

## **SUBMISSION FROM THE SUSTAINABLE AGRICULTURE & COMMUNITIES ALLIANCE (SACA)**

### **RE: PROPOSED CHANGES TO FOOD REGULATIONS REGARDING GENETICALLY ENGINEERED FOODS: (PROPOSAL P1055 – DEFINITIONS FOR GENE TECHNOLOGY AND NEW BREEDING TECHNIQUES)**

#### **1. Introduction and Comments on the New Technology of GM:**

The farmers and community members of SACA are aware that there is ample scientific evidence of the danger to health and the environment from the new methods of genetic engineering and the foods, animals, and plants that are products of these new methods.

Since its inception around forty years ago, the history of genetic engineering has been fraught with problems and damage to the organisms which the GM corporations have been manipulating. As Professor David Suzuki once said: "Anyone who says that genetic engineering is safe is either stupid or is a liar".

Damage to the genomes of GMOs is not surprising, as genetic engineering is a relatively new industry and still has much to learn. What is surprising is the fact that FSANZ is considering both deregulating GMOs and allowing them to be released into our food system and environment without oversight, rigorous testing, or labels on all GM foods or organisms. That is an abrogation of duty to protect the food chain and human and environmental health.

SACA members consider that the science of genetic engineering is still in its infancy and *any less oversight or regulation than presently exists would be irresponsible and foolhardy*. The lessons from Covid should have taught both FSANZ and government that some novel organisms can have fatal effects and once out in the community they are there permanently. Any damage from genetic engineering spreads across populations, whether these consist of plants, bacteria, animals, or people. The legacy of new GMOs is carried on down the generations, sometimes developing more unintended negative effects along the way.

#### **2. GMO Food Issues:**

##### **2.1 Food Safety:**

Right from the beginning of the approval and release of genetically engineered foods and bacteria there have been unforeseen serious health effects on people and animals that consumed the GM foods.

The factor of unintended effects related to GM foods is very relevant to the issues of food safety and nutritional value. Whilst the GM corporations claim their GMOs are safe to eat and provide good nutrition, the evidence of harm from GM foods and bacteria is undeniable. Without a change to a more rigorous system of testing of all GMOs, there is an inherent lurking threat to consumers of these foods.

The process of inserting foreign material or making changes in the genome for the purposes of achieving a desired effect is now recognised by scientists as causing damage to the genome. In the past, this damage, which may not have been apparent at the time of the insertion (possibly because it was not looked for or GM scientists did not know what to look for) has in some cases led to the development of undesirable effects and genetic instability.

*Damage to the genome and genetic instability are still major threats to any claims for the safety of GM foods. The industry continues to deny the continuation of the safety problems. These factors alone should be good reason for a continued vigilant testing and oversight process of GMOs by an independent body.*

### **More on Food Safety and Examples of Unexpected Effects from GMO Products:**

Double-stranded RNA (dsRNA) and several other forms of RNA are now recognised as problematic. It was assumed by Monsanto and other GM corporations that dsRNA would be safe to use in genetic engineering. This has been shown to be false. As reported in the Institute of Responsible Technology News: *In Brazil some research scientists fed pieces of jellyfish RNA (dsRNA) to young honeybees. They believed that there would be little if any result from this experiment. However, after only one meal containing this form of RNA the scientists discovered that 1,461 genes in the bees showed significant changes compared to controls; 10% of the bees' genes, including those vital to health, were either turned up or turned down. The authors concluded that such a massive change "undoubtedly" triggered changes in the bees' development, physiology, and behaviour.*

As Australia seems to follow the example of the USA like the tail follows the dog, it is worrying that the US Department of Agriculture has approved the addition of dsRNA to apples and potatoes in order to genetically engineer them not to turn brown when cut and exposed to the air. The type of RNA that induced genetic changes in bees is the same one that has been inserted into apples and potatoes. Some scientists are now worried about similar changes in human genomes from eating foods

containing dsRNA, and several other kinds of RNA. Could they change people's behaviour or development?

RNA is recognised as a "gene controller". This is why it has been used as a tool to make changes in the genome. Now it has been realised that changes can be made to the genome in ways not anticipated when RNA is inserted during the genetic engineering process.

The eminent scientist, Jack Heinemann, said commenting on this and similar cases: "There may be "new patterns that we've never seen before," says Heinemann. "We can be exposed to these and potentially have genes regulated by those dsRNA molecules." He went on to say: "We have to be able to assess, *before we use these foods*, whether they can have an adverse effect on people or on other organisms in the environment." When he expressed his concerns to the governments' GMO regulators in Australia and New Zealand, they dismissed them. The members of SACA believe that there is a cogent need for re-examination of the assumptions behind the practice of genetic engineering and the approval of GE foods and organisms.

## **2.2 One of many Examples of Harm from Consumption of GMO Foods and Products:**

Pesticides associated with GM foods were discovered in women in Eastern Townships of Quebec, Canada. As a result of discoveries such as these, seven countries - Austria, Hungary, Greece, France, Luxembourg, Germany and Bulgaria banned Mon810. (1)

## **3. Threats to Soils and Interacting Non-GM Organisms:**

Negative effects can result not only to the genetically changed organism, but also to interacting organisms. For example, as farmers we know that genetically engineered plants containing toxins to kill pest insects also kill the beneficial soil micro-organisms upon which we depend to nourish our crops. Pollen from GM plants also kills many of the beneficial insects that perform essential pollination of crops.

## **4. Some Of The Latest Catastrophes Involving Gene Editing:**

4.1 It was reported in *Nature Communications* and in *GM Watch* that "*in a long line of studies showing unintended effects of gene editing, the CRISPR-cas gene editing tool has been found to cause the loss of whole chromosomes and cause genomic instability in mouse embryos*". Scientists commented: "*Karyotype alterations have emerged as on-target complications from CRISPR-Cas9 genome editing. However, the events*

*that lead to these karyotypic changes in embryos after Cas9-treatment remain unknown. Here, using imaging and single-cell genome sequencing of 8-cell stage embryos, we track both **spontaneous and Cas9-induced karyotype aberrations through the first three divisions of embryonic development. We observe the generation of abnormal structures of the nucleus that arise as a consequence of errors in mitosis, including micronuclei and chromosome bridges, and determine their contribution to common karyotype aberrations including whole chromosome loss that has been recently reported after editing in embryos.***

***Together, these data demonstrate that Cas9-mediated germline genome editing can lead to unwanted on-target side effects, including major chromosome structural alterations that can be propagated over several divisions of embryonic development.” (2)***

4.2 Another recent study showed that editing human cells with CRISPR causes chromothripsis. This means that individual chromosomes are broken and then rearranged in a “haphazard” fashion. An [article](#) in Nature Biotechnology about the new findings describes chromothripsis as “an extremely damaging form of genomic rearrangement that results from the shattering of individual chromosomes and the subsequent re-joining of the pieces in a haphazard order”. As is well known, damage to the genome makes people and animals liable to develop cancers, birth defects, or severe illnesses. (3) (4)

4.3 As farmers and members of farming communities, we are aware that the world has already had a near world-wide food growing catastrophe when a soil microbe that was genetically engineered to eat rubbish in waste dumps was about to be released by GM proponents. Dr. Elaine Ingham, a soil scientist, and one of her students decided to conduct tests to see what effects the bacteria might have on growing plants. To their horror they discovered that the GM bacteria destroyed the roots of plants. If it had been released it would have spread like the Covid virus and destroyed agriculture around the world. Note: the bacteria would have travelled via vehicles, people’s feet, and on the wind. The wind only takes around a week to go around the world. When Dr. Ingham revealed the problem and prevented the organism from being released, she lost her job at the obviously pro-GM university where she was working. However, farmers know what a saviour Dr. Ingham has proved to agriculture. (5)

4.4 The incident of hornless cattle that were found to be carrying antibiotic-resistant bacteria accidentally inserted into their genome at the time of genetic engineering is yet another example of the problems inherent in meddling with the genetic structure of living forms. The

problem with these cattle was only discovered by chance after a herd had been developed for breeding in Brazil. (5)

### **OUR CONCERNS AND STEPS THAT WE SEE AS ESSENTIAL FOR PROTECTION OF OUR HEALTH AND THE ENVIRONMENT:**

SACA members are aware that the current methods of screening for abnormalities in GMOs are inadequate.

We could give many examples of damage caused to plants, animals, people and soils from the effects of genetically engineered organisms.

Any responsible government organisation such as FSANZ should not be considering deregulation of any modes of genetic engineering.

We are concerned that at present anyone, even school children, may purchase "kits" with which to conduct experiments in genetic engineering. Like the carp which were allowed to be released into our rivers and are now a great pest, genetically engineered organisms are very likely to be released and cause problems for agriculture, natural biodiversity and or people's health.

**It is essential that FSANZ ensure that:**

- 1. ALL foods containing GMO ingredients or GMOs that are presently on the market should be labelled as such. The public deserves to know when foods may contain allergens or toxins as a result of post-genetic engineering changes in the cellular biome.**
- 2. All GMOs of any type MUST be rigorously scanned using the most sophisticated tests before any of them are released. This is so that any hidden chromosomal defects or novel toxins produced as a result of genetic engineering may be revealed.**
- 3. It is not enough for the GM corporations to make assumptions that any GM plants or organisms are safe for release. All GMOs must be handed over for testing by an independent assessor answerable to FSANZ and food safety authorities.**
- 4. GM corporations cannot be left to their own devices to assess the safety of any of the GMOs that they develop. Vested interests have great power to corrupt. Independent assessment is a MUST.**

5. **Whilst we recognise that the new forms of genetic engineering will not be easy to assess for safety and that specialised tests and equipment will be required, if GMOs are to be allowed to go ahead then they must be rigorously assessed.**
6. **It must be recognised that whilst some of the new methods of genetic engineering do not necessarily require the insertion of genetic material, they may still cause damage to the genome or even ongoing changes that can lead to the development of novel toxins or allergens. Each GMO must be tested for DNA breaks, deviations from the original, and novel and unintended inclusions of foreign matter, including nanobacteria.**
7. **Research must now be conducted into whole chromosome loss; scrambling of the original genetic arrangement; inclusion of unintended foreign matter and bacteria; and genomic instability in all plants, animals, and bacteria that have been genetically engineered.**



#### References:

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