Establishment of Circular Food Systems

Material Issue
Environmentally Responsible MONOZUKURI
(Product Development and Manufacturing Practices)

Governance Strategy Risk management Metrics and targets Specific initiatives

Governance

The Fuji Oil Group has established the Sustainability Committee[*1] as an advisory body to the Board of Directors that is chaired by the President and CEO. From a multi-stakeholder perspective, the committee deliberates on and monitors Establishment of Circular Food Systems, a priority action to address material ESG issues,[*2] and makes recommendations to the Board. The Group implements related initiatives under the oversight of the Head of R&D Headquarters, the Executive Officer.

*1 Governance, Strategy, Risk Management, Metrics and Targets > Governance
https://www.fujioil.co.jp/en/sustainability/sustainability_management/#governance

*2 Governance, Strategy, Risk Management, Metrics and Targets > Metrics and targets
https://www.fujioil.co.jp/en/sustainability/sustainability_management/#index

Strategy

A circular food system refers to a mechanism that reduces environmental impact by circulating and utilizing limited resources at all stages, from the production of raw materials to food manufacturing, processing, distribution, consumption and disposal.
The mass consumption and disposal of food hinders the effective use of resources and increases the burden of waste management. This exacerbates climate change and can also have a damaging impact on nature.
Our Group is aiming to reduce the environmental impact across our product supply chain. We believe it is vital to evaluate and effectively reduce the environmental impact not only in raw material procurement and our own manufacturing processes, but throughout the entire product supply chain including at the stage at which customers process our products. As part of our efforts to minimize our environmental footprint, we are cognizant of the fact that utilizing CO_2 emissions during the raw material cultivation process contributes to reducing CO_2 emissions in the product manufacturing process when we implement such initiatives continuously.
Failure to address these issues will increase risk in all areas, including in raw material procurement, logistics, and manufacturing, as well as resulting in biodiversity loss caused by climate change-driven extreme weather events. Conversely, responding to these issues will become an opportunity to achieve a sustainable raw material supply through environmental conservation, reduce costs by streamlining production processes, and cultivate trust among stakeholders.
Starting from our own manufacturing processes, we will work to develop processing technologies with a low environmental impact and that help us achieve our reduction targets of GHG emissions, water usage, and waste outlined in our Environmental Vision 2030/2050.*
We also conduct assessments of all our business activities from a wider point of view, such as on environmental conservation during the production process of raw materials, and aim to reduce environmental impacts throughout the entire product lifecycle by leveraging technological innovation.

* Environmental Vision 2030/2050
https://www.fujioil.co.jp/en/sustainability/environmental_management/

Risk management

The Fuji Oil Group systematically manages risks and opportunities related to Environmentally Responsible MONOZUKURI (Product Development and Manufacturing Practices), an area of sustainability matters that address material ESG issues, in alignment with Group significant risks.

Group significant risks
Risk type: Strategy/ Environment and human rights/ Procurement
https://www.fujioil.co.jp/en/ir/policies_and_systems/risk/

We are aware of the risk associated with the changes in the market environment owing to the creation of innovative new technologies by other organizations. Those changes may erode the Group's technological superiority in establishing circular food systems, and lead to the loss of our market competitiveness. As a countermeasure, we will strengthen our ability to respond to the changing market environment by expanding our business and research areas through technology development in collaboration with various external organizations.

Metrics and targets

○ At least 90% complete △ At least 60% complete ✕ Less than 60% complete

FY2024 Goals	FY2024 Results	Self-assessment
Select soybean varieties suitable for increasing yields with CO_2 fertilization	Identified high-yield soybean varieties that demonstrated the potential to fix (recycle) more CO_2	○
Investigate cultivation conditions at medium-scale facilities	Conducted cultivation tests using the plant factory facilities owned by Kyushu Electric Power Co., Inc., and obtained cultivation data from multi-layer hydroponics under controlled environments	○

Analysis

With the aim of establishing a circular food system targeting the soybeans used as a raw material in our products, we are undertaking a project that involves capturing CO_2 emitted from a waste incineration facility and using it as fertilizer for soybeans cultivated in plant factories, thereby promoting soybean growth and making effective use of CO_2 emissions. In the future, we plan to utilize the carbon dioxide separation and capture equipment already installed at a waste incineration facility in Saga City to develop technology for cultivating soybeans using the captured CO_2. Using the Group's processing technology, we hope to make the soybeans grown widely available in the market as a sustainable product. In this project, establishing the underlying cultivation technology will be front of mind as we press ahead with research and development.
Achieving soybean cultivation in a plant factory requires a higher level of productivity compared to outdoor cultivation. We ran tests in a plant factory facility where we expect actual cultivation to take place and collected data on the impact of the cultivation environment on soybean growth. In doing so, we have acquired the data we need to ensure optimal environmental control for plant factory cultivation. In the future, we will conduct cultivation tests using the selected optimal soybean varieties and examine the cultivation conditions to improve productivity.

Next steps

We aim to reduce our environmental impact by utilizing CO_2 emissions. Our present challenge is to improve soybean productivity for commercialization. To address this issue, we set the following goals for FY2025:

- Verify cultivation in a medium-scale plant factory under CO_2 fertilization conditions

Specific initiatives

Research project on soybean cultivation in Japan utilizing carbon emissions from a waste incineration facility

Developing technology that helps address shortages in food resources caused by climate change and population growth is an important issue for our Group. To counter the recent price increases in food and energy resources, and from the standpoint of food security, we believe that providing delicious, healthy, and sustainable foods that use domestic crops is indispensable.
To that end, in May 2022, we launched a joint research project with Saga City, Saga University, and ITOCHU ENEX Co., Ltd. to utilize CO_2 in the production of soybeans in Japan. So far, we have conducted research on improving soybean growth speed and quality with CO_2 fertilization, as well as the selection of suitable varieties and the development of cultivation techniques to enhance growth. As a result of these research activities, we achieved an increase of up to approximately three times[*1] the average yield of soybeans in Japan in 2023, which is 169 kg per 1,000 m^2 (according to Japan's Ministry of Agriculture, Forestry and Fisheries crop statistics).
Based on our research results so far, we will continue to undertake research aimed at further boosting yields by implementing more precise environmental controls[*2] with the cooperation of Kyushu Electric Power Co., Inc. at their research facilities, in addition to the testing facilities established at the Saga University campus.

*1 Assuming a full harvest based on the conversion of the testing area to 1,000 m^2.

*2 Environmental controls refer to the control of various factors that make up the environment, such as temperature, humidity, and oxygen and carbon dioxide concentrations.

Exterior of the Kyushu Electric Power Co., Inc. research facility (Saga City)

Cultivation inside the plant factory