

遺伝子組換え食品は、危険？ 夢の技術？

遺伝子組換え食品とは、遺伝子操作によりほかの生物の細胞から有用な性質を持つ遺伝子（例えば、害虫に対する耐性）を取り出し、それを作物の遺伝子に組み込んで生み出された作物を利用して作られた食品を指します。従来の品種改良との違いは組み込む有用な遺伝子が種を超えて得られる点と、効率的な改良が可能な点です。1996年に北米でトウモロコシの商業栽培が始まって以来、遺伝子組換え作物の栽培国と作付面積は年々増加しており、日本では、2012年時点で大豆、じゃがいも、なたね、トウモロコシ、綿、てんさい、アルファルファ、そしてパイナップルの8作物の販売・流通が認められています。遺伝子組換え作物の開発・利用については、生態系への影響、その安全性などをめぐり、世界で賛成派と反対派の論争が続いています。

遺伝子組換え食品をめぐる世界の動き

1972年	アメリカ	ポールバーグが世界で初めて遺伝子組換えに成功
1975年		アシロマ会議（アメリカ）で世界の科学者が遺伝子組換えに関するガイドラインを議論
1983年		OECD、バイオテクノロジーの安全性を協議する国際会合を設置
1994年	アメリカ	最初の遺伝子組換え食品として「フレーバーセーバー」トマトを販売開始
1996年	日本	初めて遺伝子組換え作物を食品として認可、輸入開始
1997年	EU	遺伝子組換え食品のラベル表示の義務付け
2001年	日本	遺伝子組換え食品表示義務制度スタート、安全審査を法的に義務化
2003年		バイオセーフティーに関するカルタヘナ議定書発効

Warm-up Questions

- ① Do you know what kinds of food are genetically modified?
- ② When you buy food, do you care if it contains genetically modified foods? If you do, why?

Calbee Food Co. recalls Jagariko in 2001

In June 2001, Calbee Food Co. announced a recall of its popular Jagariko products produced before June 7 in the same year. This is because a genetically modified variety of potato which was not yet approved in Japan was discovered in the **ingredients** of two varieties of the potato snack—cheese flavored and lightly salted. The snacks in question had been produced at Calbee's plant in Shiga Prefecture in the previous month, and **distributed** in the Kinki region.

The Shiga prefectural government ordered the plant to recall about 260,000 problematic packages, but the company decided to **voluntarily** recall all the Jagariko products. According to Calbee, the company used imported frozen potatoes containing the New Leaf Plus from the US and Canada, a genetically modified potato which produces its own **insecticide**. It had been approved in the two countries, but was still under **examination** for its safety for use in Japan at that time. The safety was **confirmed** after tests were completed in 2003.

Notes

approve 認可する in question 問題の

Vocabulary Check

上の英文を読み、①～⑥の用語の説明としてふさわしいものを a～f より選びなさい。

- | | |
|---|-----|
| ① the act of looking at or considering something very carefully | () |
| ② a chemical used for killing pests | () |
| ③ one of the foods that are used to make a particular dish | () |
| ④ to send goods to shops and businesses | () |
| ⑤ to state or show that something is definitely true or correct | () |
| ⑥ willingly, without being forced | () |

a. confirm
d. ingredient

b. distribute
e. insecticide

c. examination
f. voluntarily

Read On *The pros and cons of GM foods*

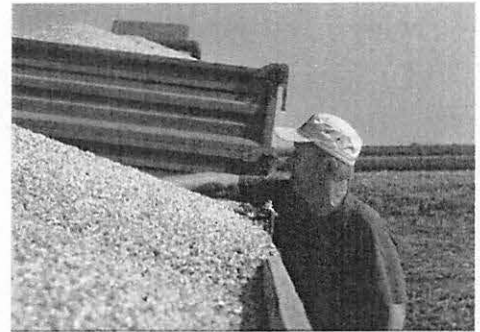
各パラグラフを読み、あとの問題に答えなさい。

Paragraph 1

遺伝子組換え食品とは



Genetically modified (GM) foods are those produced from genetically altered crops. GM crops are commonly made by adding desirable genes to their genome to increase their ^①resistance to pests or diseases, or production of extra nutrients. Currently, there are several GM crops used as food sources including soybeans, corn, canola, and cotton seed oil. In most cases, they are processed and used as ingredients in food. As of 2012, GM crops were commercially ^②cultivated in 28 countries including the U.S. with the biggest cropping acreage, followed by Brazil.



A corn farm in the U.S.

Notes

genome ゲノム canola カノーラ cotton seed oil 綿実油 cropping acreage 作付面積

Exercise 1 下線部①②とほぼ同じ意味を表す単語を a ~ d より選びなさい。

- ① a. ability b. immunity c. opposition d. sensitivity
 ② a. developed b. encouraged c. raised d. sold

Paragraph 2

遺伝子組換え食品のメリット



One advantage of GM crops is a higher yield. Pest-resistant crops are less damaged by insects, and herbicide-resistant ones can grow even where pesticides are heavily used. Other advantages of GM crops are reduced production costs and environmental friendliness. The introduction of these crops reduces the amount of pesticide and herbicide needed, which saves money and labor and contributes to environmental protection. Moreover, nutrient-enriched crops could alleviate food shortage problems in needy countries. GM crops adapted to harsh environments such as drought can be one solution to the problem of world hunger.

Notes

yield 収穫量 herbicide 除草剤 pesticide 殺虫剤・除草剤 nutrient-enriched 栄養強化された alleviate 軽減する drought 干ばつ

Exercise 2 英文の内容に合う記述には T を、合わないものは F を書き入れなさい。

- ① GM crops are environmentally friendly because they need fewer chemicals. ()
 ② GM crops have the potential to help solve some global problems. ()

One of the concerns about GM foods is their safety. So far, no harmful effects from eating GM foods have been reported, but their long-term effects on the human body are unknown. There is also a risk of negatively affecting the ecosystem. Mass-production of GM crops may decrease the genetic diversity of plants, which makes them vulnerable to certain diseases. Another concern is that a few biotechnology companies may dominate food production through the control of the seeds of GM plants they have developed. In most cases, farmers have to purchase costly seeds every year because they are protected as intellectual properties.

Notes

- mass-production 大量生産 genetic diversity 遺伝的多様性
 intellectual property 知的財産

Exercise 3 英文の内容に合う記述には T を、合わないものは F を書き入れなさい。

- ① Quite a few cases of the negative influence of GM foods on people have been reported. ()
- ② Farmers can continuously use seeds of GM crops once they have bought GM seeds from biotechnology companies. ()

Different countries have different stances on GM foods! The U.S., the biggest ^① advocate of GM foods, allows the commercial cultivation of more than 120 GM crops as food, and does not require labeling of GM foods. On the other hand, the majority of EU countries have a negative stance toward GM crops. Only one type of GM corn is being cultivated and food must carry a label indicating the presence of GM crops. There is a vague sense of ^② distrust toward GM foods in Japan, where GM crops are not commercially cultivated and labeling is required by law.

Notes

- labeling ラベル付け indicate the presence of... …の存在を示す vague 漠然とした

Exercise 4 下線部①②とほぼ同じ意味を表す単語を a ~ d より選びなさい。

- ① a. assistant b. practitioner c. promoter d. support
- ② a. awareness b. confidence c. suspicion d. responsibility

Listen to Model Opinions

Should GM foods be promoted? (遺伝子組換え食品は推進されるべきか) について、以下4人のモデルオピニオンを聞き、空欄を埋めなさい。

Pro



Carlos from Brazil



I'm in favor of GM foods. **One of the main reasons** for supporting them is that they will probably help _____ the problem of food _____ because they can produce high yields of crops.



I think we should promote GM foods. **Thanks to GM** technology, farmers can produce food more reliably and _____. It doesn't make sense not to take _____ of it.



Michell from the U.S.

Con



Kazu from Japan



I have doubts about the safety of GM foods. They may pose great health risks to the human body and the _____. They are too new for us to _____ their safety.



I don't think so. **One negative consequence of the** _____ of GM foods is a wider gap between rich and poor farmers. Rich farmers can afford _____ GM seeds while poor farmers may end up deep in debt.



Emma from Britain

Useful Expressions

議論に使える表現を覚えましょう。



1. One of the main reasons for ~ is... ~する主な理由のひとつは…である

One of the main reasons for cultivating GM crops is that they raise yields.

(遺伝子組換え作物を作る主な理由のひとつはそれらが収穫高を上げるからだ)

2. thanks to... …のおかげで

Thanks to GM technology, many starving and malnourished people in developing countries might be saved in the future.

(遺伝子組換え技術のおかげで、発展途上国の多くの飢えた、栄養失調の人々が将来救われるかもしれない)

3. One negative consequence of ~ is... ~がもたらすマイナスの結果のひとつは…である

One negative consequence of mass-production of GM foods is the loss of genetic diversity.

(遺伝子組換え食品の大量生産がもたらすマイナスの結果のひとつは遺伝的多様性が失われることだ)

Discussion

モデルオピニオンを参考にし、どちらの議論がより説得力があるか考えなさい。またその根拠を話し合ってみましょう。

I [think / don't think] that GM foods should be promoted because
