

GMO Food Labeling And CRISPR-modified Foods

Article By:

Simon J. Elliott

A new law targeted at GMO food labeling instructs the Secretary of Agriculture to establish standards for identifying “bioengineered” food. While many might think CRISPR-modified foods will be covered by such a law, certain CRISPR technologies could escape labeling requirements.

The GMO Food Labeling Law

The [Amendments to the Agricultural Marketing Act of 1946](#) were passed by a bipartisan majority in the Senate, and [signed into law by President Obama on July 29, 2016](#). The law gives the Secretary of Agriculture two years to establish a national disclosure standard for “bioengineered” foods. The disclosure will be mandatory, and could be in the form of text, symbol, or link. States are prohibited from creating alternative labeling requirements.

The law also provides that “a bioengineered food that has successfully completed the pre-market Federal regulatory review process shall not be treated as safer than, or not as safe as, a non-bioengineered counterpart of the food solely because the food is bioengineered.”

Thus, the law will create a national, mandatory requirement for labeling GMO food.

The Scope of “Bioengineered” Foods

The law defines the term “bioengineering” and similar terms used with respect to a food to refer to a food:

- (A) that contains genetic material that has been modified through *in vitro* recombinant deoxyribonucleic acid (DNA) techniques; and
- (B) for which the modification could not otherwise be obtained through conventional breeding or found in nature.

The law directs the Secretary to “determine the amounts of a bioengineered substance that may be present in food, as appropriate, in order for the food to be a bioengineered food.”

The law prohibits categorizing “food derived from an animal” as a “bioengineered” food “solely because the animal consumed feed produced from, containing, or consisting of a bioengineered substance.”

Does The GMO Food Labeling Law Apply to CRISPR?

The first CRISPR-edited food to obtain FDA approval is the [CRISPR/Cas9 edited mushroom](#) that resists browning when exposed to air. This product is made by using a bacterial plasmid construct to deliver a guide RNA and Cas9 enzyme into mushroom cells and achieve the necessary deletions. The final product does not contain any foreign DNA, such as DNA from a donor or vector organism.

In a [letter to the research team](#) following a visit to the group’s laboratory in 2015, the USDA wrote:

You describe your Crispr/Cas9-edited mushroom as a having small deletions (1–14bp) in a specific polyphenol oxidase gene but containing no foreign DNA integrated into the mushroom genome.... [The] Animal and Plant Health Inspection Service does not consider Crispr/Cas9-eited white button mushrooms ... to be regulated.

That is, the USDA determined that CRISPR-edited mushrooms are not genetically modified organisms under then-current regulations because they do not contain any foreign DNA.

Under the new law, CRISPR-edited mushrooms could fall under the definition of “bioengineered” since they contain “genetic material that has been modified through *in vitro* recombinant deoxyribonucleic acid (DNA) techniques.” Thus, the new law captures a broader range of genetically modified organisms. However, to be classified as “bioengineered,” that law provides that “the modification could not otherwise be obtained through conventional breeding or found in nature.”

The specific deletion found in the CRISPR-edited mushrooms is similar to a mutation made in apples using gene silencing to obtain non-browning apples, and to mutations made in apples through conventional mutagenesis. Since conventional mutagenesis offers a way to accelerate natural processes, it may be regarded a “conventional” breeding process. Thus, it is possible that the CRISPR-edited mushrooms will fall outside the new law if the deletion is determined to be one that “could be obtained through conventional breeding or found in nature.” If that is the case, CRISPR-edited mushrooms might not have to comply with the new GMO food labeling requirements.

Detecting CRISPR Editing

A separate problem for regulators may be how to identify food that has been engineered by CRISPR technologies. Conventional genetically modified organisms, such as *Bt*-corn, contain foreign DNA that can be used to identify even minute levels of the GMO product. Since CRISPR involves genetic *deletions*, CRISPR-edited organisms do not contain foreign DNA that can be used as an identifying marker. Even if CRISPR modification is suspected, it is difficult to screen products for specific deletions, and even more so if the specific deletion is not known. Thus, the effectiveness of this law may depend on voluntary compliance.

Source URL: <https://natlawreview.com/article/gmo-food-labeling-and-crispr-modified-foods>