



Policies for agricultural products of genome editing technology in Japan (for Biological Diversity)

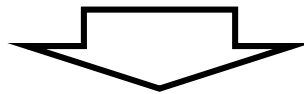
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- **Biosafety** << **“Cartagena Act”**
(Ministry of Ag., Forestry, Fisheries)
(Ministry of the Environment)
- **Food Safety** << *Food Sanitation Law*
(Ministry of Health, Labour and Welfare)
- **Feed Safety** << *Feed Safety Law*
(Ministry of Ag., Forestry, Fisheries)

LMOs are allowed for distribution, importation and cultivation and so on after completion of safety assessment.

Its formal nomenclature is “Act on the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms”



As known as “Cartagena Act”

<Six Competent Authorities>

- *The Ministry of the Environment*
- + *The Ministry of Agriculture, Forestry and Fisheries* ← *Agricultural products*
- + *The Ministry of Finance*
- + *The Ministry of Education, Culture, Sports, Science and Technology*
- + *The Ministry of Health, Labour and Welfare*
- + *The Ministry of Economy, Trade and Industry*

Points to Consider in the ERA for LMOs (e.g., animals)

- **Competitive advantages;**

Competition against wild animals for resources such as food, nesting sites, habitats, etc.

- **Predatory or parasitic ;**

Interference with inhabitation or growth of wild plants or animals by preying on or being parasitic on them

- **Production of harmful substances;**

Production of harmful substances interfering with inhabitation or growth of wildlife

- **Cross-ability;**

Hybridization with wild animals and transmitting inserted (modified) nucleic acid

- **Other properties;**

Such as indirectly effects on wildlife by changing the ecosystem

Handling of Genome Editing Organisms in the interest of Biosafety

From May 2018 to January 2019, The Central Environment Council of Japan discussed the handling of organisms obtained through genome editing technology.

<Recognition>

- If an extracellularly processed nucleic acid is not inserted into the host, the organisms are not regarded as “LMOs” in Cartagena Act.
- If an extracellularly processed nucleic acid is inserted into the host and the finally obtained organisms contain the nucleic acid or a replicated product thereof (or are not confirmed as free of it), the organisms are regarded as “LMOs” in Cartagena Act. It is necessary to take appropriate measures in Cartagena Act.
- If an extracellularly processed nucleic acid is inserted into the host and the finally obtained organisms are confirmed as free of the nucleic acid (or a replicated product thereof), the organisms are not regarded as “LMOs” in Cartagena Act.

Summary of the MoE Notification

On February 8th, 2019, Ministry of the Environment of Japan (MOE) issued “Notification: Handling of organisms which are obtained through genome editing technology but which are not defined as living modified organisms (LMOs)” stipulated in Cartagena Act (Notification No. 1902081)” (hereinafter referred to as “the MOE Notification”).

<Basic Policy>

- Prior to the use of such organisms, those who intend to use them should provide information regarding the characteristics of the organisms and the results of a review of the possible adverse effects on biological diversity to the competent government authorities.
- However, this should not apply to cases where the organisms are used in environments wherein containment measures stipulated by the Ordinance under Article 12 of Cartagena Act or the measures approved by the competent government agencies are being taken.
- After the beginning of the organisms, if it is determined that they have the potential risk of adverse effects on biological diversity, the user should immediately take necessary measures to prevent the effects and should report it promptly to the competent government agencies.

Summary of the MoE Notification

<Competent Authorities>

- *The Ministry of the Environment*
- + *The Ministry of Agriculture, Forestry and Fisheries*
 - ← *Agricultural products*
- + *The Ministry of Finance*
- + *The Ministry of Education, Culture, Sports, Science and Technology*
- + *The Ministry of Health, Labour and Welfare*
- + *The Ministry of Economy, Trade and Industry*

Procedure for the use of agricultural products of genome editing technology

- In October 2019, responding to the MOE Notification, MAFF issued a notification (hereinafter referred to as “the MAFF Notification”) regarding specific procedures for providing information to the MAFF regarding organisms obtained through genome editing technology, which falls under administrative jurisdiction of the MAFF.

Contents of the MAFF Notification

- ✓ MAFF requests users※¹ to prepare a draft of “Information Form” and consult with MAFF (**Prior Consultation**)
 - ⇒MAFF will study the contents. In an examination, **opinions of persons with relevant knowledge and experience should be considered** if necessary.
- ✓ MAFF requests users to finalize and submit an Information Form to MAFF after Prior Consultation.
- ✓ MAFF announces the contents of the Information Form on the website※²
 - ※¹ “user” assumes developer and importer
 - ※² Except information that may cause an unfair profit or disadvantage for the User when it is announced

Information Form

Items		Entry field
1.	Name and summary of the organism obtained by genome editing technology	<ul style="list-style-type: none"> • Name • Characteristics
2.	Application of the corresponding organism	Application
3.	Summary of the use-facility	Facility to use
4.	The fact (and its evidence) that the organisms do not contain extracellularly processed nucleic acid or any replicated product thereof specified in Article 2, paragraph 2, item 1 of Cartagena Act	<p>Information indicating that the organism is not subject to the Cartagena Act</p>
	(1) Whether extracellularly processed nucleic acids were inserted or not (if inserted, information about the inserted nucleic acids must be provided.)	
	(2) Whether remnants of inserted nucleic acids exist or not (including information about the process of selection/breeding and the method of confirming the presence or absence of the corresponding inserted nucleic acids.)	

Items		Entry field
5. Taxonomic species of the modified organism	(1) Name of the species based on the taxonomic classification and the variety or strain of the host	Information on modified organism (Distribution in the natural environment, etc.)
	(2) Naturally growing area in the natural environment and history and current status of use and physiological / ecological characteristics	
6. Method of genome-editing used for the modification	(1) Information about artificial nuclease	Method of genome-editing
	(2) Method of introducing the corresponding artificial nuclease	

	Items	Entry field
7. Modified gene and its function	(1) Target cleavage site on the host genome and variation that has occurred at the cleavage corresponding site	Cleavage site on the genome
	(2) Information about the gene with target cleavage site (target gene) and the theoretically likely trait change caused by the modification	<ul style="list-style-type: none"> • Modified gene information • Theoretical changes in traits
8. Changes of traits introduced by the modification		Actual changes in traits

Items		Entry field
9. Whether there are any changes of traits other than 8 above (description of the changes, if any)	(1) Information about the possibility of other modifications than that at the target site	Unintentional changes <ul style="list-style-type: none"> • Off target • Changes in other traits
	(2) Other trait changes than that mentioned in 8 above that were caused in the created organism compared with the host	
10. Discussion on possible adverse effects on biological diversity through the use of the organisms	(1) Competitive advantage	Discussion on potential impact to biodiversity
	(2) Predacity or Parasitism	
	(3) Toxic-substance produce ability	
	(4) Cross-ability	
	(5) Other characteristics	
	(6) Comprehensive discussion (Conclusive comment)	

Points to confirmation in Prior Consultation

- ✓ The organisms do not contain extracellularly processed nucleic acid or any replicated product thereof specified in Article 2, paragraph 2, item 1 of Cartagena Act
- ✓ Characteristics obtained by genome editing technology
- ✓ Whether there are any unintended changes in traits other than objective traits, including the effects of “off-targets[※]”
 - ※ existence of similar sequence to the target sequence

- ✓ Possibility on the effect on biodiversity

- Competitive advantages
- Predacity or parasitism
- Toxic-substance produce ability
- Cross-ability
- Other properties



Same as the items confirmed
in the assessment of LMOs

- As the first case, in December 2020, MAFF accepted and announced the Information Form * of the tomato with a mutation in a γ -Aminobutyric acid (GABA) synthetic enzyme gene using genome editing technology.

*Only in Japanese.

- Act on the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms

<http://www.japaneselawtranslation.go.jp/law/detail/?id=132&vm=04&re=01>

Thank you for your attention!