

# CAN GENETICALLY-ENHANCED TRAITS BE DETECTED IN MILK OR MEAT

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## ABSTRACT

There are a significant number of federal, state and international agencies assigned the task of assessing the safety of a genetically engineered product(s). Genetically Modified (GM) plants used directly as animal feeds are maize green forage or silage, soybean, maize kernel, canola and cotton used as raw seeds or oil meals. The rDNA in these animal feeds mainly code for proteins conferring tolerance to herbicides (soybeans) or insect resistance (maize, cotton) or both traits in a few cases. Recent scientific literature indicates no food safety concerns regarding the feeding of currently approved GM plants to food producing animals, e.g. dairy/beef cattle, poultry, swine. For instance, in tact rDNA coding for tolerance to herbicides or insect resistance have not been detected in bovine milk or meat.

## BACKGROUND

Consumers insist upon knowing who is watching out for their interests and who is responsible for determining the safety of genetically engineered products. These food safety concerns reach to the farm with a focus upon feeds consumed by animals destined for human consumption. In our home country, the United States Department of Agriculture (USDA), the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA) and most state governments closely monitor the development, testing, release and importation of genetically engineered products and plants. On the international side, the World Health Organization (WHO) as well as the Food and Agriculture Organization (FAO) of the United Nations use the Codex Alimentarius, the food code, as an internationally recognized food safety reference point for consumers, food producers, food processors, national food safety agencies and international food trade. As a result of the oversight of these agencies, milk, meat (bovine, porcine, poultry) and eggs have been tested for the presence of rDNA or gene products.

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## SUMMARY

Several investigations by researchers all over the world have looked into the question regarding the presence of rDNA or gene products in milk, meat, eggs, excrements when fed GM plants. A brief summary of work follows:

- Milk (Faust, 2000)- 0/147 were assay positive when fed GM Maize kernel
- Milk (Phipps 2001)- 0/12 were assay positive when fed GM maize, silage
- Milk (Phipps 2002)- 0/10 were assay positive when fed GM soybean
- Milk (Jennings 2003a) – 0/10 were assay positive when fed GM Cotton seeds
- Muscle [pig] (Jennings 2003b)- 0/50 were assay positive when fed GM Soybean meal
- Muscle, eggs (Faust 2000) – [0/20], [0/22] were assay negative when fed GM maize kernel
- Muscle, liver, spleen, kidney, egg, excrements (Einspanier 2001) – 0/17 tissues, 0/5 eggs and excrements were assay negative when fed GM maize silage

## CONCLUSIONS

It is accepted that farm animal species have been consuming many kilograms of forage plants per day, resulting in several grams of foreign DNA consumed daily since the beginning of time, without any known adverse consequence. Genetically Modified (GM) plants used directly as animal feeds are maize green forage or silage, soybean, maize kernel, canola and cotton used as raw seeds or oil meals. The rDNA in these animal feeds mainly code for proteins conferring tolerance to herbicides (soybeans) or insect resistance (maize, cotton) or both traits in a few cases. The USDA, FDA, EPA, WHO, FAO and many state agencies maintain tight controls over the research, development, release and importation of genes, gene products and agricultural commodities.

The World Health Organization and Food and Drug Administration have concluded there is no inherent risk in consuming DNA, including DNA from transgenic plants either directly or through feeding of farm animals. DNA and various proteins represent a natural and abundant component of human diets. The normal digestive processes of ruminants and monogastrics represent complex, rapid and effective digestion methods for natural and rDNA. Current scientific investigations document no genetically-enhanced traits for plant insect resistance or herbicide tolerance are present in milk, meat, eggs or excrements.

## REFERENCES

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