FREQUENTLY ASKED QUESTIONS

1. What is a Gene?

A gene is the basic unit of inheritance. It carries hereditary information passed from parents to their offspring. A gene or a group of genes account for the expression of traits we see such as height, colour of skin and hair, and traits we don't see such as the complex biochemical processes in our body.

2. What is Genetic Engineering (GE)/ Genetic Modification (GM)?

Genetic engineering/modification is the process by which an organism's genetic material is altered in a manner that does not occur naturally by mating and/or natural recombination to obtain desired characteristics.

3. What is Agricultural Biotechnology?

It is the application of scientific tools and techniques, including genetic engineering, to modify living organisms in order to address problems in all areas of agricultural production and processing. Agricultural Biotechnology can be used to improve pest and insect resistance, disease control, abiotic stresses like salt and drought tolerance, and enhance nutritional content of crops.

4. What is a Genetically Modified (GM) Crop?

When a crop such as soybean, maize or canola is genetically engineered to express a desired trait such as insect resistance or increased protein content, it is referred to as a genetically engineered soybean, maize or canola. A crop can be engineered to express multiple desired traits in a scenario referred to as stacked genes.

5. Which crops have been genetically modified worldwide?

Globally four (4) major GM crops are commercialized; these are soybean, cotton, maize and canola. Others include alfalfa, papaya, plum, potato, squash, sugar beet, tomato and wheat.

6. What are the common traits of GM food crops?

The most common traits of GM crops are herbicide tolerance and insect resistance. Others include drought tolerance, salt tolerance, and enhanced nutrient content (vitamins, minerals, essential fatty acids, protein) as well as reducing anti-nutrients.

7. Are GM foods less nutritious than comparable foods?

Nutritional assessments for GM foods evaluated by several National Competent Authorities globally have shown that these foods are as nutritious as their conventional variety counterparts. When such differences are biological significant the product is likely not to be approved.

8. How safe are foods derived from GM crops?

Food and Agriculture Organization: "The use of these techniques (modern biotechnology) does not result in food which is inherently less safe than that produced by conventional ones"

World Health Organization: "GM foods currently available on the international market have passed safety assessments and are not likely to present risks for human health. In addition, no effects on human health have been shown as a result of the consumption of such foods by the general population in the countries where they have been approved"

European Commission: "Extensive research on GMOs, co-funded by the European Commission over the last two decades, has significantly contributed to being able to identify and characterize possible risks associated with foods/feed derived from GMOs. These activities provide at least equal assurance of the safety of these foods compared to conventional counterparts, provided these GM products have been approved by the EU and the national food safety evaluation procedures."

9. Are foods derived from GM crops likely to be toxic or cause allergic reactions?

GM crops that are used as food sources are assessed for toxicity and allergenicity in accordance with internationally accepted risk assessment end points, thus products that are approved are not toxic or allergenic.

10. Are there long-term health effects of foods derived from GM crops?

There are currently no documented long term health effects resulting from the consumption of GM foods. There are however, several publications that have associated certain adverse health effects to consumption of foods derived from GM foods, the most publicized being the Seralini publication. His findings were reviewed by several national competent authorities in France, Belgium, Germany, Australia, New Zealand, and Canada among others. In all instances they noted the results were inconclusive. Thus the claim of long term use causing cancer is not valid.

11. Is there a Regulatory Structure in Ghana to Control Activities Related to GMOs?

In Ghana, the Biosafety Act, 2011, Act 831, regulates biotechnology and provide for related matters. Per this Act, the commencement of all activities relating to GMOs will require prior approval by the National Competent Authority, the National Biosafety Authority (NBA). The NBA has responsibility for handling requests for approval for the following:

1. Application for contained or confined use
2. Application to import or place on the market
3. Application to export
4. Genetically modified organisms in transit

The NBA works together with several regulatory agencies that have expertise relevant to the regulation of biotechnology and its related matters. These agencies include: Food and Drugs Authority, Environmental Protection Agency, Plant Protection and Regulatory Services Directorate, Customs and Excise Division, Veterinary Services Directorate, and the Local Assemblies.

The NBA constitutes a Technical Advisory Committee with the prime responsibility of evaluating applications received and giving recommendations to the NBA governing board that takes a final decision on the application.

12. How is the Safety of GMOs Evaluated?

GM crops that are used as food sources are rigorously assessed for its safety for use as food or feed. It is only following successful attainment of internationally accepted assessment end points for toxicity, allergenicity and nutrition, that a GM crop is approved for import, placement on the market and export. Safety assessment is considered on a case by case basis.

This assessment is undertaken in accordance with internationally established scientific principles and guidelines developed through the work of the Organisation for Economic Cooperation and Development (OECD), Food and Agriculture Organization (FAO) of the United Nations, World Health Organization (WHO) and the Codex Alimentarius Commission. Considering the impracticability of achieving absolute safety, the safety assessment process aims to establish equivalence of GM food to its conventional counterpart whose benefits and risks are well known and acceptable.

Safety assessment considers the following:

i. Intended and unintended effects of the genetic modification and how it impacts the health and safety of the populace.

ii. Comparison with conventional foods with an acceptable history of safe use for similarities and differences and any potential impact on safety and health of consumers.

13. What is the Role of FDA in the production and commercialization of foods derived from GM crops in Ghana?

The FDA is the regulatory institution with the primary responsibility of assuring safety of food in Ghana. As a result, within the National Biosafety Framework, the FDA is assigned specific roles relating to its core expertise in food safety. The FDA has an expert on the Technical Advisory Committee and a member on the Board of the NBA (as per the Biosafety Act, 2011 (Act 831)).

The FDA's inspections at the ports of entry, warehouses and market surveillance can facilitate the detection of products derived from GM crops used for food, feed and processing that have not been subjected to the regulatory approval process.

14. Do regulators do their own independent testing of GM foods?

Literature reviews are a standard scientific method of evaluation used by regulators around the world, to evaluate the safety of a variety of products including food, drugs and agricultural and veterinary chemicals. The methods and approach used are not only consistent with international guidelines developed according to scientific advice provided by the WHO, FAO, and OECD, but also reflect the methodology that has been used to regulate food and medicines in contemporary times.

Companies involved in the development of GM foods spend millions of dollars rigorously testing their products according to these requirements, which include detailed documentation of testing. Thorough evaluation of the data quality and protocols used is carried out to ensure the validity of results. When the regulator determines that the data submitted is insufficient, additional information and testing may be required. The regulator may also supplement the information provided by the Applicant with any published data locally or internationally that is relevant to the product in question.

Related Links to other FAQ websites

FAO- http://www.fao.org/fileadmin/user_upload/biotech/docs/faqsen.pdf

EFSA- http://www.efsa.europa.eu/en/topics/topic/gmo

ABNE- http://nepad-abne.net/public-awareness/gm-food-safety-qa/

USFDA- http://www.fda.gov/Food/FoodScienceResearch/GEPlants/ucm461805.htm

GMO LITERACY PROJECT: http://gmo.geneticliteracyproject.org/

WHO - http://www.who.int/foodsafety/areas_work/food-technology/faq-genetically-modifiedfood/en/