Testimony of

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"Examining FDA's Role in Regulation of Genetically Modified Food Ingredients"

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Summary Points

The Council for Agricultural Science and Technology (CAST) Issue Paper Number 54 entitled "**The Potential Impacts of Mandatory Labeling for Genetically Engineered (GE) Food in the United States**" explores the scientific, legal, and economic aspects of requiring food labeling in the United States based on the use of a breeding method (i.e., GE) rather than on some attribute of the food product itself, the implications of state versus national labeling laws, and the potential economic impacts. The conclusions of the paper were:

1. There is no science-based reason to single out foods derived from and feeds crops that were developed using the GE breeding method for mandatory process-based labeling.
2. Mandatory labeling based on process (i.e. use of a particular breeding method) abandons the traditional U.S. practice of providing for consumer food preferences through voluntary product differentiation and labeling.
3. Mandatory labeling could have negative implications for First Amendment rights and trade issues.
4. Market-driven voluntary labeling measures are currently providing interested consumers with choices to purchase products produced from crops developed using conventional plant breeding technologies.
5. Mandatory labeling will increase food costs.

Testimony

Good Morning Mr. Chairman and Members of the Subcommittee. My name is Alison Van Eenennaam and I am a Biotechnology and Genomics Cooperative Extension Specialist at the University of California, Davis. I appreciate the opportunity to speak to you today regarding the science of genetic engineering (GE) and its relationship to the role of the Food and Drug Administration (FDA) in the regulation of GE food ingredients.

I hold a Bachelor of Agricultural Science, a Master of Science and a Ph.D. in Genetics, and I work as a public sector scientist performing research and education on biotechnology. One of the reasons that I am testifying here today is that I was the Task Force Chair and lead author for the Council for Agricultural Science and Technology (CAST) Issue Paper Number 54 entitled "**The Potential Impacts of Mandatory Labeling for Genetically Engineered Food in the United States**"[1], which was released in April of 2014 and is included as an attachment to this testimony. CAST is a nonprofit organization that is composed of scientific societies, individual and student members, company, nonprofit, and associate society members. CAST (www.cast-**science**.org) assembles, interprets, and communicates science-based information by using volunteer scientific experts, such as myself, as authors and reviewers.

As a scientist speaking here today I want to clarify that GE food, commonly but less precisely referred to as Genetically Modified food, is food derived from crops produced using a breeding method based on the movement of useful genes from one species into another using recombinant DNA technology. This method is used routinely in medicine and many pharmaceuticals such as insulin and food processing aids such as rennin (used to separate curds and whey in 80-90% of

all cheeses made in the United States) are made by genetically engineered microbes. Many other breeding methods "genetically modify" plants including widely used methods such as radiation and chemical mutagenesis, protoplast fusion, embryo rescue, and induction of polyploidy. Although these methods often create extensive and largely unknown genetic modifications to DNA, plant breeding has never been considered to be inherently dangerous, nor is it specifically regulated.

Although most commercialized crops that have been developed using GE thus far have been made to resist insects or herbicides, this method can be used be used for many purposes. Public sector scientists in Hawaii and New York used GE to produce a virus-resistant papaya, a product which has literally saved the Hawaiian papaya industry. Other introductions include drought-resistant corn, virus resistant squash, and consumer traits like a non-browning apple, a low-acrylamide potato, and crops that produce improved oils for nutrition. Land grant university researchers in California, Florida and Texas are working to use GE to develop oranges that are resistant to citrus greening disease – something that's devastating the Florida orange industry; and grape varieties that are resistant to Pierce's disease. In New York, researchers are using a wheat gene to develop an American Chestnut tree resistant to the imported chestnut blight.

There are many publicly-funded groups around the world using GE to develop disease-resistant varieties of crops including apples, bananas, cassava, cowpea, eggplant, grapes, potatoes, rice, sweet potatoes and wheat. Some of these staple crops are an essential source of nutrients in the diets of the poor. These disease-resistant GE applications focus on **controlling disease with genetics rather than with chemicals** and importantly do not involve the use of chemical pesticides, an issue that often gets conflated with GE as a breeding method.

In 2013 approximately 433 million acres (175.2 million hectares) of crops developed using were cultivated worldwide by 18 million farmers, and. in the United States GE varieties were planted on 95% of sugar beet, 93% of soy, and over 90% of all cotton and corn acres. What have been the impacts of this widespread adoption? As a scientist I look to the peer-reviewed scientific literature to answer such questions, especially review and meta-analyses that present a summary of many independent studies.

In 2014 German University professors published a comprehensive analysis of 147 studies that have assessed the impact of the adoption of crops developed using GE. They found that the benefits were significant, not only in the US but especially in the developing world -- "**On average, GE technology adoption has reduced chemical pesticide use by 37%, increased crop yields by 22%, and increased farmer profits by 68%**."[2] This would explain their widespread adoption by farmers globally.

As a result of the widespread use of this technology in American agriculture, many food products in the United States include ingredients such as corn oil, soy protein, or beet sugar that might have been derived from a crop variety developed using GE. It has been estimated **that at least 70% of processed food items in the supermarket contain** at least one ingredient derived from a crop produced using GE, often the additive soy lecithin or various oils. Importantly, many highly processed ingredients such as sugar and oils contain no detectable traces of DNA or protein and hence there is no way to test these refined products to determine their genetic origin – meaning labeling of these products would require entire supply chain tracking and segregation to keep track of products derived from GE crops – an expensive and complicated proposition.

In the United States, the Food, Drug, and Cosmetic Act (FDCA) grants authority for food labeling to the FDA. The FDA has stated that it has no basis for finding that foods developed by GE "**differ from other foods in any meaningful or uniform way, or that, as a class, foods developed by the new techniques present any different or greater safety concern than foods developed by traditional plant breeding.**"

There is broad scientific consensus about the safety of food produced from GE crop varieties and solid data to support that consensus. A 2013 review article, written by independent Italian public-sector scientists, reviewed 1783 scientific records on GE crop safety published this past decade and concluded that "**The scientific research conducted so far has not detected any significant hazards directly connected with the use of GE crops**."[3] There has been an abundance of independent research over the years, see the GENERA database at BioFortified.org which is a searchable database of peer-reviewed research on GE crop safety, and a compilation of more than 130 research projects underwritten by the European Union (EU) which states "**The main conclusion to be drawn from the efforts of more than 130 research projects, covering a period of more than 25 years of research, and involving more than 500 independent research groups, is that biotechnology, and in particular GMOs, are not *per se* more risky than e.g. conventional plant breeding technologies**."[4]

My own 2014 review paper examined both well-designed animal feeding studies, and the field performance and health trends of the over one hundred billion food producing animals that have been consuming feed derived from crops developed using GE over the past decade in the United States, and found no credible evidence of harm.[5]

The American Association for the Advancement of Science (AAAS), the world's largest and most prestigious scientific society, stated in 2012 "**The science is quite clear: crop improvement by the modern molecular techniques of biotechnology is safe".** The World Health Organization, the American Medical Association, the U.S. National Academy of Sciences, the British Royal Society, and every other major scientific body and regulatory agency in the world that has examined the evidence has come to the same conclusion consuming foods containing ingredients derived from GE crops is no riskier than consuming the same foods containing ingredients from crop plants modified by conventional plant improvement techniques.

To date, no material differences in composition or safety of commercialized crops developed using GE have been identified that would justify a label based on the use of GE as a breeding method in the development of the crop variety. While this conclusion will not satisfy those who consider the insertion or manipulation of genes in a laboratory a material difference *per se*, the science of food safety does not support mandatory process-based labeling of GE food and, by extension, neither does the Food and Drug Administration.

Thank you again for the opportunity to speak with you today. I would be pleased to take questions from the Subcommittee.

PEER-REVIEWED LITERATURE CITED

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