

Reduction and Upcycling of Food Waste

Management information

Relevance to our business

As a manufacturer of food ingredients, the Fuji Oil Group recognizes the efficient use of limited food resources as a material issue, given the concerns over future food supply posed by population growth, climate change, and biodiversity loss. Food loss and waste reduction is an explicitly defined target of Goal 12 of the SDGs. Leveraging our position as a B-to-B food ingredient manufacturer, we help reduce food loss in our operations and the operations of our customers, B-to-C food manufacturers, and reduce food waste at retailers through our product development.

Basic approach

The Fuji Oil Group develops technologies to reduce waste at several steps in the food value chain. The goal of these technologies is to reduce losses in our manufacturing and distribution processes, extend the best-before date of our products and customers' products that use our products, and to enable reprocessing of customers' products. Upcycling materials that otherwise would be wasted through the remarketing of food resources is an important strategy for reducing loss during manufacturing.

Management system

Based on an ESG materiality assessment conducted in FY2022, we changed the name of this material ESG issue*1 from "food loss and waste reduction," which was used until FY2021, to "reduction and upcycling of food waste." This theme forms part of the "circular economy" category of our material ESG issues. The Chief Technology Officer (CTO) oversees initiatives in this area, while the Sustainability Committee,*2 an advisory body to the Board of Directors, monitors progress and results.

*1 Follow the link below to learn more about material ESG issues.
 > <https://www.fujioilholdings.com/en/sustainability/materiality/>
 *2 Follow the link below to learn more about the Sustainability Committee.
 > https://www.fujioilholdings.com/en/sustainability/sustainability_management/

Goals / Results

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

FY2021 Goals	FY2021 Results	Self-assessment
Develop and propose technologies that maintain product quality (extend freshness) and technologies for secondary processing (repurposing)	Developed new ingredients that maintain product quality, pitched the ingredients to customers, and achieved customer adoption	○

Analysis

We gained customers' understanding of our strategy of extending best-before dates by maintaining the quality of products during storage. This made it easier to partner with customers, which led to the development and adoption of new ingredients. We continue to work on addressing quality-related issues to achieve further reductions of food loss and waste.

Next step

We will focus our efforts on developing ingredients and technologies that preserve the "freshly made" quality of foods and extend best-before dates. We will also search ways to make good use of what is typically discarded as waste. We set the following goals for FY2022.

- Develop technologies and ingredients that prevent deterioration when food products are stored for long periods
- Develop technologies for transforming byproducts into value-added products

Developing ingredients that preserve food quality

Frozen foods have gained prominence as a solution for preventing food loss and waste, but deterioration during long-term frozen storage remains a problem. To address this issue, the Fuji Oil Group has developed GRANDMOIST, an ingredient that can be incorporated into dough to prevent deterioration in taste and texture over time. This product is being offered to the frozen bread market. We expect GRANDMOIST will achieve increasing market penetration going forward, due to its ability to maintain product freshness during storage, extend the best-before dates of products, and contribute to food waste reduction.



Product with conventional ingredients
Moisture from the bread sublimates and freezes during storage, clinging to the bread's surface as ice crystals. Deterioration becomes apparent when the bread is defrosted, at which point its surface becomes sticky and its texture becomes dry.



Product that uses GRANDMOIST
No sign of ice crystals forming on the surface when stored in the freezer. The bread remains moist and has the same quality after defrosting as it did prior to being frozen.

Creating functional food ingredients through upcycling

The Fuji Oil Group sells food ingredients made by separating plant-based raw materials into their constituent elements, such as oils, fats and protein. Using components of a raw material effectively is a crucial aspect of resource efficiency. Upcycling process streams in the production of soybean oil is an example of this. After pressing the soybeans for oil, we separate the soy protein, and from the curd byproduct we separate the water-soluble soy polysaccharides. In addition to food loss reduction through upcycling, we also work on creating new functional ingredients. One example of this is our effective use of starch residues, that tend to go to waste. The manufacturing process for pea starch, which is used to make noodles, generates large volumes of fiber as a byproduct. Making effective use of this fiber, we developed an upcycling technology for manufacturing soluble pea fiber that can be used as a stabilizer to prevent whey separation of drinkable yogurt. We built a plant in Germany dedicated to manufacturing soluble pea fiber from pea residues generated in Europe. The plant will start its commercial operation in 2022.



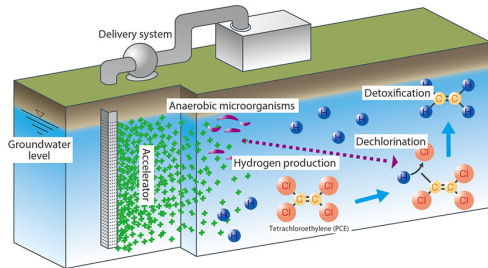
Fuji Brandenburg GmbH

Market launch of upcycled product SoyBio MA

In October 2021, Fuji Oil Co., Ltd. began sales of SoyBio MA, a bioremediation* agent for detoxifying polluted soils. SoyBio MA works by serving as a source of nutrition for microorganisms that break down toxic substances. The product has proven to be especially effective in remediating industrial brownfield sites that have been polluted by volatile organic compounds (VOCs) and oil. SoyBio MA is also priced lower than other soil amendments on the market, helping to reduce project costs.

The product draws on Fuji Oil's expertise in making nutritionally rich soy food products such as soy protein, soy peptides, and soy meat, which has become popular as a plant-based food. Soy whey, the main ingredient used to make SoyBio MA, is a byproduct of food production where the soy protein is separated, heated and concentrated, which is naturally rich in nutrients. Upcycling this whey to produce SoyBio MA helps to reduce food loss.

* A process of repairing environmental pollution that harnesses the natural activity of microorganisms.



Conceptual diagram of *in situ* bioremediation



In situ bioremediation* site where SoyBio MA is delivered via a well

* Remediation conducted at the actual site (in situ) of the polluted soil or groundwater.