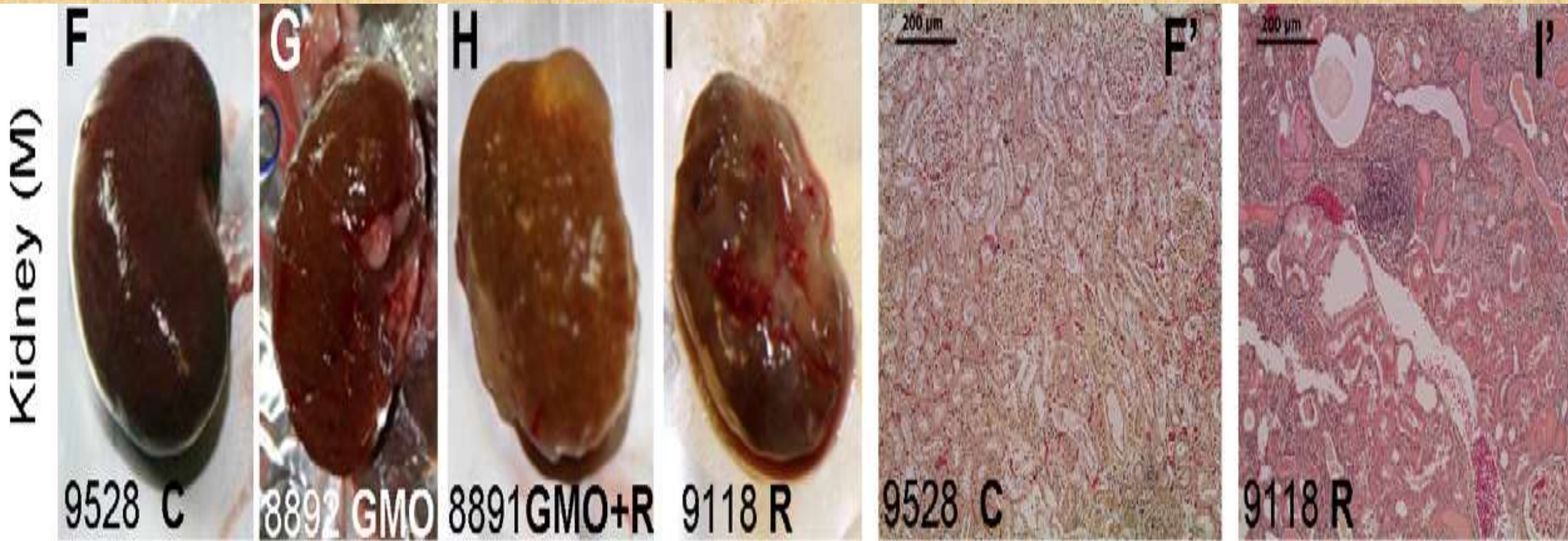
^c University of Caen, UR ABTE, EA 4651, Bd Maréchal Juin, Caen Cedex 14032, France

MORTALITY RATE

- *"In females, all treatment groups showed a 2-3 fold increase in mortality, and deaths were earlier.*
- *"This difference was also evident in three male groups fed with GM maize.*



KIDNEY



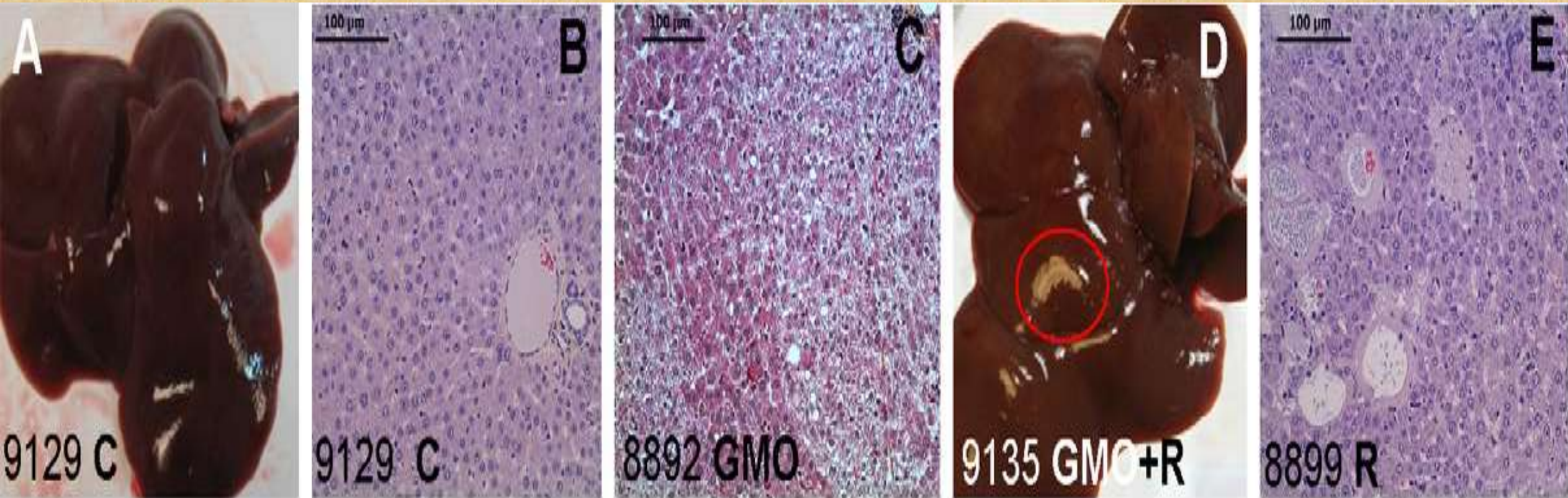
Control

Treatments

Control

Treatments

LIVER



Control

Treatments

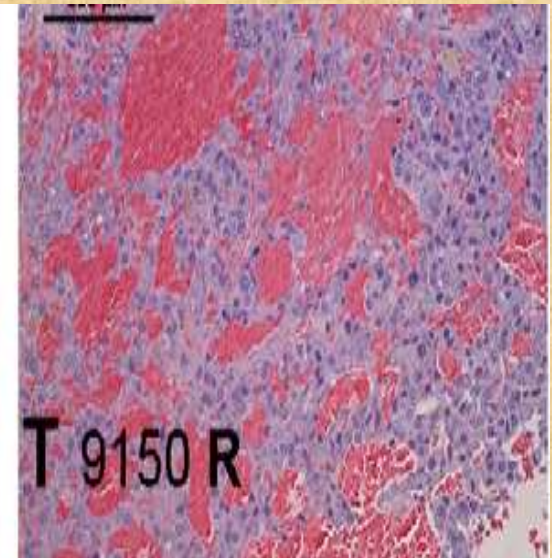
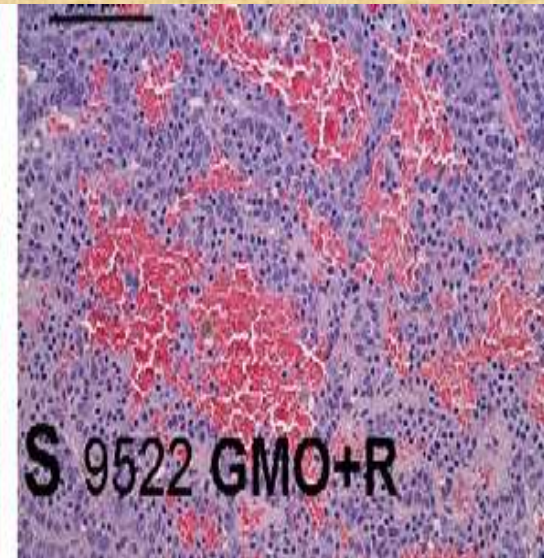
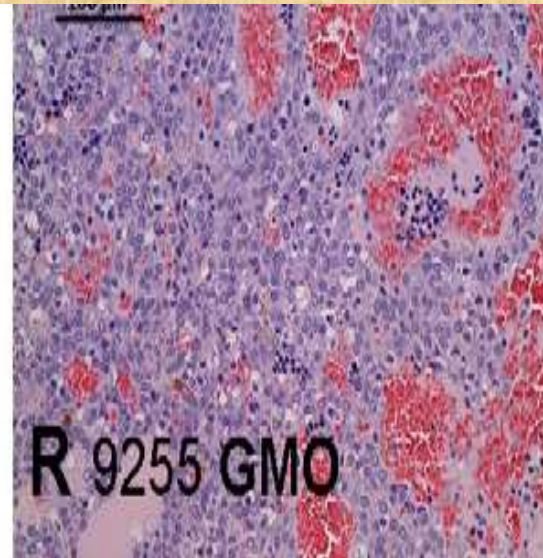
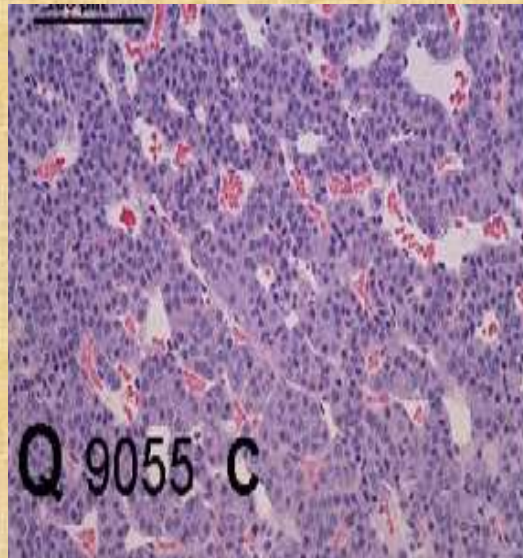
TUMORS





- *"Males presented up to four times more large palpable tumors starting 600 days earlier than in the control group, in which only one tumor was noted."*

PITUITARY GLAND



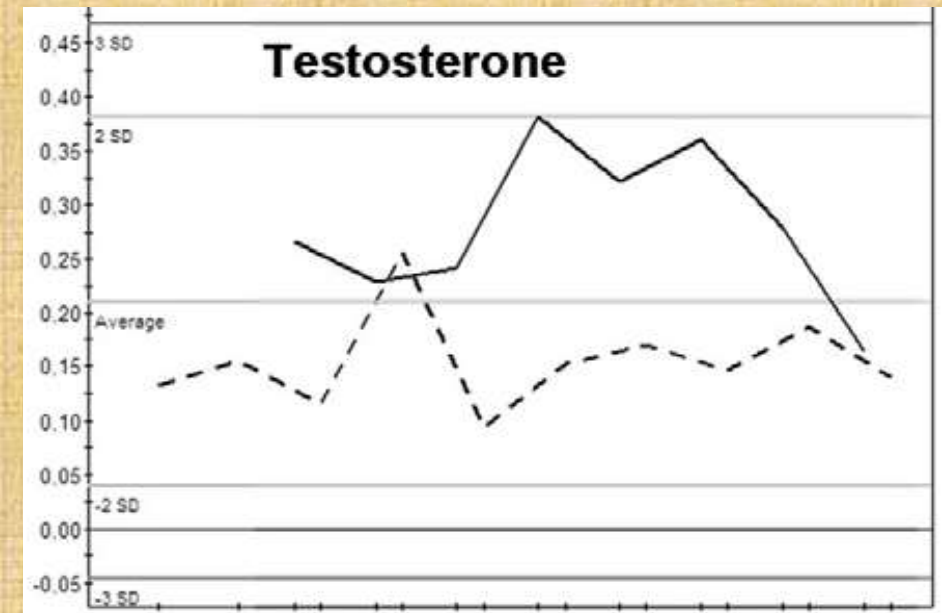
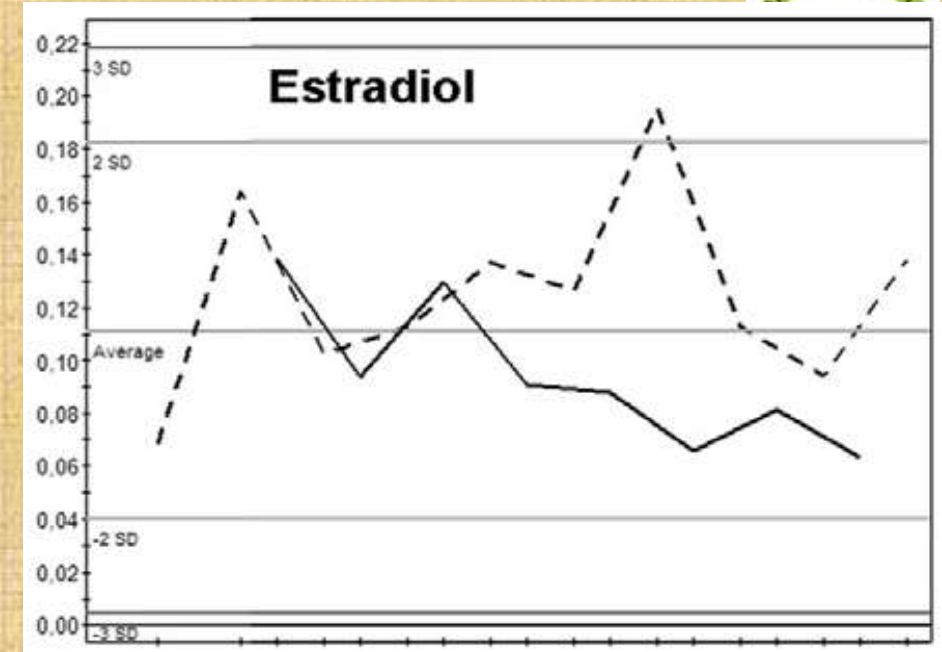


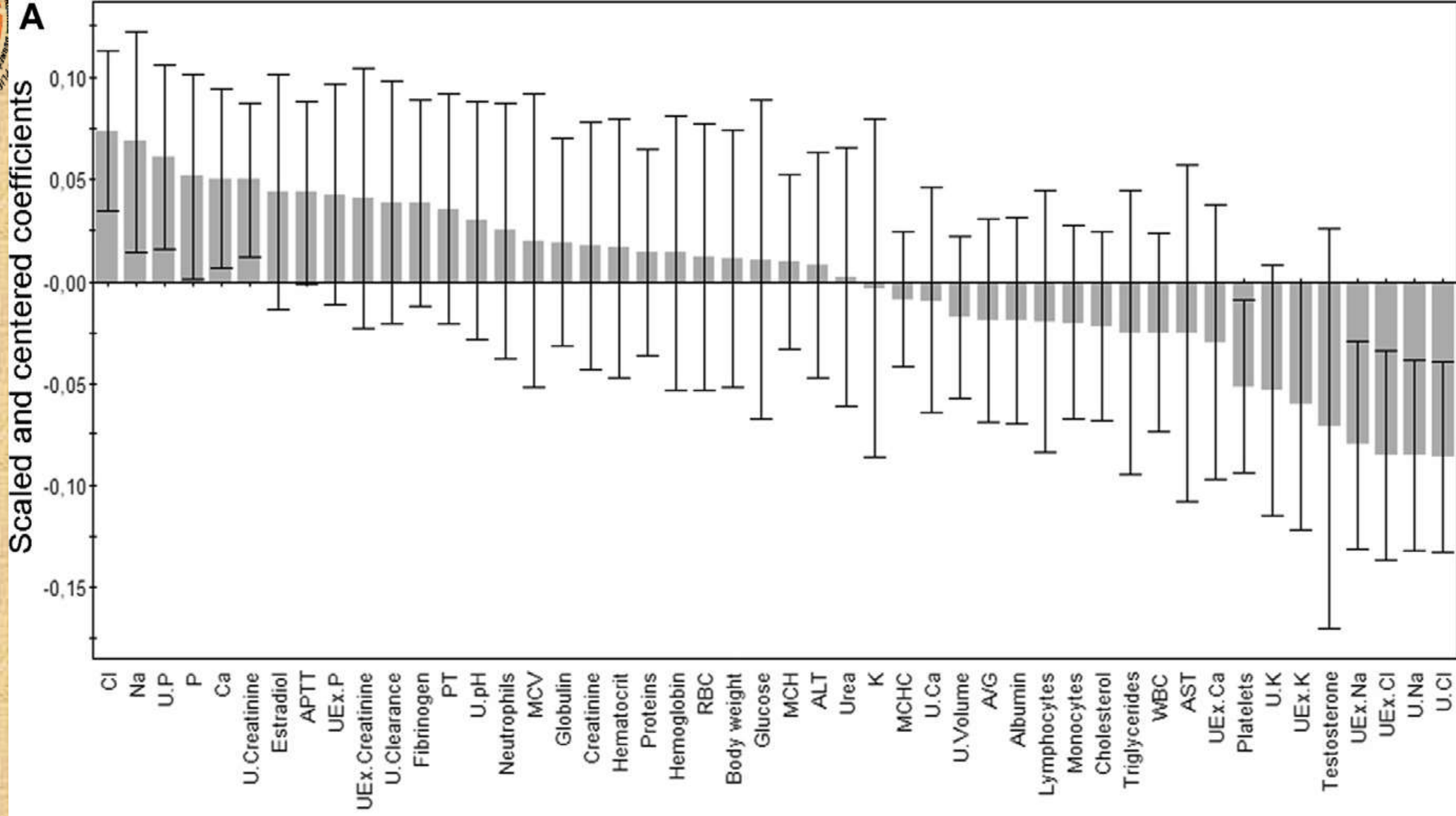
HORMONAL BALANCE

Sex hormonal balance was modified by consumption of GM maize

GMO cause increasing in the level of Estradiol hormones

GMO treatments caused decreasing of testosterone hormone level in groups which treated with GMO maize







Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize

Gilles-Eric Séralini^{a,*}, Emilie Clair^a, Robin Mesnage^a, Steeve Gress^a, Nicolas De Lorge^a,
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ABSTRACT

The health effects of a Roundup-tolerant genetically modified maize (from 11% in the diet), cultivated with or without Roundup, and Roundup alone (from 0.1 ppb in water), were studied 2 years in rats. In females, all treated groups died 2–3 times more than controls, and more rapidly. This difference was visible in 3 male groups fed GMO. All results were hormone and sex dependent, and the pathological profiles were comparable. Females developed large mammary tumors almost always more often than and before controls, the pituitary was the second most disabled organ; the sex hormonal balance was modified by GMO and Roundup treatments. In treated males, liver congestions and necrosis were 2.5–5.5 times higher. This pathology was confirmed by optic and transmission electron microscopy. Marked and severe kidney nephropathies were also generally 1.3–2.3 greater. Males presented 4 times more large palpable tumors than controls which occurred up to 600 days earlier. Biochemistry data confirmed very significant kidney chronic deficiencies; for all treatments and both sexes, 76% of the altered parameters were kidney related. These results can be explained by the non linear endocrine-disrupting effects of Roundup, but also by the overexpression of the transgene in the GMO and its metabolic consequences.

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1. Introduction

There is an ongoing international debate as to the necessary length of mammalian toxicity studies in relation to the consumption of genetically modified (GM) plants including regular metabolic analyses (Séralini et al., 2011). Currently, no regulatory authority requests mandatory chronic animal feeding studies to be performed for edited and/or formulated pesticides. However, several studies consisting of 90 day rat feeding trials have been conducted by the biotech industry. These investigations mostly concern GM soy and maize that are rendered either herbi-

cide tolerant (to Roundup (R) in 80% of cases), or engineered to produce a modified Bt toxin insecticide, or both. As a result these GM crops contain new pesticide residues for which new maximal residual levels (MRL) have been established in some countries.

If the petitioners conclude in general that there is no major change in genetically modified organism (GMO) subchronic toxicity studies (Domingo and Giné Bordonaba, 2011; Hammond et al., 2004, 2006a,b), significant disturbances have been found and may be interpreted differently (Séralini et al., 2009; Spiroux de Vendômois et al., 2010). Detailed analyses have revealed alterations in kidney and liver functions that may be the signs of early

RESEARCH

Open Access

Republished study: long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize

Gilles-Eric Séralini^{1*}, Emilie Clair¹, Robin Mesnage¹, Steeve Gress¹, Nicolas Defarge¹, Manuela Malatesta², Didier Hennequin³ and Joël Spiroux de Vendômois¹

Abstract

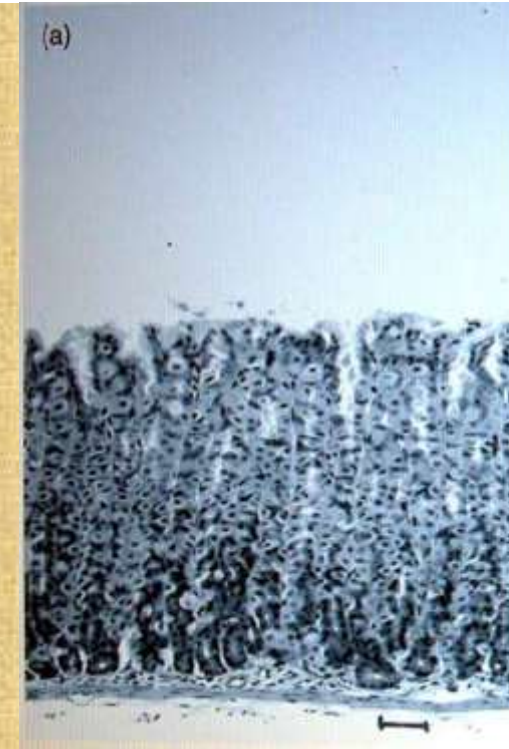
Background: The health effects of a Roundup-tolerant NK603 genetically modified (GM) maize (from 11% in the diet), cultivated with or without Roundup application and Roundup alone (from 0.1 ppb of the full pesticide containing glyphosate and adjuvants) in drinking water, were evaluated for 2 years in rats. This study constitutes a follow-up investigation of a 90-day feeding study conducted by Monsanto in order to obtain commercial release of this GMO, employing the same rat strain and analyzing biochemical parameters on the same number of animals

Effect of diets containing genetically modified potatoes expressing *Galanthus nivalis* lectin on rat small intestine

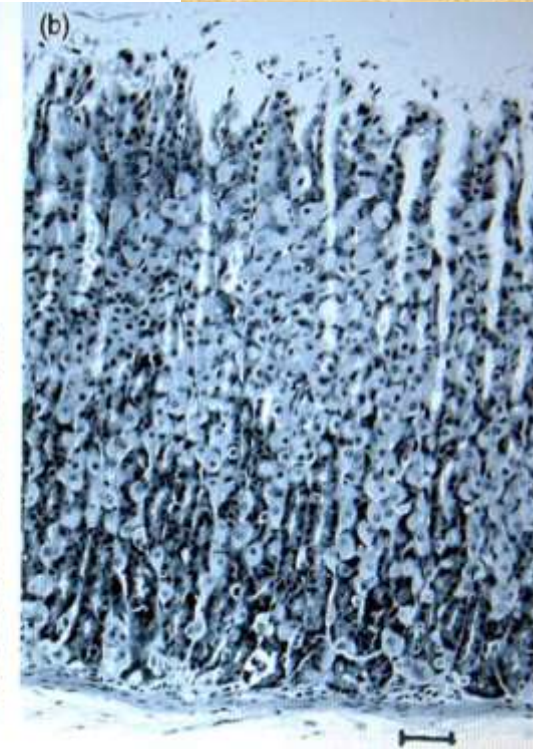
Stanley W B Ewen, Arpad Pusztai

See Commentaries pages 1314, 1315

Diets containing genetically modified (GM) potatoes expressing the lectin *Galanthus nivalis* agglutinin (GNA) had variable effects on different parts of the rat gastrointestinal tract. Some effects, such as the proliferation of the gastric mucosa, were mainly due to the expression of the GNA transgene. However, other parts of the construct or the genetic transformation (or both) could also have contributed to the overall biological effects of the GNA-GM potatoes, particularly on the small intestine and caecum.



Non-GM

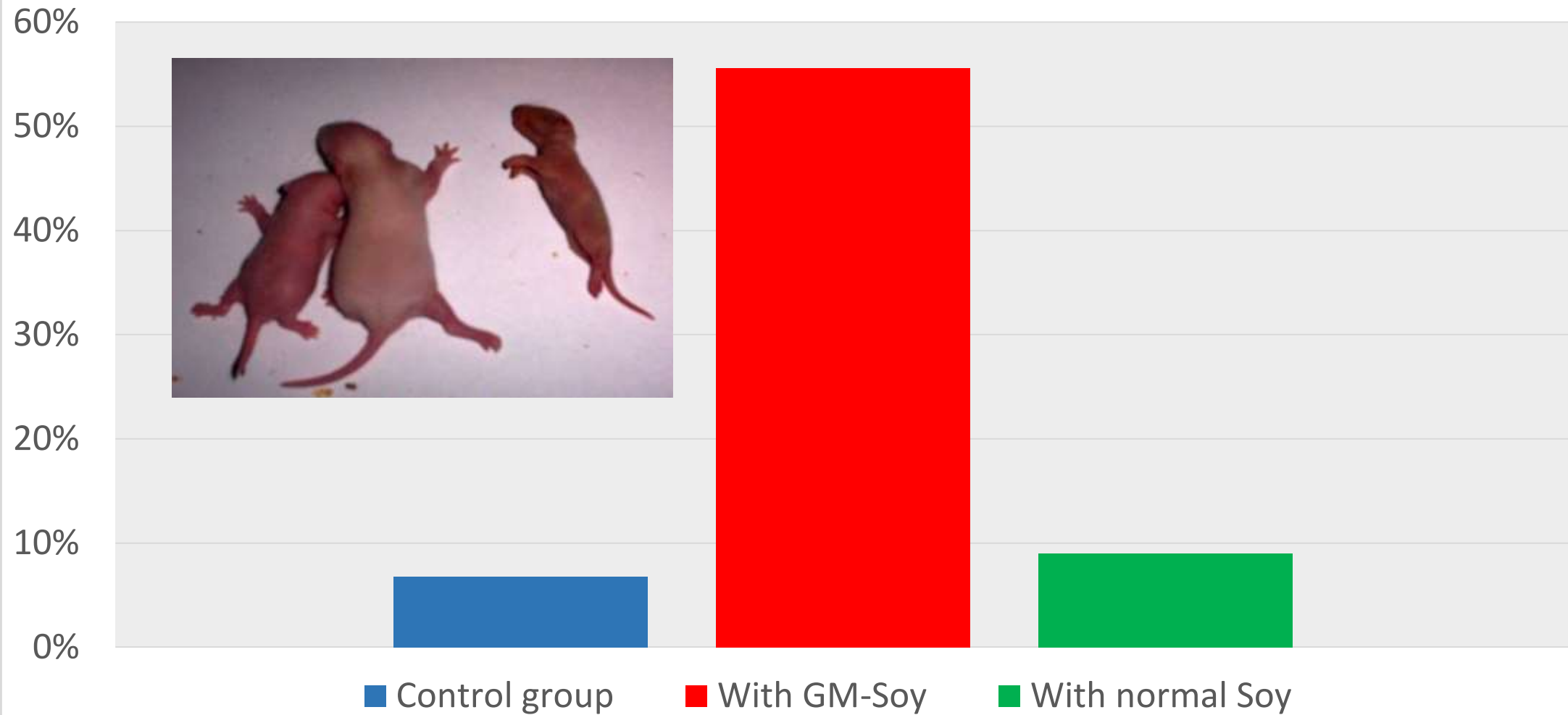


GM

Genetically modified soy effects



Death of rat's offspring



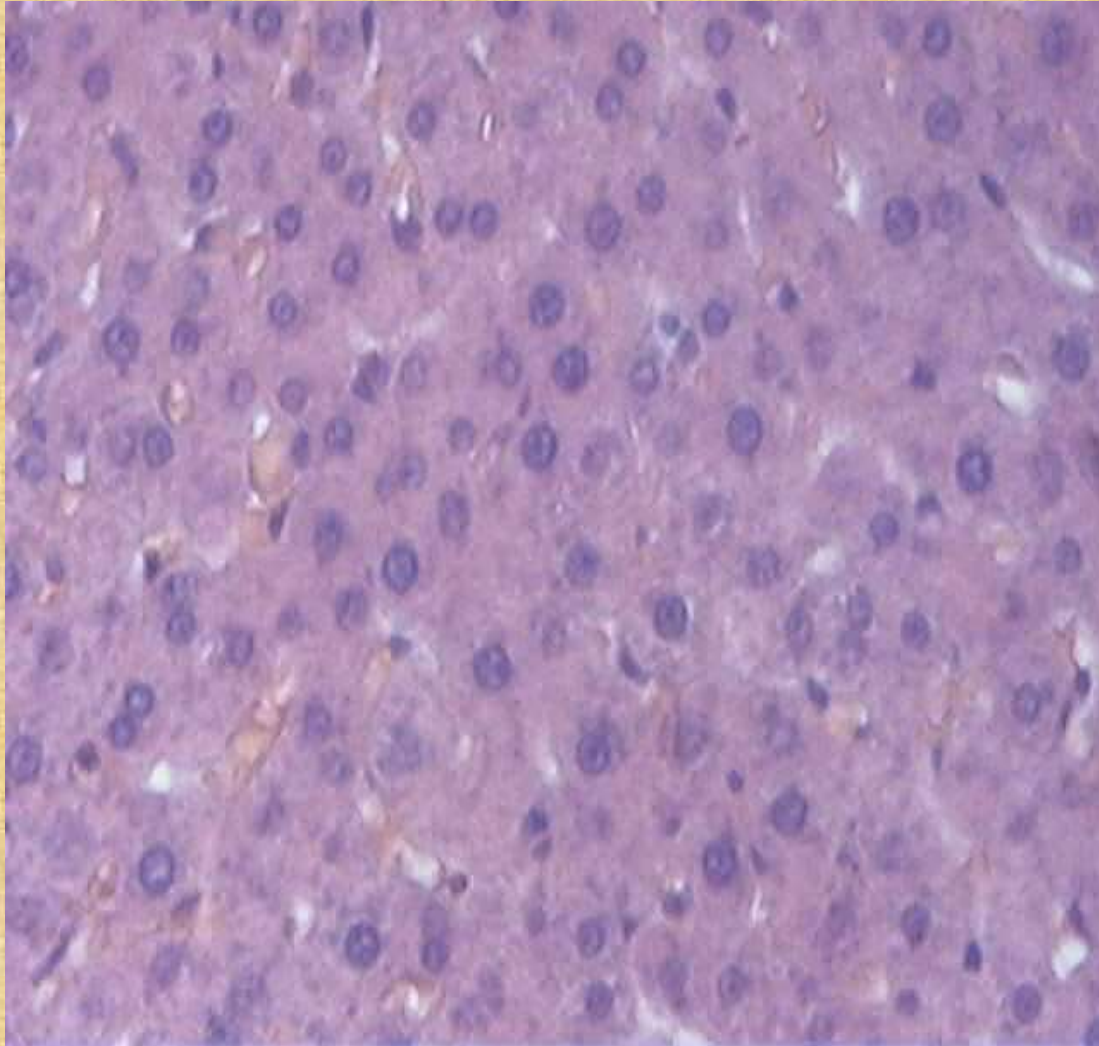
Among the differences was a dramatic reduction in average weight. Here's an example:
The mother of the smaller rat ate GM soy.



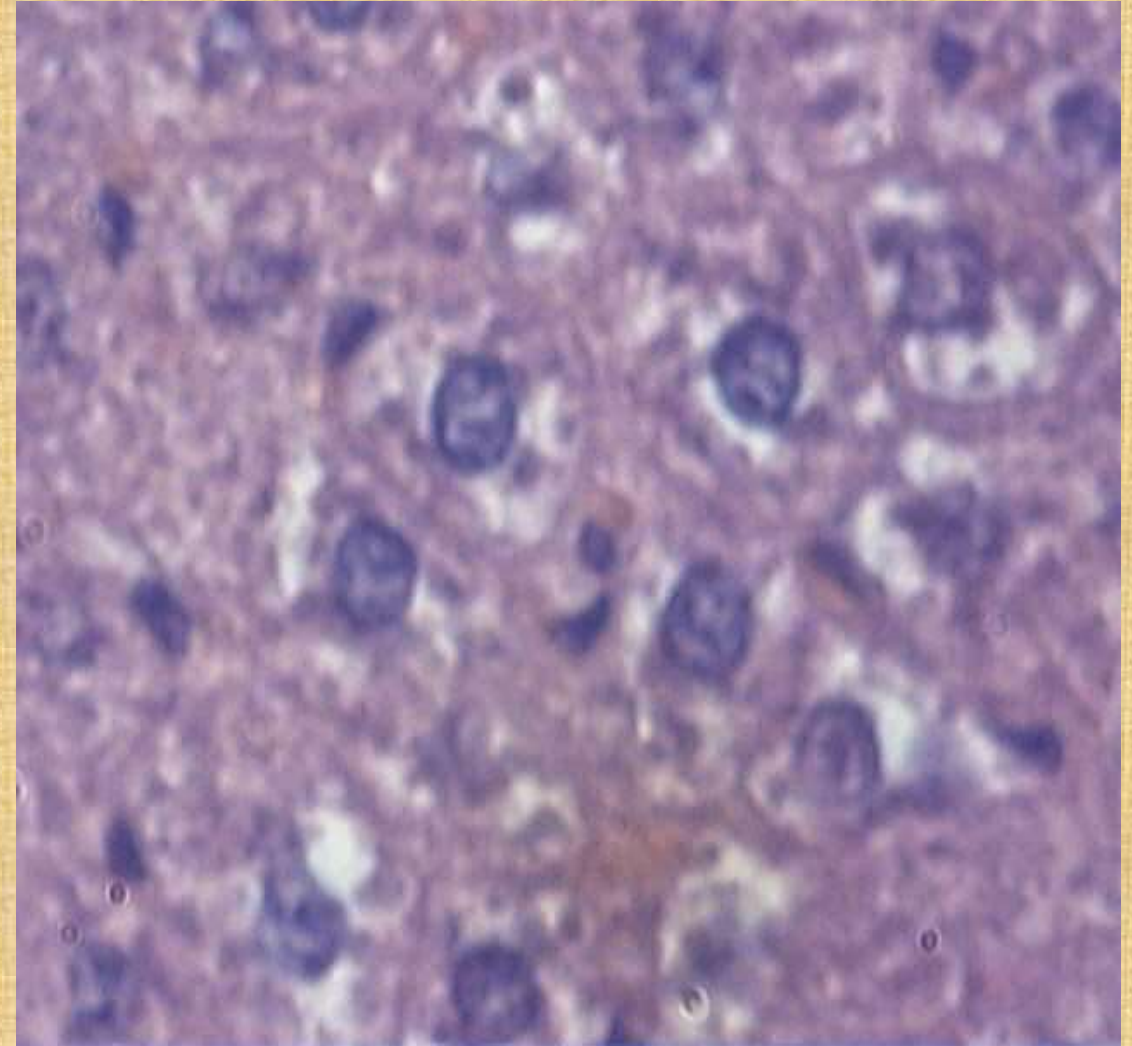
Rat Livers



Control group

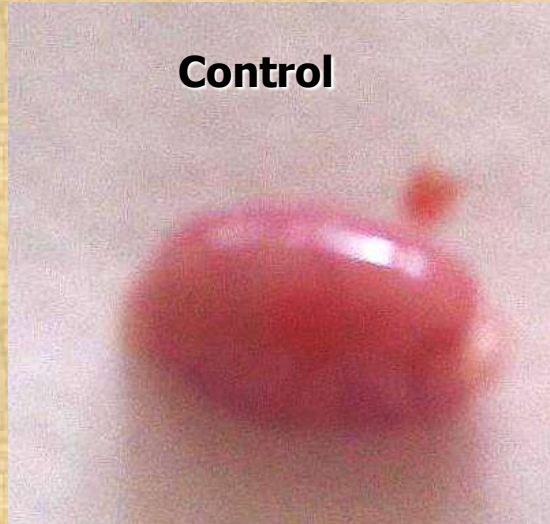


GM-soy group



Rat testicles

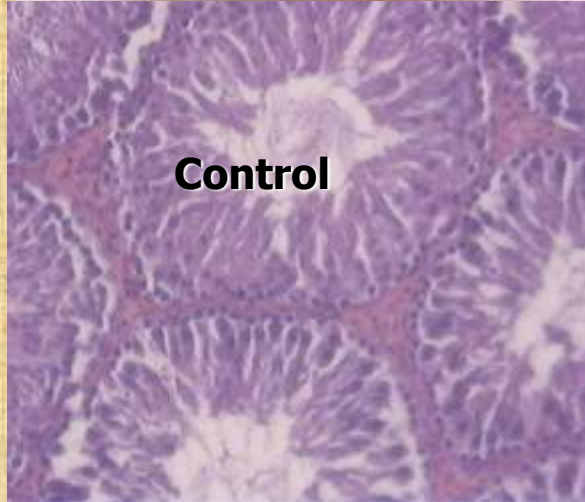
Control



GM soy fed



Control



GM-soy





CELL STRUCTURE AND FUNCTION 27: 173–180 (2002)

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Ultrastructural Morphometrical and Immunocytochemical Analyses of Hepatocyte Nuclei from Mice Fed on Genetically Modified Soybean

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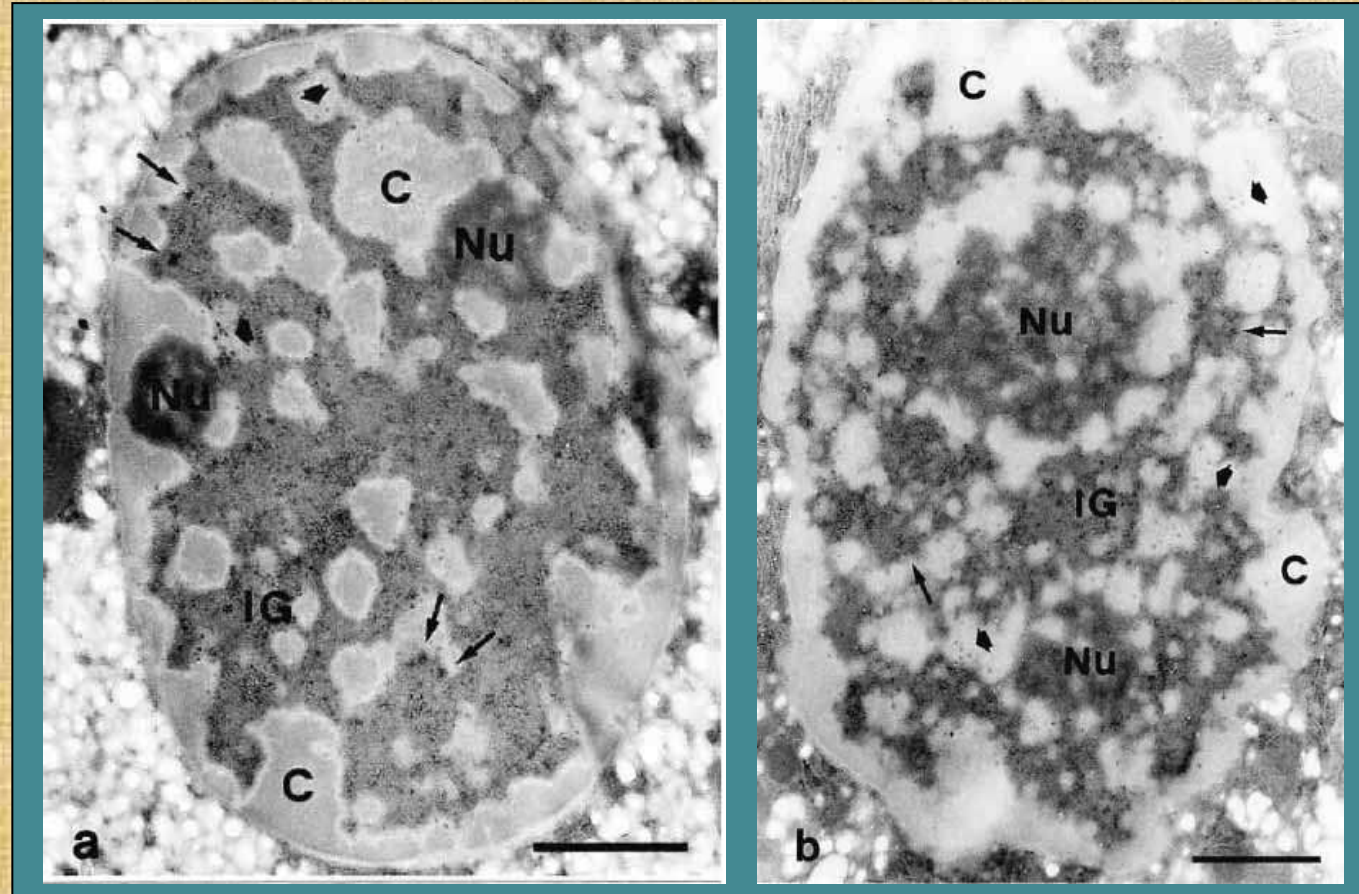
Mice fed GM soy

Liver

- Cells damaged
- Altered gene expression
- Higher metabolic activity (suggesting toxic insult)

Mice livers

Hepatocyte Nuclei



Control

GM-fed

RECOMBINANT BOVINE GROWTH HORMONE (RBGH)





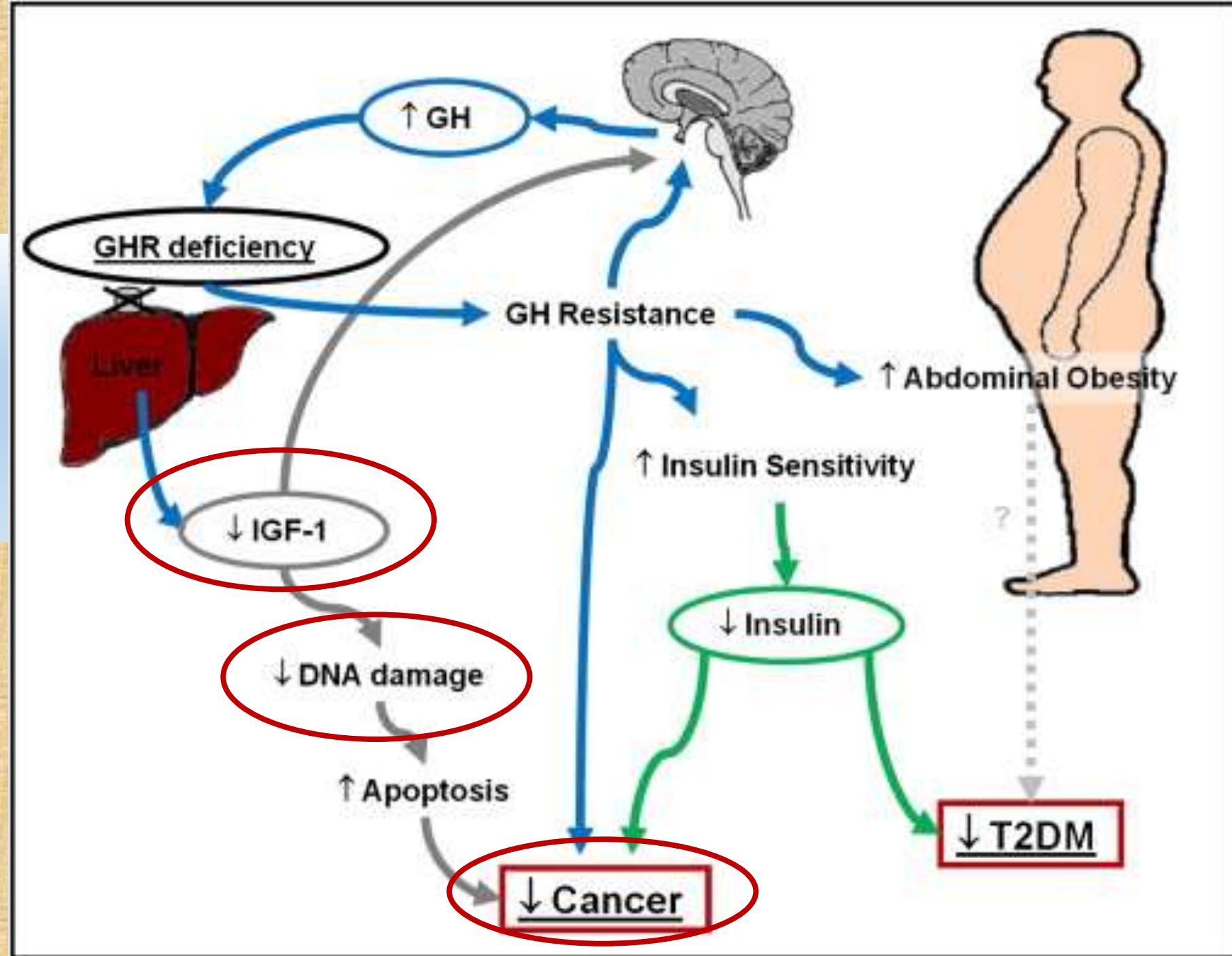
EFFECTS OF INJECTED RECOMBINANT BOVINE GROWTH HORMONE (RBGH) IN ANIMALS



The use of RBGH in dairy cattle in order to increase milk yield has caused large controversy. Problems occurring such as an increase in mastitis may pose a risk to human health since the increased antibiotic use leads to antibiotic residues in milk.



The consumption of milk from cows injected rbGH leads to an increase in IGF-I in humans, since IGF-1 survives digestion (Xian et al., 1995).





***“CAN GMO PRODUCTS
BE HALAL CERTIFIED”***

Objects on Genetic Modified Food

- The Islamic perspective on genetically modified foods is complex and goes deeper than simply a determination of whether a certain food is halal or not



First: interfering with Divine work

- Genetic engineering considered as controversial issue between scholars and jurisprudents. Genetic engineering manipulate the creation which means interfering in Divine work; and, thus, is illegitimate.

• فَأَقِمَّ وَجْهَكَ لِلدِّينِ حَنِيفاً فِطْرَتَ اللَّهِ الَّتِي فَطَرَ النَّاسَ عَلَيْهَا لَا تَبْدِيلَ لِخُلُقِ اللَّهِ

- the nature made by Allah in which He has created men. There is no altering Allah's creation.

وَلَا أُضِلُّنَّهُمْ وَلَا أَمْنِيَنَّهُمْ وَلَا أَمُرُّنَّهُمْ فَلْيُبَيِّكُنَّ ءَاذَانَ
الْأَنْعَامِ وَلَا أَمُرُّنَّهُمْ فَلْيُغَيِّرُنَّ خَلْقَ اللَّهِ وَمَنْ يَتَّخِذِ
الشَّيْطَانَ وَلِيًّا مِّن دُونِ اللَّهِ فَقَدْ خَسِرَ خُسْرَانًا
مُّبِينًا

And I will mislead them, and I will arouse in them [sinful] desires, and I will command them so they will slit the ears of cattle, and I will command them so they will change the creation of Allah ." And whoever takes Satan as an ally instead of Allah has certainly sustained a clear loss



Second: causing harm and corruption

- Islam accepts and allows the use of all science and innovations for the benefit of mankind as long as they achieved the benefits and don't lead to harm and damages.

There are many concerns upon GM crops safety and their side effect of human health as above mentioned.

وَإِذَا تَوَلَّى سَعَى فِي الْأَرْضِ لِيُفْسِدَ فِيهَا وَيُهْلِكَ الْحَرْثَ
وَالنَّسْلَ وَاللَّهُ لَا يُحِبُّ الْفُسَادَ ﴿٢٠٥﴾

And when he goes away, he strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption.

ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي النَّاسِ لِيُذِيقَهُمْ
بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ ﴿٤١﴾

Corruption has appeared throughout the land and sea by [reason of] what the hands of people have earned so He may let them taste part of [the consequence of] what they have done that perhaps they will return [to righteousness].

Another related issue that we should note is that while focus on the issue of permissibility of food in Islam has always been on the halal criterion, many people forget that in the Holy Qur'an the concept of 'halal' always come together with the concept of 'tayyib'

يَا أَيُّهَا النَّاسُ كُلُوا مِمَّا فِي الْأَرْضِ حَلَالًا طَيِّبًا وَلَا تَتَّبِعُوا خُطُوَاتِ الشَّيْطَانِ إِنَّهُ لَكُمْ عَدُوٌّ مُبِينٌ ﴿١٦٨﴾

O mankind, eat from whatever is on earth [that is] lawful and good and do not follow the footsteps of Satan. Indeed, he is to you a clear enemy

Third: Using genes from Haram sources

- The possible introduction of animal genes into food plants also presents considerable ethical difficulties for Muslims
- Theoretically, GMO products can be derived from transferring genes from Haram origins, as well as from Halal sources. So if the transferred gene source was from unlawful source, the genetically engineered food products will be Haram.



- However, present **commercial** technology appears to be more focused on splicing bacterial genes into plant genes, rather than animal genes.
- Experimentally, pig genes have already been planted into plants and plant genes have been planted in pigs (Transgenic pigs expressing plant genes, Heiner Niemann in Proc Nat Acad Sci U S A. 2004 May 11; 101(19): 7211–7212)

RESULTS

To judge on GMOs, it is necessary compare between the desired benefits and harm caused on the base:

“درء المفاسد مقدم على جلب المصالح”

" Avoiding evil has priority over bringing benefits"

And according to the previous presented scientific researchs which confirmed that GMOs may cause many known and unknown harmful effect to humankind

and on the base of:

“ لا ضرر ولا ضرار ”

“ Don't cause harm to yourself nor to others"

RESULTS

GMOs can not be in a harmony with Halal and Tayyib concepts

Muslims (Halal certifiers or consumers) have to say NO for GMO,

