

Government regulation and information presentation may determine palatability of the concept of gene-edited food

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There are great expectations for gene editing and its application to agriculture.
Credit: Hisashi Urashima

Does the term "genetically edited food" sound appetizing, or does it

inspire skepticism about what is on the table? The answer could be dependent on if you live in a country that strictly regulates genetically edited food and on the way the information was presented, according to a team from Research Organization of Information and Systems (ROIS) in Japan.

The researchers analyzed the public perceptions of the risks and benefits of gene editing of [food](#) crops in the United States, Japan, and Germany. They found that of these groups, American participants had the most positive perception and German participants the most negative, with Japanese participants assessing the risks similarly to the Germans but the benefits similarly to the Americans.

The results were published in *Science, Technology, & Human Values* on October 17, 2022.

"We set out to understand how different regulatory measures for biotechnology in the U.S., European Union and Japan impact public perceptions by statistically examining the variations in the mean values of public perceptions of risks and benefits of the application of gene editing technology to food crops among the three countries," said corresponding author Naoko Kato-Nitta, associate professor at the Joint Support Center for Data Science Research and the Institute of Statistical Mathematics, Research Organization of Information and Systems, Tokyo. "Further, we wanted to statistically examine how different information provision affects the above people's perceptions in the three study countries of risks and benefits toward gene-edited crops."

The U.S., Germany and Japan all have different levels of regulation when it comes to biotechnology use for food crops. According to the researchers, in 2018, the European Court of Justice ruled that gene edited food should be regulated in the same way as genetically modified crops, while the U.S. exempts most crops using gene editing from

regulation. Japan imports large quantities of GM crops but has labeling requirements and has taken a cautious stance on domestic cultivation of GM crops. The researchers selected these countries for the study in part because they could exemplify industrialized countries from around the globe with differing policies, which potentially could impact public perception.

"To understand people's attitudes toward the application of genome editing technology to [food crops](#) by statistically examining differences in perceived risks and benefits across nations, it is important to gain insight into how the underlying political culture affects their attitudes," Kato-Nitta said.

When conducting the survey in these three countries, the researchers divided each country's participants into two groups. One group was presented with the information on gene editing using animal illustrations, and one group was presented with gene editing using plant illustrations. The researchers then assessed the perceptions of the risks and benefits of gene editing of agricultural crops in each of two categories across the three countries for a total of six groups. In all groups, the surveys first assessed if participants were aware of gene editing and to what degree.

The researchers found that the U.S. participants perceived the highest benefits and lowest risks of the groups. According to the researchers, this result validates their assumption that public attitudes toward gene editing are more positive in a country with less strict gene-editing regulations. While there was no statistical difference between Japan and Germany for the risk perceptions, the Japanese participants perceived greater benefits. The German participants also had less exposure to beneficial aspects of gene-editing information, which the researchers posit could account for why they perceived the least benefit and greatest risk.

The study also found that the U.S. participants' perceptions were not as influenced by whether they received an explanatory illustration with an animal or with a plant as those in Germany or Japan, possibly because of their greater previous exposure to gene-editing information.

Kato-Nitta said that the next steps include extending this type of research to other emerging science and technology to assess [public perception](#).

"My ultimate goal is to more comprehensively understand the key factors that affect people's perceptions of risks and benefits toward emerging science based on empirical results and to establish a new model of science communication," she said.

More information: Naoko Kato-Nitta et al, Public Perceptions of Risks and Benefits of Gene-edited Food Crops: An International Comparative Study between the US, Japan, and Germany, *Science, Technology, & Human Values* (2022). [DOI: 10.1177/01622439221123830](#)

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