What are Genetically modified Foods?
Genetically modified foods are foods produced from genetically modified organisms (GMOs) crops or animals that have had specific changes introduced into their DNA using genetic engineering techniques. These techniques are much more precise than selective breeding or exposing plants or animals to radiation or chemicals which create a non-specific but stable change.

Genetically modified foods were first introduced for commercial sale in 1994 by Calgene with its marketing of Flavr Savr delayed ripening tomato. Most GMO foods are transgenic (animal or plant containing genetic material artificially transferred from another species) including soybean, corn, canola and cottonseed that have been engineered for faster growth, resistance to pathogens, production of extra nutrients or other beneficial purpose. There are very few experimentally developed GMO livestock with only a GMO salmon near FDA approval. Animals (e.g. goat,) usually used for food production (e.g. milk,) have already been genetically modified and approved by the FDA and EMA (European Medical Association) to produce non-food products (pharmaceuticals) i.e. recombinant antithrombin, an anticoagulant protein drug used to treat inherited antithrombin deficiency as well as acquired deficiencies resulting from liver dysfunction, sepsis (blood infection), premature birth, kidney disease with nephritic syndrome as well as the result of interventions such as major surgery, cardiopulmonary bypass or excess warfarin administration. Antithrombin can be made from human blood products, but that blood cannot be used for other critical blood products.

There is broad scientific consensus that food on the market derived from GMO crops pose no greater risk to human health than conventional food. However, critics have objected to GMO foods on several grounds, including safety issues, ecological concerns, and economic concerns (raised by the fact GMO plants and potentially animals are food sources that are subject to intellectual property law).

In the laboratory, genetically modified plants are usually generated by altering their genetic makeup by adding one or more genes to a plant's genome using well established and regulated genetic engineering techniques. Once the desired plant is developed, and sufficient seeds gathered, the company must first apply for regulatory approval to first field-test the seeds. After a successful field testing, the company must then seek regulatory approval for the crop to be marketed. Once approval is obtained, the seeds are mass-produced and sold to farmers. The farmers then sell their crops as commodities into the food supply market only in counties where such sales are permitted.

Currently, there are several GMO crops that are food sources. In some cases, the product is directly consumed as food, but in most cases, crops that have been genetically modified are sold as commodities, which are further processed into food ingredients. In addition to GMO crops, additional items involved in food production are also genetically modified. For example, cheese making requires the use of rennet, a mixture of enzymes used to coagulate cheese, which was originally only available from the fourth stomach of calves and therefore scarce and expensive. With the development of genetic engineering methods, it became possible to extract the rennet producing genes and insert them in certain bacteria, fungi or yeast to produce chymosin. The genetically modified microorganisms are killed after fermentation, and chymosin isolated and

used by the cheese producers. In ripe cheese, the type and provenance of chymosin used in production cannot be determined.

The regulation of genetic engineering concerns the approaches taken by governments to assess and manage the risks associated with the use of genetic engineering technology and the development and release of genetically modified organisms (GMO). There are differences in the regulation of GMOs between countries, with some of the most marked differences occurring between the USA and Europe. Regulation varies in a given country depending on the intended use of the products of the genetic engineering. For example, a crop not intended for food use is generally not reviewed by authorities responsible for food safety, while GMO crops intended for use in human or animal food are reviewed by such authorities. Additionally, various regulations govern the importation of GMO commodities as well as food made using GMO commodities.

This is a short introduction to GMO which will provide background for the Fall Kickoff! This is the first of a series of articles presented to educate, discuss and understand the on-going update of the LWVUS Agriculture Position. If you have any questions or need additional information please contact the Environmental Quality Committee. Interested in food safety – come join the Environmental Quality Committee! For summer reading in preparation of the Agriculture Study please visit the LWVUS webpage: http://www.lwv.org/content/agriculture-update-suggested-summer-readings