

**Voluntary Report** – Voluntary - Public Distribution

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**Report Name:** MHLW Publishes Considerations for Genome Edited Fish

**Country:** Japan

**Post:** Tokyo

**Report Category:** Biotechnology and Other New Production Technologies, Fishery Products

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**Report Highlights:**

Japan's Ministry of Health, Labour, and Welfare (MHLW) released precautional notes explaining its food safety regulatory vision for fish products developed using genome editing technology. The notes include conditions for the notification of genome edited fish products to MHLW.

## Background

In February 2018, Japan's Environmental Ministry finalized policies for regulating genome editing technologies based on Japan's Cartagena Act ([JA9024](#)). Through 2020 and 2021, Japan's food and agricultural biotechnology regulators finalized regulatory guidance for the handling, consultation, and notification processes for genome editing products ([JA2021-0106](#)). In December 2020, regulators determined, for the first time, that a genome edited crop, a tomato with enhanced nutritional value, would not be regulated as genetically engineered (GE) ([JA2020-0200](#)). In September 2021, Japan determined that a genome edited sea bream with an increased edible portion is not genetically engineered (GE) and therefore not subject to the requisite GE food safety review (see [list of genome edited food products notified as non-GE](#), in Japanese).

## Handling Procedures for Genome Edited Fish Products

On February 10, MHLW convened a series of Research Committee for Genetically Engineered Foods meetings, to discuss handling of genome edited fish for food use. On June 25, MHLW released the "[Precautional Notes on the Handling of Fishes Obtained via Genome Editing Technology](#)." A provisional translation of the Precautionary Notes is included in the Appendix of this report.

MHLW concluded the below conditions for the notification of genome edited fish:

- The mutation (number of edited bases, location in genome, etc.) of the target gene is the same among the population notified by product developers,
- Confirmation of no residual foreign gene,
- Confirmation that off-target mutation does not result in the production of new allergens or an increase in the known and inert toxic substances.

MHLW sought additional clarification on genome edited fish products because of differences between most plants and fish products raised for human consumption. MHLW also notes the relatively short history of breeding and selection of fish species, and the possibility of mosaicism occurrences.

Product developers seeking consultation with MHLW should reach out the office below:

Office of Health Policy on Newly Developed Food  
Food Safety Standards and Evaluation Division  
Pharmaceutical Safety and Environmental Health Bureau  
Ministry of Health, Labour and Welfare

Mailing address: 1-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100-8916, Japan

Email: [ISESHINKAI@mhlw.go.jp](mailto:ISESHINKAI@mhlw.go.jp)

Tel: 81-3-5253-1111, ext.4270 or 4284

Fax: 81-3-3501-4868

## Appendix

(Provisional Translation – Official Version currently available in Japanese only)

June 25, 2021

Research Committee for Genetically Engineered Foods  
Ministry of Health, Labour and Welfare

### Precautional Notes on the Handling of Fishes Obtained via Genome Editing Technology

#### 1. Consideration on Food Hygiene

##### 1) General precaution

- In comparison to agricultural crops, the handling of “fish derived from genome editing technology” (hereafter “genome edited fish”) requires precautions for aquaculture as below.
  - (1) The breeding history is very short
  - (2) Some fish have greater genetic variance
  - (3) In the generation to which genome was edited, each cell is prone to mosaic mutation (However, in the next generation by these crosses, the mutation will be uniform in all cells)

##### 2) Consideration on the selection of group to be notified (note the reference)

- In past experience of genetically engineered foods (plants), safety review is based on the principle that the “population” is derived from line of one event (one mutated cell).
- However, for genome-edited fish that do not have any residue of foreign genes, the genetic changes can be considered to be within the range of those that can occur naturally or by conventional breeding techniques, and do not necessarily need to be a population derived from a single event-derived (i.e., organism derived from single-cell-mutation) strain, as in the safety evaluation of genetically modified foods.

In this case, the following conditions will be required for the selection of the notified group prior to initiate case-by-case determination whether accepting the notification. It is necessary to consider the conditions for selecting the notified group as shown below and make a decision individually.

#### Example of Condition (Required for the Acceptance of Notification)

The mutation (number of edited bases, location in the genome, etc.) of the target gene is exactly the same among the population to be notified, and necessary study to ensure food safety is made, such as, but not limited to, the confirmation of no residual foreign gene in all individuals of the parental generation of the notified population (or in all individuals of the notified population), and that the off-target mutation not resulting in the production of new allergens or an increase in the known and inert toxic substances.

#### 3) Important Note regarding Fish Containing Endobiological Poison

- Even for genome-edited fish that are considered to be equivalent to conventional products, as long as the conventional fish themselves pose food safety risk, and if there are relevant regulations in the Food Sanitation Act and/or related notices, those regulations must be complied.
- The risk of natural toxicity should be considered carefully, regardless of the degree or location of genome editing. For example, in the case of puffer fish, it is necessary to show by appropriate

studies that the toxicity of the edible parts of conventional puffer fish and that of genome-edited puffer fish are equivalent from a food safety perspective.

#### 4) Other Considerations in Food Hygiene

- Confirmation of the presence or absence of foreign genes and off-target mutations by whole genome sequencing analysis is not necessarily perfect in the current situation, and is considered to be one of the methods to be chosen in combination with other methods as necessary from food safety perspective.

#### 2. Other Notes of Consideration

- It is important to address consumer concerns to genome editing technology for foods, desirable to implement considerate risk communication to encourage consumer understanding.
- It is also necessary to continue to encourage industry the transparent communication including labeling for consumers' right to choose.

#### **Attachments:**

No Attachments.